# Details of the New Courses Introduced Across All Programmes.

# 2023-2024

Mahajana Education Society (R)
Education to Excel

**SBRR MAHAJANA FIRST GRADE COLLEGE**

**(Autonomous)**

Jayalakshmipuram, Mysuru – 570 012
Affiliated to University of Mysore Re-accredited by NAAC with 'A' Grade
College with Potential for Excellence

# BOARD OF STUDIES (BoS)

# DEPARTMENT OF BIOCHEMISTRY

**UG** ✓

**PG** ☐

**NEP Syllabi for V and VI Semester B.Sc. Biochemistry**

**2023-24**

# DEPARTMENT OF BIOCHEMISTRY

## *Motto*

*Science for Future*

## *Vision*

*Improving knowledge of Science through innovation and research for Better Future*

## *Mission*

*To provide a broad-based fundamental knowledge of Biochemistry by creative research ideas and professional skills*

# Program Outcomes (POs) for Bachelor of Science

**PO 1: Domain Knowledge** - Acquire and apply knowledge of science in relevant areas.

**PO 2: Problem Analysis -** Recognize real-world problems and user's requirements to propose solutions for the same using basic principles of science.

**PO 3: Design and Development of Solutions -** Developing solutions and inferences for complex problems using critical and analytical thinking.

**PO 4: Investigation & Research** - Ability to formulate hypothesis, augment research questions and identify & refer relevant sources for examining or inspecting technical issues as per their level of understanding and knowledge.

**PO 5: Use of Modern Techniques/Tools** - Use digital resources, various software/platforms and appropriate techniques to interpret concepts of science.

**PO 6: Impact of Science on Society** - To prepare competent human resource and to develop scientific attitude at local and global levels for social benefit.

**PO 7: Environment and Sustainability -** Apply the knowledge gained for conserving environment and to handle environmental issues with sustainable solutions.

**PO 8: Moral and Ethical Values** - Imbibe moral values and professional ethics to maintain the integrality in a professional scenario while being aware of the cultural diversities.

**PO 9: Individual and Team Work with Time Management** - Work productively in a team or as an individual while exhibiting time management skills.

**PO 10: Communication** - Develop the caliber to convey various concepts of science effectively.

**PO 11: Project Management and Finance** - Set up enterprises/companies and build entrepreneurship, project management and finance planning skills.

**PO 12: Life-long Learning** - Engage in the art of self-directed learning.

# List of BoS Members

| Sl. No | Category | Name and Designation | Address for Communication | e-Mail & Mobile No. |
|---|---|---|---|---|
| 1. | Chairperson | **Ms. Ramya V**<br><br>Assistant Professor<br>&<br>HoD | Department of Biochemistry,<br><br>SBRR Mahajana First Grade College, Autonomous Jaylakshmipuram, Mysuru-12 | ramyav.fgc@mahajana.edu.in<br>7760108585 |
| 2. | **Nominee by the Vice Chancellor** | **Dr. Kemparaju K**<br><br>Professor | DoS in Biochemistry, Manasagangothri University of Mysore, Mysuru. | kemparajuom@gmail.com<br>kemparaj@biochemistry.unimysore.ac.in<br>9945996543 |
| 3. | **Two Experts from Other University** | **Mr. Haleshappa R**<br>Assistant Professor | Department of Biochemistry, Nrupathunga University Nrupathunga Road, Bangalore - 560001 | haleshr222@gmail.com<br>9743896433 |
| 4. | | **Dr. Siddesha J M**<br>Assistant Professor | Division of Biochemistry, School of Life Sciences, JSS Academy of Higher Education & Research, SS Nagar, Mysuru-15 | siddeshajm@gmail.com<br>7019041500 |
| 5. | **One Person from Industry** | **Dr.PuneethKumar**<br>Managing Director | Azymus Life science Pvt. Ltd. Kellamballi industrial Area, KIADB, Chamarajanagara | azymus.pharma@gmail.com<br>8971155575 |
| 6. | **Alumnus** | **Ms. Pallavi M R**<br>Assistant Professor | Department of Biochemistry<br><br>MMK & SDM College,<br><br>Mahila Maha Vidyalaya, Mysuru | pallavimr1990@gmail.com<br>9538582629 |
| 7. | **Member** | **Ms. Radhika P**<br>Assistant Professor | Department of Biochemistry,<br><br>SBRR Mahajana First Grade College, Autonomous Jayalakshmipuram, Mysuru-12 | radhikap.fgc@mahajana.edu.in<br>9986585574 |

# Course Structure (NEP 2020)

## III Year B.Sc. Biochemistry

### Discipline Specific Courses (DSC), Internship (INT)

| Course Code, Type and Title | | Hours /week L | Hours /week T/P | Number of Credits (L:T:P) | Max marks IA C1 | Max marks IA C2 | Max marks Exam C3 | Exam Duration | Total Marks |
|---|---|---|---|---|---|---|---|---|---|
| **V SEMESTER** | | | | | | | | | |
| **232569** | DSC (5) Biochemistry of Biomolecules and Nutrition | 4 | 0 | 4: 0: 2 (6 credits) | 20 | 20 | 60 | 2½ Hours | 100 |
| | DSC (5) LAB Qualitative analysis of Biomolecules and their nutritional aspects | 0 | 4 | | 10 | 15 | 25 | 3 Hours | 50 |
| **232570** | DSC (6) Human Physiology and Enzymology | 4 | 0 | 4: 0: 2 (6 credits) | 20 | 20 | 60 | 2½ Hours | 100 |
| | DSC (6) LAB Human Physiology and Enzymology | 0 | 4 | | 10 | 15 | 25 | 3 Hours | 50 |
| **VI SEMESTER** | | | | | | | | | |
| **232669** | DSC (7) Metabolism with Clinical Correlations | 4 | 0 | 4: 0: 2 (6 credits) | 20 | 20 | 60 | 2½ Hours | 100 |
| | DSC (7) LAB Metabolism with Clinical Correlations | 0 | 4 | | 10 | 15 | 25 | 3 Hours | 50 |
| **232670** | DSC (8) Molecular Biology and Immunology | 4 | 0 | 4: 0: 2 (6 credits) | 20 | 20 | 60 | 2½ Hours | 100 |
| | DSC (8) LAB Molecular Biology and Immunology | 0 | 4 | | 10 | 15 | 25 | 3 Hours | 50 |
| **INT 23INTBIC01** | Internship | 2 | 0 | 2:0:0 (2credits) | 50 | 50 | - | - | 100 |

# DSC (5) Syllabus for B.Sc. Biochemistry

# Semester-V

| Course Code: | 232569 | |
|---|---|---|
| **Course Title:** | **DSC (5) Theory** | **DSC (5) Lab** |
| | **Biochemistry of Biomolecules And Nutrition** | **Qualitative analysis of Biomolecules and their nutritional aspects** |
| **Total Course credits (L:T:P) (4:0:2)** | 04 | 02 |
| **Total contact hours** | 60 | 60 |
| **Hours of teaching/week** | 04 | 04 |
| **Formative assessment marks** | 40 | 25 |
| **Semester End Assessment marks** | 60 | 25 |
| **Exam duration** | 2 ½ Hrs | 3 Hrs |

### COURSE OUTCOMES (COs):

- **CO 1:** Develop the ability to classify, depict the structure and describe the chemical properties and functions of carbohydrates. Get acquainted with the basics of nutrition of carbohydrates.
- **CO 2:** Ability to classify amino acids and proteins based on various categories. Depict the structure of amino acids and describe the chemical properties of amino acids, peptides, proteins and sequencing methods of amino acids. Gain the knowledge of nutritional aspects of proteins.
- **CO 3:** Explicate the different types of lipids and their biological role. Acquire the knowledge on composition, types and chemical properties of nucleic acids.
- **CO 4:** Interpret and apply the basic concepts of nutrition and describe the physiological functions of various macro and micronutrients. Acquire the knowledge on nutritional disorders, adulterants and their implications.

| Course Content: DSC (5) - Biochemistry of Biomolecules and Nutrition | 60Hr |
|---|---|
| **UNIT 1: Carbohydrates** | **15hr** |
| <ul><li>Definition, empirical formulae, classification and biological importance.</li><li>**Monosaccharides:** Configuration relationship of D-aldoses and D-ketoses. General properties of aldoses and ketoses. Oxidation, reduction, reducing property, addition – HCN, acylation, formation of glycosides, methylation and condensation with phenyl hydrazine. Interconversion of aldoses and ketoses by chemical method. Ascending and descending series by chemical methods.</li></ul> | |

Stereochemistry of monosaccharides: (+) and (-), D and L, epimers, anomers and diastereomers.

- **Glucose:** Elucidation of open chain structure and ring structure of glucose. Conformation of glucose (only structures), mutarotation. Structure of ribose, galactose and mannose (open chain and Hawarth ring structure)

- **Derivatives of monosaccharides:** Structure and biological importance of sugar acids, deoxy sugars, amino sugars, derivatives of amino sugars - neuraminic and muramic acid.

- **Disaccharides:** Establishment of structures of Sucrose and Lactose, Biological Importance and structure of Isomaltose, Trehalose and Maltose.

- **Polysaccharides:** Partial structure, occurrence and biological importance of Starch, Glycogen, Inulin, Cellulose, Chitin, and Pectin.

- **Glycosaminoglycans:** Occurrence, structure of the repeating units and importance of heparin, hyaluronic acid, teichoic acid and chondroitin sulphate. Bacterial cell wall polysaccharide - peptidoglycans.

- **Nutrition of Carbohydrates:** Dietary sources, dietary fibers - types, beneficial and adverse effects, protein sparing action, Glycemic Index- importance with examples, Lactose intolerance.

| UNIT 2: Amino acids and Proteins | 15 hr |
|---|---|

- **Amino acids:** Structure and classification of amino acids based on charge, functional group and solubility. Stereoisomerism of amino acids (D & L notation). Reactions of the amino groups with $HNO_2$, $LiAlH_4$, Ninhydrin, Phenyl isothiocyante, Dansyl Chloride and Flurodinitro benzene. Reaction of carboxyl group with Hydrazine. Chemical properties of amino acids - Zwitterionic property, amphoteric property, pKa and pKb values

- **Peptides:** Definition, Peptide bond, structure, and biological importance of Glutathione, Valinomycin and Vasopressin. Synthetic peptides - polyglutamic acid and polylysine

- **Proteins:** Classification of proteins based on solubility, structure and functions with examples. Forces that stabilise the structure of proteins. Primary structure of proteins, Determination of amino acid composition, Methods of sequencing amino acids - Determination of N-terminal amino acids by Sangers method and Edman degradation method, C-terminal amino acids by hydrazinolysis method and enzymatic method (carboxypeptidase).

- Secondary Structure – α helix, β-sheet and β-bend.

- Tertiary and quaternary structures, 3D structure of haemoglobin, denaturation and renaturation of proteins. Anfinsen's experiment.
- **Nutritional aspects of Proteins:** Dietary sources, essential amino acids, Nutritional classification, Nutritional value of proteins – PER, NPU and Biological value of proteins (BV), Nitrogen balance, mutual supplementation of proteins.

| UNIT 3: Lipids and Nucleic acids | 15 hr |
|---|---|

- **Lipids:** Classification and biological role, Fatty acids - Structure and nomenclature of saturated and unsaturated fatty acids.

  **Acylglycerols**: Mono, di and triacylglycerols. Saponification, saponification value, iodine value, acid value, Peroxide value and significance. Rancidity-types (oxidative and hydrolytic rancidity) and prevention of rancidity.

  **Phosphoglycerides**: Structure and biological importance of lecithin (phosphatidyl choline), cephalins, phosphatidy linositol, plasmalogens and cardiolipin.

  **Sphingolipids**: Structure and importance of sphingomyelin.

  **Glycosphingolipids:** Composition and biological importance of gangliosides and cerebrosides.

  **Eicosanoids:** Definition, Prostaglandins-types, structure of $PGE_2$ and $PGF_2\alpha$. Biological importance of thromboxanes ($TX_2$), leukotrienes and lipoxins.

  **Plasma lipoproteins:** Types and functions.

  **Nutritional aspects of Fats:** Dietary sources of fats, visible and invisible fat, trans fats, non-essential fatty acids, essential fatty acids - types with examples and functions. Role of omega 3 fatty acids - DHA and EPA.

- **Nucleic acids:** Composition of DNA and RNA. Nucleosides and Nucleotides, Chargaff's rule, Watson and Crick model of DNA, Physico-chemical properties of Nucleic acids: Effect of heat on DNA (denaturation and renaturation), Melting of DNA (Tm) factors affecting (Tm), UV absorption and Hyperchromic effect. Effect of alkali and acid on DNA. Variants of DNA (A, B and Z form). Structure and functions of types of RNA - mRNA, tRNA and rRNA. Secondary structures of tRNA – Clover leaf model.

| Unit 4:  Nutrition | 15 hr |
|---|---|

- **Introduction:** Concept of Nutrition, calorific value of foods and its Determination (Bomb calorimeter). Respiratory quotient, Basal

Metabolic Rate, factors affecting BMR. Specific dynamic action (SDA) of foods.

- **Introduction:** Concept of Nutrition, calorific value of foods and its determination (Bomb calorimeter). Respiratory quotient, Basal Metabolic Rate, factors affecting BMR. Specific dynamic action (SDA) of foods.
- **Vitamins:** Biochemical functions and deficiency symptoms of Thiamine, Riboflavin, Niacin, Pantothenic acid, Pyridoxine, Biotin, Folic acid, Vit-$B_{12}$ and Vit - C. Fat soluble vitamins - A, D, E and Vit-K.
- **Mineral Metabolism:** Physiological functions and deficiency disorders of Ca, P, Na, K, Cl, Mg, Fe and I
- **Protein energy malnutrition (PEM):** Kwashiorkar and Marasmus
- **Antinutritional factors:** Sources and harmful effects of anti-vitamins (Eg. Avidin, Dicoumarol), Natural toxicants (Eg. Lathyrus sativa) and adulterants (Eg. butter yellow, lead chromate)
- **Nutraceuticals:** Introduction, functional foods and pre and pro-biotics in health and disease prevention.

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1. David T Plummer, An Introduction to practical Biochemistry.
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3. Lehninger A L, Principles of Biochemistry (1982), Worth Publishers,Inc, NewYork.
4. Ramakrishnan and Vasudevan D M, Text Book of Medical Biochemistry.
5. Sathyanarayana U, Biochemistry, Books and Allied (P) Ltd. Kolokatta.
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7. Voet D and Voet J G (2004), Biochemistry,3rd Edn., JohnWiley & Sons, Inc.USA.
8. Swaminathan - M Text book of food and nutrition. Bappco publishers (2009).
9. Sri Lakshmi B. Nutrition Science. New Age International (P) Ltd. New Delhi (2015).
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12. Harper's Illustrated Biochemistry, Victor W Rodwell, et.al, 31st edition, Mc Graw Hill Education Lange ® 2018.
13. Sumati R Mudambi and Rajagopal M V, Fundamentals of Foods, Nutrition and Diet Therapy, New Age International Private Limited.
14. Tom Brody, Nutritional Biochemistry 2nd Edn., Academic press (1999).
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Churchill Livingstone Publishers, UK (2000).

16. Lanham S, Mac Donald I and Roche H, Nutrition and Metabolism, 2nd Edn., The Nutrition Society, London, UK, (2012).

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- https://www.medicalnewstoday.com
- https://www.med-health.net/Lifestyle-Diseases.html

# DSC (5): Practical Syllabus

| Course Content - DSC (5): Lab<br>Qualitative analysis of Biomolecules and their nutritional aspects | 60Hr |
|---|---|
| **List of experiments to be conducted** | |
| I. **Qualitative analysis of Biomolecules:**<br>a) **Carbohydrates:**<br>    Monosaccharides (Glucose and Fructose), Disaccharides (lactose, maltose, sucrose), polysaccharides (starch/glycogen).<br>b) **Proteins**: Precipitation reactions of proteins, Colour reactions of proteins, Colour reactions of amino acids like tryptophan, tyrosine, cysteine, methionine, arginine, proline and histidine.<br>c) **Lipids:** solubility test, acrolein test, Salkowski test and Lieberman-Burchard test.<br>d) **Nucleic acids:** DPA test (ribose), Orcinol test (deoxy ribose) | |
| II. **Experiments on Nutrition:**<br>1. Detection of food adulterants in various food stuffs.<br>2. Determination of moisture content of food.<br>3. Extraction and estimation of Vitamin C in biological sample<br>4. Extraction and estimation of Calcium in ragi powder.<br>5. Estimation of Phosphorous from food sample.<br>6. Estimation of amino acid by formal titration method.<br>7. Extraction and estimation of iron in mustard seeds. | |

8. Determination of Saponification value of oil/fat.

9. Determination of iodine value of oil/fat.

### References:

1. Practical Biochemistry,Geetha Damodaran, Jaypee, 2011
2. Biochemical methods, S.Sadasivam, A. Manickam, 3$^{rd}$ Edition, New Age International Pvt Ltd, 2007
3. An Introduction to Practical Biochemistry, David Plummer, 3$^{rd}$ edition 2017
4. Laboratory manual in Biochemistry, J.Jayaraman 2011.

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- https://bio.libretexts.org
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### COURSE ARTICULATION MATRIX: 232569

| PO / CO | Program Outcomes | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO10 | PO 11 | PO 12 |
| CO1 | 3 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| CO2 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| CO3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| CO4 | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 |
| Weighted average | 3 | 1.75 | 2 | 2 | 1.5 | 1 | 1 | 1 | 1 | 1 | 2.5 | 1.75 |

# DSC (6) Syllabus for B.Sc. Biochemistry

| Course Code: | 232570 | |
|---|---|---|
| Course Title: | DSC (6): Human Physiology and Enzymology | |
| | Theory | Practical |
| Total Course credits (L: T:P) (4:0:2) | 04 | 02 |
| Total contact hours | 60 | 60 |
| Hours of teaching/week | 04 | 04 |
| Formative assessment marks | 40 | 25 |
| Semester End Assessment marks | 60 | 25 |
| Exam duration | 2 ½ Hrs | 3 Hrs |

## COURSE OUTCOMES (COs):

- **CO 1**: Get acquainted with the anatomy, structure and physiological functions of nervous system, respiratory system, circulatory system, muscle tissue and their mechanisms.
- **CO 2:** Ability to describe the structure and physiological functions of bone, cartilage, excretory and hepatic system. Elucidate the role of digestive enzymes functions of various endocrine hormones, their mechanism and regulation in the body.
- **CO3:** Illustrate the general characteristics, nature of different types of enzymes and their mechanism of action. Develop competence in isolating various enzymes and calculate its activity and specific activity.
- **CO 4:** Analyze the various parameters of enzyme kinetics, factors effecting its activity and get acquainted with the concept of enzyme inhibition. Develop skills to calculate the kinetic parameters of enzyme and represent it graphically.

| Course Content: DSC (6) Human Physiology and Enzymology | 60 Hr |
|---|---|
| UNIT 1: | 15 hr |
| • **Introduction**: Basic body plan in humans & Location of organs.<br>• **Nervous System**: Brief outline of nervous system, Types of Neurons, generalized structure of multipolar neuron, Action potential & resting potential. Synapse, types of synapses, mechanism of nerve impulse transmission along the axon, synaptic transmission. Neurotransmitters, types - Excitatory & Inhibitory with examples.<br>• **Respiratory system**: Respiration, Structure and functions of lungs, | |

Mechanism of respiration (inspiration and expiration), Exchange of gases, Biochemical events in the transport of gases and the factors affecting the exchange of gases, Role of lungs in acid-base balance. Hypoxia, emphysema.

- **Circulatory system:** Components of circulatory system (heart, blood vessels and blood), Structure and functions of heart. Blood vessels – types and functions. Phases of Cardiac cycle, heart rate, cardiac output. Blood pressure - types, measurement and its regulation. **Blood:** Composition, volume, structure and functions of RBC, WBC and platelets. Mechanism of blood coagulation. Cerebrospinal fluid, lymph and their functions. Blood brain Barrier.

- **Muscular system:** Types of muscles and their structure. Ultrastructure of skeletal muscle. Contractile and regulatory proteins of muscle. Sliding filament model of skeletal muscle contraction.

| UNIT 2: | 15 hr |
|---|---|

- **Bone and Cartilage:** Composition of bone, types of bones, Components of long bone, Growth and remodelling of long bone. Factors affecting its growth. Cartilage and its types.
- **Digestive System:** Anatomy of GIT and accessory organs, digestive secretions, Digestion, absorption & transport of carbohydrates, lipids and proteins. Role of various enzymes involved in digestive process.
- **Excretory system:** Brief outline of various excretory organs and their excretory products, Structure of nephron, formation of urine – Glomerular filtration, tubular reabsorption and secretions. Role of kidneys in acid-base balance. Regulation of kidney functions.
- **Hepatic System:** Liver, Structure of a liver lobule. Role of liver in metabolic, storage and Detoxification.
- **Endocrine system:** Outline of Endocrine organs and glands, General characteristics of hormones, classification of hormones based on chemical nature, solubility and nature of action. Physiological functions of the hormones of hypothalamus, pituitary, adrenal, thyroid, pancreas, gonads. Hormonal regulation by feedback mechanism. General mechanism of action of peptide and steroid hormones. Concept of second messengers. E.g.: cAMP, DAG and IP3.

| UNIT 3: | 15 hr |
|---|---|

- **Introduction to enzymes:** Definition, Nature of enzymes - protein

and non-protein (ribozyme), Characteristics of enzymes. Holoenzyme - apoenzyme and prosthetic group, Cofactors & Coenzymes - definition with examples. IUBMB classification of enzymes with examples. Enzyme activity & Units of enzyme activity, specific activity of enzymes.

- Monomeric and oligomeric enzymes, multifunctional enzymes (Fattyacid synthase)**,** multi-enzyme complexes (PDH) and isoenzymes (lactate dehydrogenase). Immobilized enzymes-methods and applications.

- **Features of enzyme catalysis**:

  Catalysis, reaction rates and thermodynamics of reaction. Activation energy and transition state theory. Catalytic power, specificity of enzymes, concept of active site, Theories of enzyme catalysis- Fischer's lock and key hypothesis, Koshland's induced fit hypothesis.

| | |
|---|---|
| **UNIT 4:** | **15 hr** |

- **Enzyme kinetics of single substrate reactions:**

  Michaelis-Menten equation, equilibrium constant - mono substrate reactions, relationship between initial velocity and substrate concentration**.** Factors affecting the rate of enzyme catalysed reactions - enzyme concentration, substrate concentration, pH, temperature and metal ions. Lineweaver- Burk plot. Determination of Vmax & Km from L-B plot and their significance. K$_{cat}$ and turnover number.

- **Enzyme Inhibition:**

  Definition, types of inhibition -reversible and irreversible inhibition. Reversible inhibition- competitive, uncompetitive, non-competitive with graphical representations using L-B plots, Evaluation of Km and Vmax in presence of inhibitor (mixed and substrate). Irreversible inhibition - Suicide inhibition, Antibiotics as inhibitors - penicillin.

- **Clinical Enzymes:** Alkaline phosphatase, serum transaminases (SGPT & SGOT), Cardiac injury profile- CPK and LDH.

**References:**

1. Chatterjee C C, Human physiology, Medical allied Agency. New Delhi 2020
2. Gerard J Tortora, Bryan H Derrickson. Principles of anatomy and physiology, 13th edition, John Wiley & Sons 2000
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# DSC (6): Practical Syllabus

| Course Content | 60Hr |
|---|---|
| **DSC (6): Human Physiology and Enzymology** | |
| **List of experiments to be conducted** | |
| **Part A: Human Physiology**<br><br>1. Determination of Blood clotting time<br><br>2. Enumeration of RBC and WBC count using Haemocytometer<br><br>3. Separation of Serum and Plasma from Blood<br><br>4. Estimation of percentage of haemoglobin content in blood<br><br>5. Determination of Blood pressure by Sphygmomanometer. | |

**Part B: Enzyme Assays**

1. Salivary amylase/β- amylase

   a. Determination of activity and specific activity of salivary amylase by DNS method. (Construction of Maltose/glucose calibration curve by DNS method)

   b. Determination of optimum temperature of salivary amylase.
   c. Determination of pH optimum of salivary amylase.
   d. Determination of time kinetics of salivary amylase
   e. Determination of Km and Vmax of salivary amylase.
   f. Effect of Sodium chloride on amylase

2. Isolation of acid phosphatase and demonstration of its activity by PNP method.

3. Isolation of Urease and demonstration of its activity.

4. Isolation of invertase and demonstration of its activity.

**References:**

1. Text book of Practical Physiology, C.L. Ghai, Jaypee brother's medical publishers, New Delhi, 10th edition 2022
2. Text book of Medical Physiology - C, Guyton and John.E.Hall. Miamisburg, OH, U.S.A, 12thedition 2011
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- https://www.sciencedirect.com/science/article/pii/S2213020914000068
- https://tipbiosystems.com/blog/enzyme-kinetic-assays-and-enzyme-assays/

## COURSE ARTICULATION MATRIX: 232570

| PO / CO | Program Outcomes | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO10 | PO 11 | PO 12 |
| CO1 | 3 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 |
| CO2 | 3 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 |
| CO3 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 1 |
| CO4 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 2 |
| Weighted average | 3 | 2.5 | 1.5 | 2 | 1.5 | 1.5 | 1 | 1 | 1.5 | 1 | 1.5 | 1.75 |

# DSC (7) Syllabus for B.Sc. Biochemistry

## Semester-VI

| Course Code: | | 232669 |
|---|---|---|
| Course Title: | | DSC (7) Metabolism with Clinical Correlations |
| | Theory | Practical |
| Total Course credits (L:T:P) (4:0:2) | 04 | 02 |
| Total contact hours | 60 | 60 |
| Hours of teaching/week | 04 | 04 |
| Formative assessment marks | 40 | 25 |
| Semester End Assessment marks | 60 | 25 |
| Exam duration | 2 ½ Hrs | 3Hrs |

### COURSE OUTCOMES (COs):

- **CO 1:** Get acquainted with the principle of thermodynamics. Depict the structure of mitochondria and comprehend the role of ETC complexes in respiratory chain. Able to describe chemiosmosis hypothesis of ATP synthesis.
- **CO 2:** Acquire the knowledge on compartmentalization of metabolic pathways. Elucidate various metabolic pathways of carbohydrate and harvest its energetics and regulatory steps. Interpret the disorders associated with errors in carbohydrate metabolism.
- **CO 3:** Schemate biosynthetic and oxidation pathways of lipid metabolism and calculate its energetics. Describe the action of nucleases and elucidate the catabolic and anabolic pathways of nucleic acids. Interpret the disorders associated with errors in lipids and nucleic acid metabolism metabolism.
- **CO 4:** Comprehend the general reactions of amino acids and their significances. Schemate urea cycle, catabolic and anabolic pathways of amino acids. Illustrate the inherited disorders associated with the error in the amino acid metabolism.

| Course Content: DSC (7) – Metabolism with Clinical Correlations | 60Hr |
|---|---|
| **UNIT 1: Bioenergetics** | **15 hr** |
| Definition, significance of bioenergetics, Laws of Thermodynamics: first and second law. Concept of enthalpy, entropy and free energy change, equilibrium constant. Coupled reactions. High energy compounds: ATP - structural features, ATP cycle, its free energy change during hydrolysis. Ultra-structure of mitochondrion, Electron transport chain and their complexes Complex I, II, III and IV. Uncouplers and inhibitors of respiration (Rotenone, Antimycin, Cyanide and 2,4 DNP) Oxidative phosphorylation: Proton gradient generation, redox loop, Q cycle, Proton pumping. P/O ratio. Outline of | |

| | |
|---|---|
| - Peter Mitchell's Chemiosmotic hypothesis. Substrate level phosphorylation with examples. | |
| **UNIT 2: Metabolism of Carbohydrates** | **15 hr** |
| <ul><li>**Introduction:** Metabolism, phases of metabolism: anabolism and catabolism, compartmentalization of metabolic pathways</li><li>**Carbohydrate Metabolism:** Glycolysis, energetics and regulatory steps of glycolysis. Entry of other carbohydrates (Fructose, galactose, mannose and Lactose) into glycolytic pathway. Fates of pyruvate – conversion of pyruvate to lactate, alcohol and acetyl Co-A. Citric acid cycle, it's energetics and regulatory steps, Amphibolic integrating roles of TCA cycle. Anaplerotic reactions. Cori cycle. Gluconeogenesis, Pentose phosphate pathway and its significance. Glycogen metabolism – glycogenolysis, glycogen synthesis.</li><li>**Inborn errors of Carbohydrate Metabolism:** Von-Gierke's and Cori's disease.</li></ul> | |
| **UNIT 3: Metabolism of Lipids and Nucleic acids** | **15 hr** |
| <ul><li>**Metabolism of Lipids:** Introduction, hydrolysis of triacylglycerols, transport of fatty acids into mitochondria, Oxidation of fatty acid – α, β and ω types, β- oxidation of saturated and unsaturated fatty acids, Energetics of β-oxidation. Schematic representation of biosynthesis of even number saturated fatty acids. Elongation of Fatty acid (Mitochondrial elongation). Biosynthesis of TAG, Phospholipids (Lecithin and Cephalin). Cholesterol Metabolism (synthesis and degradation).</li><li>**Inborn errors of Lipid Metabolism:** Niemann-Pick disease and Gaucher disease</li><li>**Metabolism of Nucleic acids:** Degradation of nucleic acids, action of nucleases: DNase I and II, RNase and phosphodiesterases. Catabolism of purines and pyrimidines. Salvage and Denovo biosynthetic pathways of purine and pyrimidine nucleotides. Conversion of ribonucleotides to deoxy ribonucleotides.</li><li>**Inborn errors of Nucleic acid Metabolism:** Gout, Lesch-Nyhan syndrome</li></ul> | |
| **UNIT 4: Metabolism of Amino acids** | **15 hr** |
| <ul><li>**Metabolism of Amino acids:** General reactions of amino acid degradation – Transamination, deamination (oxidative and non-oxidative), decarboxylation, desulphation and their significances. Ketogenic and glucogenic amino acids. Urea cycle – energetics and</li></ul> | |

its significance. Regulations of urea cycle (coarse, fine/allosteric, compartmentalization). Inherited disorders of urea cycle – Hyperammonemia Type I and Type II, Hyperargeninemia and Citrullinemia. Synthesis and catabolism of alanine, serine and cysteine.

- **Inborn errors of amino acid Metabolism:** Phenylketonuria, alkpatonuria and albinism.

**References:**

1. Principles of Biochemistry, Donald Voet, Judith G Voet, Charlotte W. Pratt, 4th Edition, John Wiley and Sons Inc, 2012
2. Lehninger-Principles of Biochemistry; D L Nelson and M M Cox 6th Edn. Mac millan Publications 2012
3. Biochemistry the chemical reactions of living cells, David E Metzler, 2nd Edition, Elsevier Academic Press.
4. Fundamentals of Biochemistry, Jain, J. L, S.Chand publication 6th Edition, 2005.
5. Biochemistry, Jeremy M. Berg, John L. Tymoczko, Lubert Stryer, Freeman and company, 7th Edition, 2010.
6. Harper's Illustrated Biochemistry, Victor W Rodwell, et.al, 31st edition, Mc Graw Hill Education Lange ® 2018
7. Rastogi S.C, V.N. Sharma, Anuradha Tanden, Concepts in molecular biology, 1993.
8. Ambika Shanmugam, Fundamentals of Biochemistry for Medical Students, November 1, 2012.
9. Deb, A.C., Fundamentals of Biochemistry, New Central Agency, Calcutta, 3rd Edition, 1989.
10. Cell Biology: Organelle structure and function, David E Sadava, Jones and Bartlett Publishers, 1993.
11. Murray, K. Robert, et al., - Harper's Biochemistry. 21st edition, 1998.
12. Chatterjee, C.C - Human Physiology – Volume I & II, 11th edition, 1992.

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- https://www.osmosis.org/notes/Protein_Metabolism
- https://www.britannica.com/science/nucleic-acid/Nucleic-acid-metabolism

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# DSC (7): Practical Syllabus

| Course Content - DSC (7) – Metabolism with Clinical Correlations | 60 Hr |
|---|---|
| **List of experiments to be conducted** | |
| **Part A: Colorimetric estimations** | |

1. Glucose by Anthrone method.
2. Ketoacid (Pyruvate) by DNPH method
3. Amino acid by Ninhydrin method.
4. Protein by Biuret method.
5. Protein by Lowry's method.
6. Uric acid by PMA method.
7. Urea by DAMO method.
8. Creatinine by Jaffe's method.
9. Phosphorous by Fiske and Subbarow's method.
10. Iron by Wong's method.

**Part B: Qualitative analysis of constituents of Urine**

1. **Qualitative analysis of normal constituents of urine:**

   - Organic: constituents: urea, uric acid, creatinine and amino acid.
   - Inorganic constituents: chlorides, sulfates, phosphates and ammonia

2. **Qualitative analysis of Abnormal constituents of urine:**

   Abnormal constituents -glucose, albumin, bile pigments, bile salts and ketone bodies

**References:**

1. Practical manual in chemistry and biochemistry- Victor J templa and Samsung Grant
2. Practical manual in Clinical biochemistry- Dr Rjeshwari, Dr Aliya Nusrath
3. Intrumental methods of analysis – practical manual by Dr Muralidhara Rao AVN Swamy, and Dr Daraneeshwara swamy

4. Colorimetric analysis | Mark Buluma Eugine Academia.edu
5. A guide to colorimetry - Cole-Parmar and Cole-Parmer
6. Colorimetric Analysis, Hardcover – 4 February 2019 by F. D. Snell
7. Analytical Chemistry from Laboratory to Process Line by Gennady E. Zaikov
8. Arneson Clinical Chemistry A Laboratory Perspective, by Wendy Arneson.
9. Practical Clinical Biochemistry, Methods and Interpretations, by Ranjan Chawla.
10. Practical Biochemistry, Geetha Damodaran, Jaypee, 2011
11. An Introduction to Practical Biochemistry, David Plummer, 3rd edition 2017
12. Laboratory manual in Biochemistry, J. Jayaraman 2011.

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## COURSE ARTICULATION MATRIX:  232669

| PO / CO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 |
| CO2 | 3 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 |
| CO3 | 3 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 |
| CO4 | 3 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 |
| Weighted average | 3 | 2 | 1 | 2 | 1 | 1.25 | 1 | 1 | 2 | 1 | 1 | 2 |

# DSC (8) Syllabus for B.Sc. Biochemistry

| Course Code: | 232670 | |
|---|---|---|
| Course Title: | DSC (8) Molecular Biology and Immunology | |
| | **Theory** | **Practical** |
| Total Course credits (L:T:P) (4:0:2) | 04 | 02 |
| Total contact hours | 60 | 60 |
| Hours of teaching/week | 04 | 04 |
| Formative assessment marks | 40 | 25 |
| Semester End Assessment marks | 60 | 25 |
| Exam duration | 2 ½ Hrs | 3 Hrs |

### COURSE OUTCOMES (COs):

- **CO1:** Able to justify the nucleic acids as genetic carriers and describe the central dogma of molecular biology. Explicate the mechanism of DNA replication, different types of mutations and illustrate the mutagenic effect of various mutagens.

- **CO2:** Illustrate the mechanisms spanning from transcription to translation. Apply the knowledge in analyzing problems at their molecular level. Employ the molecular biology techniques to analyze the changes at gene level for the development of new therapies for problem solving.

- **CO3:** Acquire the knowledge on scope and various techniques of genetic engineering & apply the principle of various blotting techniques in separation of nucleic acids. Employ the techniques of genetic engineering in the production level benefiting various fields.

- **CO4:** Develops ability to describe the types of immunity with examples, characteristics, types of antigens and antibodies. Illustrate the role of immunologically important organs and cells, acquire knowledge on concept of immunization and preparation of vaccines and develop competence in handling various immunological techniques. Gain ability to describe various immunological disorders.

| Course Content: DSC (8) Molecular biology and Immunology | 60Hr |
|---|---|
| **UNIT 1: DNA Replication and Mutation** | **15 hr** |
| <ul><li>**Introduction:** Nucleic acids as genetic information carriers, experimental evidences – Griffith, Avery Macleod and McCarty experiment, Hershey and Chase experiment. Central dogma of molecular biology and its modification.</li><li>**Replication:** DNA replication, types of replications - conservative,</li></ul> | |

semi conservative and dispersive. Meselson and Stahl experiment. Enzymes and protein factors involved in replication, Mechanism of semi-conservative replication in prokaryotes.

- **Mutation:** Definition, Somatic and germline mutation, spontaneous and induced mutation, Concept of gene mutation- a) Point mutation- silent, missense and nonsense mutation b) frameshift mutation (addition and deletion). Mutagens and types of mutagens. Effect of mutagens -effect of $HNO_2$, alkylating agents, intercalating agents and UV radiation.

| UNIT 2: Transcription, Genetic code, Translation and Regulation of Gene expression | 15 hr |
|---|---|

- **Prokaryotic Transcription:** Structure of Prokaryotic gene and role of RNA polymerase. Mechanism of transcription - Initiation, elongation and termination (rho dependent and rho independent). Post transcriptional modifications (eukaryotes) – capping, splicing and poly adenylation.
- **Genetic code:** General features, wobble hypothesis.
- **Prokaryotic Translation:** Mechanism of translation- Activation of Amino acids, amino acyl tRNA synthesis. Initiation, elongation and termination of protein synthesis. Inhibitors of protein synthesis. Post translational modifications.
- **Regulation of Gene expression:** General aspects of regulation, Gene expression in prokaryotes; inducible and repressible systems - concept of Lac operon and trp operon. Functional unit in a typical eukaryotic gene – Promoter, introns and exons.

| UNIT 3 : Genetic Engineering | 15 hr |
|---|---|

- **Introduction:** Historical development, aim and scope of genetic engineering. Isolation of DNA, Restriction endonucleases –Types, staggered cut and blunt end cut
- **Outline techniques of Genetic Engineering**: Cutting of genomic DNA, Vectors- plasmid (pBR 322), bacteriophage, definition and examples of cosmids, phagemid and plant vectors. Insertion of foreign DNA into vectors- linkers, adaptors and homopolymer tailing. Transfection of vectors into host cells. cDNA. Principle and applications of polymerase chain reaction.
- **Blotting techniques**: Principle and applications of Southern blotting, Northern blotting, Western blotting, Dot blot technique and DNA finger printing.
- **Applications of Genetic engineering -** Transgenic plants, transgenic animals and gene therapy. Human genome project.

| UNIT 4: Immunology | 15 hr |
|---|---|

- **Overview of the Immune system:** Immunity, types - Innate and acquired immunity. (Passive and active immunity). Cellular and humoral immunity. Role of immunologically important organs and cells - bone marrow, thymus, spleen and lymphocytes. Cellular components of immune system, Formation and functions of T & B Lymphocytes. Helper T-cells and killer T-cells.

- **Antigens:** Definition, types, chemical nature and antigenicity. Epitopes, haptens and adjuvants

- **Antibodies:** Definition, types and structure of a typical immunoglobulin (IgG), paratope. Polyclonal and monoclonal antibodies. Production and applications of monoclonal antibodies.

- **Immunization:** Vaccines and their preparations, primary and secondary immune response.

- **Immunological disorders and Hypersensitivity reactions:** Autoimmune disorder - Definition, example - systemic lupus erythematous, Hypersensitivity reactions and its types

- **Ag-Ab reactions and Immunological techniques:** Formation of antigen-antibody complex. Agglutination and precipitation reactions. Principle, procedure and applications of immunodiffusion, RIA and ELISA.

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1. Owen, Judith A., Jenni Punt, and Sharon A. Stranford. Kuby immunology. New York: W H Freeman, 2013.
2. Delves, Peter J., Seamus J. Martin, Dennis R. Burton, and Ivan M. Roitt. & Roitt's essential immunology. Vol. 20. John Wiley & Sons, 2011.
3. Principles of cell and molecular biology 2nd edition – Lewis J Kleinsmith, Valerie M Kish, February, 1995
4. De Robertis, EDP, E.M.F Robertis, 7th edition Cell and molecular biology, Saunders Company 1980.
5. Harvey Lodish, Baltimore. Arnold Berk et al,. 3rd edition. Molecular cell biology 1995.
6. Trevor Palmer, 3rd edition, Understanding enzymes. Ellis-Horwood Limited, 1991.
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8. Garret R H and Grisham C M, Biochemistry 6th Edn., Cengage Learning (2016).
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10. David Freifelder and George M Malacinski, The Essentials of Molecular Biology, 3rd Edn., Jones and Bartlett Publishers (1998).

11. Baltimore, Molecular Cell Biology, 5th Edition, W.H.Freeman Company (2003).
12. William H Elliott & Daphne C Elliott, Biochemistry and Molecular Biology, 4th Edn., Oxford University press (2009).
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14. Geoffrey M Cooper and Robert E Hausman, The Cell - A Molecular Approach, 3rd Edn., Sinauer Associates Inc., (2003).

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- https://www.immunology.org/public-information/what-immunology
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- https://www.nature.com/nsmb
- https://dnalc.cshl.edu/resources/3d/04-mechanism-of-replication-advanced.html
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# DSC (8) - Practical Syllabus

| Course Content–DSC (8): Molecular biology and Immunology | 60Hr |
|---|---|
| **List of experiments to be conducted** | |
| 1. Isolation of DNA from banana/endosperm of coconut or any other source.<br>2. Isolation of RNA from spinach leaves/any other source.<br>3. Determination of lambda max of proteins and nucleic acid<br>4. Determination of purity of nucleic acids.<br>5. Estimation of DNA by DPA method<br>6. Estimation of RNA by orcinol method.<br>7. Electrophoretic separation of nucleic acids by Agarose gel electrophoresis.<br>8. Identification of blood group and Rh factor by Hemeagglutination reaction<br>9. Determination of Antigen specificity by Single Radial immuno-diffusion assay (SRID)<br>10. Determination of Antigen specificity/Ag-Ab reaction by Outcherlony double diffusion method<br>11. Demonstration of pregnancy test<br>12. Purification of Immunoglobulin G from egg yolk.<br>13. Demonstration of Western blotting.<br>14. Demonstration of WIDAL test. | |
| **References:** | |

1. Analytical techniques in Biochemistry and Molecular Biology; Katoch, Rajan. Springer, 2011
2. Wilson and Walker's Principles and Techniques of Biochemistry and Molecular Biology 8th Edn. Andreas Hoffman and Samuel Clockie, Ed., Cambridge University Press, 2018.
3. Biochemistry and Molecular Biology; 5th Edn. D. Papachristodoulou, A. Snape, W.H. Elliott and D. C. Elliott, Oxford University Press, 2014
4. Molecular Biology: A Laboratory Manual by by Ashwani Kumar S.K. Gakhar, Monika Miglani, 2019
5. Wilson And Walkers Principles and Techniques of Biochemistry and Molecular Biology 8th ed (Sae) by Hofmann, 1983
6. Laboratory Manual of Microbiology, Biochemistry and Molecular Biology by J. Saxena, M. Baunthiyal, I. Ravi, 2015
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8. An Introduction to Practical Biochemistry by David Plummer, 3rd edition 2017
9. Laboratory manual in Biochemistry, J. Jayaraman 2011
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11. Practical Immunology, Frank C Hey, Publisher: John Wiley and Sons Ltd, 2000
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## COURSE ARTICULATION MATRIX: 232670

| PO \ CO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 |
| CO2 | 3 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 2 |
| CO3 | 3 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 |
| CO4 | 3 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 2 |
| Weighted average | 3 | 2 | 1 | 2 | 1.5 | 1.25 | 1 | 1 | 2 | 1 | 1 | 2 |

# Internship

# B.Sc. Biochemistry

## Semester - VI

| Course Code: | 23INTBIC01 |
|---|---|
| Course Title: | Internship |
| Total Course credits | 02 |
| Total contact hours | 90 |
| Formative assessment marks | C1 – 50 |
| | C2 – 50 |
| | Total = 100 marks |

**Note: This course will run as per the guidelines defined by the BoS Biochemistry, University of Mysore, Mysuru and the same is approved by BoS, Biochemistry, SBRR, Mahajana First Grade College, Autonomous Mysuru.**

### COURSE OUTCOMES (COs):

- **CO1:** Integrate Theory and Practice of the area selected for Internship to explore the Career Opportunities prior to Graduation
- **CO2:** Develop Communication, Interpersonal, Work Habits, Attitude, technical and other Critical Skills required for a job.

### COURSE ARTICULATION MATRIX – 23INTBIC01

| PO / CO | Program Outcomes | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO10 | PO 11 | PO 12 |
| CO1 | 3 | 3 | 3 | 3 | 3 | - | 1 | 1 | 3 | 3 | 2 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | 2 | 2 |
| Weighted average | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | 2 | 2 |

# Continuous Formative Evaluation/Internal Assessment (DSC)

Total marks for each course shall be based on continuous assessments and semester end examinations. The pattern is **40:60** for IA and Semester End Theory Examinations respectively and **50:50** for IA and Semester End Practical Examinations respectively.

|  | THEORY | PRACTICAL |
|---|---|---|
| **Total Marks** | 100 Marks | 50 Marks |
| **Continuous Assessment – 1 (C1)** | 20 Marks | 10 Marks |
| **Continuous Assessment – 2  (C2)** | 20 Marks | 15 Marks |
| **Semester End Examination  (C3)** | 40 Marks | 25 Marks |

**Evaluation Process of IA Marks shall be as follows:**

- The first component (C1) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, project work etc. This assessment and score process should be completed after completing 50% of syllabus of the course and within 45 working days of semester program.

- The second component (C2) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, internship/industrial practicum/project work, quiz etc. This assessment and score process should be based on completion of remaining 50% of syllabus of the course of the semester.

- During the 17th – 19th week of the semester, a semester end examination shall be conducted by the college for each course. This forms the third and final component of assessment (C3) and the maximum marks for the final component will be 60%.

- In case of a student who has failed to attend the C1 or C2 on a scheduled date, it shall be deemed that the student has dropped the test. However, in case of a student who could not take the test on scheduled date due to genuine reasons, such a candidate may appeal to the Principal. The Principal in consultation with the concerned teacher shall decide about the genuineness of the case and decide to conduct special test to such candidate on the date fixed by the concerned teacher, but before commencement of the concerned semester end examinations.

- The outline for continuous assessment activities for Component-I (C1) and Component-II (C2) of a course shall be as under:

| Theory Formative assessment | C1 Marks | C2 Marks | Total Marks |
|---|---|---|---|
| Session Test | 20 | - | 20 |
| Seminar/ Presentation/ Assignment/ Activity/ Case Study/ Field Work/ Project Work/ Quiz etc. | - | 20 | 20 |
| Total | 20 | 20 | 40 |

- For practical course of full credits, seminar shall not be compulsory. In its place, marks shall be awarded for Practical Record Maintenance (the marks is 25 (10 + 15) and 25. Evaluated for a total of 50 Marks).

- Conduct of Test, Seminar, Case study/Assignment etc., can be either in C1 or in C2 component as decided by the college and concerned department/teacher.

| Practical Formative assessment | C1 Marks | C2 Marks | Total Marks |
|---|---|---|---|
| Session Test | 10 | - | 10 |
| Record/ Assignment/ Activity/ Case Study/ Field Work/ Project Work/ Quiz etc. | - | 15 | 15 |
| Total | 10 | 15 | 25 |

- For assignments, tests, case study analysis etc., of C1 and C2, the students should bring their own answer scripts (A4 size), graph sheets etc., required for such tests/assignments and these be sealed/signed by the concerned department at the time of conducting tests/assignment/project work etc.

- The teachers concerned shall conduct test/seminar/case study etc., the students should be informed about the modalities well in advance. The evaluated courses assignments during component I (C1) and component II (C2) of assessment are immediately provided to the candidates after obtaining acknowledgement in the register by the concerned teacher(s) and maintained by the Department.

- Before commencement of the semester end examination, the evaluated test, assignment etc., of C1 and C2 shall be obtained back to maintain them till

the announcement of the results of the examination of the concerned semester.

- The marks of the internal assessment shall be published on the notice board of the department/college for information of the students.

- The internal assessment marks shall be communicated to the CoE at least 10 days before the commencement of the semester end examinations and the CoE shall have access to the records of such periodical assessments.

- There shall be no minimum in respect of internal assessment marks.

- Internal assessment marks may be recorded separately. A candidate, who has failed or rejected the result, shall retain the internal assessment marks.

# B.Sc. Biochemistry Semester- V
## Practical Examination- Scheme of Valuation (2023-24)

### (DSC 5): Qualitative analysis of Biomolecules and their Nutritional aspects Practical 5

**Duration: 3-hour**                                          **Max. Marks: 25**

C1 and C2 are internal tests to be conducted during 8th and 16th weeks respectively of the semester. C3 is the semester-end examination conducted for 3 hours. The students will be evaluated on the basis of skill, comprehension and recording the results.

The student has to compulsorily submit the practical record during C1 and C2. For C3, Students must submit completed practical records duly signed by batch teachers and certified by HOD at the time of examination. (No evaluation of record)

The student is evaluated for **C1 and C2** respectively as per the following scheme:

| Heading | Marks |
|---|---|
| **C1**: Minor Experiment /procedure writing | 10 |
| **C2:** Major Experiment + Record | 10 + 05 = 15 |
| **Total** | 25 |

The student is evaluated for **25 marks** in **C3** as per the following scheme.

- **PART- A:  Minor Experiment/ Procedure writing      Marks - 08**
- **PART- B:   Major Experiment                                  Marks - 12**
- **PART- C:   Viva Voce                                              Marks - 05**

 **PART-A:**                                                          **Marks-08**

**Any ONE of the following experiments is to be given for conduction.**

1. Detection of food adulterants in various food stuffs.
2. Estimation of Vitamin C in biological sample
3. Estimation of Calcium extracted from ragi powder.
4. Estimation of amino acid by formal titration method.
5. Estimation of iron extracted from mustard seeds.

## OR

**Any ONE of the following experiments is to be given for procedure writing**

1. Determination of Moisture content of food.
2. Determination of Saponification value of oil/fat.

**3.** Determination of iodine value of oil/fats

## PART A:  Assessment of Experimental results

➢ For **Detection of food adulterants** (any 4 samples to be given) …**4 X 2 =8**

   (**Edible** oil, ghee, tea powder, pepper, dhal, chili powder, butter, milk, sweet)

➢ For **estimation** of amino acid/ Ascorbic acid / iron/ calcium (Normality of the titrant for the experiment given for conduction is to be specified by the examiner)

   **Principle and Reaction ……………………………. 03 marks**

| Discrepancy in titre value | Estimation Marks (5) |
|---|---|
| ±0.1 - 0.3ml | 4m |
| ±0.4 - 0.7ml | 3m |
| ±0.8 - 1.0ml | 2m |
| Any other value | 1m |
| **Calculation** | 1m |

➢ For **procedure writing** of determination of saponification value/ iodine value of an oil/fat /determination of moisture content of food and Estimation of total sugars in food sample.

   **Principle and formulae …...................... 03 marks**
   **Procedure writing……………………… 05 marks**

## PART B:  Assessment of Experimental results                       Marks 12

   Any **ONE** of the following biomolecules is to be given for qualitative analysis.

## I. Qualitative analysis of Carbohydrates.

   The candidate has to identify the given carbohydrate and report it.

   [Monosaccharides- (Glucose, Fructose), Disaccharides (Lactose, Maltose)]

## Assessment of Experimental results

- Identification of biomolecule -Molisch test……………… **1M**
- Iodine test………………………………………............ **1M**
- Reducing tests (min 2 test) …………………….......... **3M**
- Distinguishing test between Mono and Disaccharides …. **1M**
- Distinguishing test between Aldose/Ketose (mono) ........ **1M**
- Osazone test …………............................................. **3M**

- **Report:**

     Identification and Structure (Monosaccharides)………... **2M**

     Identification and Structure (Disaccharides)…………… **3M**

## II. Qualitative analysis of proteins and amino acids.

Any **ONE** of the Protein (**albumin/ BSA**)/ Amino acids is to be given for analysis

   **Assessment of Experimental results:**

➢  For **Protein** analysis:

- Identification of biomolecule (Molisch and Biuret test) …. **2M**
- Protein Precipitation test (any 02) ................................. **2M**
- Xanthoproteic test …………………………….............**1M**
- Identification of any 3 amino acids……………...…..........**6M**
- Report …………………………………………...………....**1M**


➢  For **amino acid** analysis:

     (Tyrosine, Tryptophan, Arginine, Cysteine)

- Identification of biomolecule (Molisch and Ninhydrin test) ….**1M**
- Xanthoproteic test …………………………………………….**1M**
- Identification tests for amino acids (4 tests) ……………......**8M**
- Structure …………………………………………………….... **1M**
- Report ……………………………………………………… **1M**

# B.Sc. Biochemistry Semester V
## Practical Examination - Scheme of Valuation (2023-24)

## (DSC 6): Human Physiology and Enzymology- Practical 6

**Duration: 3-hour**          **Max. Marks: 25**

C1 and C2 are internal tests to be conducted during 8th and 16th weeks respectively of the semester. C3 is the semester-end examination conducted for 3 hours. The students will be evaluated on the basis of skill, comprehension and recording the results.

The student has to compulsorily submit the practical record during C1and C2. For C3, Students must submit completed practical records duly signed by batch teachers and certified by HOD at the time of examination. (No evaluation of record)

The student is evaluated for **C1**and **C2** respectively as per the following scheme:

| Heading | Marks |
|---|---|
| **C1**: Procedure writing (2) | **10** |
| **C2:** Major Experiment + Record | **10 + 05 = 15** |
| **Total** | **25** |

The student is evaluated for **25 marks** in **C3** as per the following scheme

- **PART-A: Procedure writing**      **Marks - 05**
- **PART-B: Major Experiment**      **Marks - 15**
- **PART-C: Viva Voce**      **Marks - 05**

**PART- A:**          **Marks- 05**

**Any ONE of the following experiments is to be given for procedure writing.**

1. Determination of Blood clotting time
2. Enumeration of RBC and WBC count using Hemocytometer
3. Separation of Serum and Plasma from Blood
4. Estimation of percentage of haemoglobin content in blood
5. Determination of Blood pressure by Sphygmomanometer.

**PART- B: Major Experiment**          **Marks- 15**

**Any ONE of the following enzyme assays is to be given for conduction.**

1. Salivary amylase/β- amylase

**a.** Determination of activity and specific activity of salivary amylase by DNS method. (Construction of Maltose/glucose calibration curve by DNS method)

**b.** Determination of optimum temperature of salivary amylase.

**c.** Determination of pH optimum of salivary amylase.

**d.** Determination of time kinetics of salivary amylase

**e.** Determination of Km and Vmax of salivary amylase.

**f.** Effect of Sodium chloride on amylase

**2.** Isolation of acid phosphatase and demonstration of its activity by PNP method.

**3.** Isolation of Urease and demonstration of its activity.

**4.** Isolation of invertase and demonstration of its activity.

## Assessment of Experimental results……………………… 15 Marks

➢ For determination of Activity and Specific activity of Salivary amylase. (The protein value is to be specified by the examiner)

Principle……………………………....**3M**
Tabular column……………….... **2M**
Conduction of Experiment ………...**2M**
Calculation…………………………**3M**
Graph……………………………….**2M**
Result…………………………**3M**

➢ For determination of activity of acid phosphatase/ Urease/ invertase.

Principle……………………………....**3M**
Tabular column……………….... **2M**
Conduction of Experiment ………...**2M**
Calculation…………………………**3M**
Graph……………………………….**2M**
Result…………………………**3M**

| % Error | Marks   awarded |
|---|---|
| < 10% | 3 |
| 10-15% | 2 |
| Any other value | 1 |

➢ For determination of Optimum time, pH, time, temperature, effect of NaCl

Principle……………………………....**3M**
Tabular column……………….... **3M**
Conduction of Experiment ………...**3M**
Graph……………………………….**4M**
Result……………………………**2M**

# B.Sc. Biochemistry Semester VI
## Practical Examination - Scheme of Valuation (2023-24)

## <u>(DSC 7): Metabolism with Clinical Correlations- Practical 7</u>

**Duration: 3-hour**                                                                    **Max. Marks: 25**

C1 and C2 are internal tests to be conducted during 8th and 16th weeks respectively of the semester. C3 is the semester-end examination conducted for 3 hours. The students will be evaluated on the basis of skill, comprehension and recording the results.

The student has to compulsorily submit the practical record during C1and C2. For C3, Students must submit completed practical records duly signed by batch teachers and certified by HOD at the time of examination. (No evaluation of record)

The student is evaluated for **C1**and **C2** respectively as per the following scheme:

| Heading | Marks |
|---|---|
| **C1**: Minor Experiment | **10** |
| **C2:** Major Experiment + Record | **10 + 05=15** |
| **Total** | **25** |

The student is evaluated for **25 marks** in **C3** as per the following scheme

> **PART-A: Major Experiment**          **Marks 14**
> **PART-B:  Minor Experiment**          **Marks 06**
> **PART-C:  Viva-voce**          **Marks 05**

**PART A: Major Experiment**                                                           **Marks-14**

**Any ONE of the following Colorimetric estimation is set for conduction**

1.  Glucose by Anthrone method.
2.  Ketoacid (Pyruvate) by DNPH method
3.  Amino acid by Ninhydrin method.
4.  Protein by Biuret method.
5.  Protein by Lowry's method.
6.  Uric acid by PMA method.
7.  Urea by DAMO method.
8.  Creatinine by Jaffe's method.
9.  Phosphorous by Fiske and Subbarow's method.
10. Iron by Wong's method.

> **Assessment of Experimental results:**

- Principle and reaction……….…..... **4M**
- Tabular Column…………………….. **3M**
- Graph…………………………….... **3M**
- Result…………………………….....**4M**

| % Error | Marks awarded |
|---|---|
| <10% | 4 |
| 10-15% | 3 |
| Any other value | 1 |

**PART-B: Minor Experiment**                          **Marks-06**

Candidate has to be given any **ONE** of the abnormal constituents in the urine sample to analyze qualitatively and report the same.

(Abnormal constituents - glucose, albumin, bile pigments, bile salts and ketone bodies)

- Tests …………………... …. **1X 5 = 5M**

- Report………………………….....**1M**

# B.Sc. Biochemistry Semester VI
## Practical Examination - Scheme of Valuation (2023-24)

## (DSC 8): Molecular Biology and Immunology - Practical 8

**Duration: 3-hour**                                                                     **Max. Marks: 25**

C1 and C2 are internal tests to be conducted during 8th and 16th weeks respectively of the semester. C3 is the semester-end examination conducted for 3 hours. The students will be evaluated on the basis of skill, comprehension and recording the results.

The student has to compulsorily submit the practical record during C1 and C2. For C3, Students must submit completed practical records duly signed by batch teachers and certified by HOD at the time of examination. (No evaluation of record)

The student is evaluated for **C1** and **C2** respectively as per the following scheme:

| Heading | Marks |
|---|---|
| **C1**: Procedure writing **(02)** | **10** |
| **C2:** Major Experiment + Record | **10 + 05=15** |
| **Total** | **25** |

The student is evaluated for **25 marks** in **C3** as per the following scheme

> **PART-A:  Procedure writing**                    **Marks - 08**
> **PART-B:  Major Experiment**                     **Marks - 12**
> **PART-C:  Viva-voce**                            **Marks - 05**

**PART A: Minor Experiment**                                                          **Marks - 08**

**Any ONE of the following is to be given for procedure writing**

1. Determination of lambda max of proteins and nucleic acid

2. Determination of purity of nucleic acids.

3. Electrophoretic separation of nucleic acids by Agarose gel electrophoresis.

4. Demonstration of pregnancy test

5. Purification of Immunoglobulin G from egg yolk.

6. Demonstration of Western blotting.

7. Demonstration of WIDAL test.

**PART-B:  Major Experiment**                                           **Marks -12**

## Any ONE of the following experiments is to be given for conduction

1. Isolation of DNA from banana/endosperm of coconut /any other source.

2. Isolation of RNA from spinach leaves/any other source.

3. Estimation of DNA by DPA method

4. Estimation of RNA by orcinol method.

5. Identification of blood group and Rh factor by Hemeagglutination reaction

6. Determination of Antigen specificity by Single Radial Immunodiffusion assay (SRID)

7. Determination of Antigen specificity by Outcherlony double diffusion method

### Assessment of Experimental results:

➢ For the Experiments No – 1,2,5,6,7

- Principle and procedure……………………………....**6M**
- Conduction of Experiment ………………………. **4M**
- Report…………………………………………… **2M**

➢ For Estimation of DNA/RNA

- Principle and reaction……………...**3 M**
- Tabular column…………………... **3M**
- Graph………………………………**3M**
- Result…………………………...**3M**

| % Error | Marks awarded |
|---|---|
| <10% | 3 |
| 10-15% | 2 |
| Any other value | 1 |

# B.Sc. Biochemistry Semester VI

## Scheme of Valuation for Internship

C1 and C2 are internal assessments to be conducted during 8th and 16th weeks respectively of the semester. The student will be evaluated on the basis of presentation skills and project development. The student Internship may be full-time/part-time (full-time during semester holidays and part-time in the academic session). The student shall avail their discipline specific internship or project in any laboratory, hospitals, companies or Research institutes.

The student has to compulsorily submit the report for evaluation during C2. The report has to be certified by the Head of the Department and the Mentor/Supervisor.

**The student is evaluated for 100marks in C1 and C2 as per the following scheme:**

| Assessment Criteria | Marks |
|---|---|
| **C1**: Project Progress Presentation and skills | **50** |
| **C2**: Project Development skills and Report | **50** |
| **Total** | **100** |

# B.Sc. (Basic) Semester V/VI Examination

## Model question paper: Discipline Specific Course (DSC)

## Biochemistry

**Duration: 2.30 hours**                                                    **Max. Marks: 60**

**Instructions: Answer any FIVE questions from Part A and any FIVE from Part B.**

|  |  |
|---|---|
| **Part -A** | **2 x 5 = 10** |

1.  a.
    b.
    c.
    d.
    e.
    f.
    g.

|  |  |
|---|---|
| **Part –B** | **5 x 10= 50** |

2.  a.
    b
3.  a.
    b.
4.  a.
    b.
5.  a.
    b.
6.  a.
    b.
    c.
7.  a.
    b.
    c.
8.  a.
    b.
    c.

**************

**NOTE:**

1.  Ten marks questions may be divided in to 6+4 or 5+5 for question 2 to 5 and 3+3+4 for 6 to 8
2.  Question and marks on each unit should be proportional to the number of teaching hours allotted

# B.Sc. Biochemistry Practical Examination

## Model question paper

## V Semester

### DSC (5) - Qualitative analysis of Biomolecules and nutritional aspects

1.  Minor experiment/ Procedure writing         **08 Marks**
2.  Major experiment (Conduction of experiment)     **12 Marks**
3.  Viva Voce         **05 Marks**

### DSC (6) - Human Physiology and Enzymology

1.  Write the procedure for the experiment……….     **05 Marks**
2.  Major experiment (Conduction of experiment)     **15 Marks**
3.  Viva Voce         **05 Marks**

## VI Semester

### DSC (7) - Metabolism with Clinical Correlations

1.  Minor experiment (Conduct the experiments and report the results) **06 Marks**
2.  Major experiment (Conduct the experiments and report the results **14 Marks**
3.  Viva Voce         **05 Marks**

### DSC (8) -Molecular Biology and Immunology

1.  Write the procedure for the experiment…………...     **08 Marks**
2.  Major experiment (Conduct the experiments and report the results) **12 Marks**
3.  Viva Voce         **05 Marks**

## Board of Studies

| Sl No | Name and address | Designation | Signature |
|---|---|---|---|
| 1 | Ms Ramya V <br> Head, Department of Biochemistry <br> SBRR Mahajana First Grade College, Autonomous <br> Jaylakshmipuram, Mysuru <br> Mobile No: 77601018585 <br> ramyav.fgc@mahajana.edu.in | Chairperson | |
| 2 | Dr. Kemparaju K <br> Professor, DoS in Biochemistry, Manasagangothri <br> University of Mysore, Mysuru. <br> Mobile No:9945996543 <br> kemparajuom@gmail.com <br> kemparaj@biochemistry.uni-mysore.ac.in | Member | |
| 3 | Mr. Haleshappa R <br> Assistant Professor, Department of Biochemistry, <br> Nrupathunga University <br> Nrupathunga Road, Bengaluru - 560001 <br> Mobile No:9743896433 <br> haleshr222@gmail.com | Member | |
| 4 | Dr. Siddesha J M <br> Assistant Professor ,Division of Biochemistry, <br> School of Life Sciences, JSS Academy of Higher <br> Education & Reasearch, SS Nagar, Mysuru-15 <br> Mobile No:7019041500 <br> siddeshajm@gmail.com | Member | |
| 5 | Dr. Puneeth Kumar <br> Managing Director, Azymus <br> Lifescience Pvt. Ltd. <br> Kellamballi Industrial Area, KIADB, Chamrajnagara. <br> Mobile No:8971155575 <br> azymus.pharma@gmail.com | Member | |
| 6 | Ms. Pallavi <br> Assistant Professor, Department of Biochemistry <br> MMK & SDM College, Mahila Mahavidyalaya, Mysuru <br> Mobile No:9538582629 <br> pallavimr1990@gmail.com | Member | Absent |
| 7 | Smt. Radhika P <br> Assistant Professor, Department of Biochemistry <br> SBRR Mahajana First Grade College, Autonomous <br> Jaylakshmipuram, Mysuru <br> Mobile No:9986585574 <br> radhikap.fgc@mahajana.edu.in | Member | |

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# BOARD OF STUDIES (BoS)

# DEPARTMENT OF BIOTECHNOLOGY

**UG** ✓

**PG**

## NEP Syllabi for V and VI Semester B.Sc.

## Biotechnology

## 2023-24

# DEPARTMENT OF BIOTECHNOLOGY

### Motto

**Science for Future**

### Vision

**To pave way for an innovative future and welfare of society
by enhancing technical skills in solving the real world problems.**

### Mission

**To understand Biotechnology at Molecular level
To create skilled researchers to meet practical challenges.
To provide quality education and attain new heights in achieving goals**

# Program Outcomes (POs) for Bachelor of Science

**PO 1: Domain Knowledge -** Acquire and apply knowledge of science in relevant areas.

**PO 2: Problem Analysis -** Recognize real-world problems and user's requirements to propose solutions for the same using basic principles of science.

**PO 3: Design and Development of Solutions -**Developing solutions and inferences for complex problems using critical and analytical thinking.

**PO 4: Investigation & Research** - Ability to formulate hypothesis, augment research questions and identify & refer relevant sources for examining or inspecting technical issues as per their level of understanding and knowledge.

**PO5: Use of Modern Techniques/Tools** – Use digital resources, various software/platforms and appropriate techniques to interpret concepts of science.

**PO6: Impact of Science on Society** – To prepare competent human resource and to develop scientific attitude at local and global levels for social benefit.

**PO7: Environment and Sustainability** – Apply the knowledge gained for conserving environment and to handle environmental issues with sustainable solutions.

**PO8: Moral and Ethical Values** – Imbibe moral values and professional ethics to maintain the integrality in a professional scenario while being aware of the cultural diversities.

**PO9: Individual and Team Work with Time Management** – Work productively in a team or as an individual while exhibiting time management skills.

**PO 10: Communication** – Develop the caliber to convey various concepts of science effectively.

**PO 11: Project Management and Finance** – Set up enterprises/companies and build entrepreneurship, project management and finance planning skills.

**PO 12: Life-long Learning** – Engage in the art of self-directed learning.

# List of BoS Members

| Sl No | Category | Name and Designation | Address for Communication | e-Mail & Mobile No. |
|---|---|---|---|---|
| 1. | Chairperson | Priyanka Shenoy N Assistant professor and Head | Department of Biotechnology, SBRR Mahajana First Grade College,Mysuru -12 | Priyankapravanvivek83741@gmail.com Ph no-9663218437 |
| 2. | Nominee by the Vice Chancellor | Dr. Geetha N Professor | S in Biotechnology, Manasagangothri University of Mysore, Mysuru. | Geethabiotech.uom@gmail.com Ph no- 9986203018 |
| 3. | Two Experts from Other University | Dr. Sumana K. Associate Professor | Department of Microbiology, Faculty of life Sciences, JSS – Academy of Higher Education and Research, Mysuru – 570004 | mnsumana@jssuni.edu.in Ph No 91740390666 |
| 4. | | Dr. Chandrashekar Assistant Professor | Department of studies in Biotechnology Davangere University, Davengere | chandru.s@davangereuniversity.ac.in Ph No 9164176224 |
| 5. | One Person from Industry | Dr. Irfanulla Sharieff Chief scientific officer | Triphase pharmaceuticals Pvt Ltd, KSSIDC Industrial estate, Hebbal, Mysore-16 | Sharieffirfan17@gmail.com Ph No 9845881086 |
| 6. | Alumnus | Ms. Brunda A Tutor Department of Biochemistry | Kanachur Institute of Medical Sciences Mangalore | brundaa@jssuni.edu.in Ph No 7259722515 |

**Course Structure (NEP 2020)**

**<u>III Year B.Sc. Biotechnology</u>**

**Discipline Specific Courses (DSC), Employability Skills (EMP), Internship Programme (INT)**

**L:** Lecture; **T:** Tutorial; **P:** Practical

| Course Code, Type and Title | | Hours /week | | Number of Credits (L:T:P) | Max marks | | | Exam Duration | Total Marks |
|---|---|---|---|---|---|---|---|---|---|
| | | L | T/P | | IA | | Exam | | |
| | | | | | C1 | C2 | C3 | | |
| **V SEMESTER** | | | | | | | | | |
| 232559 | **DSC (5)** **Genetic Engineering** | 4 | 0 | **4 : 0 : 2** **(6 credits)** | 20 | 20 | 60 | 2½ Hours | 100 |
| | **DSC (5) LAB** **Genetic Engineering** | 0 | 4 | | 10 | 15 | 25 | 3 Hours | 50 |
| 232560 | **DSC (6)** **Plant and Animal Biotechnology** | 4 | 0 | **4 : 0 : 2** **(6 credits)** | 20 | 20 | 60 | 2½ Hours | 100 |
| | **DSC (6) LAB** **Plant and Animal Biotechnology** | 0 | 4 | | 10 | 15 | 25 | 3 Hours | 50 |
| 23EMPBIT 01 | **Sec(5)** **Biotechnology skills and analytical techniques** | 2 | 0 | **3:0:0** **(3 credits)** | 10 | 10 | 30 | 1½ Hours | 100 |
| | **Quality control methods in Biology** | 0 | 1 | | 10 | 15 | 25 | 3 Hours | |
| **VI SEMESTER** | | | | | | | | | |
| 232659 | **DSC (7)** **Immunology** | 4 | 0 | **4 : 0 : 2** **(6 credits)** | 20 | 20 | 60 | 2½ Hours | 100 |
| | **DSC (7) LAB** **Immunology** | 0 | 4 | | 10 | 15 | 25 | 3 Hours | 50 |
| 232660 | **DSC (8)** **Bioprocess and Environmental Biotechnology** | 4 | 0 | **4 : 0 : 2** **(6 credits)** | 20 | 20 | 60 | 2½ Hours | 100 |
| | **DSC (8) LAB** **Bioprocess and Environmental Biotechnology** | 0 | 4 | | 10 | 15 | 25 | 3 Hours | 50 |
| **INT** | **Internship** **23INTBIT01** | 2 | 0 | **2 : 0 : 0** | 50 | 50 | - | - | 100 |

4

# DSC (5) Syllabus for B.Sc. Biotechnology (Basic and Honors)

## Semester V

| Course Code: **232559** | **Course Title**: <br> Genetic Engineering (Theory) <br> Genetic Engineering Lab (Practical) |
|---|---|
| **Course Credits (L:T:P) :** 06 (4:0:2) | **Hours of Teaching/Week:** 04 (Theory) <br> 04 (Practical) |
| **Total Contact Hours:** <br> 60 Hours(Theory) <br> 60 Hours (Practical) | **Formative Assessment Marks:** <br> 40 (Theory) <br> 25 (Practical) |
| **Exam Duration:** 2½ Hours(Theory) <br> 3 Hours (Practical) | **Semester End Examination Marks:** <br> 60 (Theory) <br> 25 (Practical) |

**Course Outcomes (COs):**

**CO 1:**   Interpret and apply the basic concepts of nucleic acid isolation, quantification and gene expression analysis. Acquire the information about the process of cloning and different types of cloning vectors.

**CO 2**:   Analyze the basic principles of genome editing and manipulation techniques of both prokaryotic and eukaryotic organisms. Get acquainted with the basic techniques of Genetic engineering.

**CO 3:**   Describes the basic principles and applications of genetic engineering in various field.

**CO 4:** Interpret the concepts of industrial scale up and advances in genetic engineering. Debate on ethical implications associated with genetic engineering

| Course Content | |
|---|---|
| **Genetic Engineering - Content of Theory** | **60Hrs** |
| **Unit I- Fundamentals of Genetic Engineering** | **15** |
| Definition, scope, and historical overview of genetic engineering. **DNA Structure and Manipulation** - Techniques for DNA isolation and purification. Methods for quantification and characterization of DNA samples. **RNA Analysis and Gene Expression**- Methods for RNA isolation and purification. Analysis of gene expression. **Recombinant DNA technology** – Introduction to molecular cloning. Overview of cloning vectors. Plasmids, phage, cosmid, BAC, and YAC. Features and applications of cloning vectors in genetic engineering. Enzymes used in recombinant DNA technology: Restriction endonucleases, Polymerases, Ligase, kinases, and phosphatases. Techniques for molecular cloning of DNA or RNA fragments in bacterial and eukaryotic systems. | |
| **Unit II- Practices in Genetic Engineering** | **15** |
| Recombinant Protein Expression and Purification, affinity tags. Techniques for expressing recombinant proteins using bacterial, animal,and plant expression systems. Strategies for protein purification and characterization. Hybridization techniques, Southern, Northern, Western, FISH, Polymerase Chain Reaction (PCR) and its types, molecular probes, DNA sequencing- Sanger's, Next Generation Sequencing **Gene Manipulation Techniques** - Methods of gene delivery. Physical (electroporation, micro-injection, gene gun) chemical (liposome mediated, Calcium phosphate) and biological methods (Transformation, transfection) Gene knockout techniques in bacterial and eukaryotic organisms. **Genome Editing** - Introduction to genome editing techniques- Principles and applications of genome editing techniques. CRISPR-Cas9, site-directed mutagenesis, and other genome editing methods. | |
| **Unit III- Applications of Genetic Engineering** | **15** |
| Introduction and diverse applications of genetic engineering. Gene therapy and its potential in treating genetic disorders. Strategies for gene delivery in therapeutic applications. Diagnostic Applications. DNA fingerprinting and its applications in forensics. Molecular diagnostic techniques and their role in disease diagnosis. Use of genetic engineering in the development of therapeutics and vaccines. Production of biopharmaceuticals using recombinant DNA technology. | |
| **Unit –IV- Advances in Genetic Engineering and Ethics** | **15** |

Industrial Applications. Industrial applications of genetic engineering, such as enzyme production, biofuel production, and bioremediation. Scale-up techniques and process optimization in industrial settings. Introduction to synthetic biology and its integration with genetic engineering. Design and construction of artificial biological systems.
**Ethical and Regulatory Considerations** - Discussion of ethical implications associated with genetic engineering. Introduction to regulatory guidelines and safety considerations for genetic engineering research and applications

**References:**

1. Principles of Gene Manipulation and Genomics (2016) 8th ed., Primrose, SB, and Twyman, R, Wiley Blackwell, ISBN: 978-1405156660.

2. Gene Cloning and DNA Analysis: An Introduction (2019) 7th ed., Brown, TA, Wiley Blackwell, ISBN: 978-1119072560.

3. Genome 4 (2017) 4th ed., Brown, TA, Garland Science, ISBN: 978-0815345084.

4. Introduction to Genomics (2015) 2nd ed., Lesk, AM, Oxford University Press India, ISBN: 978-0198745891.

5. Genomics and Personalized Medicine: What Everyone Needs to Know (2016) 1st ed., Snyder, M, OUP-USA, ISBN: 978-0190234768.

6. Molecular Biology of the Gene (2014) 7th ed., Watson, JD, Baker, TA, Bell, SP, Gann, A, Levine, M, and Losick, R, Pearson, ISBN: 978-0321762436.

7. Principles of Gene Manipulation and Genomics (2019) 9th ed., Primrose, SB, and Twyman, R, Wiley Blackwell, ISBN: 978-1119163774.

8. Genomes (2018) 4th ed., Brown, TA, Garland Science, ISBN: 978-0815345084.

9. Introduction to Genomics and Proteomics (2015) 2nd ed., Burrell, MM, Wiley, ISBN: 978- 0470850075.

10. Genomics: The Science and Technology Behind the Human Genome Project (2019) 2nd ed., Gibson, G, and Muse, SV, Oxford University Press, ISBN: 970198786207.

11. Genomics and Evolution of Microbial Eukaryotes (2019) 1st ed., Katz, LA, and Bhattacharya, D, Oxford University Press, ISBN: 978-0198830202.

12. Essentials of Genomic and Personalized Medicine (2016) 2nd ed., Ginsburg, GS, and Willard, HF, Academic Press, ISBN:978-0124078652.

13. Genomic Medicine: Principles and Practice (2014) 2nd ed., Ginsburg, GS, and Willard, HF, Oxford University Press, ISBN: 978-0199334468.

14. Genomic Medicine in Resource-limited Countries: Genomics for Every Nation (2019)1st ed., Wonkam, A, Puck, JM, and Marshall, CR, Academic Press, ISBN: 978-0128133003.

15. Molecular Genetics and Genomics (2020) 1st ed., Krebs, JE, and Goldstein, ES, Jones & Bartlett Learning, ISBN: 978-1284154544.

16. Bioinformatics and Functional Genomics (2015) 3rd ed., Pevsner, J, Wiley-Blackwell, ISBN: 978-1118581780.

17. Genomic Approaches for Cross-Species Extrapolation in Toxicology (2019) 1st ed., Wichard, J, and Maertens, A, CRC Press, ISBN: 978-0815348023.

18. Introduction to Genetic Analysis (2020) 12th ed., Griffiths, AJF, Wessler, SR, Carroll, SB, and Doebley, J, W.H. Freeman, ISBN: 978-1319149609.

19. Genetic Engineering: Principles and Methods (2019) 3rd ed., Fowler, MR, CABI, ISBN: 978- 1789240605

**Weblinks:**

1. https://bio.libretexts.org/Bookshelves/Microbiology/ Microbiology(Bruslind)/18%3A_Genetic_Engineering
2. https://www.ncbi.nlm.nih.gov/books/NBK424529/
3. https://fcen.uncuyo.edu.ar/catedras/techniques-in-genetic-engineering.pdf
4. https://link.springer.com/book/10.1007/978-1-4899-1766-9
5. https://www.cambridge.org/core/books/an-introduction-to-genetic-engineering/A3B274BAC608CE61F02B78BFC24836C9
6. https://onlinelibrary.wiley.com/doi/book/10.1002/9783527620838

**DSC (5): Practical**

**Genetic Engineering**

**(4Hrs/week) 2 Credits**

1. **Introduction to Laboratory Techniques** - Safety guidelines and
   laboratory protocols Aseptic techniques
   and proper handling of materials. Basic equipment and instrument operation
   Preparation of reagents and media
2. **Nucleic Acid Extraction and Quantification** (DNA/RNA)
   DNA extraction from different sources (e.g., bacteria/plant/ animal).
   Quality assessment and quantification of nucleic acids
   (DNA/RNA) (spectrophotometry, gel electrophoresis).
3. **Polymerase Chain Reaction (PCR)**
   Primer design and optimization
   PCR setup and cycling conditions Agarose gel electrophoresis for PCR product
   analysis
4. **Cloning and Plasmid Manipulation**
   Isolation of Plasmid Restriction enzyme digestion Ligation reactions
   Transformation of bacterial cells with recombinant plasmids Colony selection
   and screening for successful cloning
5. **Gel Electrophoresis and DNA Analysis**
   Agarose gel electrophoresis for DNA fragment separation and analysis
   DNA size determination using molecular weight markers DNA band
   visualization techniques (e.g., Ethidium bromide staining, DNA intercalating
   dyes)

**Course Articulation Matrix – 232559**

| CO/PO | PO 1 | PO 2 | PO 3 | PO4 | PO 5 | PO 6 | PO7 | PO 8 | PO 9 | PO10 | PO11 | PO12 |
|-------|------|------|------|-----|------|------|-----|------|------|------|------|------|
| **CO 1** | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 2 | 2 |
| **CO 2** | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 1 | 2 |
| **CO 3** | 2 | 1 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 3 | 2 | 2 |
| **CO 4** | 2 | - | 2 | 2 | - | 2 | 2 | 3 | - | 2 | 1 | 2 |
| **Weighted Average** | 2 | 1 | 1.75 | 2.25 | 2 | 2 | 2 | 2 | 1 | 2.75 | 1.5 | 2 |

SBRR MAHAJANA FIRST GRADE COLLEGE (AUTONOMOUS)

# DSC (6) Syllabus for B.Sc. Biotechnology (Basic and Honors)

| Course Code: 232560 | Course Title: Plant and Animal Biotechnology (Theory) Plant and Animal Biotechnology (Practical) |
|---|---|
| Course Credits (L:T:P): 06 (4:0:2) | Hours of Teaching/Week: 04 (Theory) + 04(Practical) |
| Total Contact Hours: 60 Hours(Theory) 60 Hours(Practical) | Formative Assessment Marks: 40 (Theory) 25(Practical) |
| Exam Duration: 2½ Hours (Theory) 3 Hours (Practical) | Semester End Examination Marks: 60 (Theory) 25 (Practical) |

**Course Outcomes (COs):**

**CO 1:** Exposure to the plant tissue culture skills and applications in Plant Biotechnology and research

**CO 2:** Acquire information about the concepts of cloning and transgenesis of both plants and animals with respect to the advancement in medical, agricultural and pharmaceutical industry.

**CO 3:** Develop the ability about animal cell potency, mass production of cell lines and basic characterization of mammalian cell culture.

**CO 4:** Elucidate and specify different types of gene transfer techniques, gene editing and basic concept about ethical issues.

**Course Content:**

| Unit I– Plant Tissue culture methods | 60 Hrs |
|---|---|
| Introduction, principle, history, definition, hypothesis of plant tissue culture and cellular totipotency. media and laboratory organization, types of culture; callus culture, seed culture, embryo culture, meristem culture, bud culture, their limitations and applications. Concept of morphogenesis, differentiation, direct, indirect organogenesis, somatic embryogenesis, synthetic seeds. In vitro propagation and micropropagation, Secondary metabolites, In vitro secondary metabolite production, Suspension cultures, cell cultures, growth vs secondary metabolite production, bioreactors and scaling up of secondary metabolite production, limitations, and applications. | 15 |

| Unit –II  Transgenic Plants and biosafety | |
|---|---|
| Overview of transgenic plants and their significance in agriculture. - Techniques for introducing foreign genes into plants: Agrobacterium-mediated transformation, biolistics, and other methods. Selection and screening of transformed plants. Applications of Transgenic Plants - Improved crop traits through genetic engineering: pest resistance, herbicide tolerance, disease resistance, and abiotic stress tolerance. Biosafety assessment of transgenic plants: potential risks and benefits. International regulatory frameworks for releasing and commercializing genetically modified organisms (GMOs). Ethical and socio-economic impacts of transgenic crops. Intellectual property rights and access to transgenic technologies. | **15** |
| **Unit –III  Animal Cell culture methods** | |
| History and laboratory organization, types of Media (Natural media, artificial media, serum free media, chemically defined media and protein free media). Cell types and culture characters, Concept of Pluripotency, Multipotency, Differentiation, Trans differentiation Reprogramming, Biology and characterization of cultured cells- cell adhesion, proliferation, differentiation, morphology of cells, and identification. The basic technique of mammalian cell culture in vitro, Measuring parameters of growth in cultured cells (Lag phase, log phase, and plateau phase) cell viability, and cytotoxicity. Large-scale culture of cell lines- monolayer, suspension, and immobilized cultures. Organ and histotypic culture: Technique, advantages, limitations and applications. Stem cells: types (embryonic, adult, induced pluripotent), isolation, identification, expansion, differentiation and uses, stem cell engineering and ethical issues. | **15** |
| **Unit- IV  Gene transfer in animals and applications** | |
| Gene constructs promoter/ enhancer sequences for transgene expression in animals. Selectable markers for animal cells- thymidine kinase. Transfection of animal cells- calcium phosphate coprecipitation, electroporation, lipofection, peptides, direct DNA transfer, viral vectors, Retrovirus, microinjection. Transgene identification methods. Transgenic and genome-edited animals. Ethical issues in transgenesis. Recent advances and applications in the field. Manipulation of animal reproduction and characterization of animal genes, Embryo transfer in cattle and applications. Somatic cell cloning - cloning of Dolly. Ethical issues. Production of recombinant vaccines. | **15** |

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2. https://www.britannica.com/science/tissue-culture
3. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7088179/
4. https://www.isaaa.org/resources/publications/pocketk/14/default.asp
5. https://www.ncbi.nlm.nih.gov/books/NBK207572/
6. https://www.nifa.usda.gov/grants/programs/biotechnology-programs/animal-biotechnology
7. https://www.tandfonline.com/journals/labt20

# DSC (6): Plant and Animal Biotechnology

**(4Hrs/week) 2 Credits**

1. Laboratory organization of basic and commercial plant tissue culture

2. Media preparation (MS, B5), solid media preparation, and Liquid media preparation

3. Explant preparation – Leaf, bud, rhizome, and meristem

4. Synthetic seed production

5. Callus culture- Initiation and establishment of different types of callus cultures

6. Micropropagation with a suitable example – Stage 0. 1, 2, 3, and 4

7. Staining, cell viability, and cell count of cell cultures

8. Preparation of cell culture media: Preparation of basic cell culture media, such as Dulbecco's Modified Eagle Medium (DMEM), supplemented with fetal bovine serum (FBS), antibiotics, and other required additives.

9. Aseptic techniques and sterile handling: Practicing aseptic techniques, including properly handling tools and equipment, working in a laminar flow hood, and maintaining sterility throughout the cell culture process.

10. Sterilization: Practice filter sterilization for sensitive media ingredients.

11. Cell counting and viability assessment: Count cells using a hemocytometer or automated cell counter, and perform viability assays (e.g., trypan blue exclusion) to determine the percentage of viable cells.

12. Cell staining and microscopy: Staining the cultured cells using dyes such as hematoxylin and eosin (H&E), and observe them under a light microscope to study cell morphology and structure.

13. Contamination identification and troubleshooting: Learn to identify and troubleshoot common issues in cell culture, such as contamination by bacteria, fungi, or mycoplasma, and implement appropriate corrective measures.

14. Experimental design and data analysis: Students can design and execute simple experiments, record and analyze data, and interpret the results based on their observations and measurements.

**Course Articulation Matrix – 232560**

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 3 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 3 | 2 | 2 |
| **CO 2** | 2 | 2 | 2 | 1 | 3 | 2 | 3 | 1 | 2 | 3 | 1 | 2 |
| **CO 3** | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 3 |
| **CO 4** | 2 | 2 | 2 | 2 | 3 | 1 | 1 | 3 | 2 | 2 | 2 | 2 |
| **Weighted Average** | 2.25 | 1.75 | 1.75 | 1.5 | 2.5 | 1.25 | 2 | 2 | 1.5 | 2.25 | 1.75 | 2.25 |

## Biotechnology Skills and
## Analytical Techniques
## Semester V

| | |
|---|---|
| **Course Code: 23EMPBIT01** | **Course Title:** Biotechnology and Analytical techniques (Theory) Quality control methods in biology (Practical) |
| **Course Credits (L:T:P):** 03 (2:0:1) | **Hours of Teaching/Week:** 02 (Theory) 02(Practical) |
| **Total Contact Hours:** 30 Hours(Theory) 30 Hours(Practical) | **Formative Assessment Marks:** 20 (Theory) 25(Practical) |
| **Exam Duration:** 1½ Hours (Theory) 3 Hours (Practical) | **Semester End Examination Marks:** 30 (Theory) 25(Practical) |

**Course Outcomes (COs):**

- CO 1: To introduce the concept of executive industrial skills and Digital skills
- CO 2: Familiarize the working principle of several bioanalytical techniques like microscopy, centrifugation, spectroscopy and electrophoretic and other technique.

| Course Content | 30Hrs |
|---|---|
| **Unit-I Insights into the biotechnology industry and basic professional skills** | |
| Biotechnology Industry in Indian and Global Context- Organization in the context of large/medium/small enterprises, their structure, and benefits. **Industry-oriented professional skills:** Planning and organizing skills, decision-making, problem solving skills, analytical thinking, critical thinking, team management, and risk assessment. Interpersonal skills: Writing skills, reading skills, oral communication, conflict resolution techniques, interpretation of research data, and troubleshooting in the workplace. **Digital skills:** Basic computer skills (MS Office, excel, power point, internet) for the workplace. Professional E-mail drafting skills and PowerPoint presentation skills. Overview of good manufacturing practices (GMP), Good Documentation practices (GDP), and good laboratory practices (GLP). | **15** |
| **Unit- II Basic laboratory skills and Analytical Techniques** | |
| **Analytical skills in the laboratory:** Preparations of solutions, molarity, molality, normality, mass percent % (w/w), percent by volume (%v/v), parts per million (ppm), parts per billion (ppb), dilution of concentrated solutions. Standard | |

| | |
|---|---|
| solutions, stock solution, and solution of acids. Reagent bottle label reading and precautions. | |
| **Analytical techniques:** Basic principle, operation, application, maintenance, calibration, validation, and troubleshooting of instruments- Microscope-Simple, compound, TEM, SEM, fluorescence. Centrifuge and different types, Hot air oven, pH meter, different types of pH electrodes Autoclave, Incubator, BOD, COD, cell counter, Laminar airflow. Spectroscopy Colorimeter, UV-Visible spectroscopy. Electrophoresis- Agarose Gel electrophoresis, SDS-PAGE, PCR, Conductivity meter, and Potentiometer. Biosafety cabinets. | **15** |

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**Web links:**
1.**https://www.pharmatutor.org/articles/bioanalytical-techniques-overview**
2. **https://www.intechopen.com/chapters/67668**
3. **https://bookstore.teri.res.in/books/9788179935293**

# Quality control methods in Biology

| Course Content | 30Hrs |
|---|---|

**Unit-I  Methods and practices of cleaning and management of lab**

Learning and Practice of Integrated clean-in-place (CIP) and sterilize-in-place (SIP) as per industry standards, material requirements for cleaning specific areas, equipment, ventilation area, personal protective requirements Calibration of and use of micropipette.

**Unit- II**

Preparation of Standard Operating Procedure (SOP) for various equipment in the QC Lab, Best practices of using and storing chemicals: Knowledge and practice in handling chemicals, labeling, and stock maintenance. SOP and material handling. Procedures to maintain chemicals, labeling, storage, and disposal.

**Handling and calibration of lab equipment**- weighing balance, Autoclave, Hot air Oven, Incubator, Centrifuge, Water bath, Colony Counter, and stability chamber, Preparation of Normality, Molarity, and buffer solutions.

**Unit- III**

**Preparation of media:** Maintenance and storage of purified water for media (plant tissue culture media, microbiological med, and animal cell culture media) preparation. Preparation and storage of concentrated stock solutions. Documentation and disposal of expired stocks. Collection of indents of media requirement, preparation, and storage. Media coding, documentation, and purpose of usage. Demonstration, handling, and troubleshooting of High-Performance Liquid Chromatography and Gas chromatography. Demonstration of Polymerase Chain Reaction (PCR), Hands-on training on colorimeter and spectrophotometer, Industry visit, or analytical laboratory visit.

**Course Articulation Matrix -23EMPBIT01**

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 2 | 1 | 1 | 2 | 3 | - | 2 | 1 | 2 | 3 | 2 | 3 |
| | | | | | | | | | | | | |
| CO 2 | 3 | 2 | 2 | 2 | 3 | 1 | 2 | - | 2 | 3 | 2 | 2 |
| Weighted Average | 2.5 | 1.5 | 1.5 | 2 | 3 | 1 | 2 | 1 | 2 | 3 | 2 | 2.5 |

## DSC (7) Syllabus for B.Sc. Biotechnology (Basic and Honors)
### VI SEMSTER

| Course Code: 232659 | Course Title: Immunology (Theory) Immunology (Practical) |
|---|---|
| Course Credits (L:T:P) :06 (4:0:2) | Hours of Teaching/Week:   04 (Theory) + 04 (Practical) |
| Total Contact Hours: 60 Hours (Theory) 60 Hours (Practical) | Formative Assessment Marks:  40 (Theory) 25 (Practical) |
| Exam Duration: 2½ Hours (Theory) 3 Hours (Practical) | Semester End Examination Marks: 60 (Theory) 25 (Practical) |

**Course Outcomes (COs):**

**CO 1:** Overview of various aspects about cells and organs of immune system.

**CO 2**: Strengthen the concept of antigen-antibody interaction, MHC, Hypersensitivity and complementation pathways**.**

**CO 3:** Technical skills with respect to immunology and vaccine development

**CO 4:** Application and interpretation of immunological techniques for treating autoimmune diseases, immuno-deficiencies and cancer immunotherapy

| Course content | 60 Hours |
|---|---|
| **Unit–I Cells and Organs of the Immune System** | |
| Introduction to the Immune System: History of Immunology, Types of Immunity: first and second line of defense, innate and acquired/adaptive immunity, specificity, diversity. Cells of the immune system: Antigen-presenting cells (APCs), Role of B and T-lymphocytes in Humoral immunity and cell-mediated immunity, primary and secondary immune response, Immunization, memory. Organs of the Immune system: Thymus, bone marrow, spleen, Lymph Node, peripheral lymphoid organs | 15 |
| **Unit -II Molecules of the Immune System** | |
| Antigens and haptens: Properties (foreignness, molecular size, heterogeneity). Adjuvants. Antigenicity and Immunogenicity. Affinity and Avidity. B and T cell epitopes, superantigens Immunoglobulins: Classification, structure, and function. Antibody diversity, Monoclonal and polyclonal antibodies. Major histocompatibility complexes: Classification, structure, and function. Antigen processing pathways – Cytosolic and Endocytic, Complement Pathways, Cytokines: Classification and function, Hypersensitivity: Reactions – Types I, II, and III. Delayed Type Hypersensitive Response. | 15 |
| **Unit -III Immuno-techniques and vaccines** | |
| Structure and properties of antigens- iso- and allo-antigens, antigen specificity, Cross-reactivity, Precipitation, Immunodiffusion reactions Radial immunodiffusion, Ouchterlony double diffusion, Immuno electrophoresis. Agglutination: Agglutination reactions. ELISA, RIA Immunocytochemistry, Fluorescent Techniques. | 15 |
| **Unit – IV** | |
| Transplantation immunology: Phases in graft rejection and immuno-suppressors. Autoimmune Disorders: Systemic and Organ-specific Autoimmune disorders with examples Immunodeficiencies: Primary and secondary immunodeficiencies; acquired immunodeficiency syndrome (PIDD-SCID, X-Linked agammaglobulinemia). Cancer and the immune system – immune surveillance, immunological escape, cancer antigens, cancer immunotherapy Vaccines: Conventional (Killed vaccines, live attenuated vaccines toxoids), peptide vaccines, subunit, DNA vaccines. Toxoids, antisera, edible vaccines, plantibodies, and Cancer vaccines (HPV) | 15 |

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**Web links:**
1. https://www.immunology.org/public-information/what-immunology
2. https://www.ncbi.nlm.nih.gov/books/NBK7795/
3. https://www.sciencedirect.com/topics/medicine-and-dentistry/immunology
4. https://www.nii.res.in/
5. https://www.health.mil/Military-Health-Topics/Health-Readiness/Immunization-Healthcare/Clinical-Consultation-Services/Immunology-Basics

# DSC (7): Practical
## Immunology
### (4Hrs/week) 2 Credits

1. Hemagglutination of ABO Blood groups

2. Determination of Rh factor

3. Whole Count of WBC using Hemocytometer

4. Cells of the Immune System

5. Radial immunodiffusion

6. Ouchterlony double diffusion

7. ELISA – Demonstrate

8. Serum Immuno-electrophoresis

9. Western Blotting

## Course Articulation Matrix – 232659

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 2 | 1 | 1 | 2 | 3 | 2 | 1 | 1 | 1 | 3 | 1 | 3 |
| CO 2 | 2 | - | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 |
| CO 3 | 2 | 2 | 1 | 2 | 3 | 2 | 2 | 1 | 1 | 3 | 2 | 1 |
| CO 4 | 2 | 1 | 3 | 3 | 2 | 2 | - | 2 | 1 | 3 | 1 | 3 |
| Weighted Average | 2 | 1.3 | 1.75 | 2.25 | 2.5 | 2 | 1.3 | 1.25 | 1.25 | 2.75 | 1.25 | 2.25 |

SBRR MAHAJANA FIRST GRADE COLLEGE (AUTONOMOUS)

## DSC (8) Syllabus for B.Sc. Biotechnology (Basic and Honors)

| Course Code: 232660 | Course Title: |
|---|---|
| | Bioprocess and Environmental Biotechnology (Theory) |
| | Bioprocess and Environmental Biotechnology (Practical) |
| Course Credits (L:T:P) : 06 (4:0:2) | Hours of Teaching/Week: 04 (Theory) + 04 (Practical) |
| Total Contact Hours: 60 Hours (Theory) 60 Hours (Practical) | Formative Assessment Marks: 40 (Theory) 25 (Practical) |
| Exam Duration: 2½ Hours (Theory) 3 Hours (Practical) | Semester End Examination Marks: 60 (Theory) 25 (Practical) |

**Course Outcomes (COs):**

**CO1**: The skills of exploitation of microorganisms for bioprocess technology, principle of upstream processing and concept of fermentation techniques.

**CO2:** The basic concept introduces significance of bioreactors, certain analytical techniques in downstream processing and its biological applications.

**CO3**: The concept introduces evaluations of environmental biotechnology in regards with major issues in environmental pollution, detection and abandonment.

**CO4:** Illustration and importance of bioremediation and various biological approach for waste water management.

| Course Content | 60 Hours |
|---|---|
| **UNIT- I – Introduction to bioprocess technology** | |
| Basic principle components of fermentation technology. Strain improvement of industrially important microorganisms. Types of microbial culture and its growth kinetics– Batch, Fed-batch, and Continuous culture. Principles of upstream processing – Media preparation, Inocula development, and sterilization. | 15 |

| | Hours |
|---|---|
| **UNIT- II-Bioreactors and downstream processing** | |
| Bioreactors- Significance of Impeller, Baffles, Sparger; Specialized bioreactors- design and their functions: airlift bioreactor, tubular bioreactors, membrane bioreactors, tower bioreactors, fluidized bed reactor, packed bed reactors Downstream processing- cell disruption, precipitation methods, solid-liquid separation, liquid-liquid extraction, filtration, centrifugation, chromatography, drying devices (Lyophilization and spray dry technology), crystallization, biosensors-construction and applications, Microbial production of ethanol, amylase and Single Cell Proteins. | 15 |
| | |
| **Unit III- Fundamentals of Environmental Biotechnology** | |
| Introduction to Environmental Biotechnology- Principles of Environmental Science. Role of Biotechnology in Environmental Conservation. Microbial Processes in Environmental Biotechnology. Pollution and Biotechnology – Major issues in environmental pollution and the role of biotechnology in addressing them. Biotechnological Methods of Pollution Detection-General bioassay methods for pollution detection. Cell biological methods for assessing pollution levels. Use of biosensors in pollution monitoring. Biotechnological Methods in Pollution Abatement-Reduction of $CO_2$ emission using biotechnological approaches. Addressing eutrophication through biotechnological interventions. Application of cell immobilization techniques in pollution abatement. | 15 |
| **Unit IV- Bioremediation and Waste Management** | |
| Importance of bioremediation in environmental cleanup. Types of contaminants suitable for bioremediation. Microorganisms used in bioremediation. In-situ Bioremediation Methods. – Bioaugmentation. Biostimulation. Bioventing. Phytoremediation. Ex-situ Bioremediation Methods – Composting, Land farming, Biopile and bioslurry systems. Xenobiotics. Bio metallurgy and biomining. Waste water Management. Waste water Characterization and Composition. Biological Processes in Waste water Treatment. Activated Sludge Process and Biological Nutrient Removal, Anaerobic Digestion and Biogas Production. Solid Waste Management. | 15 |
| | |

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SBRR MAHAJANA FIRST GRADE COLLEGE (AUTONOMOUS)

**References:**

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1. https://www.ncbi.nlm.nih.gov/books/NBK236005/
2. https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SBTA1304.pdf
3. https://www.studocu.com/row/document/harare-institute-of-technology/bioprocess-engineering/environmental-biotech-notes/42751292
4. https://www.springer.com/journal/12257
5. https://journals.scholarsportal.info/browse/12268372

# DSC (8): Practical

**Bioprocess and Environmental Biotechnology**

**(4Hrs/week) 2 credits**

1. Bacterial growth curve.
2. Calculation of the thermal death point (TDP) of a microbial sample.
3. Study of fermenter- Demonstration.
4. Production of wine.
5. Estimation of the percentage of alcohol, total acidity & volatile acidity in wine.
6. Production and analysis of ethanol.
7. Production and analysis of amylase.
8. Production and analysis of lactic acid.
9. Isolation of industrially important microorganisms from natural resources.
10. Standard analysis of Water (Biological oxygen demand, toxic chemicals and estimation of total dissolved solids, microbial examination of given water sample).

## Course Articulation Matrix – 232660

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 2 | 1 | 1 | 3 | 2 | 2 | 3 | 1 | 1 | 2 | 1 | 3 |
| CO 2 | 2 | 2 | 1 | 3 | 2 | 1 | 3 | 1 | 1 | 2 | 1 | 2 |
| CO 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 1 | 2 | 1 | 2 |
| CO 4 | 1 | 3 | 1 | 2 | 3 | 2 | 3 | 1 | 1 | 2 | 2 | 2 |
| Weighted Average | 1.75 | 2 | 1.25 | 2.5 | 2.25 | 1.75 | 3 | 1.25 | 1 | 2 | 1.25 | 2.25 |

SBRR MAHAJANA FIRST GRADE COLLEGE (AUTONOMOUS)

# B.Sc. Biotechnology 6<sup>th</sup> Semester
## Internship Program

| | |
|---|---|
| **Course Code: 23INTBIT01** | **Course Title :**Internship |
| **Course Credits:** 02 | **Hours of Teaching/Week: 4-5 weeks** |
| **Total Contact Hours:** 90 Hours Internship | **Formative Assessment Marks** 100 Marks (C1=50+C2=50) |

**Course Outcomes (COs):**

**CO1:** Integrate Theory and Practice of the area selected for Internship to

Explore Career Opportunities prior to Graduation.

**CO2:** Develop Communication, Interpersonal, Work Habits, Attitude and

other Critical Skills required for a job.

## Course Articulation Matrix – 23INTBIT01

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 3 | 3 | 3 | 3 | 3 | - | - | 1 | 3 | 3 | 2 | 2 |
| **CO 2** | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | 2 | 2 |
| **Weighted Average** | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | 2 | 2 |

# Continuous Formative Evaluation/Internal Assessment
## (DSC)

Total marks for each course shall be based on continuous assessments and semester end examinations. The pattern is 40:60 for IA and Semester End Theory Examinations respectively and 50:50 for IA and Semester End Practical Examinations respectively.

|  | **THEORY** | **PRACTICAL** |
|---|---|---|
| **Total Marks** | 100 Marks | 50 Marks |
| **Continuous Assessment – 1 (C1)** | 20 Marks | 10 Marks |
| **Continuous Assessment – 2 (C2)** | 20 Marks | 15 Marks |
| **Semester End Examination (C3)** | 60 Marks | 25 Marks |

**Evaluation Process of IA Marks shall be as follows:**

a) The first component (C1) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, project work etc. This assessment and score process should be completed after completing 50% of syllabus of the course and within 45 working days of semester program.

b) The second component (C2) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, internship/industrial practicum/project work, quiz etc. This assessment and score process should be based on completion of remaining 50% of syllabus of the course of the semester.

c) During the 17th – 19th week of the semester, a semester end examination shall be conducted by the college for each course. This forms the third and final component of assessment (C3) and the maximum marks for the final component will be 60%.

d) In case of a student who has failed to attend the C1 or C2 on a scheduled date, it shall be deemed that the student has dropped the test. However, in case of a student who could not take the test on scheduled date due to genuine reasons, such a candidate may appeal to the Program Coordinator/Principal. The Program Coordinator/Principal in consultation with the concerned teacher shall decide about the genuineness of the case and decide to conduct special test to such candidate on the date fixed by the concerned teacher, but before commencement of the concerned semester end examinations.

e) For assignments, tests, case study analysis etc., of C1 and C2, the students should bring their own answer scripts (A4 size), graph sheets etc., required for such tests/assignments and these be sealed/signed bythe concerned department at the time of conducting tests/assignment/project work etc.

f) The outline for continuous assessment activities for Component-I (C1) and Component-II (C2) of a course shall be as under:

| | C1 Marks | C2 Marks | Total Marks |
|---|---|---|---|
| **Session Test** | 20 | - | 20 |
| **Seminar/Presentation/Assignment/Activity/CaseStudy/Field Work/Project Work/Quiz etc.** | | 20 | 20 |
| **Total** | 20 | 20 | 40 |

- For practical course of full credits, seminar shall not be compulsory. In its place, marks shall be awarded for Practical Record Maintenance (the ratio is 25 (10 + 15):25).

- Conduct of Test, Seminar, Case study/Assignment etc., can be either in C1 or in C2 component as decided by the college and concerned department/teacher.

- The teachers concerned shall conduct test/seminar/case study etc., the students should be informed about the modalities well in advance. The evaluated courses assignments during component I (C1) and component II (C2) of assessment are immediately provided to the candidates after obtaining acknowledgement in the register by the concerned teacher(s) and maintained by the Department. Before commencement of the semester end examination, the evaluated test, assignment etc., of C1 and C2 shall be obtained back to maintain them till the announcement of the results of the examination of the concerned semester.

g) The marks of the internal assessment shall be published on the notice board of the department/college for information of the students.

h) The internal assessment marks shall be communicated to the CoE at least 10 days before the commencement of the examinations and the CoE shall have access to the records of such periodical assessments.

i) There shall be no minimum in respect of internal assessment marks.

j) Internal assessment marks may be recorded separately. A candidate, who has failed or rejected the result, shall retain the internal assessment marks.

## Scheme of Valuation for Practical Examinations

C1 and C2 are internal tests to be conducted during 8th and 16th weeks respectively of the semester. C3 is the semester-end examination conducted for 3 hours. The student will be evaluated on the basis of procedure development and its execution. The student has to compulsorily submit the practical record for evaluation during C2. For C3, the record has to be certified by the Head of the Department.

- The student is evaluated for 25 marks in C1 and C2 as per the following scheme:

Part-A (C1): 10 marks

Part-B (C2): 10 marks + Record: 05 marks = 15 marks

- The student is evaluated for 25 marks in C3 as per the following scheme:

| Part A | Major question | 08 |
|---|---|---|
| Part B | Minor question | 06 |
| Identify and comment (Any four photographs: Decided by the External Examiner) | | 06 |
| Viva Voce | | 05 |
| **TOTAL** | | **25** |

# Continuous Formative Evaluation/Internal Assessment (SEC)

Total marks for each course shall be based on continuous assessments and semester end examinations. The pattern is 20:30 for IA and Semester End Theory Examinations respectively and 25:25 for IA and Semester End Practical Examinations respectively.

|  | THEORY | PRACTICAL |
|---|---|---|
| **Total Marks** | 50 Marks | 50 Marks |
| **Continuous Assessment – 1 (C1)** | 10 Marks | 10 Marks |
| **Continuous Assessment – 2 (C2)** | 10Marks | 15 Marks |
| **Semester End Examination (C3)** | 30 Marks | 25 Marks |

**Evaluation Process of IA Marks shall be as follows:**

a) The first component (C1) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, project work etc. This assessment and score process should be completed after completing 50% of syllabus of the course and within 45 working days of semester program.

b) The second component (C2) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, internship/industrial practicum/project work, quiz etc. This assessment and score process should be based on completion of remaining 50% of syllabus of the course of the semester.

c) During the 17th – 19th week of the semester, a semester end examination shall be conducted by the college for each course. This forms the third and final component of assessment (C3) and the maximum marks for the final component will be 60%.

d) In case of a student who has failed to attend the C1 or C2 on a scheduled date, it shall be deemed that the student has dropped the test. However, in case of a student who could not take the test on scheduled date due to genuinereasons, such a candidate may appeal to the Principal. The Principal in consultation with the concerned teacher shall decide about the genuineness ofthe case and decide to conduct special test to such candidate on the date fixedby the concerned teacher, but before commencement of the concerned semester end examinations.

e) For assignments, tests, case study analysis etc., of C1 and C2, the students should bring their own answer scripts (A4 size), graph sheets etc., required for such tests/assignments and these be sealed/signed by the concerneddepartment at the time of conducting tests/assignment/project work etc.

f) The outline for continuous assessment activities for Component-I (C1) and Component-II (C2) of a course shall be as under:

| | C1 Marks | C2 Marks | Total Marks |
|---|---|---|---|
| **Session Test** | 10 | - | 10 |
| **Seminar/Presentation/Assignment/Activity/Case Study/Field Work/Project Work/Quiz etc.** | - | 10 | 10 |
| **Total** | 10 | 10 | 20 |

- For practical course of full credits, seminar shall not be compulsory. In its place, marks shall be awarded for Practical Record Maintenance(the marks is 25 (10 + 15) and 25. Evaluated for a total of 50 Marks).

- Conduct of Test, Seminar, Case study/Assignment etc., can be either in C1 or in C2 component as decided by the college and concerned department/teacher.

- The teachers concerned shall conduct test/seminar/case study etc., The students should be informed about the modalities well in advance. The evaluated courses assignments during component I (C1) and component II (C2) of assessment are immediately provided to the candidates after obtaining acknowledgement in the register by the concerned teacher(s) and maintained by the Department. Before commencement of the semester end examination, the evaluated test, assignment etc., of C1 and C2 shall be obtained back to maintain them till the announcement of the results of the examination of the concerned semester.

g) The marks of the internal assessment shall be published on the notice board of the department/college for information of the students.

h) The internal assessment marks shall be communicated to the CoE at least 10 days before the commencement of the semester end examinations and the CoE shall have access to the records of such periodical assessments.

i) There shall be no minimum in respect of internal assessment marks.

j) Internal assessment marks may be recorded separately. A candidate who has failed or rejected the result shall retain the internal assessment marks.

## SEC: Scheme of Valuation for Practical Examinations

C1 and C2 are internal tests to be conducted during 8th and 16th weeks respectively of the semester. C3 is the semester-end examination conducted for 3 hours. The student will be evaluated on the basis of procedure development and its execution. The student has to compulsorily submit the practical record for evaluation during C2. For C3, the record has to be certified by the Head of the Department.

- The student is evaluated for 25 marks in C1 and C2 as per the following scheme:

  Part-A (C1): 10 marks

  Part-B (C2): 10 marks + Record: 05 marks = 15 marks

- The student is evaluated for 25 marks in C3 as per the following scheme:

| Part A | Major question | 08 |
|---|---|---|
| Part B | Minor question | 06 |
| Identify and comment (Any four photographs: Decided by the External Examiner) | | 06 |
| Viva Voce | | 05 |
| **TOTAL** | | **25** |

SBRR MAHAJANA FIRST GRADE COLLEGE (AUTONOMOUS)

# Scheme of Valuation for Internship

C1 and C2 are internal assessments to be conducted during 8th and 16th weeks respectively for the semester. The student will be evaluated on the basis of presentation skills and project development. The student has to compulsorily submit the project report for evaluation during C2. The report has to be certified by the Head of the Department and the Mentor/Supervisor.

 • **The student is evaluated for 50 marks in C1 and C2 as per the following  scheme:**

Project progress presentation (**C1**): 50 Marks
Project Development and Report (**C2**): 50 Marks

| Assessment Criteria | Marks |
|---|---|
| Project Presentation Skills | 50 |
| Project Development Skills and Report | 50 |
| **Total** | **100** |

# DSC V AND VI SEM -THEORY QUESTION PAPER PATTERN

# BSc BIOTECHNOLOGY

**DURATION: 2½ Hours**                                    **MAXIMUM: 60 Marks**

**Instructions: All questions are compulsory.**
**Draw neat labeled diagrams wherever necessary.**

**I. Answer any 6 questions**                                    **6X2=12**

  **a)**
  **b)**
  **c)**
  **d)**
  **e)**
  **f)**
  **g)**

**II. Answer any one question**

**(UNIT-1)**
                                                        **1X12=12**

  **1.**
  **2.**

**III.   Answer any one question**

**(UNIT-II)**                    **1X12=12**
  **3.**
  **4.**

**IV. Answer any one question**                    **1X12=12**
                    **(UNIT-III)**
  **5.**
  **6.**

**V.Answer any one question**
  **7.**                    **(UNIT-IV)**                    **1X12=12**
  **8.**

# V AND VI SEM PATTERN OF PRACTICAL EXAMINATION

## Practical examination – B.Sc BIOTECHNOLOGY- C3

**Duration: 3 hours**                                          **Max. Marks: 25**

Q1. Major question                                                    08 Marks

Q2. Minor question                                                    06 Marks

Q3. Identify and Comment                                      2X3= 06 Marks

Q4. Viva-voce                                                          05 Marks

**BSc BIOTECHNOLOGY**

**Duration: 1½ hours**                                    **Maximum: 30 Marks**

**Instructions:All questions are compulsory**

**Draw the neat labelled diagrams where ever necessary**

**I.**    **Define any FIVE of the following**                    **5x2=10 M**

   **1.  (a)**                        **(b)**

     **(c)**                        **(d)**

     **(e)**                        **(f)**

     **(g)**

**II.**   **Explain any TWO of the following**                    **2x10=20M**

   **2.**                        **6.**

   **3.**                        **7.**

   **4.**                        **8.**

   **5.**

SBRR MAHAJANA FIRST GRADE COLLEGE (AUTONOMOUS)

## PATTERN OF PRACTICAL EXAMINATION

## SEC: Practical examination – B.Sc BIOTECHNOLOGY- C3

**Duration: 3 hours**                                           **Max. Marks: 25**

Q1. Major question                                              08 Marks

Q2. Minor question                                              06 Marks

Q3. Identify and Comment                                        2X3= 06 Marks

Q4. Viva-voce                                                   05 Marks

SBRR MAHAJANA FIRST GRADE COLLEGE (AUTONOMOUS)

## B.Sc. Biotechnology SEMESTER V

### Practical Examination – Scheme of Valuation (2023-24)
### DSC -5: Genetic Engineering

**Duration: 3 hours**                                    **Max. Marks: 25**

Q1. **Extraction of DNA from plant source**

                                                            **08M**

(Conducting experiment- 4M, Procedure -2M, Result- 1M, Report -1M)

Q 2. **Quantification of DNA by Spectrophotometry**          **06M**
(Conducting experiment- 02M,  Result and Calculation- 4M)

Q 3.  **Comment on A, B and C**

                                                            **(2 x 3) = 6M**

 (Identification - 1M, Comment -1M)

Q.4  **Viva-voce**                                          **05M**


### Practical DSC-6: Plant and Animal Biotechnology

**Duration: 3 hours**                                    **Max. Marks: 25**

Q 1. **Cell counting and Viability assessment using Haemocytometer by Tryphan blue exclusion method**          **8M**
(Conducting experiment-4M, Procedure -2M,  Report and calculation 2M)

Q 2. **Preparation of Explants**
(Conducting experiment-4M, Procedure -2M)                   **6M**
     **OR**
 **Synthetic seed preparation**
(Conducting experiment-4M, Procedure -2M)

Q 3. **Comment on A, B and C**
(Identification - 1M, Comment -1M)                     **(2 x 3) = 06M**

Q 4. **Viva voce**                                          **05 M**

SBRR MAHAJANA FIRST GRADE COLLEGE (AUTONOMOUS)

# B.Sc. Biotechnology SEMESTER VI

## Practical Examination – Scheme of Valuation (2023-24)
### DSC -7: Immunology

**Duration: 3 hours**            **Max.Marks: 25**

**Q1.Determination of ABO blood groups and Rh factor**

                                         **8M**

(Conductingexperiment-4M,Procedure-2M,Report2M)

**Q2.Ouchterlony double diffusion/ Radial immunodiffusion**       **6M**
  **(**Conducting experiment-4M, Procedure -2M)

**Q3. Comment on A, B and C**                       **(2 x 3) = 06M**
(Identification - 1M, Comment -1M)

**Q4. Viva voce**                                      **05M**

## DSC 8: Bioprocess and Environmental Biotechnology

**Duration: 3 hours**            **Max. Marks: 25**

**Q1.Estimation of the Biochemical oxygen demand/ toxic chemicals**     **8M**
(Conductingexperiment-4M,Procedure-2M,Report2M)

**Q2. Identification of biological indicators of water pollution**
**(**Identification-1 , Explanation of any two organisms with diagram -3M,
Procedure -2M)
                   OR
 **Estimation of alcohol by specific gravity**                      **6M**
(Conducting experiment-3M, Procedure -2M,  Report  1M)

**Q3. Comment on A, B and C**

  (Identification - 1M, Comment -1M)                 **(2 x 3) = 06M**

**Q4. Viva voce**                                     **5M**

**B.Sc. Biotechnology- Semester V**

<span style="color:#8B0000">**Practical Examination – Scheme of Valuation (2023-24)**
**SEC -5: Quality control methods in Biology**</span>

**Duration: 3 hours**                                    **Max.Marks: 25**

**Q1. Demonstration of Polymerase Chain Reaction          8M**

                              **OR**

**Handling and Calibration of Autoclave /Hot air Oven/Incubator/**

**Centrifuge/Water bath/Colony Counter and stability chamber**

 (Conducting experiment-4M, Procedure-2M, Report2M)

**Q2. Preparation of Normality, Molarity and Buffer solutions     6M**
  **(**Conducting experiment-4M, Procedure -2M)
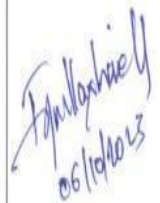
**Q3. Comment on A, B and C**                    **(2 x 3) = 06 M**
(Identification - 1M, Comment -1M)

**Q4. Viva voce**                                         **05 M**

## Board of Studies

| Sl.no | Name and address | Designation | Signature |
|---|---|---|---|
| 1. | Priyanka Shenoy N<br>Assistant professor and Head<br>Department of Bitechnology<br>SBRR Mahajana First Grade College,<br>Mysore<br>Priyankapravanvivek83741@gmail.com<br>Ph no-9663218437 | Chairperson | 06/10/23 |
| 2. | Dr.Geetha N<br>Professor<br>DOS in Biotechnology<br>University of Mysore<br>Mysore<br>Geethabiotech.uom@gmail.com<br>Ph no- 9986203018 | Member | 6/10/23 |
| 3. | Dr. Sumana K.<br>Associate Professor<br>Department of Microbiology, JSS<br>Academy of Higher education and<br>Research, Mysore<br>Ph No 91740390666<br>mnsumana@jssuni.edu.in | Member | Attended Online. |
| 4. | Dr. Chandrashekar S<br>Assistant Professor<br>Department of studies in Biotechnology<br>Davangere University, Davengere<br>chandru.s@davangereuniversity.ac.in<br>Ph No 9164176224 | Member | Attended Online. |
| 5. | Dr. IrfanullaSharieff<br>Chief scientific officer<br>Triphase pharmaceuticals Pvt Ltd,<br>KSSIDC Industrial estate, hebbal,<br>Mysore-16<br>Ph No 9845881086<br>Sharieffirfan17@gmail.com | Member | 06/10/2023 |
| 6. | Ms. Brunda A<br>TutorDepartment of Biochemistry,<br>Kanachur Institute of Medical Sciences,<br>Mangalore<br>Ph No 7259722515<br>brundaa@jssuni.edu.in | Member | Attended Online. |

**SBRR MAHAJANA FIRST GRADE COLLEGE (AUTONOMOUS)**

**Mahajana Education Society (R.)**
**Education to Excel**
**SBRR MAHAJANA FIRST GRADE COLLEGE (Autonomous)**
**Jayalakshmipuram, Mysuru – 570 012**
**Affiliated to University of Mysore Re-accredited by NAAC with 'A' Grade**
**College with Potential for Excellence**


# BOARD OF STUDIES (BoS)


## DEPARTMENT OF BUSINESS ADMINISTRATION


**UG** ✓

**PG** ☐


**NEP Syllabi for V and VI Semester BBA 2023-24**

**DEPARTMENT OF BUSINESS ADMINISTRATION**

**Motto**

TO CREATE BUSINESS LEADERS WITH

SOCIAL RESPONSIBILITY


**Vision**

To create and develop entrepreneurs who exhibit professionalism, accountability, transparency, human values and uphold Indian heritage in high esteem.


**Mission**

- Giving practical orientation to entrepreneurial ability.

- Giving professional exposure and building up leadership ability by organizing seminars, workshops, management fests and to make students participate in other similar activities.

- Make students to understand the importance of social responsibility in the corporate governance.

- Giving exposure on Indian ethos to future business leaders.

# Programme outcomes for Business Administration

| POs | Programme Outcomes (POs) |
|---|---|
| PO1 | **Domain knowledge: Acquire** knowledge of management theories and practices with special focus on professional accounting and finance. |
| PO2 | **Problem analysis:** Identify, formulate and analyze complex business problems in a structured approach to focus upon real issues. |
| PO3 | **Design/development of solutions:** Developing solutions by using critical thinking and analytical reasoning with appropriate qualitative, quantitative techniques and software applications in solving business and research problems. |
| PO4 | **Investigation and research:** Implementation of research methods to investigate specific business problems and draw conclusions. |
| PO5 | **Use of modern techniques/tools**: Ability to analyze and interpret data using mathematical, statistical, ICT and risk management techniques to solve business problems. |
| PO6 | **Business and Society**: Entrepreneurs/Managers with socio-economic value system. |
| PO7 | **Environment and Sustainability:** Contemplate and Introspect prevailing environmental challenges and channelize inclination towards sustainable development. |
| PO8 | **Moral and Ethical values**: Assimilate ethical, value based leadership skills and moral principles. |
| PO9 | **Individual and Team work:** Ability to perform as an individual or leader in diverse settings. |
| PO10 | **Communication and leadership skills:** Harness communication and leadership skills effectively to adapt to the growing business world. |
| PO11 | **Project management and Finance:** Design methods and process; apply skills and knowledge to complete projects in accordance with project acceptance criteria and financial considerations. |
| PO12 | **Lifelong Learning**: Evolve and improve as an individual by updating knowledge to enable oneself to thrive in social and professional life. |

# OBJECTIVES

1.  To develop the skills required for the application of business concepts and techniques learnt in the classroom at the workplace.

2.  To provide competent and technical skills personnel to the industry in the area of Marketing, Finance, Human Resource, Data Analytics, Retailing and Logistics and Supply Chain Management. To enhance the employability skills of the management students.

3.  To enhance the capability of the students to improve their decision-making skills.

4.  To encourage entrepreneurship among students pursuing education in the field of Business Administration.

5.  To empower students for pursuing professional courses like MBA, Chartered Accountancy, Company Secretary, etc.,

6.  To ensure holistic development of Business administration students

# LIST OF BoS MEMBERS

| Sl. No. | Category | Name Smt./Sri | Designation | Address for Communication | E-mail and Mobile No. |
|---|---|---|---|---|---|
| 1 | HoD & Chairman | Dr.Shyla S | Assistant Professor | SBRR Mahajana First Grade College, Mysore | shylas.fgc@mahajana.edu.in 9845859475 |
| 2 | Faculty Members | 1.Dr. Manjunath V | Assistant Professor | SBRR Mahajana First Grade College, Mysore | vmanjunath.joge@gmail.com 9900306941 |
| | | 2. Dr.Anita   B R | Assistant Professor | SBRR Mahajana First Grade College, Mysore | anitaprapti@gmail.com 9901114867 |
| | | 3. Sunil.N | Assistant Professor | SBRR Mahajana First Grade College, Mysore | sunil9284@gamil.com 9900148051 |
| | | 4. Dr. Nirmala.N | Assistant Professor | SBRR Mahajana First Grade College, Mysore | nirmalamysore223@gmail.com 7483907737 |
| 3 | Two Experts from external university | 1. Prejna.N. Pai | Assistant Professor | Jain Deemed-to-be-university Bangalore | prejna@gmail.com 9900212911 |
| | | 2. Sunayana | Assistant Professor & HOD | Amritha school of Arts& Science, Mysore | sunayanadiger@gmail.com 9880980506 |
| 4 | Nominee by the Vice Chancellor | Dr. R Mahesh | Associate Professor | DoS in Management BIMS, Manasa Gangothri, Mysore | mahesh@bims.uni-mysore.ac.in 9886639536 |
| 5 | Two Person from Industry /Corporate Sector / Allied area | 1. Rajesh R | Chartered Accountant | B S Ravi kumar & Associates Chartered Accountants, Mysore | rajesh@bsra.in 9448229994 |
| | | 2. Lokesh V | Managing Director & CEO | Innomantra consulting Pvt. Ltd. Bangalore | lokeshv@innomantra.com 9845272555 |
| 6 | Alumnus | Tejasvi Nathan | Vice President, HR | Swiss Re Global Business solutions India Pvt.  Ltd., Bangalore | tejasvinathan@gmail.com 9900084170 |

| Course Type, Code and Name | | | Teaching Hours per Week (L:T:P) | C1 | C2 | C3 | Exam Duration | Total Marks |
|---|---|---|---|---|---|---|---|---|
| DSC(15) 234529 | Production and Operations Management | DSC | 4:0:0 | 20 | 20 | 60 | 2½ hrs | 100 |
| DSC(16) 234530 | Income Tax-I | DSC | 4:0:0 | 20 | 20 | 60 | 2½ hrs | 100 |
| DSC(17) 234531 | Banking Law and Practice | DSC | 4:0:0 | 20 | 20 | 60 | 2½ hrs | 100 |
| DSE(1) | Elective 1- **Advanced Corporate Financial Management (FNI) (23DSEBBA01) Consumer Behavior (MK1) (23DSEBBA02)** Anyone to be chosen | DSE | 3:0:0 | 20 | 20 | 60 | 2½ hrs | 100 |
| DSE(2) | Elective 2- **Compensation and Performance Management (HRM1) (23DSEBBA03)** **Fundamentals of Retail Management (RM1) (23DSEBBA04)** | DSE | 3:0:0 | 20 | 20 | 60 | 2½ hrs | 100 |
| **Vocational-1** | Information Technology for Business (Excel &DBMS) **(23VOCBBA01)** Digital Marketing **(23VOCBBA02)** | Anyone to be chosen | 3:0:0 | 20 | 20 | 60 | 2½ hrs | 100 |
| SEC(5) 23EMPBBA01 | Employability Skills | SEC | 2:0:1 | 30 | 20 | 50 | 2 hrs | 100 |

**ELECTIVE GROUPS AND COURSES:**

**Note: Students have to choose Two Electives in V Semester and Continue with the same Elective combinations in VI Semester.**

## SEMESTER – VI

| Course Type, Code and Name | | | Teaching Hours per Week (L:T:P) | C1 | C2 | C3 | Exam Duration | Total Marks |
|---|---|---|---|---|---|---|---|---|
| DSC(18) 234629 | Business Law | DSC | 4:0:0 | 20 | 20 | 60 | 2½ hrs | 100 |
| DSC(19) 234630 | Income Tax-II | DSC | 4:0:0 | 20 | 20 | 60 | 2½ hrs | 100 |
| DSC(20) 234631 | International Business | DSC | 4:0:0 | 20 | 20 | 60 | 2½ hrs | 100 |
| DSE(3) | Elective 1 –**Security analysis & portfolio Management** (**FN2**) (**23DSEBBA05**) **Advertising and Media Management. (MK2)** (**23DSEBBA06**) | DSE | 3:0:0 | 20 | 20 | 60 | 2½ hrs | 100 |
| DSE(4) | Elective 2- **Human Resources Development** (**HRM2**) (**23DSEBBA07**) **Retail Operations Management (RM2)** (**23DSEBBA08**) | DSE | 3:0:0 | 20 | 20 | 60 | 2½ hrs | 100 |
| **Vocational-2** | Goods and Services Tax (**23VOCBBA03**) ERP Application (**23VOCBBA04**) | Anyone to be chosen | 3:0:0 | 20 | 20 | 60 | 2½ hrs | 100 |
| 23INTBBA01 | Internship | | 3:0:0 | 50 | 50 | | | 100 |

<table>
<tr><td colspan="2" align="center">**DSC (15) Syllabus for BBA**<br>**Semester -** V</td></tr>
<tr><td>Course Code: 234529</td><td>Course Title: **Production and Operations Management**</td></tr>
<tr><td>Course Credit (L:T:P): 4( 4:0:0)</td><td>Teaching Hours/Week:4</td></tr>
<tr><td>Total Contact Hours:60</td><td>Formative Assessment Marks: 40</td></tr>
<tr><td>Duration of Exam: 2 ½ Hours</td><td>Semester End Examination Marks: 60</td></tr>
</table>

**Pedagogy:** Classroom lectures, tutorials, Group discussion, Seminar, Case studies & field work etc.,

**Course Outcomes: On successful completion of the course, the students' will be able to**
   a) Gain knowledge on the ever growing importance of Production and Operations Management in uncertain business environment.
   b) Illustrate the different aspects of Plant Location and Layout
   c) Analyze the process of Production Planning and Control.
   d) Comprehend the unique challenges faced by firms in Inventory Management
   e) Develop skills to operate competitively in the current business scenario.

| **Syllabus:** | **Hours** |
|---|---|
| **Module No.1: Introduction to Production and Operations Management** | **12** |
| Introduction -Meaning of Production and Operations, differences between Production and Operations Management, Scope of Production Management, Production System. Types of Production, Benefits of Production Management, Responsibility of a Production Manager, Decisions of Production Management.  Operations management: Concept and Functions | |
| **Module No. 2:  Plant Location and layout** | **12** |
| Meaning and definition –Factors affecting location, Theory and practices, cost Factor in location – Plant layout Principles – Space requirement – Different types of facilities – Organization of physical facilities – Building, Sanitation, Lighting, Air Conditioning and Safety. | |
| **Module No.3**: **Production Planning and Control** | **12** |
| Meaning and Definition-Characteristics of Production Planning and Control, Objectives of Production Planning and Control, Stages of Production Planning and Control, Scope of Production Planning & Control, Factors Affecting Production Planning and Control, Production Planning System,  Process Planning  Manufacturing, Planning  and Control System, Role of Production Planning and Control in Manufacturing Industry. | |
| **Module No. 4: Inventory Management** | **12** |
| Inventory Management – Concepts, Classification: Objectives: Factors Affecting Inventory Control Policy.  Inventory costs: Basic EOQ Model: Re-order Level: ABC Analysis.  Quality Management - Quality Concepts, Difference between Inspections, Quality Control, Quality Assurances, Total Quality Management: Control Charts: acceptance sampling. | |
| **Module 5:  Maintenance and Waste Management** | **12** |

Introduction – Meaning – Objectives – Types of maintenance, Breakdown, Spares planning and control, Preventive routine, Relative Advantages, Maintenance Scheduling, Equipment reliability and Modern Scientific Maintenance Methods - Waste Management–Scrap and surplus disposal, Salvage and recovery.

**Skill Development Activities:**
1. Visit any industry and list out the stages of its automation and artificial intelligence with as many details as possible.
2. List out the factors which are important while selecting a plant layout and draw a chart on Plant layout
3. Describe the Functions of Quality Circles in an industry
4. List out the Functions of Inventory Management in an organization.

**Books for Reference:**
1. Ashwathappa. K & Sridhar Bhatt: Production & Operations Management, HPH.
2. Gondhalekar & Salunkhe: Productivity Techniques, HPH.
3. SN Chary, Production & Operations Management, McGraw Hill.
4 U. Kachru, Production & Operations Management, Excel Books.
5. Alan Muhlemann, John Oaclank and Keith Lockyn, Production & Operations Management, PHI.
6 K KAhuja, Production Management, CBS Publishers.
7. S.A. Chunawalla & Patel: Production & Operations Management, HPH.
https://www.vssut.ac.in
https://ddceutkal.ac.in
https://www.ascdegreecollege.ac.iN

## Course Articulation Matrix - 234529

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 1 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 |
| CO2 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 |
| CO3 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 2 |
| CO4 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 |
| CO5 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 2 |
| **WA** | **1.4** | **1.6** | **2** | **1.4** | **1.4** | **1.4** | **1.4** | **1.2** | **1.2** | **1.4** | **1.2** | **2** |

| DSC (16) Syllabus for BBA | |
|---|---|
| **Semester - V** | |
| Course Code: 234530 | Course Title: **Income Tax – I** |
| Course Credit (L:T:P): 4( 4:0:0) | Teaching Hours/Week:4 |
| Total Contact Hours:60 | Formative Assessment Marks: 40 |
| Duration of Exam: 2 ½ Hours | Semester End Examination Marks: 60 |

**Pedagogy:** Classroom lectures, tutorials, Group discussion, Seminar, Case studies &field work etc..

**Course Outcomes:** On successful completion of the course, the students will be able to:

a) Gain knowledge on the computation of Total Income and tax liability of an individual.

b) Evaluate the provisions for determining the residential status of an Individual.

c) Comprehend the meaning of Salary, Perquisites, Profit in lieu of salary, allowances and various retirement benefits.

d) Compute the income house property for different categories of house property.

e) Comprehend TDS & advances tax Ruling and identify the various deductions under section 80.

| Syllabus: | Hours |
|---|---|
| **Module-1: Basic Concepts of Income Tax** | **10** |
| Introduction –Meaning of tax-, types of taxes, cannons of taxation. Brief history of Indian Income Tax, legal framework of taxation, Important definitions, assessment, assessment year, previous year including exceptions, assesses, person, income, casual income, Gross total income, Total income, Agricultural income, scheme of taxation, – Exempted incomes of an individual under section 10. | |
| **Module -2: Residential Status and Incidence of Tax** | **10** |
| Introduction – Residential status of an individual. Determination of residential status of an individual. Incidence of tax or Scope of Total income. Problems on computation of Gross total Income of an individual. | |
| **Module- 3: Income from Salary** | **15** |
| Introduction - Meaning of Salary -Basis of charge Definitions–Salary, Perquisites and profits in lieu of salary - Provident Fund –Transferred balance. - Retirement Benefits – Gratuity, pension and Leave salary. Deductions and Problems on Computation of Taxable Salary. | |
| **Module -4: Income from House Property** | **15** |
| Introduction - Basis for charge - Deemed owners -House property incomes exempt from tax, composite rent and unrealized rent. Annual Value –Determination of Annual Value - Deductions from Annual Value - Problems on Computation of Income from House Property. | |

| Module No.-5: Tax Deduction at Sources & Advance Tax Ruling | 10 |
|---|---|
| Introduction - Meaning of TDS - Provisions regarding TDS - TDS to be made from Salaries - Filing of Quarterly statement – Theory and Problems; Advance Tax: Meaning of advance tax - Computation of advance tax - Instalment of advance tax and due dates.<br>**Deductions** under Section 80C, 80CCC, 80CCD, 80CCG, 80D, 80DD, 80DDB, 80E, 80G, 80GG, 80TTA and 80U as applicable to individuals under old regime. (Individuals only). | |

**Skill Development Activities:**

1. Prepare a slab rates chart for different Individual assesses.

2. Visit any Chartered Accountant Office Collect and record the procedureinvolved in filing the Income tax returns of an Individual.

3. List out any 10 Incomes exempt from tax of an Individual.

4. Prepare the list of perquisites received by an employee in an organization.

5. Identify and collect various enclosures pertaining to Income tax returns of an individual.

6. Any other activities, which are relevant to the course.

**Books for References:**
1. Mehrotra H.C and T.S.Goyal, Direct taxes, Sahithya Bhavan Publication, Agra.
2. Vinod K. Singhania, Direct Taxes, Taxman Publication Private Ltd, New Delhi.
3. Gaur and Narang, Law and practice of Income Tax, Kalyani Publications, Ludhiana.
4. Bhagawathi Prasad, Direct Taxes.
5. B.Mariyappa, Income tax Law and Practice-I, Himalaya Publishing House.
6. Dr. R G Saha, Dr Ushabdevi N: Income Tax I
**Note: Latest edition of text books may be used.**
   https://cleartax.in
   https://www.bankbazaar.com
   https://taxguru.in

## Course Articulation Matrix - 234530

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | P10 | P11 | P12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 |
| CO2 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 |
| CO3 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 |
| CO4 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 |
| CO5 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 |
| WA | 1 | 1.6 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 |

| DSC (17) Syllabus for BBA<br>Semester - V | |
|---|---|
| Course Code: 234531 | Course Title: **Banking Law and Practice** |
| Course Credit (L:T:P): 4( 4:0:0) | Teaching Hours/Week:4 |
| Total Contact Hours: 60 | Formative Assessment Marks: 40 |
| Duration of Exam: 2 ½ Hours | Semester End Examination Marks: 60 |

**Pedagogy:** Classroom lectures, tutorials, Group discussion, Seminar, Casestudies & field work etc.,

**Course Outcomes:** On successful completion of the course, the students will be able to:
   a) Understand the legal aspects of banker and customer relationship.
   b) Open the different types of accounts.
   c) Describe the various operations of banks.
   d) Understand the different types of crossing of cheques and endorsement.
   e) Understanding of different types of E-payments.

| Syllabus: | Hours |
|---|---|
| **Module No. 1: Banker and Customer** | **16** |
| A) Banker and Customer Relationship: Introduction – Meaning of Banker& Customer; General and Special relationships between Banker & Customer, (Rights and Obligationsof Banker & Customer).<br><br>B) Customers and Account Holders: Types of Customer and Account Holders – Procedure and Practice in opening and operating the accounts of different types of customers – Minor, Joint Account Holders, Partnership Firms, Joint Stock Companies,<br>Clubs, Non-Resident Account – NRI & NRE Accounts. | |
| **Module No. 2: Banking Operations.** | **08** |
| Meaning – Duties and Responsibilities of Collecting Banker, Holder for Value, Holder inDue Course; Statutory Protection to Collecting Banker. | |
| **Module No. 3: Paying Banker** | **12** |
| Meaning – Precautions – Statutory Protection to the Paying Banker; Cheques – Crossingof Cheques – Types of Crossing; Endorsements - Meaning, Essentials and Kinds of Endorsement; Dishonor of Cheque - Grounds for Dishonor of cheque. | |
| **Module No. 4: Lending Operations** | **12** |
| Principles of Bank Lending, Kinds of lending - Loans, Cash Credit, Overdraft, Bills Discounting, Letters of Credit. Types of securities and Methods of creation of charge, Secured and Unsecured Advances; Procedure - Housing, Education and Vehicle loan's; Non-Performing Asset (NPA): Meaning, circumstances & impact; Government Regulations on Priority lending for commercial banks. | |

| Module No. 5: Banking Innovations | 12 |
|---|---|
| New technology in Banking – E-services – plastic cards . Internet Banking, ATM based services, ECS, MICR, RTGS, NEFT, DEMAT, IMPS UPI , AADHAR enabled payment system, USSD, E-Valet and application based payment systems, Role of artificial intelligence in banks, Block Chain – Meaning and features. | |

**Skill Development Activities:**

1. Collect and paste pay in slip for SB A/c and Current a/c.
2. Draw a specimen of a crossed cheque.
3. List out different types of customers and collect KYC documents required for loan
4. List out various fee-based services offered by a bank in your locality
5. List out application-based payment systems provided by a commercial bank.

**Books for References:**

1. Gordon & Natarajan: Banking Theory Law and Practice, HPH.
2. Maheshwari. S.N.: Banking Law and Practice, Vikas Publication.
3. Kothari N. M: Law and Practice of Banking.
4. Tannan M.L: Banking Law and Practice in India, Indian Law House

Note: Latest edition of Reference Books may be used

https://www.icsi.edu

https://www.indiacode.nic.in

https://unacademy.com

## Course Articulation Matrix - 234531

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 |
| CO2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 |
| CO3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 2 |
| CO4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 |
| CO5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| WA | 1.8 | 1 | 1 | 1 | 1 | 1.2 | 1 | 1 | 1.8 | 1.4 | 1 | 1.6 |

<table>
<tr><td colspan="2" align="center"><strong>DSE (1) Syllabus for BBA</strong><br><strong>Semester – V FN-1</strong></td></tr>
<tr><td>Course Code: 234532</td><td>Course Title: <strong>Advanced Corporate Financial Management</strong></td></tr>
<tr><td>Course Credit (L:T:P): 3( 3:0:0)</td><td>Teaching Hours/Week:3</td></tr>
<tr><td>Total Contact Hours:45</td><td>Formative Assessment Marks: 40</td></tr>
<tr><td>Duration of Exam: 2 ½ Hours</td><td>Semester End Examination Marks: 60</td></tr>
</table>

**Pedagogy:** Classroom lectures, tutorials, Group discussion, Seminar, Case studies & field work etc.,

**Course Outcomes:** On successful completion of the course, the students will be able to:
   a) Illustrate and determine the overall cost of capital and evaluate capital structure
   b) Comprehend the different advanced capital budgeting techniques.
   c) Analyze the importance of dividend decisions and dividend theories.
   d) Evaluate mergers and acquisition.
   e) Acquire knowledge on ethical and governance issues in financial management.

| Syllabus: | Hours |
|---|---|
| **Module No. 1: Cost of Capital and Capital Structure Theories** | 10 |
| **Cost of Capital**: Meaning and Definition – Significance of Cost of Capital – Types of Capital –Computation of Cost of Capital – Specific Cost – Cost of Debt – Cost of Preference Share Capital – Cost of Equity Share Capital – Weighted Average Cost of Capital – Problems. <br> **Theories of capital structures**: The Net Income Approach, The Net Operating Income Approach,Traditional Approach and MM Hypothesis – Problems. | |
| **Module No. 2: Risk Analysis in Capital Budgeting** | 10 |
| Risk Analysis – Types of Risks – Risk and Uncertainty – Techniques of Measuring Risks – Riskadjusted Discount Rate Approach – Certainty Equivalent Approach – Sensitivity Analysis - Probability Approach - Standard Deviation and Co-efficient of Variation – Decision Tree Analysis – Problems. . | |
| **Module No. 3: Dividend Decision & Theories of Dividend.** | 10 |
| Introduction - Dividend Decisions: Meaning - Types of Dividends – Types of Dividends Polices – Significance of Stable Dividend Policy - Determinants of Dividend Policy; Dividend Theories: Theories of Relevance – Walter's Model and Gordon's Model and Theory of Irrelevance – The Miller-Modigliani (MM) Hypothesis - Problems. | |
| **Module No. 4: Mergers and Acquisitions** | 10 |
| Meaning - Reasons – Types of Combinations - Types of Merger – Motives and Benefits of Merger – Financial Evaluation of a Merger - Merger Negotiations – Leverage buyout, Management Buyout Meaning and Significance of P/E Ratio. Problems on Exchange Ratios based on Assets Approach, Earnings Approach and Market Value Approach and Impact of Merger on EPS, Market Price and Market capitalization. | |
| **Module No. 5: Ethical and Governance Issues** | 5 |
| Introduction to Ethical and Governance Issues: Fundamental Principles, Ethical Issues in Financial Management, Agency Relationship, Transaction Cost Theory, Governance Structures and Policies, Social and Environmental Issues, Purpose and Content of an Integrated Report. | |

| Skill Development Activities: |
|---|
| 1. Visit an organisation in your town and collect data about the financial objectives. |
| 2. Compute the specific cost and Weighted average cost of capital of an Organisation, you have visited. |
| 3. Case analysis of some live merger reported in business magazines. |

4. Meet the financial manager of any company, discuss ethical issues in financial management.
5. Collect the data relating to dividend policies practices by any two companies.
6. Any other activities, which are relevant to the course.


**Books for References:**
1. I M Pandey, Financial management, Vikas publications, New Delhi.
2. Abrish Guptha, Financial management, Pearson.
3. Khan & Jain, Basic Financial Management, TMH, New Delhi.
4. S N Maheshwari, Principles of Financial Management, Sulthan Chand & Sons, New Delhi.
5. Chandra & Chandra D Bose, Fundamentals of Financial Management, PHI, New Delhi.
Note: Latest edition of Reference Books may be used

https://www.managementstudyguide.com
https://www.investopedia.com
https://cleartax.in

# Course Articulation Matrix -  234532

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 2 |
| CO2 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 2 |
| CO3 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 2 |
| CO4 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 2 |
| CO5 | 3 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| WA | 3 | 1.8 | 1.8 | 1 | 2 | 1.2 | 1.2 | 1.2 | 2 | 1.2 | 2 | 2 |

| DSE (2) Syllabus for BBA<br>Semester – V MK-1 ||
|---|---|
| Course Code: 234533 | Course Title: **Consumer Behaviour** |
| Course Credit (L:T:P): 3( 3:0:0) | Teaching Hours/Week:3 |
| Total Contact Hours:45 | Formative Assessment Marks: 40 |
| Duration of Exam: 2 ½ Hours | Semester End Examination Marks: 60 |

**Pedagogy:** Classroom lectures, tutorials, Group discussion, Seminar, Case studies &field work etc.,

**Course Outcomes:** On successful completion of the course, the students will be able to:
  a) Understanding of Consumer Behaviour towards products, brands andservices.
  b) Distinguish between different consumer behaviour influences andtheir relationships.
  c) Establish the relevance of consumer behaviour theories and conceptsto marketing decisions.
  d) Implement appropriate combinations of theories and concepts.
  e) Recognise social and ethical implications of marketing actions onconsumer behaviour.

| Syllabus: | Hours |
|---|---|
| **Module -1: Introduction to Consumer Behaviour** | **10** |
| Meaning and Definition, Need for Consumer Behaviour, consumer and customer. Buyers and users. Need to study consumer behaviour. Applications in Marketing, Consumer research process –Understanding consumer through Research process. Factors influencing Consumer Behaviour. External factors – Culture, Sub Culture, Social Class, Reference Groups, Family, Internal factors– Needs & Motivations, Perception, Personality, Lifestyle, Values, Learning, Memory, Beliefs & Attitudes. ||
| **Module -2: Individual Determinants of Consumer Behaviour** | **08** |
| Consumer Needs & Motivation; Personality and Self-Concept; Consumer Perception; Learning & Memory; Nature of Consumer Attitudes – Psychological:<br>Motivation, Perceptions, Learning, Belief and Attitudes. Consumer Attitude,Formation and Change. ||
| **Module-3: Environmental Determinants of Consumer Behaviour** | **12** |
| Family Influences; Influence of Culture; Subculture & Cross-Cultural Influences; Group Dynamics and Consumer Reference Groups; Social Class: Family role. Person's Age, Life cycle stage, Occupational and economic circumstances. ||
| **Module - 4: Consumer's Decision-Making Process** | **09** |
| Opinion leadership, dynamics of opinion leadership process, The Motivationbehind opinion leadership- The Diffusion Process-The adoption process- levels of<br>consumer decision making- Models of consumer decision making. ||

| Module -5:Consumer Satisfaction & Consumerism | 06 |
|---|---|

Concept of Consumer Satisfaction; Working towards enhancing Consumer Satisfaction; Sources of Consumer Dissatisfaction; Dealing with Consumer Complaint. Concept of Consumerism; Consumerism in India; Reasons for Growth of Consumerism in India.

**Skill Development Activities:**

1. Collect information on behaviour of consumers at an unorganized retail Outlets.
2. prepare a questionnaire to conduct consumer survey to assets the important factor motivates their purchase like mobile, shoes, bags,etc
3. Collect and record feedback on customer satisfaction online shoeing
4. Write a report on the marketing problem faced by an organization of your choice.
5. Visit any three local restaurants and assess how each attracts clients in different stages of the family life cycle.

**Books for References:**

1. Leon. G. Schiffman & Leslve Lazer Kanuk; Consumer behaviour; 6th Edition; PHI, New Delhi, 2000.
2. Suja.R.Nair, Consumer behaviour in Indian perspective, First Edition, Himalaya Publishing House, Mumbai, 2003.
3. Batra/Kazmi; Consumer Behaviour.
4. David. L. Loudon & Albert J. Bitta; Consumer Behaviour; 4th Edition, Mcgraw Hill, Inc; New Delhi,1993.
5. K. Venkatramana, Consumer Behaviour, SHBP.
6. Assael Henry; Consumer behaviour and marketing action; Asian Books(P) Ltd, Thomson learning, 6th Edition; 2001.

https://www.sciencedirect.com

https://hbr.org

https://study.com

## Course Articulation Matrix -  234533

|     | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 2 | 1 | 2 | 1 | 1 | - | 2 | 2 | 2 | 1 | 2 |
| CO3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 2 |
| CO4 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | - | 2 |
| CO5 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 2 |
| WA  | 2.4 | 1.4 | 1.2 | 1.6 | 1.4 | 1.2 | 1 | 2 | 2 | 2 | 1 | 2 |

## DSE (1) Syllabus for BBA
## Semester – V HRM-1

| Course Code: 234534 | Course Title: **Compensation And Performance Management** |
|---|---|
| Course Credit (L:T:P): 3( 3:0:0) | Teaching Hours/Week:3 |
| Total Contact Hours:45 | Formative Assessment Marks: 40 |
| Duration of Exam: 2 ½ Hours | Semester End Examination Marks: 60 |

**Pedagogy:** Classroom lectures, tutorials, Group discussion, Seminar, Case studies & field work etc.,

**Course Outcomes:** On successful completion of the course, the students will be able to:
a) Understand the concepts of Compensation management.
b) Describe job evaluation and its methods.
c) Evaluate the different methods of wages.
d) Describe performance management and methods of performance management.
e) Acquire the knowledge on the Preparation of Payroll.

| SYLLABUS: | HOURS |
|---|---|
| **Module No. 1: Introduction to Compensation Management** | **11** |

Compensation - Definition - Classification - Types - Wages, Salary, Benefits, DA, Consolidated Pay; Equity based programs, Commission, Reward, Remuneration, Bonus, Short term and Long term Incentives, Social Security, Retirement Plan, Pension Plans, Profit Sharing Plan, Stock Bonus Plan, ESOP ,Employer Benefits and Employer Costs for ESOP, Individual Retirement Account, Savings Incentive Match Plan for Employees.

Compensation Management- Compensation and Non-Compensation Dimensions, 3-P Concept in Compensation Management, Compensation as Retention Strategy, Compensation Issues, Compensation Management in Multi-National organizations Compensation Strategy: Organizational and External Factors Affecting Compensation Strategies, Compensation Strategies as an Integral Part of HRM, Compensation Policies.

| **Module No. 2: Job Evaluation** | **06** |
|---|---|

Definition of Job Evaluation, Major Decisions in Job Evaluation, Job Evaluation Methods, Point Factor Method of Job Evaluation: Combining Point factor and Factor Comparison Methods, Job Evaluation Committee, Factor Evaluation System (FES), Using FES to determine Job Worth, Position Evaluation Statements.

| **Module No. 3: Wage and Salary Administration** | **08** |
|---|---|

Theories of Wages - Wage Structure - Wage Fixation - Wage Payment - Salary Administration. Difference between Salary and Wages - Basis for Compensation Fixation- Components of Wages - Basic Wages - Overtime Wages - Dearness Allowance - Basis for calculation - Time Rate Wages and Efficiency Based Wages - Incentive Schemes - Individual Bonus Schemes, Group Bonus Schemes - Effect of various Labour Laws on Wages-Preparation of Pay Roll

| Module No. 4: Performance Management | 12 |
|---|---|

Evolution of Performance Management, Definitions of Performance Management, Importance of Performance Management, Aims and Purpose of Performance Management, Employee Engagement and Performance Management, Principles and Dimensions of Performance Management Performance Appraisal Methods: Traditional Methods, Modern Methods, Performance Appraisal Feedback: Role, Types and Principles, Levels of Performance Feedback, 360-Degree Appraisal, Ethics in Performance Appraisal.

| Module No. 5: Issues In Performance Management | 08 |
|---|---|

Team Performance Management, Performance Management and Learning Organizations, Performance Management and Virtual Teams, Role of Line Managers in Performance Management, Performance Management and Reward, Linking Performance to Pay –A Simple System Using Pay Band, Linking Performance to Total Reward, Challenges of Linking Performance and Reward.

**Skill Development Activities:**
1. List the various components of total compensation in Multinational Companies.
2. Construct a questionnaire for a salary survey on nurses.
3. Design a performance appraisal plan using any Modern Performance Appraisal Tool for an IT company.
4. Study any one contemporary practice of Performance Management System (Balance scorecard, Lean Management, BPRE, Six Sigma and so on)

**Books for References:**
1. Joseph J. Martocchio, Strategic Compensation, 3rd Edition, Pearson Education
2. Michael Armstrong &amp; Helen Murlis: Hand Book of Reward Management – Crust Publishing House.
3. Milkovich &amp; Newman, Compensation, Tata McGraw Hill
4. Richard I. Anderson , Compensation Management in Knowledge based world, 10th edition, Pearson Education
5. Thomas. P. Plannery, David. A. Hofrichter &amp; Paul. E. Platten: People, Performance &amp; Pay – Free Press.
6. Aguinis Herman, Performance Management, 2nd Edition, 2009 Pearson Education, New Delhi.
7. Aziz A, Performance Appraisal: Accounting and Quantitative Approaches, 1993, Pointer.
8. Bhatia S.K, Performance Management: Concepts, Practices and Strategies for Organisation Success, 2007, Deep &amp; Deep, New Delhi.
9. BD Singh, Compensation &amp; Reward Management, Excel Books

https://www.tutorialsduniya.com
https://dde.pondiuni.edu.in
https://ecampusontario.pressbooks.pub

## Course Articulation Matrix - 234534

|     | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 3 | 2 |
| CO2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| CO3 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 2 |
| CO4 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO5 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| WA | 2 | 1.8 | 1.8 | 1.6 | 1.8 | 1.6 | 1.2 | 1.6 | 1.8 | 1.6 | 2 | 1.8 |

| DSE (2) Syllabus for BBA<br>Semester – V RM-1 | |
|---|---|
| Course Code: 234535 | Course Title: **Fundamentals of Retail Management** |
| Course Credit (L:T:P): 3(3:0:0) | Teaching Hours/Week:3 |
| Total Contact Hours:45 | Formative Assessment Marks: 40 |
| Duration of Exam: 2 ½ Hours | Semester End Examination Marks: 60 |

**Pedagogy: Classroom lectures, Case studies, Group discussion, Seminar &field work etc.,**

**Course Outcomes: On successful completion student will demonstrate:**
a) Acquire knowledge about Retail Business.
b) Evaluate the business operations in Retailing.
c) Formulate the retail strategies of Retail Business.
d) Apply the Retailing principles and theories.
e) Explore the career opportunities in the Retail sector.

| Syllabus: | Hours |
|---|---|
| **Module -1: Introduction to Retail Business** | **10** |

Definition, functions and types of retail Ownership-Independent Retailer, Chain

Stores, Franchising, Leased departmental stores, Vertical Marketing system, Consumer co-operatives; forms of retail business ownership. Indian Retail Scenario- Factors influencing retail business in India; Ethical Issues in Retailing;International perspective in retail business- FDI in Indian Organized Retail Sector.

| **Module -2: Consumer Behaviour in Retail Business** | **08** |
|---|---|

Buying decision process and its implication on retailing –Customer shopping Behavior,

Customer service and customer satisfaction. Retail planning process: Factors to

consider in preparing a business plan – implementation – risk analysis.

| **Module-. 3: Retail Organization and Functional Management** | **08** |
|---|---|

Business Models in Retailing, Classification of Retailing Formats, Operational Stages in Retailing, Factors influencing Location of stores, Stores Designing, Space planning, Inventory Management, Merchandising Management, Selection and optimization of Workforce. Retail Accounting and Cash Management.

| Module -4: Retail Marketing Mix | 12 |
|---|---|

Introduction -Product: Decisions related to selection of goods (Merchandise Management) Product Assortment and display, new product launch, PLC inRetailing; Pricing- Influencing factors – approaches to pricing – price sensitivity
- Value pricing – Markdown pricing. Place: Supply channel, Retail logistics, computerized replenishment system, corporate replenishment Policies. Promotion
: Setting objectives, communication effects , promotional mix.; Retail distribution-In Store and Online Store, Factors influencing retail distribution; Human ResourceManagement in Retailing- Selection and Optimization of work force.

| Module- 5: Impact of Information Technology in Retailing | 07 |
|---|---|

Non store retailing (e-retailing) - The impact of Information Technology inretailing - Integrated systems and networking – EDI – Bar coding – Electronic article surveillance – Electronic shelf labels – customer database management system. Legal aspects in retailing, Social issues in retailing, Ethical issues in
retailing.

**Skill Development Activities:**

a) Draw a retail life cycle chart and list the stages.

b) Draw a chart showing store operations.

c) List out the major functions of a store manager diagrammatically.

d) List out the current trends in e-retailing

List out the Factors Influencing in the location of a New Retail outlet.

**Books for References:**

1. Suja Nair; Retail Management,HPH
2. Karthic – Retail Management, HPH
3. S.K. Poddar&amp; others – Retail Management, HPH.
4. R.S.Tiwari ; Retail Management, HPH 18
5. Barry Bermans and Joel Evans: &quot;Retail Management – A Strategic Approach&quot;, 8th edition, PHI/02
6. A.J.Lamba, &quot;The Art of Retailing&quot;, 1st edition, Tata McGrawHill, Newdelhi, 2003.
 https://sim.edu.in
 https://ebooks.lpude.in
https://oms.bdu.ac.in

## Course Articulation Matrix -  234535

|  | PO1 | PO2 | P03 | P04 | P05 | P06 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 2 |
| CO2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 |
| CO3 | 2 | 3 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 |
| CO4 | 2 | 3 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 |
| CO5 | 2 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 2 |
| WA | 2 | 2.4 | 1.6 | 1.2 | 1.2 | 2 | 1.4 | 1.2 | 1.2 | 2 | 1.6 | 2 |

## VOCATIONAL-1 Syllabus for BBA
## Semester - V

| | |
|---|---|
| Course Code: 234536 | Course Title: **Information Technology For Business** |
| Course Credit (L:T:P): 3( 3:0:0) | Teaching Hours/Week:3 |
| Total Contact Hours:45 | Formative Assessment Marks: 40 |
| Duration of Exam: 2 ½ Hours | Semester End Examination Marks: 60 |

**Pedagogy:** Classroom's lecture, tutorials, Group discussion, Seminar, Case studies.

**Course Outcomes: On successful completion Student will demonstrate;**
   a) Acquire the knowledge about the fundamentals of information technology
   b) Apply the usage of  information technology in business.
   c) Learn core concepts of computing and modern systems
   d) Applications of Excel and SQL.
   e) Awareness about latest information.

| Syllabus | Hours |
|---|---|
| **Module No. 1: Information Technology and Information System** | **10** |
| Introduction to IT, Introduction to IS, Difference be IS and IT, Need for Information System, Information Systems in the Enterprise, Impact of Information Technology on Business (Business Data Processing, Intra and Inter Organizational communication using network technology, Business process and Knowledge process outsourcing), Managers and Activities in IS, Importance of Information systems in decision making and strategy building, Information systems and subsystems. | |
| **Module  No. 2: Subsystems of Information System** | **10** |
| Transaction Processing Systems (TPS), Management Information System (MIS), Decision Support Systems (DSS), Group Decision Support System (GDSS), Executive Information System (EIS), Expert System (ES), Features, Process, advantages and Disadvantages, Role of these systems in Decision making process. | |
| **Module No. 3: Database Management System** | **10** |
| Introduction to Data and Information, Database, Types of Database models, Introduction to DBMS, Difference between file management systems and DBMS, Advantages and Disadvantages of DBMS, Data warehousing, Data mining, Application of DBMS, Introduction to MS Access, Create Database, Create Table, Adding Data, Forms in MS Access, Reports in MS Access. | |
| **Module No. 4: Microsoft Excel in Business** | **10** |

| Introduction to MS Excel, features of MS Excel, Cell reference, Format cells, Data Validation, Protecting Sheets, Data Analysis in Excel: Sort, Filter, Conditional Formatting, Preparing Charts, Pivot Table, what if Analysis (Goal Seek, Scenario manager), Financial Functions: NPV, PMT, PV,FV, Rate, IRR, DB,SLN,SYD. **Logical Functions**: IF, AND, OR, Lookup Functions: V Lookup, H Lookup, Mathematical Functions, and Text Functions. | |
|---|---|
| **Module No. 5: Recent Trends in IT** | **05** |
| Virtualization, Cloud computing, Grid Computing, Internet of Things, Green Marketing, Artificial Intelligence, Machine Learning. | |

**Skill Developments Activities:**
1. Creating Database Tables in MS Access and Entering Data
2. Creating Forms in MS Access
3. Creating Reports in MS Access
4. Creating charts in Excel
5. What if analysis in Excel
6. Summarizing data using Pivot Table
7. VLookup and HLookup Functions
8. Rate of Interest Calculation using Financial Function
9. EMI calculation using Financial Function
10. Data Validation in Excel
11. Sort and Filter
12. Conditional Formatting in Excel.

**Books for Reference:**
1. Lauaon Kenneth & Landon Jane, "Management Information Systems: Managing the Digital firm", Eighth edition, PHI, 2004.
2. Uma G. Gupta, "Management Information Systems – A Management Prespective", Galgotia publications Pvt., Ltd., 1998.
3. Louis Rosenfel and Peter Morville, "Information Architecture for the World wide Web", O'Reilly Associates, 2002.
4. C.S.V.Murthy: Management Information Systems, HPH
5. Steven Alter, "Information Systems – A Management Perspective", Pearson Education, 2001.
6. Uma Gupta, "Information Systems – Success in 21st Century", Prentice Hall of India, 2000.
7. Robert G. Murdick, Joel E. Ross and James R. Claggett, "Information Systems for Modern Management", PHI, 1994.
8. Introduction to Database Systems, CJ Date, Pearson
9. Database Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGraw Hill 3rd Edition.
10. The Database Systems – The Complete Book, H G Molina, J D Ullman, J Widom Pearson
11. Database Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
12. Fundamentals of Database Systems, Elmasri Navrate Pearson Education
**https://smallbusiness.chron.com**
**https://www.aeologic.com**
**https://www.infomentum.com**

## Course Articulation Matrix -234536

|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | P10 | P11 | P12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| **CO2** | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| **CO3** | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| **CO4** | 1 | 2 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **CO5** | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| **WA** | **1** | **1.8** | **2.2** | **1.8** | **2** | **1** | **1** | **1** | **1** | **1** | **1.4** | **1.8** |

| VOCATIONAL-1 Syllabus for BBA<br>Semester - V | |
|---|---|
| Course Code: 234537 | Course Title: **Digital Marketing** |
| Course Credit (L:T:P): 3( 3:0:0) | Teaching Hours/Week:3 |
| Total Contact Hours:45 | Formative Assessment Marks: 40 |
| Duration of Exam: 2 ½ Hours | Semester End Examination Marks: 60 |

**Pedagogy:** Classrooms lecture, Case studies, Tutorial Classes, Group
discussion, Seminar & field work etc.,

**Course Outcomes: On successful completion of the course, the students will be able to**
   a) Acquire knowledge on Digital Marketing and strategies.
   b) Comprehend the concepts of Email marketing and Content marketing.
   c) Awareness about Social Media Marketing and Web Analytics.
   d) Learn YouTube Advertising & Conversions.

| Syllabus: | Hours |
|---|---|
| **Module No. 1: Introduction to Digital Marketing** | **10** |
| Introduction, Overview of digital marketing, Evolution of digital marketing, Importance and benefits of digital marketing, Digital marketing channels and platforms.<br>Digital Marketing Strategy and Planning: Developing a digital marketing strategy, Setting goals and objectives, Budgeting and resource allocation. Campaign planning and execution, Monitoring and adjusting digital marketing campaigns. | |
| **Module No. 2: Email and Content Marketing:** | **10** |
| Introduction to email marketing, building an email list, Creating effective email campaigns, Email automation and segmentation, Email marketing metrics and analytics.<br>Content Marketing: Understanding content marketing, Content strategy and planning, Content creation and distribution, Content promotion and amplification, Content marketing metrics and analytics. | |
| **Module No. 3: Social Media Marketing (SMM)** | **10** |

Social Media Marketing: Overview of social media marketing, Social media platforms and their features, Creating and optimizing social media profiles, Social media content strategy, Social media advertising and analytics. Mobile Marketing: Mobile marketing overview, Mobile advertising strategies, Mobile app marketing, Location-based marketing, Mobile marketing analytics.

| Module No. 4: Web Analytics | 5 |
|---|---|

 Analytics and Reporting: Importance of analytics in digital marketing, Setting up web analytics tools (e.g., Google Analytics), Tracking and measuring key performance indicators (KPIs), Conversion tracking and optimization, Reporting and data visualization

| Module No. 5: YouTube Advertising (Video Ads) and conversion | 10 |
|---|---|

YouTube Advertising (Video Ads): YouTube advertising, its usages, Creating YouTube campaigns Choose the audience for video ads, Instream ads, In video ads, In-search ads, In-display ads, Measuring your YouTube ad performance. Conversions: Understanding Conversion Tracking, Types of Conversions, Setting up Conversion Tracking, Optimizing Conversions, Track offline conversions Analyzing conversion data, Conversion optimizer.

**Skill Development Activities:**
1. Explain the key digital marketing activities needed for competitive success.
2. Examine the concept of Digital Media and benefits to be derived.
3. Recognise the core features of CRM and retention programmes
4. Identify the metrics used in digital marketing.
5. Organise how we can limit the marketing materials we get through e-mail.

**Books for Reference:**
1. Understanding DIGITAL Marketing, Marketing strategies for engaging the digital generation Damian Ryan & Calvin Jones
2. The Art of Digital Marketing: The Definitive Guide to Creating Strategic By Ian Dodson
3. Internet Marketing: a practical approach By Alan Charlesworth
4. Social Media Marketing: A Strategic Approach By Melissa Barker, Donald I. Barker, Nicholas F. Bormann, Krista E Neher
5. "Mobile Marketing: How Mobile Technology is Revolutionizing Marketing, Communications and Advertising" by Daniel Rowles

   https://www.studocu.com
   https://www.scribd.com
   https://collegetutor.net

## Course Articulation Matrix - 234537

|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 1 | 2 | 2 | 3 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| CO2 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 2 |
| CO4 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 |
| **WA** | **1.5** | **1** | **1.5** | **1.75** | **2** | **1.25** | **1.25** | **1** | **1.5** | **1.75** | **1.5** | **1.75** |

| SEC- Syllabus for BBA<br>Semester - V | |
|---|---|
| CourseCode:<br>23EMPBBA01 | Course Title: **Employability Skills** |
| Course Credit (L:T:P): 3( 2:0:1) | Teaching Hours/Week:3 |
| Total Contact Hours: 45 | Formative Assessment Marks:40 |
| Duration of Exam: 2 1/2 Hours | Semester End Examination Marks: 60 |

**Pedagogy:** Classrooms lecture, Case studies, Group discussion, Seminar & field work etc.,

**Course Outcomes: On successful completion of the course, the students' will be able to**

a) Acquire information on various vacancies notified by Central and State Government authorities as well as Private organizations.
b) Evaluate the problems on quantitative aptitude, logical reasoning and analytical ability.
c) Application of basic computer skills like MS word, MS excel, MS PPTs. Email etiquettes Etc.,
d) Articulate communication and leadership skills.
e) Evaluate self SWOC analysis and set his career goals.

| Syllabus: | Hours |
|---|---|
| **Module 1: Competitive Examinations** | **5** |

**Central Government Examinations:** UPSC, SSC, IBPS, LIC, RRB, RBI, NABARD and Department of Posts.
**Karnataka State Government Examinations**: KPSC, KEA, KSPEB. Eligibility criteria for various examinations. Common Examination pattern.
**Private Organizations:** Access vacancies fromNaukari.com; Indeed.com; shine.com; linkedin.com etc.,
**Practical:** Explore various vacancies notified by the above-stated authorities.

| Module 2: Quantitative aptitude, logical reasoning, and analytical ability | 10 |
|---|---|

**Quantitative aptitude:** Percentage, Profit or loss calculation, Time and work, Speed and Distance, Ratio and proportion. (Simple problems)
**Logical Reasoning:** Coding and Decoding, Blood Relations, Directions, and Venn Diagram.
**Analytical Ability:** Statement and assumptions and Data interpretation.
**Practical:** Conduct Mock competitive examination for quantitative aptitude, logical reasoning and analytical ability.

| **Module 3: Digital Literacy** | **10** |
|---|---|

Basic computer skills: MS Word and MS Excel (only layout, basic operations and short cut keys). MS PowerPoint, Internet and web browsing skills, Email etiquette.
**Practical:** Draft an Email to the HR of a company as an aspirant for the job by attaching your resume.

| **Module 4: Soft Skills** | **10** |
|---|---|

| **Communication Skills**: Verbal and Non-verbal communication, Effective listening skills, Excellent writing skills, and Presentation skills. |
|---|

**Communication Skills**: Verbal and Non-verbal communication, Effective listening skills, Excellent writing skills, and Presentation skills.
**Interpersonal Skills**: Understanding the importance of teamwork, Conflict resolution, and Building positive relationships with team members.
**Leadership skills:** importance and Effective leadership.
**Practical:** As a team leader write a draft appreciation letter to the team members for the completion of the project successfully.

| **Module 5: Career Development and Workplace Etiquette** | **10** |
|---|---|

**Career Development**: SWOC analysis for self-assessment, setting career goals and creating a career plan, Job search strategies, Interview skills, and effective resume writing. **Workplace Etiquette:** Time Management- importance and strategies for effective time management, Dress code, personal grooming, Office and workplace manners, Meeting etiquette. Work ethics and integrity.

**Practical:**
1. Prepare a resume with at least 2 references.
2. Conduct a mock interview based on the resume prepared by the students.

### Books for Reference:
1. Barun K Mitra, Personality Development and Soft Skills, Oxford university press, New Delhi.
2. GitangshuAdhikary, Communication and Corporate Etiquette, NotionPress, Mumbai.
3. Seema Gupta, Soft Skills- Interpersonal & Intrapersonal skills development, V&S Publishers, New Delhi.
4. Dr. R S Aggarwal, Quantitative Aptitude, S.Chand Publication, New Delhi.
5. Bittu Kumar, Mastering MS Office, V&S Publisher, New Delhi
6. List of Government Competitive Exams, Jobs & Vacancies (exampur.com)
7. https://www.safalta.com
8. https://sarkaariservice.in

**Note: Latest edition of books may be used**
## Course Articulation Matrix – 23EMPBBA01

|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 1 |
| CO2 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 |
| CO3 | 2 | 1 | 2 | 2 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 2 |
| CO4 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 1 | 2 |
| CO5 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 3 |
| **WA** | **1.8** | **1.6** | **1.6** | **1.6** | **1.8** | **1.8** | **1.2** | **1.4** | **1.8** | **1.8** | **1.2** | **1.8** |

| DSC (18) Syllabus for BBA |
|---|
| **Semester - VI** |

| Course Code: 234629 | Course Title: **Business Law** |
|---|---|
| Course Credit (L:T:P): 4( 4:0:0) | Teaching Hours/Week:4 |
| Total Contact Hours:60 | Formative Assessment Marks: 40 |
| Duration of Exam: 2 ½ Hours | Semester End Examination Marks: 60 |

**Pedagogy:** Classroom lectures, Case studies, Tutorial classes, Group discussion, Seminar &field work etc.,

**Course Outcomes:** On successful completion of the course, the students will be able to
  a. Comprehend the laws relating to Contracts and its application in business activities.
  b. Learn the rules for Sale of Goods and rights and duties of a buyer and a Seller.
  c. Acquire knowledge about the importance of Negotiable Instrument Act and its provisions relating to Cheque and other Negotiable Instruments.
  d. Infer the significance of Consumer Protection Act and its features
  e. Understand the need for Environment Protection.

| Syllabus: | Hours |
|---|---|
| **Module No. 1: Indian Contract Act, 1872** | **16** |
| Introduction – Definition of Contract, Essentials of Valid Contract, Offer and acceptance, consideration, contractual capacity, free consent. Classification of Contract, Discharge of acontract, Breach of Contract and Remedies to Breach of Contract. | |
| **Module No. 2: The Sale of Goods Act, 1930** | **12** |
| Introduction - Definition of Contract of Sale, Essentials of Contract of Sale, Conditions and Warranties, Transfer of ownership in goods including sale by a non- owner and exceptions. Performance of contract of sale - Unpaid seller, rights of an unpaid seller against the goods and against the buyer. | |
| **Module No. 3: Negotiable Instruments Act 1881** | **12** |
| Introduction – Meaning and Definition of Negotiable Instruments – Characteristics of Negotiable Instruments – Kinds of Negotiable Instruments – Promissory Note, Bills of Exchange and Cheques (Meaning, Characteristics and types) – Parties to Negotiable Instruments –Dishonour of Negotiable Instruments – Notice of dishonour – Noting and Protesting. | |
| **Module No. 4: Consumer Protection Act 1986** | **10** |
| Definitions of the terms – Consumer, Consumer Dispute, Defect, Deficiency, Unfair Trade Practices, and Services, Rights of Consumer under the Act, Consumer Redressal Agencies –District Forum, State Commission and National Commission. | |

| Module No. 5: Environment Protection Act 1986 | 10 |
|---|---|

Introduction - Objectives of the Act, Definitions of Important Terms – Environment, Environment Pollutant, Environment Pollution, Hazardous Substance and Occupier,Types of Pollution, Powers of Central Government to protect Environment in India.

**Skill Developments Activities:**
1. Discuss the case of "Carlill vs Carbolic Smoke Ball Company" case
2. Discuss the case of "Mohori Bibee v/s Dharmodas Ghose".
3. Briefly narrate any one case law relating to minor.
4. List at least 5 items which can be categorized as 'hazardous substance' according toEnvironment Protection Act.
5. List out any six cybercrimes.

**Csases:**
The relevant legal point, facts and the judicial decision relating to the following 10 case laws areto be specifically dealt with –
1. Balfour Vs Balfour
2. Carlill Vs Carbolic Smoke Ball Company
3. Felthouse Vs Bindley
4. Lalman Shukla Vs. Gauridutt
5. Durgaprasad Vs Baldeo
6.Chinnayya Vs Ramayya
7.Mohiribibi Vs. Dharmodas Ghosh
8. Ranganayakamma Vs Alvar Chetty
9. Hadley Vs Baxendale

**Books for Reference:**

1. M.C. Kuchhal, and Vivek Kuchhal, Business Law, Vikas Publishing House,New Delhi.
2. Avtar Singh, Business Law, Eastern Book Company, Lucknow.
3. Ravinder Kumar, Legal Aspects of Business, Cengage Learning
4. SN Maheshwari and SK Maheshwari, Business Law, National PublishingHouse, New Delhi.
5. Aggarwal S K, Business Law, Galgotia Publishers Company, New Delhi
6. Bhushan Kumar Goyal and Jain Kinneri, Business Laws, InternationalBookHouse
7. Sushma Arora, Business Laws, Taxmann Publications.
8. Akhileshwar Pathak, Legal Aspects of Business, McGraw Hill Education, 6thEd.
9. P C Tulsian and Bharat Tulsian, Business Law, McGraw Hill Education
10. Sharma,J.P. and Sunaina Kanojia, Business Laws, Ane Books Pvt. Ltd., NewDelhi
https://josephscollege.ac.in
https://www.studocu.com
https://www.studeersnel.nl

# Course Articulation Matrix - 234629

|     | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 2   | 2   | 2   | 2   | 1   | 2   | 2   | 1   | 1   | 2    | 1    | 2    |
| CO2 | 2   | 2   | 1   | 2   | 1   | 2   | 1   | 2   | 2   | 2    | 2    | 2    |
| CO3 | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 1   | 2   | 2    | 2    | 2    |
| CO4 | 2   | 2   | 2   | 2   | 2   | 2   | 3   | 2   | 2   | 1    | 1    | 2    |
| CO5 | 2   | 1   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2    | 1    | 2    |
| **WA** | **2** | **1.8** | **1.8** | **2** | **1.6** | **2** | **2** | **1.6** | **1.8** | **1.8** | **1.4** | **2** |

| DSC (19) Syllabus for BBA<br>Semester - VI | |
|---|---|
| Course Code: 234630 | Course Title: **Income Tax – II** |
| Course Credit (L:T:P): 4( 4:0:0) | Teaching Hours/Week:4 |
| Total Contact Hours:60 | Formative Assessment Marks: 40 |
| Duration of Exam: 2 ½ Hours | Semester End Examination Marks: 60 |

**Pedagogy:** Classroom lectures, tutorials, Group discussion, Seminar, Case studies & field work etc.,

**Course Outcomes: On successful completion of the course, the students will:**
  a) Gain knowledge about the procedure for computation of income from business and otherProfession.
  b) Evaluate the provisions for determining the capital gains.
  c) Compute the income from other sources.
  d) Demonstrate the computation of total income of an Individual.
  e) Comprehend the assessment procedure and to know the power of income tax authorities.

| Syllabus: | Hours |
|---|---|
| **Module No. 1: Profits and Gains of Business and Profession** | 15 |
| Introduction-Meaning and definition of Business, Profession and Vocation. - Expenses Expressly allowed - Expenses Expressly Disallowed - Allowable losses - Expressly disallowed expenses and losses, Expenses allowed on payment basis. Problems on computation of income from business of a sole trading concern - Problems on computation of income from profession: Medical Practitioner - Advocate and Chartered Accountants. | |
| **Module No. 2:  Capital Gains** | 10 |
| Introduction - Basis for charge - Capital Assets - Types of capital assets – Transfer - Computation of capital gains – Short term capital gain and Long term capital gain -Exemption under section 54, 54B, 54EC, 54D, 54F, and 54G. Problems covering the above sections. | |
| **Module No. 3:  Income from other Sources** | 15 |

| Introduction - Incomes taxable under Head income other sources – Securities - Types of Securities - Rules for Grossing up. Ex-interest and cum-interest securities. Bond Washing Transactions - Computation of Income from other Sources. | |
|---|---|
| **Module No. 4: Set Off and Carry Forward of Losses & Assessment of individuals.** | **10** |
| Introduction – Provisions of Set off and Carry Forward of Losses (Theory only) Computation ofTotal Income and tax liability of an Individual. | |
| **Module No. 5: Assessment Procedure and Income Tax Authorities** | **10** |
| Introduction - Due date of filing returns, Filing of returns by different assessees, E-filing of returns, Types of Assessment, Permanent Account Number -Meaning, Procedure for obtaining PAN and transactions were quoting of PAN is compulso**ry.** Income Tax Authorities their Powers and duties. | |

**Skill Developments Activities:**
1. Visit any chartered accountant office and identify the procedure involved inthe computation of income from profession.
2. List out the different types of capital assets and identify the procedure involved in thecomputation of tax for the same.
3. List out the steps involved in the computation of income tax from othersources and critically examine the same.
4. Identify the Due date for filing the returns and rate of taxes applicable forindividuals.
5. Draw an organization chart of Income Tax department in your locality.
6. Any other activities, which are relevant to the course.

**Books for References:**
1. Dr. Vinod K. Singhania: Direct Taxes – Law and Practice, Taxmann publication.
2. B.B. Lal: Direct Taxes, Konark Publisher (P) ltd.
3. Dr. Mehrotra and Dr. Goyal: Direct Taxes – Law and Practice, Sahitya Bhavan Publication.
4. Dinakar Pagare: Law and Practice of Income Tax, Sultan Chand and sons.
5. Gaur & Narang: Income Tax.
6. Swamynathan C, Abhirami D, Srinivas G: Income tax
   https://cleartax.in
   https://www.bankbazaar.com
   https://taxguru.in

# Course Articulation Matrix - 234630

|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | P10 | P11 | P12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 |
| CO3 | 3 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 |
| CO5 | 3 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 |
| WA | 3 | 1.2 | 1.8 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 |

## DSC (20) Syllabus for BBA
## Semester - VI

| | |
|---|---|
| Course Code: 234631 | Course Title: **International Business** |
| Course Credit (L:T:P): 4( 4:0:0) | Teaching Hours/Week:4 |
| Total Contact Hours:60 | Formative Assessment Marks: 40 |
| Duration of Exam: 2 ½ Hours | Semester End Examination Marks: 60 |

**Pedagogy:** Classroom lectures, tutorials, Group discussion, Seminar, Case studies & field work etc.,

**Course Outcomes: On successful completion of the course, the students will able to:**
   a) Acquire knowledge about the concepts of International Business.
   b) Compare the Internal and External International Business Environment.
   c) Evaluate the difference MNC and TNC
   d) Understand the role of International Organisations in International Business.
   e) Learn International Operations Management.

| Syllabus: | Hours |
|---|---|
| **Module No. 1:  Introduction to International Business** | **14** |

   Introduction- Meaning and definition of international business, need and importance of international business, stages of internationalization, tariffs and non-tariff barriers to international business.

   Mode of entry into international business - exporting (direct and indirect), licensing and franchising, contract manufacturing, turnkey projects, management contracts, wholly owned manufacturing facility, Assembly operations, Joint Ventures, Third country location, Mergers and Acquisition, Strategic alliance, Counter Trade; Foreign investments.

| **Module No. 2:  International Business Environment** | **12** |
|---|---|

   Overview, Internal and External environment - Economic environment, Political environment, Demographic environment, Social and Cultural environment, Technologicaland Natural environment.

| **Module No.3:  Globalization** | **12** |
|---|---|

| | Meaning, features, essential conditions favoring globalization, challenges to globalization, MNCs, TNCs - Meaning, features, merits and demerits; Technology transfer - meaning and issues in technology transfer. | |
|---|---|---|
| **Module No.4: Organizations Supporting International Business** | | **12** |
| | Meaning, Objectives and functions of - IMF, WTO, GATT, GATS, TRIM, TRIP; and Regional Integration- EU, NAFTA, SAARC, BRICS. | |
| **Module No.5: International Operations Management** | | **10** |
| | Global Supply Chain Management- Global sourcing, Global manufacturing strategies, International Logistics, International HRM - Staffing policy and it's determinants; Expatriation and Repatriation (Meaning only). | |

**Skill Developments Activities:**
   a) Tabulate the foreign exchange rate of rupee for dollar and euro currencies for 1month
   b) List any two Indian MNC's along with their products or services offered.
   c) Prepare a chart showing currencies of different countries
   d) Collect and paste any 2 documents used in Import and Export trade.

**Books for References:**

**1.** Rakesh Mohan Joshi. (2011). International Business, Oxford University Press, NewDelhi.

**2.** Francis Cherunilam; International Business, Prentice Hall of India

**3.** P. SubbaRao – International Business – HPH
   https://www.studocu.com
   https://archive.nptel.ac.in
   https://www.worldsupporter.org

## Course Articulation Matrix - 234631

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 2 |
| CO2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 2 |
| CO3 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 |
| CO4 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO5 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 |
| **WA** | **2** | **1.6** | **1.8** | **1.6** | **1.6** | **1.4** | **1.6** | **1.4** | **1.6** | **1.6** | **1.8** | **2** |

<table>
<tr><td colspan="2" align="center">**DSE (2) Syllabus for BBA**<br>**Semester – VI FN-2**</td></tr>
<tr><td>Course Code: 234632</td><td>Course Title: **Security Analysis and Portfolio Management**</td></tr>
<tr><td>Course Credit (L:T:P): 3( 3:0:0)</td><td>Teaching Hours/Week:3</td></tr>
<tr><td>Total Contact Hours:45</td><td>Formative Assessment Marks: 40</td></tr>
<tr><td>Duration of Exam: 2 ½ Hours</td><td>Semester End Examination Marks: 60</td></tr>
</table>

**Pedagogy:** Classroom lectures, Case studies, Tutorial classes, Group discussion,Seminar &field work etc.,

**Course Outcomes:** On successful completion of the course, the students will be able to:
   a) Gain knowledge on the basic concepts of Investment.
   b) Illustrate the relationship between risk and return and evaluate the different investment alternatives.
   c) Analyze and evaluate the fundamental investment analysis.
   d) Comprehend the basics of Technical analysis.
   e) Evaluate portfolio and portfolio management

| Syllabus: | Hrs. |
|---|---|
| **Module No. 1: Introduction to Investments** | **10** |

Introduction- Investment process, Criteria for Investment, types of Investors, Investment, Speculation and Gambling. Elements of Investment, Investment Avenues, Factors influencingselection of investment alternatives.
Security Market- Introduction, functions, Secondary Market Operations. Stock Exchanges in India, Security Exchange Board of India, Government Securities Market, Corporate Debt Marketand Money Market Instruments.

| **Module No. 2: Risk-Return Relationship** | **05** |
|---|---|

Meaning of risk, types off risk, measuring risk, risk preference of investors. Meaning of return, measures of return, holding period of return, Annualized return, expected return, investors' attitude towards risk and return.

| **Module No. 3: Fundamental Analysis** | **10** |
|---|---|

Introduction- Investment Analysis, Fundamental Analysis, Macro Economic Analysis, IndustryAnalysis, Company Analysis, Trend Analysis, and Ratio Analysis.

| **Module No. 4: Technical Analysis** | **10** |
|---|---|

Meaning of Technical Analysis, Fundamental vs Technical Analysis, Charting techniques, Technical Indicators, Testing Technical Trading Rules and Evaluation of Technical Analysis.

| **Module No. 5: Portfolio Management** | **10** |
|---|---|

Framework-Portfolio Analysis – Selection and Evaluation – Meaning of portfolio – Reasons to hold portfolio – Diversification analysis – Markowitz's Model – Assumptions –Specific model – Risk and return optimization – Efficient frontier – Efficient portfolios –Leveraged portfolios – Corner portfolios –Sharpe's Single Index model – Portfolio-evaluation measures – Sharpe's Performance Index – Treynor'sPerformance Index – Jensen's Performance Index.

**Skill Development**
1. Prepare an imaginary investment portfolio for individual with a salary of 10 lakhs per annum.
2. List of 10 companies approached SEBI for IPO
3. Prepare a technical analysis chart on Blue Chip Companies of BSE.
4. Collect information regarding GDRs, ADRs, IDRs and various Bonds and make a chart.
5. Watch market movement for a day and analyze the trend of Nifty-Fifty Index.

**Books for Reference**
1. A. Brahmiah & P. Subba Rao, Financial Futures and Options, HPH.
2. Singh Preeti, Investment Management, HPHG
3. Alexander Fundamental of Investments, Pearson Ed.
4. Hangen: Modern Investment theory. Pearson Ed.
5. Kahn: Technical Analysis – Plain and sample Pearson Ed.
6. Ranganthan: Investment Analysis and Port folio Management.
7. Chandra Prasanna: Managing Investment – Tata Mc Gram Hill.
   https://www.managementstudyguide.com
   https://www.udemy.com
   https://www.investopedia.com
   https://cleartax.in

## Course Articulation Matrix - 234634

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| CO3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO5 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| **WA** | **2** | **1.6** | **1.6** | **1.2** | **1.6** | **1.2** | **1.6** | **1.6** | **1.6** | **1.6** | **2** | **2** |

<table>
<tr><td colspan="2" align="center"><strong>DSE (2) Syllabus for BBA</strong><br><strong>Semester – VI MK-2</strong></td></tr>
<tr><td>Course Code: 234633</td><td>Course Title: <strong>Advertising and Media Management</strong></td></tr>
<tr><td>Course Credit (L:T:P): 3( 3:0:0)</td><td>Teaching Hours/Week:3</td></tr>
<tr><td>Total Contact Hours:45</td><td>Formative Assessment Marks: 40</td></tr>
<tr><td>Duration of Exam: 2 ½ Hours</td><td>Semester End Examination Marks: 60</td></tr>
</table>

**Pedagogy:** Classroom lectures, tutorials, Group discussion, Seminar, Case studies & field work etc.,

**Course Outcomes:** On successful completion of the course, the students will be able to:
   a) Gain knowledge on the nature, role, and importance of IMC in marketing strategy
   b) Evaluate the effective design and implementation of advertising strategies
   c) Present a general understanding of content, structure, and appeal of advertisements
   d) Analyze ethical challenges related to responsible management of advertising ad brand strategy.
   e) Evaluate the effectiveness of advertising and agencies role

| Syllabus: | Hours |
|---|---|
| **Module -1: Introduction to Integrated MarketingCommunication** | **10** |
| Integrated marketing communication, AIDA Model, Setting goals and objectives, concept of DAGMAR in setting objectives, elements of IMC; Role of advertising in India's economic development, Ethics in advertising, Social, Economic and Legal aspects of advertising. | |
| **Module -2: Consumer and Media** | **10** |
| How advertising works: perception, cognition, affect, association, persuasion, behaviour, Associating feeling with brands, Use of research in advertising planning; Advertising Media; industry structure, functions, advantages, disadvantages of print, Television, Radio, Internet, Outdoor, Basic concept of media planning, media selection, Media Scheduling strategy, setting media budgets | |
| **Module-3: Advertising Program** | **10** |
| Planning and managing creative strategies; Creative approaches; Building Advertising Program: Message, Theme, advertising appeals; Advertising layout: howto design and produce advertisements; Advertising Budget: nature and methods of advertising appropriation; Art of copywriting; Guidelines for copywriting; Copywriting for print, Audio, TV and outdoor media. | |
| **Module -4: Other Elements of IMC- Sales Promotion, PR, Events andExperiences and Word of Mouth** | **10** |
| Consumer and trade sales promotion, application of sales promotion in different domains**;** Using public relations in image building**;** Planning and executing events, event management**;** Viral marketing, building organic word of mouth communication. | |

| | Module -5:Measuring Effectiveness | 05 |
|---|---|---|

Measuring Advertising Effectiveness: stages of evaluations and various types of testing-Pre and Post testing; Advertising agencies: history, role, importance, organizational structure, functions; Selection of agency, client agency relationship, compensation strategies

**Skill Development Activities:**
a) List out ethical issues in Advertisements.
b) List out different modes of Advertisement.
c) Write a note on guidelines for copywriting.
d) List out types of Outdoor Advertisement.
e) State the process in selection of Advertisement Agency.

**Books for References:**
1. Advertising Principles and Practice, William Wells, John Burnett, Sandra Moriarty, 6th ed., Pearson education, Inc.
2. Advertising and Promotion, G.Belch, Michael Belch, Keyoor Purani, 9th edition, Tata Mcgraw Hill publication, ISBN: 978-1-25-902685-0.

https://www.studocu.com
https://www.enotesmba.com
https://archive.mu.ac.iN

## Course Articulation Matrix -  234633

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 2 |
| CO2 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| CO3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| CO5 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| **WA** | **2.4** | **1.2** | **1.2** | **1.2** | **1.2** | **1.2** | **1** | **2** | **2** | **1.8** | **1.6** | **2** |

<table>
<tr><td colspan="2" align="center">**DSE (2) Syllabus for BBA**<br>**Semester – VI HRM-2**</td></tr>
<tr><td>Course Code: 234634</td><td>Course Title: **Human Resources Development**</td></tr>
<tr><td>Course Credit (L:T:P):3( 3:0:0)</td><td>Teaching Hours/Week:3</td></tr>
<tr><td>Total Contact Hours:45</td><td>Formative Assessment Marks: 40</td></tr>
<tr><td>Duration of Exam: 2 ½ Hours</td><td>Semester End Examination Marks: 60</td></tr>
</table>

**Pedagogy:** Classroom lectures, tutorials, Group discussion, Seminar, Case studies & field work etc.,

**Course Outcomes:** On successful completion of the course, the students will be able to:
a) Acquire knowledge about HRD.
b) Comprehend the framework of HRD.
c) Assess the models for evaluating the HRD programs.
d) Evaluate the need for employee counseling.
e) Apprehend the HR performance.

| Syllabus: | Hours |
|---|---|
| **Module No.1: Conceptual Analysis of HRD** | **08** |
| Introduction – Meaning and Definition of HRD - Need for HRD-Multiple Goals of HRD – HRD Department and its Task –HRD for Organizational Effectiveness – HRD in the Indian Context -HRD Mechanisms. | |
| **Module No.2: Frame Work of Human Resource Development** | **10** |
| Frame work of Human Resource Development –HRD Processes-Assessing HRD Needs- HRD Model - Designing Effective HRD Program - HRD Interventions– Training Methods- Training - On-the-Job and Off-the-Job training- Brain Storming - Case Studies - Role Plays -Simulations – T-Groups - Transactional Analysis. | |
| **Module No. 3: Human Resource Performance** | **10** |
| Introduction -HR Performance and Bench Marking - Impact of Globalization on HRD- Diversity of Work Force - Work Force Reduction - Realignment and Retention - HRD programs for diverse employees. | |
| **Module No. 4: HRD Evaluating Programs** | **09** |
| Evaluating HRD Programs- Models and Frame Work of Evaluation - Assessing the Impact of HRD Programs - Human Resource Development - Applications - Fundamental Concepts of Socialization. | |
| **Module No. 5: Employee Counselling Services** | **08** |
| Introduction - Employee counselling – Counselling as an HRD Activity - Counselling Programs – components and characteristics, Issues in Employee Counselling. | |

**Skill Development Activities:**
1. Encourage students to visit any business outlet and learn about the various developmental activities undertaken for their Employees.
2. Conduct in-class Transactional analysis' activities
3. Promote student to come up with their own ideas to manage workforce diversity.
4. Conduct Role plays taking real world scenarios.

**Books for References:**

**1.** Werner & Desimone, Human Resource Development, Cengage Learning, 2006

**2.** William E. Blank, Handbook For Developing Competency Based Training,
    Programmes Prentice-Hall, New Jersey, 1982.

**3.** Uday Kumar Haldar, Human Resource Development, Oxford
    University Press, 2009
    https://backup.pondiuni.edu.in
    https://www.studocu.com
    https://mis.alagappauniversity.ac.in

## Course Articulation Matrix – 234634

|     | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| CO2 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| CO3 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 1 |
| CO4 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 |
| CO5 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| **WA** | **1.8** | **1.4** | **1.4** | **1.6** | **1.6** | **1.4** | **1.2** | **1.8** | **2** | **1.8** | **1.2** | **1.6** |

| DSE (2) Syllabus for BBA | |
|---|---|
| **Semester – V RM-2** | |
| Course Code: 234635 | Course Title: **Retail Operations Management** |
| Course Credit (L:T:P): 3( 3:0:0) | Teaching Hours/Week:3 |
| Total Contact Hours:45 | Formative Assessment Marks: 40 |
| Duration of Exam: 2 ½ Hours | Semester End Examination Marks: 60 |

**Pedagogy: Classroom lectures, Case studies, Group discussion, Seminar &field work etc.,**

**Course Outcomes: On successful completion student will demonstrate:**
  a) Compare various retail formats and technological advancements for setting up appropriate retail business.
  b) Identify the competitive strategies for retail business decisions.
  c) Examine the site location and operational efficiency for marketing decisions.
  d) Analyse the effectiveness of merchandising and pricing strategies.
  e) Assess store layout and planogram for retail business.

| Syllabus: | Hours | |
|---|---|---|
| **Module -1: Retail and Logistics Management** | **07** | |
| Introduction Retailing and economic significance- Functions of a retailer - Types of retailers – Trends in retailing – International Retailing – Retailing as a career –Retail Management Decision Process - Service Retailing. | | |
| **Module -2: Retailing Environment Theories** | **10** | |
| Theory of Retail Change: Theory of Natural Selection in retailing, Theory of Wheel of retailing, General-Specific-General Cycle or Accordion Theory, Retail Life Cycle Theory- - Multi channel retailing – Retail Aggregators Business Model – Phases of growth of retail markets – Retail Mix. | | |
| **Module-. 3: Store Loyalty Management and Retail Location** | **10** | |
| Types of customers – Variables influencing store loyalty – Store loyalty models – Influencing customers through visual merchandising – Value added through private labels – Retail location strategy– Importance of location decision – Retail location strategies and techniques – Types of retail locations. | | |
| **Module -4: Merchandise Management** | **10** | |
| Meaning - Roles and responsibilities of the merchandiser and the buyer – Function of Buying for different types of Organizations – Process of Merchandise Planning – Merchandise Sourcing – Methods of procuring merchandise – Concept of private label - Retail Pricing policies. | | |
| **Module- 5: Category Management** | **08** | |
| Meaning - Definition of Category Management - Components of Category Management - Category Management Business process - Category Definition - Defining the Category Role-Destination Category, Routine Category, Seasonal Category, Convenience Category - Category Assessment - Category PerformanceMeasures - Category Strategies - Category Tactics - Category Plan implementation - Category Review. | | |

**Skill  Development Activities:**

a) Write a note on Visual merchandising training programme layout design, and product placement.

b) Write a note Leadership training: Develop skills in coaching, delegation, and motivation.

c) Derive Customer analysis by considering skills in understanding customer behavior and preferences to improve customer satisfaction.

d) Chart out the types of customers in creating customer loyalty programs.

**Books for References:**

1. Coughlem: Marketing Channels.ϖ  Gilbert Pearson: Retail Marketing Education Asia 2001.

2.  Micheal Levyϖ & Barton AWeitz: Retailing Management, McGraw

3. Patrick M Dunne: Robert F Lusch: Retail Management Hill Publications.

4.  Suja Nair: Retail Management, Himalaya Publishing House.ϖ

https://www.academia.edu
https://www.studocu.com

https://ebooks.lpude.in

## Course Articulation Matrix -  234635

|     | PO1 | PO2 | P03 | P04 | P05 | P06 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 1 |
| CO2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 2 |
| CO3 | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 |
| CO4 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 |
| CO5 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 2 |
| WA | 2 | 1.4 | 1.2 | 1.2 | 2 | 1.4 | 1.4 | 1.2 | 1.4 | 2 | 1.4 | 1.6 |

| Vocational -2 Syllabus for BBA | |
|---|---|
| **Semester -** VI | |
| Course Code: 234636 | Course Title- **Goods And Services Tax** |
| Course Credit (L:T:P): 3( 3:0:0) | Teaching Hours/Week: 3 |
| Total Contact Hours: 45 | Formative Assessment Marks: 40 |
| Duration of Exam: 2 ½ Hours | Semester End Examination Marks: 60 |

**Pedagogy:** Classroom's lecture, tutorials, Group discussion, Seminar, Case studies.

**Course Outcomes: On successful completion Student will demonstrate**

a) Gain knowledge on the basics of taxation, including the meaning and types of taxes, andthe differences between direct and indirect taxation.

b) Analyze the history of indirect taxation in India and the structure of the Indiantaxation system.

c) Illustrate the framework and definitions of GST, including the constitutional framework, CGST, SGST, IGST, and exemptions from GST.

d) Evaluate the time, place, and value of supply under GST, and apply this knowledge to calculate the value of supply and determine GST liability.

e) Comprehend input tax credit under GST, including its meaning and process foravailing it, and apply this knowledge to calculate net GST liability.

| Syllabus | Hours |
|---|---|
| **Module No. 1: Basics of Taxation** | **5** |
| Tax – Meaning and Types, Differences between Direct and Indirect Taxation, Brief History of Indirect Taxation in India, Structure of Indian Taxation. | |
| **Module  No. 2: Goods and Services Tax –Framework and Definitions** | **10** |
| Introduction to Goods and Services Tax, Constitutional Framework, Orientation to CGST, SGST and IGST, Meaning and Scope of Supply, Types of Supply. Exemptions from GST. | |
| **Module No. 3: Time, Place And Value of Supply** | **10** |
| Time of Supply – in case of Goods and in case of Services - Problems on ascertaining Time of Supply; Place of Supply – in case of Goods and in case of Services (both General and Specific Services) – Problems on Identification of Place of Supply; Value of Supply – Meaning, Inclusions and Exclusions. Problems on calculation of 'Value of Supply'. | |
| **Module No. 4: GST Liability and Input Tax Credit** | **10** |
| Rates of GST – Classification of Goods and Services and Rates based on classification, Problems on computation of GST Liability. Input Tax Credit – Meaning, Process for availing Input Tax Credit – Problems on calculation of Input Tax Credit and Net GST Liability. | |
| **Module No. 5: GST Procedures** | **10** |

Registration under GST, Tax Invoice, Levy and Collection of GST, Composition Scheme, Due dates for Payment of GST, Accounting record for GST, Features of GST in Tally Package. GST Returns – Types of Returns, Monthly Returns, Annual Return and FinalReturn – Due dates for filing of returns. Final Assessment. Accounts and Audit under GST.

**Skill Developments Activities:**
  a) List out the process of GST registration for a business.
  b) Chart out 'time of supply' concept relevance in GST.
  c) Identify the place of supply for goods and services in different scenarios.
  d) Calculate GST liability for a particular transaction using imaginary values.
  e) Explain the process of availing input tax credit in GST.

**Books for Reference:**
1. V Rajesh Kumar and Mahadev, "Indirect Taxes", Mc Graw Hill Education
2. Datey, V S, "Indirect Taxes", Taxmann Publications.
3. Hiregange et al, "Indirect Taxes:, Puliani and Puliani.
4. Haldia, Arpit, "GST Made Easy", Taxmann Publications.
5. Chaudhary, Dalmia, Girdharwal, "GST – A Practical Approach", Taxmann Publications.
  https://www.gst.gov.in
  https://cbic-gst.gov.in
  https://gstcouncil.gov.in

## Course Articulation Matrix - 234636

| GST | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | P10 | P11 | P12 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 2 |
| CO2 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 2 |
| CO3 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 2 |
| CO4 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 2 |
| CO5 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 2 |
| WA | 1.6 | 1.2 | 1.6 | 1.6 | 1.4 | 1.6 | 1.6 | 1.6 | 1 | 1 | 2 | 2 |

| Vocational - 2 Syllabus for BBA Semester - VI | |
|---|---|
| **Vocational - 2 Syllabus for BBA** <br> **Semester -** VI | |
| Course Code: 234637 | Course Title **Enterprise Resource Planning** |
| Course Credit (L:T:P): 3( 3:0:0) | Teaching Hours/Week:3 |
| Total Contact Hours:45 | Formative Assessment Marks: 40 |
| Duration of Exam: 2 ½ Hours | Semester End Examination Marks: 60 |

**Pedagogy:** Classrooms lecture, Case studies, Tutorial Classes, Group
iscussion,Seminar & field work etc.,

**Course Outcomes: On successful completion of the course, the students' will be able to**
a) Evaluate the business process of an enterprise to grasp the activities of
ERP project management cycle to understand the emerging trends in ERP
developments.
b) Integrate and automate the business processes and shares information enterprise-wide.
c) Explore the significance of ERP to provide a solution for better project management.
d)  Enable the students to understand the various process involved in implementing ERP in a variety of
businessenvironment
e) Evaluate the issues involved in design and implementation of ERP systems.

| Syllabus: | Hours |
|---|---|
| **Module No. 1:** I**ntroduction to ERP** | **10** |
| Enterprise Resource Planning - Defining ERP - Origin and Need  for  an  ERP System - Benefits of an  ERP System - Reasons for the Growth of  ERP Market – Risk of ERP - Road map for successful ERP | |
| **Module No. 2: ERP related Technologies and Modules** | **10** |
| Business Process Re- engineering – Product life cycle – Customer relationship management - Functional  Modules- Sales and  Distribution, service - Human Resource - Finance   – Production  - Materials  Management – Purchasing  –  Quality  Management.. | |
| **Module No. 3: ERP implementation** | **10** |
| ERP  Implementation Life cycle –  Transition  strategies  -  ERP Implementation Process - ERP Vendor Selection - Role of the Vendor - Consultants: Types of consultants - Role of a Consultant - Vendors and Employees -Resistance by employees - Dealing with employee resistance - Project team | |
| **Module No. 4: ERP post implementation** | **10** |
| Success and Failure factor of ERP implementation – ERP operations and maintenance – Data Migration – Project Management and  Monitoring - Maximizing the ERP system. | |
| **Module No. 5: Future  directions  in  ERP** | **5** |
| New Trends in ERP- ERP to ERP II - Implementation of Organization Wide ERP- Development of  New Markets and    Channels-Latest ERP  Implementation Methodologies - ERP and E- business. | |

**Skill Development Activities:**
1.   State the steps and activities in the ERP life cycle
2.   Develop a process of driven thinking towards business process.
3.   Demonstrate a good understanding of the basic issues in ERP systems.
Any other activities, which are relevant to the course.

**Books for Reference:**
 1. Alexis Leon, "ERP Demystified", Tata McGraw Hill, New Delhi, 2007.
 2.Joseph A Brady, Ellen F Monk, Bret Wagner, "Concepts in Enterprise Resource Planning",Thompson Course Technology, USA, 2009
3.Vinod Kumar Garg and Venkitakrishnan N K, "Enterprise Resource Planning – Concepts and Practice", PHI, New Delhi, 2004
4.MahadeoJaiswal and Ganesh Vanapalli, ERP Macmillan India, 2013.
**https://www.investopedia.com**
**https://www.sap.com**
**https://www.qad.com**

## Course Articulation Matrix -  234637

|      | PO1 | PO2 | P03 | P04 | P05 | P06 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1  | 2   | 2   | 1   | 2   | 2   | 2   | 1   | 2   | 1   | 2    | 2    | 2    |
| CO2  | 1   | 1   | 2   | 1   | 1   | 1   | 1   | 1   | 2   | 2    | 2    | 2    |
| CO3  | 2   | 1   | 1   | 2   | 2   | 1   | 1   | 1   | 1   | 2    | 2    | 2    |
| CO4  | 2   | 2   | 2   | 2   | 1   | 1   | 2   | 1   | 2   | 2    | 2    | 2    |
| CO5  | 1   | 1   | 2   | 1   | 2   | 1   | 1   | 1   | 1   | 2    | 2    | 2    |
| **WA** | **1.6** | **1.2** | **1.6** | **1.6** | **1.6** | **1.2** | **1.2** | **1.2** | **1.4** | **2** | **2** | **2** |

# Internship

**Semester: VI**

| | |
|---|---|
| **Course Code: 23INTBBA01** | **Course Title: Internship** |
| **Course Credits:  03** | **Hours of Teaching/Week:** |
| **Total Contact Hours:**<br>90 Hours Internship | **Formative Assessment Marks:**<br>100 Marks(C1=50+C2=50) |

**Note: This course will run as per the guidelines defined by the BoS, Business Administration, University of Mysore, Mysuru and the same is approved by BoS, Business Administration, SBRR Mahajana First Grade College, Mysuru.**

**Course Outcomes (COs):**

**CO1:** Demonstrate the ability to apply management concepts and theories learnt in the classroom to real world business scenarios.

**CO2:** Enhance leadership abilities and interpersonal skills such as communication, conflict resolution, delegation and decision making through hands on experience in a professional setting.

## Course Articulation Matrix – 23INTBBA01

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| **CO 2** | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |
| **Weighted Average** | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 |

# Scheme of Valuation for Internship

C1 and C2 are internal assessments to be conducted during 8th and 16th weeks respectively for the semester. The student will be evaluated on the basis of presentation skills and project development. The student has to compulsorily submit the project report for evaluation during C2. The report has to be certified by the Head of the Department and the Mentor/Supervisor.

• **The student is evaluated for 100 marks in C1 and C2 as per the following scheme:**

Project Progress Presentation (**C1**): 50 marks

Project Development and Report (**C2**): 50 marks

| Assessment Criteria | Marks |
|---|---|
| Project Presentation Skills | 50 |
| Project Development Skills and Report | 50 |
| **Total** | **100** |

**Guidelines for Continuous Internal Evaluation and Semester End Examination:**

The CIE and SEE will carry 40% and 60% weightage each, to enable the course to be evaluated for a total of 100 marks, irrespective of its credits. The evaluation system of the course is comprehensive& continuous during the entire period of the Semester. For a course, the CIE and SEE evaluation will be on the following parameters:

| Sl. No. | Parameters for the Evaluation | Marks |
|---------|-------------------------------|-------|
| | **Continuous Internal Evaluation(CIE)** | |
| 1 | Continuous & Comprehensive Evaluation(CCE) – (A) (SEC-30 Marks) | 20Marks |
| 2 | Internal Assessment Tests(IAT) –(B) | 20Marks |
| | Total of CIE(A+B)- SEC-50 Marks | 40Marks |
| 3 | Semester End Examination(SEE) – (C)-SEC-50 Marks | 60Marks |
| | Total of CIE and SEE(A+B+C) | 100Marks |

## Continuous Internal Evaluation:

a. **Continuous & Comprehensive Evaluation (CCE):**

**Individual Assignments**

- i. Seminars/Class Room Presentations/Quizzes
- ii. Group Discussions/Class Discussion/Group Assignments
- iii. Case studies/Caselets
- iv. Participatory &Industry-Integrated Learning/Industrial visits
- v. Practical activities/Problem Solving Exercises
- vi. Participation in Seminars/Academic Events/Symposia, etc.
- vii. Mini Projects/Cap stone Projects

b. **Internal Assessment Tests (IAT):** The IAT will carry a maximum of 20% weightage (20 marks) of total marks of a course.

# PATTERN OF QUESTION PAPER

## (DSC, DSE, Vocational)

**TIME: 2½ HOURS**                                   **MARKS: 60**

### PART – A

**Answer any FIVE of the following questions. Each question carries 2 marks. (5x2= 10)**

1. --------------------------------------------------------------------------------------------
2. --------------------------------------------------------------------------------------------
3. --------------------------------------------------------------------------------------------
4. --------------------------------------------------------------------------------------------
5. --------------------------------------------------------------------------------------------
6. --------------------------------------------------------------------------------------------
7. --------------------------------------------------------------------------------------------

### PART – B

**Answer any TWO of the following questions. Each question carries 10 Marks. (2x10 =20)**

8. ---------------------------------------------------------------------------------------------
9. ---------------------------------------------------------------------------------------------
10. --------------------------------------------------------------------------------------------
11**----------------------------------------------------------------------------------------**

### PART – C

**Answer any TWO of the following questions. Each question carries 15 Marks (2X15=30)**

12----------------------------------------------------------------------------------------------
13----------------------------------------------------------------------------------------------
14----------------------------------------------------------------------------------------------
15**----------------------------------------------------------------------------------------**

# PATTERN OF QUESTION PAPER

## (SEC-Employability Skills)

**TIME: 2 HOURS**                                    **MARKS: 50**

### PART – A

**Answer any FIVE of the following questions. Each question carries 2 marks. (5x2= 10)**

1. ----------------------------------------------------------------------------------------------
2. ----------------------------------------------------------------------------------------------
3. ----------------------------------------------------------------------------------------------
4. ----------------------------------------------------------------------------------------------
5. ----------------------------------------------------------------------------------------------
6. ----------------------------------------------------------------------------------------------

### PART – B

**Answer any TWO of the following questions. Each question carries 10 Marks. (4x5 =20)**

7. ----------------------------------------------------------------------------------------------

8. ----------------------------------------------------------------------------------------------
9. ----------------------------------------------------------------------------------------------
10. ---------------------------------------------------------------------------------------------
11-----------------------------------------------------------------------------------------------

### PART – C

**Answer any TWO of the following questions. Each question carries 15 Marks (2X10=20)**

12-----------------------------------------------------------------------------------------------
13-----------------------------------------------------------------------------------------------
14-----------------------------------------------------------------------------------------------
15-----------------------------------------------------------------------------------------------

Mahajana Education Society (R.)

Education to Excel

# SBRR MAHAJANA FIRST GRADE COLLEGE (Autonomous)

Jayalakshmipuram, Mysuru – 570 012

Affiliated to University of Mysore Re-accredited by NAAC with 'A' Grade

College with Potential for Excellence

# BOARD OF STUDIES

# DEPARTMENT OF COMMERCE

**UG** ✓

**PG**

# NEP Syllabi for V and VI Semester

# 2023-24

# DEPARTMENT OF COMMERCE

## Motto:

*Simply Better*

## Vision:

*Imparting contemporary education to make the students well versed in the domain of Business and honing the students to mount high with the prevailing corporate scenario.*

## Mission:

*Giving a practical edge to the curriculum by building life skills through service oriented programs and to pursue knowledge through academics, extracurricular activities to develop the student's personality with a strong value base.*

# SBRR MAHAJANA FIRST GRADE COLLEGE
# (Autonomous)

Jayalakshmipuram, Mysuru – 570 012
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College with Potential for Excellence

## BCOM -Programme Outcomes

| | |
|---|---|
| **PO 1** | **Domain Knowledge-** Inculcation of fundamental concepts, principles and application of the same. |
| **PO 2** | **Problem Analysis-** Identifying and analyzing the problems in the field of business. |
| **PO 3** | **Design & Development of Solutions-** Adapting INDAS, Companies act, designing the costing techniques and methods, marketing strategies, business and tax planning along with its approaches. |
| **PO 4** | **Research and Investigation-** Research methodology with SPSS, probabilities and testing of hypothesis. |
| **PO 5** | **Modern Techniques & Tools**- Technology based education towards revolutionizing the skills. |
| **PO 6** | **Domain & Society-** Inculcating positive impact on the society and making accountable by imparting the significance and its applicability. |
| **PO 7** | **Environment & Sustainability-** Capable of handling the uncertainties to sustain the current challenges. |
| **PO 8** | **Moral & Ethical Values-** Inculcate ethical values in aiming towards Corporate social responsibility. |
| **PO 9** | **Individual & Teamwork-** Assimilate the quality of personnel through adoption of scientific management studies and curtail any flaws without conflicts. |
| **PO 10** | **Communication-** Stream light the thoughts to reach the goals by creating tactical outreach plans. |
| **PO 11** | **Project Management & Finance-** Create opportunities through well planned diversified projects. |
| **PO 12** | **Life Long Learning-** Develop inquisitiveness in continuous and self-motivated approach towards grooming the global leaders. |

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College with Potential for Excellence
## Department of Commerce
## Board of Studies 2023-2024

| Sl. No. | Category | Name | Designation | Address for Communication |
|---|---|---|---|---|
| 1 | Chairman | Major. B.R. Nikil | Assistant Professor and HOD | Department of Commerce SBRR Mahajana First Grade College, Jayalakshmipuram, Mysore -12 |
| 2 | Faculty of the Department | Smt. Rekha. B | Assistant Professor | Department of Commerce SBRR Mahajana First Grade College, Jayalakshmipuram, Mysore -12 |
| | | Smt. Vasagi S | Assistant Professor | Department of Commerce SBRR Mahajana First Grade College, Jayalakshmipuram, Mysore -12 |
| | | Smt. Shambhavi P Bhounsle | Assistant Professor | Department of Commerce SBRR Mahajana First Grade College, Jayalakshmipuram, Mysore -12 |
| | | Dr. N Roopesh Kumar | Associate Professor and Head of the Department | Department of Commerce Mahajana PG Center, Mysore. |
| 3 | Two Experts from Other University | Dr. Srinivas K T | Associate Professor & Chairman | Department of Studies in Commerce, Davangere University, Davangere. |
| | | Dr. Parameshwara | Associate Professor | Department of Commerce, Mangalore University, Konaje Mangalore. |
| 4 | Nominee by the Vice Chancellor | Prof. Nagaraja N | Professor | DoS in Commerce, University of Mysore, Manasagangothri, Mysuru-570006. |
| 5 | Alumnus | R. Rajesh | Chartered Accountant | B S Ravikumar & Associates, Mysuru, |
| 6 | Industrial Expert | Smt. Nandini R Muttur | Partner | Geartech Solutions, Hebbal Industrial Area, Mysuru |

# Scheme of Teaching & Evaluation for B.Com.

| | | | | Semester V | | | | |
|---|---|---|---|---|---|---|---|---|
| Sl. No. | Course Code | Title of the Course | Category of Courses | Teaching Hours per Week (L : T : P) | SEE | CIE | Total Marks | Credits |
| 1 | 233516 | Financial Management | DSC-13 | 4:0:0 | 60 | 40 | 100 | 4 |
| 2 | 233517 | Income Tax Law and Practice-I | DSC-14 | 4:0:0 | 60 | 40 | 100 | 4 |
| 3 | 233518 | Principles and Practice of Auditing | DSC-15 | 4:0:0 | 60 | 40 | 100 | 4 |
| 4 | 23DSECOM01 23DSECOM03 | Elective 1 | DSE - 1 | 3:0:0 | 60 | 40 | 100 | 3 |
| 5 | 23DSECOM02 23DSECOM04 | Elective 2 | DSE - 2 | 3:0:0 | 60 | 40 | 100 | 3 |
| 6 | 23VOCCOM01 | GST- Law & Practice | Vocational - 1 | 2:0:1 | 60 | 40 | 100 | 3 |
| | | | | | | | | |
| **Sub –Total (D)** | | | | | **360** | **240** | **600** | **21** |

Elective Groups and Courses:

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Discipline Specific Electives – V Semester | | | | | | | | | | | |
| Sl. No. | Course Code | Accounting | Course Code | Finance | Course Code | Marketing | Course Code | Human Resources | Course Code | Information Systems | |
| 1 | **23DSECOM01** | Indian Accounting Standards1 | **23DSECOM02** | Financial Institutions and Markets | **23DSECOM04** | Retail Management | **23DSECOM04** | Human Resource Development | **23DSECOM05** | Basics of Business Analytics | |

Note:
1. Under DSE, Dual Specialization to be offered, students should choose two elective groups from the above elective groups. Same elective groups should be continued in the 6th Semester also.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Semester VI** |
| **Sl. No.** | **Course Code** | **Title of the Course** | **Category of Courses** | **Teaching Hours per Week (L : T : P)** | **SEE** | **CIE** | **Total Marks** | **Credits** |
| 8 | 233616 | Advanced Financial Management | DSC-16 | 4:0:0 | 60 | 40 | 100 | 4 |
| 9 | 233617 | Income Tax Law and Practice-II | DSC-17 | 4:0:0 | 60 | 40 | 100 | 4 |
| 10 | 233618 | Management Accounting | DSC-18 | 4:0:0 | 60 | 40 | 100 | 4 |
| 11 | 23DSECOM06 23DSECOM08 | Elective 1 | DSE - 3 | 3:0:0 | 60 | 40 | 100 | 3 |
| 12 | 23DSECOM07 23DSECOM09 | Elective 2 | DSE - 4 | 3:0:0 | 60 | 40 | 100 | 3 |
| 13 | 23VOCCOM02 | Assessment of Non-Individuals & Filing ofITRs | Vocational -2 | 2:0:1 | 60 | 40 | 100 | 3 |
| 14 | 23INTCOM01 | Internship/ Projects | SEC - SB | 4 to 5 weeks | 30 | 20 | 50 | 3 |
| | **Sub –Total (D)** | | | | | 390 | 260 | 650 | 24 |

Elective Groups and Courses:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Discipline Specific Electives – VI Semester** |
| **Sl. No** | **Course Code** | **Accounting** | **Course Code** | **Finance** | **Course Code** | **Marketing** | **Course Code** | **Human Resources** | **Course Code** | **Information Systems** |
| 1 | 23DSE COM06 | Indian Accounting Standards-2 | 23DSEC OM07 | Invest ment Manag ement | 23DSECO M08 | Custo mer Relati onship Management | 23DSE COM09 | Cultural Diversity at Work Place | 23DSE COM10 | HR Analytics |

Note:
1. Under DSE, Dual Specialization to be offered, students should choose two elective groups from the above elective groups. Same elective groups should be continued in the 6th Semester also.

| Course Code: 233516 | Course Title: Financial Management |
| --- | --- |
| Course Credits: 4 .(L:T:P): 4:0:0 | Teaching Hours/Week: 04 Hours |
| Total Contact Hours: 60 Hours | Formative Assessment Marks: 40 |
| Exam Duration: 2 1/2 Hours | Semester End Examination Marks: 60 |

**Course objective:** To acquaint the students with the knowledge of financial planning and results.

**Course Outcomes:**
   **CO1-** Know the role of financial managers effectively in an organization.
   **CO2-** Knowledge of knowing the techniques for time and value of money.
   **CO3-** Imparting the skills of financial decisions.
   **CO4-** Gain the knowledge of investment and expenses.

| Syllabus: | Hours |
| --- | --- |
| **Module No. 1: Introduction to Financial Management** | **12** |
| Introduction –Meaning of Finance, Finance Function, Objectives of Finance function, Organization of Finance function -Meaning and definition of Financial Management; Goals of Financial Management, Scope of Financial Management, Functions of Financial Management, Role of Finance Manager in India. Financial planning-- Meaning –Need – Importance -Steps in financial Planning – Principles of a sound financial plan and Factors affecting financial plan. | |
| **Module No. 2: Time Value of Money** | **12** |
| Introduction – Meaning of time value of money-time preference of money-Techniques of time value of money: Compounding Technique-Future value of Single flow, Multiple flow and Annuity -Discounting Technique-Present value of Single flow, Multiple flow – and Annuity. Doubling Period- Rule 69 and 72. | |
| **Module No. 3:  Financing Decision** | **12** |
| Introduction-Meaning and Definition of Capital Structure, Factors determining the Capital Structure, sources of finance Concept of Optimum Capital Structure, EBIT-EPS Analysis- Problems. Leverages: Meaning and Definition, Types of Leverages- Operating Leverage, Financial Leverage and Combined Leverages. Problems. | |
| **Module No. 4: Investment Decision** | **12** |
| Introduction-Meaning and Definition of Capital Budgeting, Features, Significance – Steps in Capital Budgeting Process. Techniques of Capital budgeting: Traditional Methods – Pay Back Period, and Accounting Rate of Return – DCF Methods: Net Present Value Internal Rate of Return and Profitability Index- Problems. | |

| Module 5: Working Capital Management | 12 |
|---|---|
| Introduction- Meaning and Definition, types of working capital, operating cycle, Determinants of working capital needs – Estimation of working capital requirements. dangers of excess and inadequate working capital, Merits of adequate working capital, Sources of working capital. Cash Management, Receivable Management, and Inventory Management (Concepts only). | |

**Skill Development Activities:**
1. Visit the Finance Department of any organization and collect and record theFunctions and Responsibilities of Finance Manager.
2. As a finance manager of a company advice the management in designing anappropriate Capital Structure.
3. Evaluate a capital investment proposal by using NPV method with imaginaryfigures.
4. Illustrate with imaginary figures the compounding and discounting techniquesof time value of money.
5. Estimate working capital requirements of an organization with imaginary figures.
6. Any other activities, which are relevant to the course.

**Text Books:**
1. I M Pandey, Financial management, Vikas publications, New Delhi.
2. Abrish Guptha, Financial management, Pearson.
3. Khan & Jain, Basic Financial Management, TMH, New Delhi.
4. S N Maheshwari, Principles of Financial Management, Sulthan Chand & Sons,New Delhi.
5. Chandra & Chandra D Bose, Fundamentals of Financial Management, PHI,New Delhi.
6. B.Mariyappa, Financial Management, Himalaya Publishing House, NewDelhi.
7. Ravi M Kishore, Financial Management, Taxman Publications
8. Prasanna Chandra, Financial Management, Theory and Practice, Tata McGraw Hill.

**Note: Latest edition of text books may be used.**

Web links:
https://www.managementstudyguide.com/financial-management.htm
https://www.oracle.com/in/erp/financials/financial-management
https://en.wikipedia.org/wiki/Financial_management

## Course Articulation Matrix - 233516

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | PO 11 | PO 12 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|
| CO1 | 2 | 1 | - | - | - | 1 | - | 1 | 1 | 1 | 1 | 1 |
| CO2 | 2 | 2 | 1 | 1 | 2 | 1 | - | 1 | 2 | 2 | 2 | 3 |
| CO3 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 3 |
| CO4 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 3 |
| Wtd. Avg. | 2 | 1.75 | 1.6 | 1.6 | 2 | 2 | 1 | 1 | 1.75 | 1.25 | 1.75 | 2.5 |

| Course Code: 233517 | Course Title:  Income Tax Law and Practice - I |
|---|---|
| Course Credits: 4 .(L:T:P): 4:0:0 | Teaching Hours/Week: 04 Hours |
| Total Contact Hours: 60 Hours | Formative Assessment Marks: 40 |
| Exam Duration: 2 1/2 Hours | Semester End Examination Marks: 60 |

| Course Objective: To gain the knowledge of assessment of  tax payments. | |
|---|---|

**Course Outcomes:**
**CO1-** Knowledge of the concepts of income tax.
**CO2-** Provisions for determining the residential status of an Individual.
**CO3-** Gain the knowledge of individual and house income.
**CO4-** Knowledge of capital gains.

| Syllabus: | Hours |
|---|---|
| **Module No. 1:     Basic Concepts of Income Tax** | **12** |
| Introduction –Meaning of tax-, types of taxes, cannons of taxation.  Brief history of Indian Income Tax, legal framework of taxation, Important definitions, assessment, assessment year, previous year including exceptions, assesses, person, income, casual income, Gross total income, Total income, Agricultural income, scheme of taxation, – Exempted incomes of an individual under section 10. | |
| **Module No. 2:     Residential Status and Incidence of Tax** | **10** |
| Introduction – Residential status of an individual. Determination of residential status of an individual. Incidence of tax or Scope of Total income. Problems on computation ofGross total Income of an individual. | |
| **Module No. 3:     Income from Salary** | **14** |
| Introduction - Meaning of Salary -Basis of charge Definitions–Salary, Perquisites and profits in lieu of salary - Provident Fund –Transferred balance. - Retirement Benefits – Gratuity, pension and Leave salary. Deductions and Problems on Computation of Taxable Salary. | |
| **Module No. 4:     Income from House Property** | **14** |
| Introduction - Basis for charge - Deemed owners -House property incomes exempt fromtax, composite rent and unrealized rent. Annual Value –Determination of Annual Value - Deductions from Annual Value - Problems on Computation of Income from House Property. | |
| **Module  No. 5:  Capital Gains** | **10** |
| Introduction - Basis for charge - Capital Assets - Types of capital assets – Transfer - Computation of capital gains – Short term capital gain and Long term capital gain - Exemption under section 54, 54B, 54EC, 54D, 54F, and 54G. Problems covering the above sections. | |

**Skill Developments Activities:**

1. Prepare a slab rates chart for different Individual assesses.
2. Visit any Chartered Accountant Office Collect and record the procedure involved in filing the Income tax returns of an Individual.
3. List out any 10 Incomes exempt from tax of an Individual.
4. Prepare the list of perquisites received by an employee in an organization.
5. Identify and collect various enclosures pertaining to Income tax returns of an individual.
6. Any other activities, which are relevant to the course.

**Text Books:**

1. Mehrotra H.C and T.S.Goyal, Direct taxes, Sahithya Bhavan Publication, Agra.
2. Vinod K. Singhania, Direct Taxes, Taxman Publication Private Ltd, New Delhi.
3. Gaur and Narang, Law and practice of Income Tax, Kalyani Publications, Ludhiana.
4. Bhagawathi Prasad, Direct Taxes.
5. B.Mariyappa, Income tax Law and Practice-I, Himalaya Publishing House. NewDelhi.s
6. Dr. Saha, Law and Practice of Income Tax, Himalaya Publishing House.

**Note: Latest edition of text books may be used.**

Weblinks: https://www.sultanchandandsons.com/book/575/income-tax-%E2%80%93-law-and-practice
https://www.gacrkl.ac.in/studymaterial/gacr-ug-com-c6.pdf
https://www.icsi.edu/docs/webmodules/Publications/4.%20Tax%20Laws%20and%20Practice.

**Course Articulation Matrix - 233517**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 1 | 1 | - | - | 1 | - | 1 | - | - | - | 1 |
| CO2 | 2 | 1 | - | - | - | 1 | 1 | 1 | - | 1 | - | 1 |
| CO3 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| CO4 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 2 |
| Wtd. Avg. | **2** | **1.5** | **1.6** | **1** | **2** | **1** | **1.3** | **1** | **1** | **1.3** | **2** | **1.5** |

| Course Code: 233518 | Course Title: Principles and Practice of Auditing |
|---|---|
| Course Credits: 4 .(L:T:P): 4:0:0 | Teaching Hours/Week: 04 Hours |
| Total Contact Hours: 60 Hours | Formative Assessment Marks: 40 |
| Exam Duration: 2 1/2 Hours | Semester End Examination Marks: 60 |

**Course Objective:** To analyze and assess the differences between the accounting standards.

**Course Outcomes:**

**CO1-** Analyze the framework of auditing.

**CO2-** Examine the risk assessment and internal control in auditing.

**CO3-** Comprehend the relevance of IT in audit and audit sampling for testing.

**CO4-** Knowledge of auditing and reporting in the companies.

| Syllabus: | Hours |
|---|---|
| **Module No. 1: Introduction to Auditing** | **10** |
| Introduction – Meaning and Definition – Objectives– Types of Audit– Merits and Demerits of Auditing – Relationship of audit with other disciplines. Preparation before commencement of new audit - Working Papers -Audit Note Book, Audit Programme Qualities of an Auditor – Audit planning – Audit strategy —Audit Engagement – Audit -Audit Documentation - Audit Evidence – Written Representation. | |
| **Module No. 2: Risk Assessment and Internal Control** | **12** |
| Introduction – Audit risk – Assessment of risk – Internal Control-Meaning and objectives– Internal check- Meaning, objectives and fundamental Principles. Internal check with regards to wage payment, cash sales, and cash purchases. | |
| **Module No. 3: Verification and Valuation of Assets and Liabilities** | **14** |
| Meaning and objectives of verification and valuation – Position of an auditor as regards the valuation of assets- Verification and Valuation of different items of Assets- Land and Building, Plant and Machinery, Goodwill, Investments, Stock in Trade. Liabilities-Bills payable, Sundry Creditors and Contingent liabilities. | |
| **Module No. 4: Company Audit and Audit of other Entities** | **12** |
| Company Auditor: appointment, Qualification, powers, duties and liabilities, professional ethics of an auditor. Other Entities: Audit Procedure of NGOs - Charitable institutions - Educational institutions – Government – Local Bodies – Cooperative societies – hotels – hospitals – clubs & Banks. | |

| Module 5: Audit Report & Professional Ethics | 12 |
|---|---|
| Introduction – Meaning – Elements of audit report –Types of audit report - Independent Auditor's report and their illustration; Professional Ethics: Code of Ethics - Professional Accountants in Public practices and business – Fundamental Principles of<br>Professional Ethics. | |

**Skill Development Activities:**
1. Design and develop an audit plan program for a joint stock company
2. List the various documents necessary to be verified in the audit process
3. Draft an audit report (qualified or clean) with imaginary data.
4. Visit an audit firm, write about the procedure followed by them in auditing the books of accounts of a firm.
5. Record the verification procedure with respect to any one fixed asset.
6. Draft an audit program.
7. Any other activities, which are relevant to the course.

**Text Books:**
1. ICAI Study Materials on Auditing and Assurance
2. B.N. Tandon, Principles of Auditing, S. Chand and Company, New Delhi.
3. T.R. Sharma, Auditing Principles and Problems, Sahitya Bhawan, Agra.
4. J.M. Manjunatha and others, Auditing and Assurance, HPH.
5. Gupta Karnal, Contemporary Auditing, Tata Mc. Graw-Hill, New Delhi.
6. R.G. Saxena, Principles of Auditing.

**Note: Latest edition of text books may be used.**

Web links: https://www.sultanchandandsons.com/book/209/principles-and-practice-of-auditing
https://www.teachmint.com/tfile/studymaterial/b-com/ppa/principles-practices-of-auditing
http://www.charulathapublications.com/products/auditing-principles-practices

## Course Articulation Matrix - 233518

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 1 | - | - | - | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| CO2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 2 |
| CO3 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 2 |
| CO4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| Wtd. Avg. | 2 | 1.75 | 2 | 1.3 | 1.6 | 1.75 | 1.5 | 2 | 2 | 2 | 1 | 2 |

| Course Code: 23DSECOM01 | Course Title:   Indian Accounting Standards-1 |
|---|---|
| Course Credits: 3 .(L:T:P): 3:0:0 | Teaching Hours/Week: 03 Hours |
| Total Contact Hours: 45 Hours | Formative Assessment Marks: 40 |
| Exam Duration: 2 1/2 Hours | Semester End Examination Marks: 60 |

**Course Objective:** To understand the different  accounting standards.

**Course Outcomes**:
**CO1**- Gain the knowledge of the accounting standards.
**CO2**- Preparation of the financial statements as Indian Accounting standards.
**CO3-** Comprehend the requirements of Indian Accounting Standards.
**CO4-** Understand the Accounting Standards for Items that do not Appear in
      Financial Statements

| Syllabus | Hours |
|---|---|
| **Module No. – 1 Introduction to Indian Accounting Standards.** | **10** |
| Introduction- Meaning and Definition of Accounting Standards – Objectives of Accounting Standards – Benefits and Limitations of Accounting Standards – Process of Formulation of Accounting Standards in India – List of Indian Accounting Standards (Ind AS) – Need for Convergence Towards Global Standards– International Financial Reporting Standards -Features and Merits and Demerits of IFRS – Benefits of Convergence with IFRS – Applicability of Ind AS in India. | |
| **Module No. 2 Preparation of Financial Statements (Ind AS 1)** | **12** |
| Frame work for preparation of Financial Statements, presentation of Financial Statement as per Ind AS 1. Statement of Profit and Loss, Balance Sheet, Statement of changes in Equity, statement of Cash /flow and Notes to accounts. Problems on preparation of Statement of Profit and Loss and Balance Sheet as per Schedule III of Companies Act, 2013. | |
| **Module No. – 3 Provision under Accounting Standard for Items Appear in Financial Statements.** | **13** |
| Property, Plant and Equipment (Ind AS 16) - Intangible assets (Ind AS 38) -Impairment of assets (Ind AS 36) – Inventories (Ind AS 2) - Borrowing costs (Ind AS 23) – Investment Property (Ind AS – 40) –objectives, Scope, definitions, Recognition Measurement and disclosures of the above-mentioned Standards. Simple Problems on the above standards. | |

| Module No.- 4 Provisions under Accounting Standards for Items that do not Appear in Financial Statements. | 10 |
|---|---|
| Segment Reporting (Ind AS 108), Related Party Discloser (Ind AS 24), Events Occurring after Balance Sheet Date (Ind AS 10), Interim Financial Reporting (Ind As - 34) | |

**Skill Development Activities:**

1. Explain the structure and functions of Indian Accounting Standards Board
2. Set out the procedure for issue of an Accounting Standard by theAccounting Standards Board.
3. List out the financial statements in accordance with Ind AS 1 and show theformats of the same with imaginary figures.
4. Explain the main provisions of Ind AS 2, Ind AS 16 and Ind AS 18
5. State and explain the provisions pertaining to Segment Reporting andRelated Party Disclosure under Ind AS.

**Text Books:**

1. Study material of the Institute of Chartered Accountants of India
2. Anil Kumar, Rajesh Kumar and Mariyappa, Indian Accounting Standards,HPH
3. Miriyala, Ravikanth, Indian Accounting Standards Made Easy, CommercialLaw Publishers
4. Dr.A.L.Saini IFRS for India, , Snow white publications.
5. CA Shibarama Tripathy Roadmap to IFRS and Indian AccountingStandards
6. Ghosh T P, IFRS for Finance Executives Taxman Allied Services PrivateLimited.
   **Note:** Latest edition of text books may be used

Weblinks:
https://www.mca.gov.in/content/mca/global/en/acts-rules/ebooks/accounting-standards.html
https://en.wikipedia.org/wiki/Indian_Accounting_Standards
https://www.icai.org/post/indian-accounting-standards-indas
https://icmai.in/upload/Students/Syllabus2016/Ind_AS.pdf

**Course Articulation Matrix - 23DSECOM01**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | PO 11 | PO 12 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|
| CO1 | 2 | 1 | - | - | 1 | 1 | - | 1 | - | 1 | 1 | 2 |
| CO2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 |
| CO3 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| CO4 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| Wtd. Avg. | 2 | 1.5 | 1.6 | 2 | 1.75 | 1.6 | 1 | 1 | 1.3 | 1.5 | 1.5 | 2 |

| **Course Code: 23DSECOM02** | **Course Title: Financial Institutions and Markets** |
|---|---|
| **Course Credits: 3 .(L:T:P): 3:0:0** | **Teaching Hours/Week: 03 Hours** |
| **Total Contact Hours: 45 Hours** | **Formative Assessment Marks: 40** |
| **Exam Duration**: **2 1/2 Hours** | **Semester End Examination Marks: 60** |

**Course Objective:** To understand how to invest and deal in the different markets.

**Course Outcomes:**
**CO1-** Gain the knowledge of the structure of Indian financial system and its constituents.
**CO2-** Outline the role of capital and money market in economic development.
**CO3-** Comprehend primary and secondary market and its relevance in capital formation.
**CO4-** knowledge of the role played by Banking and NBFC's

| **Syllabus:** | **Hours** |
|---|---|
| **Module No. 1:  Financial System in India** | **09** |
| Introduction – Meaning – Financial concepts - Constituents of financial system – Structure of financial system – Role of financial system- Functions of financial system – Development of financial system in India till date- Financial sector reforms – Financial System and Economic development – Weakness of Indian financial system. | |
| **Module No. 2:  Capital Market & Money Market** | **08** |
| Introduction - Capital Market: Introduction- Meaning – Importance – Functions – Players in the capital market – Instruments of capital Market – Components of capital Market – Recent trends in Capital Market.; Money Market: Introduction- Meaning- Importance – Functions – Instrument of money market – Recent trends in Money Market. | |
| **Module No. 3: Primary Market & Secondary Market** | **10** |
| Introduction - Primary Market/New Issue Market: Introduction – Meaning –- Methods of floating new issues: Public issue–Offer for sale – Right Issue – Private placement – Problems of Indian primary market; Secondary Market: Introduction – Meaning – History – Methods in Stock Markets - Recognition of stock exchanges – Function of stock exchanges of BSE- NSE – OTCI – Listing of securities – trading & settlement procedure in the stock market - Problems of Indian Stock Market; SEBI: History – objectives  - functions –Role- Reforms in secondary Market. | |

| Module No. 4 Banking & Development Financial Institutions | 10 |
|---|---|
| Introduction - Banking: Introduction – Meaning – Role and functions – Types of Banks; Development Financial Institutions: Introduction – History – Management - Role & Functions of EXIM Bank –NABARD SIDBI – MUDRA – NHB – LIC & GIC - UTI – SFCs. | |
| **Module No. 5: Non-Banking Financial Companies (NBFCs) & Forex Market** | **08** |
| Introduction – Meaning- Role – Importance – Types of NBFCs – Insurance Companies - Loan Companies - Investment Companies — Leasing & Hire Purchase - Housing Finance — Chit Funds - Mutual funds -Venture Capital Funds - Factors & Forfeiting - Credit Rating - Depository and Custodial Services; Forex market- Concept- Meaning-Importance-Merits of forex market- Fluctuations in foreign exchange rates- Causes and Effects. | |

**Skill Developments Activities:**
1. List out any five recent financial sectors reforms and analyse them.
2. Collect Share Application Forms of any five different companies who have offered IPO in the last/present financial year.
3. Collect data on last financial year price rigging and insider trading cases reportedas per SEBI.
4. Visit website of Development Financial Institutions (DFIs) and prepare report onthe history/milestone and functions of the DFIs
5. Identify the Different types of Venture capital firms operating in Karnataka andtheir investment.
6. Any other activities, which are relevant to the course.

**Text Books:**
1. Livingston, Miles; Financial Intermediaries; Blackwell
2. Sudhindra Bhat, Financial Institutes and Markets, Excel Books
3. NitiBhasin; Banking and Financial Markets In India 1947 To 2007; New Century
4. Indian Financial Systems, Khan M.Y, Tata McGraw Hill New Delhi.
5. E Gordon, k Natarajan (2010). Financial markets and services. Himalaya publishing house, New Delhi

**Note: Latest edition of text books may be used.**

## Weblinks:

https://www.fisdom.com/financial-markets-and-institutions
https://books.google.com/books/about/Financial_Institutions_and_Markets

## Course Articulation Matrix - 23DSECOM02

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | PO 11 | PO 12 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|
| CO1 | 2 | - | - | - | 1 | 1 | - | 1 | - | 1 | - | 2 |
| CO2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 |
| CO3 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| CO4 | 2 | - | - | - | 1 | 1 | - | 1 | - | 1 | - | 2 |
| Wtd. Avg. | 2 | 2 | 2 | 2 | 1.5 | 1.25 | 1 | 1 | 1 | 1 | 1 | 2 |

| Course Code: 23DSECOM04 | Course Title:  Human Resources Development |
|---|---|
| Course Credits: 3 .(L:T:P): 3:0:0 | Teaching Hours/Week: 03 Hours |
| Total Contact Hours: 45 Hours | Formative Assessment Marks: 40 |
| Exam Duration: 2 1/2 Hours | Semester End Examination Marks: 60 |

**Course Objective:** To understand how to deal with the human resource and their development in an organisation.

**Course Outcomes:**
**CO1-** Gain the knowledge of HRD.
**CO2-** Comprehend the framework of HRD.
**CO3-** Skill of cognize the human resources.
**CO4-** Apprehend the HR performance with counseling.

| Syllabus: | Hours |
|---|---|
| **Module No. 1: Introduction to HRD** | **08** |
| Human Resource Development – Evolution of HRD - Relationship with HRM - Human Resource Development Functions - Roles and Competencies of HRD Professionals - Challenges to Organization and HRD professionals – Employee Behaviour – External and Internal Influence – Motivation as Internal Influence – Learning and HRD – Learning Strategies and Styles | |
| **Module No. 2: Frame work of Human Resource Development** | **08** |
| Frame work of Human Resource Development - HRD Processes - Assessing HRD Needs - HRD Model - Designing Effective HRD Program - HRD Interventions-Creating HRD Programs - Implementing HRD programs - Training Methods - Self Paced/Computer Based/ Company Sponsored Training - On-the-Job and Off-the-Job - Brain Storming - Case Studies - Role Plays - Simulations – T-Groups - Transactional Analysis. | |
| **Module No.** 3**: Evaluating HRD Programs** | **09** |
| Introduction-Evaluating HRD programs - Models and Frame Work of Evaluation - Assessing the Impact of HRD Programs - Human Resource Development Applications - Fundamental Concepts of Socialization - Realistic Job Review - Career Management and Development. | |
| **Module No. 4: Management Development** | **10** |
| Introduction **-** Management Development - Employee counselling and wellness services
– Counselling as an HRD Activity-Counselling Programs - Issues in Employee
Counselling - Employee Wellness and Health Promotion Programs - Organizational Strategies Based on Human Resources. | |

| Module No. 5: HR Performance | 10 |
|---|---|
| Introduction -Work Force Reduction, Realignment and Retention - HR Performance and Bench Marking - Impact of Globalization on HRD- Diversity of Work Force - HRD programs for diverse employees - Expatriate & Repatriate support and development. | |

**Skill Development Activities:**

1. Discuss with HR manager on HRD and report on the same.
2. Visit any Organisation in your locality, collect information and report onemployee welfare facilities provided by the company.
3. Meet HR trainer, discuss their role and responsibilities.
4. Visit any Organisation, discuss with employees about effectiveness of training.

5. Any other activities, which are relevant to the course.

**Text Books:**

1. Werner & Desimone, Human Resource Development, Cengage Learning.
2. William E. Blank, Handbook for Developing Competency Based TrainingProgrammes, Prentice -Hall, New Jerse
3. Uday Kumar Haldar, Human Resource Development, Oxford University Press.
4. Srinivas Kandula, Strategic Human Resource Development, PHI Learning.
5. Nadler, Leonard: Corporate Human Resource Development, Van NostrandReinhold, ASTD, New York.
6. Rao, T.V and Pareek, Udai: Designing and Managing Human Resource Systems,Oxford IBH Pub. Pvt. Ltd., New Delhi, 2005.
7. Rao, T.V: Readings in HRD, Oxford IBH Pub. Pvt. Ltd., New Delhi, 2004.
8. Viramani, B.R and Seth, Parmila: Evaluating Management Development, VisionBooks, New Delhi.
9. Rao, T.V. (et.al): HRD in the New Economic Environment, Tata McGraw-HillPub.Pvt, Ltd., New Delhi, 2003.
10. Rao, T.V: HRD Audit, Sage Publications, New Delhi.

**Note: Latest Edition of text books may be used.**


Weblinks: https://en.wikipedia.org/wiki/Human_resource_management
https://hbr.org/1981/09/managing-human-resources

## Course Articulation Matrix - 23DSECOM04

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|-------|-----|-----|-----|-----|-----|-----|------|------|------|-------|-------|-------|
| CO1 | 2 | - | 1 | - | 1 | 2 | 1 | 2 | 2 | 2 | - | 2 |
| CO2 | 2 | - | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | - | 2 |
| CO3 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 2 |
| CO4 | 2 | 1 | 1 | - | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 2 |
| Wtd. Avg. | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 2 |

| Course Code: 23DSECOM05 | Course Title:   Basics of Business Analytics |
|---|---|
| Course Credits: 3 .(L:T:P): 3:0:0 | Teaching Hours/Week: 03 Hours |
| Total Contact Hours: 45 Hours | Formative Assessment Marks: 40 |
| Exam Duration: 2 1/2 Hours | Semester End Examination Marks: 60 |

**Course Objective:** To have the basic knowledge of how to analyze the business and conduct the research.

**Course Outcomes:**
**CO1-** Understand the analytical applications in practice.
**CO2-** Validate the sources of data, use of statistical tools and techniques.
**CO3-** Formulate business models, using quantitative methods including spreadsheets and graphical methods.
**CO4-** Awareness about the emerging trends in the world of analytics.

| Syllabus: | Hours |
|---|---|
| **Module No. 1:     Introduction to Business Analytics** | **08** |
| Data, Types of Data- Forms of Data-Evolution of Big Data- Business Analytics - Need forAnalytics- Types of Analytics-Importance of Business Analytics in Decision Making-Analytics Process Model-SMART model-Spreadsheet analysis-Internet of Things. | |
| **Module No. 2:   Technology of Big Data** | **07** |
| Overview of DBMS, Data Warehousing: Concepts, Need, Objectives– Relevance of Data Warehousing in Business Analytics-Data Mining-Application of Data Mining-Data Mining Technique- Data Classification- Hadoop Distributed File System-Features of HDFS-MapReduce-Features of MapReduce. | |
| **Module** No. 3:  **Data Scientists and Data Visualization** | **10** |
| Data Scientists-New Era of Data Scientists -Data Scientist model- Sources of Data scientists- Horizontal Versus Vertical Data Scientists- Retention of Data Scientists-Data Visualization-Types of Data Visualization -Issues in Data Visualization-Tools in data visualization- Data Collection, Sampling and Pre-processing- Types of Data Sources- Sampling-Types of Data Elements-Visual Data Exploration and Exploratory Statistical Analysis-Missing Values-Missing Values- Standardizing Data-Categorization-Weights of Evidence Coding-Variable Selection-Segmentation. | |

| Module No. 4:  Practices of Analytics | 10 |
|---|---|
| Predictive Analytics- Target Definition-Linear Regression -Logistic Regression - DecisionTrees -Neural Networks -Support Vector Machines-Ensemble Methods - Multiclass Classification Techniques -Evaluating Predictive Models-Descriptive Analytics- Association Rules -Sequence Rules –Segmentation-Survival Analysis- Survival Analysis Measurements-Kaplan Meier Analysis-Parametric Survival Analysis-Proportional Hazards Regression-Extensions of Survival Analysis Models- Evaluating Survival Analysis Models-Social Network Analytics-Social Network Definitions-Social Network Metrics-Social Network Learning-Relational Neighbor Classifier-Probabilistic RelationalNeighbor Classifier -Relational Logistic Regression-Collective Inferencing –Egonets- Mobile Analytics- Practices of analytics in - Google-General Electric-Microsoft-Kaggle-Facebook-Amazon. | |

| Module No. 5: Big Data and Emerging trends | 10 |
|---|---|
| Data for Big Data-Enterprise orientation for Big data –leadership –Targets-Analysts-Other Factors to Consider in Big Data Success-Emerging Technologies in Health Information Systems: Transforming Health in Information Era-Omics Revolution and Personalized Medicine-Genomic Data Integration into Medical Records-Socio-demographic Data for Health Records-Family Health History-Genomics  Driven Wellness Tracking and Management System(GO-WELL)- Emerging trends of analytics<br>in Education, government, finance & Supply Chain Management. | |

**Skill Development Activities:**
**Course teacher can identify and give the skill development activities.**

**Text Books:**
1. Big Data Black Book, DT Editorial Services, Dreamtech Press, 2015.
2. Big Data at Work, Thomas H. Davenport, Harvard Business Review Press,Boston, Massachusetts, 2014.
3. Analytics in a Big Data World, John Wiley & Sons, Inc., Hoboken, NewJersey,2014.
4. Big Data and Internet of Things: A Roadmap for smart Environments, Nik BessisCiprian Dobre Editors, Springer International Publishing Switzerland 2014

**Note: Latest edition of text books may be used.**

Weblinks: - https://www.oracle.com/in/business-analytics/what-is-business-analytics
https://pll.harvard.edu/course/business-analytics

## Course Articulation Matrix - 23DSECOM05

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | PO 11 | PO 12 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|
| CO1 | 2 | - | 1 | - | 1 | 2 | 1 | 2 | 2 | 2 | - | 2 |
| CO2 | 2 | - | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | - | 2 |
| CO3 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 2 |
| CO4 | 2 | 1 | 1 | - | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 2 |
| Wtd. Avg. | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 2 |

| Course Code: 23DSECOM03 | Course Title:    Retail Management |
|---|---|
| Course Credits: 3 .(L:T:P): 3:0:0 | Teaching Hours/Week: 03 Hours |
| Total Contact Hours: 45 Hours | Formative Assessment Marks: 40 |
| Exam Duration: 2 1/2 Hours | Semester End Examination Marks: 60 |

**Course Objective:** To gain the knowledge of the market constraints and how to resolve it.

**Course Outcomes:**
**CO1-** Knowledge of the contemporary of retail management.
**CO2-** Know the issues, strategies and tends in Retailing.
**CO3-** Perceive the role and responsibilities of store manager and examine the visual
　　　merchandising and its techniques in the present context.
**CO4-** Comprehend the emerging trends in Retail Industry.

| Syllabus: | Hours |
|---|---|
| **Module No. 1:     Introduction and Perspectives on Retailing** | **08** |
| Introduction – Meaning – Characteristics - Emergence of organizations of retailing - Types of Retailers (Retail Formats) - Multichannel Retailing -Customer Buying Behaviour, Historical Perspective - role of retailing - trends in retailing – FDI in Retail - Problems of Indian Retailing - Current Scenario. | |
| **Module No. 2:  Theories and Strategies of Retail Planning** | **10** |
| Introduction - Wheel of retailing - The Retail Accordion - Strategy - Financial Strategy - Site & Locations (Size and space allocation - location strategy - factors affecting the location of Retail - Retail Location Research and Techniques, Objectives of Good Store Design.) – Human Resource Management in retailing - Information Systems and supply chain management & Logistics in retail. | |
| **Module  No. 3:  Store Management and Visual Merchandising** | **10** |
| Introduction - Store Management: Responsibilities of Store Manager - Store Security- Parking Space Problem at Retail Centers, Store Record and Accounting System - Coding System - Material Handling in Stores - Management of Modern  retails -Store Layout, Design: Types of Layouts. **Visual Merchandising:** Introduction - Visual Merchandising Techniques - Controlling Costs and Reducing Inventories Loss – Exteriors & Interiors Customer Service - Planning Merchandise Assortments -Buying systems –Buying merchandise and Retail Communication Mix- Role of Visual Merchandiser. | |

| Module No. 4:    Retail Pricing | 07 |
|---|---|

Introduction – Meaning of Retail Pricing - Factors influencing retail pricing - Retailpricing strategies.

| Module No. 5: Emerging trends in Retail Industry | 10 |
|---|---|

Artificial intelligence in retailing – Shopping with AR - Hyperlocal in retailing - Product customization - Visual search – Omni channel experiences - Pop-up shops - Same-day delivery - Social shopping - Private label brands - Ethical and value-based brands - Google Shopping.

**Skill Developments Activities:**
1) Visit any large scale retail centre, list out the problems of a retailer.
2) Discuss with retailer on the strategies considered while planning the retail business.
3) Contact any store manager, collect the role and responsibilities discharged by himin the retail shop.
4) Visit any Virtual merchandising, find out the techniques adopted bymerchandiser.
5) Contact any retailer, collect the information on factors influencing on retail pricing.
6) Any other activities, which are relevant to the course.

**Text Books:**
1. Sinha, Piyush Kumar & Uniyal (2010), Managing Retailing, Oxford UniversityPress.
2. Chetan Bajaj, Retail Management, Oxford University press.
3. Levy &Weitz (2012), Retail Management, TMH, 8th Edition
4. Dravid Gilbert, Retail Marketing Management, Pearson Education, 2nd Edition.
5. A. J. Lamba, The Art of Retailing, McGraw Hill.
6. Swapna Pradhan (2012), Retailing Management, TMH,
7.  Barry Berman, Joel R. Evans, Retail Management: A Strategic Approach, PearsonPublications.

**Note: Latest edition of text books may be used.**

Weblinks: https://www.managementstudyguide.com/retail-management.htm
https://www.shiksha.com/online-courses/articles/retail-management

## Course Articulation Matrix - 23DSECOM03

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | PO 11 | PO 12 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|
| CO1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 3 | 3 | 1 | 2 |
| CO2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 3 | 3 | 1 | 2 |
| CO3 | 2 | 2 | 2 | 2 | 2 | - | 1 | 3 | 3 | 3 | 1 | 2 |
| CO4 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 3 | 3 | 1 | 2 |
| Wtd. Avg. | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 3 | 3 | 1 | 2 |

| Course Code: 23VOCCOM01 | Course Title:   GST-Law & Practice (voc) |
|---|---|
| Course Credits:3 .(L:T:P): 2:0:1 | Teaching Hours/Week: 03 Hours |
| Total Contact Hours: 45 Hours | Formative Assessment Marks: 40 |
| Exam Duration: 2 1/2 Hours | Semester End Examination Marks: 60 |

**Course objectives:** To gain the knowledge of assessment of tax payments.

**Course Outcomes:**
**CO1-** Knowledge of the concepts of GST.
**CO2-** Comprehend the fundamentals of GST.
**CO3-** Analyze the GST Procedures in the Business.
**CO4-** Know the GST Assessment and its computation.

| Syllabus: | Hours |
|---|---|
| **Module No. 1:  Introduction to GST** | **08** |
| Introduction-Meaning and Definition of GST, Objectives, Features, Advantages and Disadvantages of GST, Taxes subsumed under GST, Structure of GST (Dual Model) - CGST, SGST and IGST. GST Council, Composition, Powers and Functions. CGST Act,2017- Important definitions. | |
| **Module No. 2:  GST Registration and Taxable Event** | **08** |
| Registration under GST provision and process. Amendment and cancellation of registration, Taxable event -Supply of goods and Services-Meaning, Scope and types- composite supply, Mixed supply. Determination of time and place of supply of goods and services. Levy and collection of tax. List of exempted goods and services-Problems. | |
| **Module No.  3:  Input Tax Credit** | **08** |
| Input Tax Credit Eligible and Ineligible Input Tax Credit; Apportionments of Credit and Blocked Credits; Tax Credit in respect of Capital Goods; Recovery of Excess Tax Credit; Availability of Tax Credit in special circumstances; Transfer of Input tax, Reverse Charge Mechanism, tax invoice, Problems on input tax credit. | |
| **Module No. 4 : GST Assessment** | 12 |
| Tax Invoice, Credit and Debit Notes, Returns, Audit in GST, Assessment: Self-Assessment, Summary and Scrutiny. Special Provisions. Taxability of E-Commerce, Anti-Profiteering, Avoidance of dual control- issues in filing of returns, monthly collection targets, GST Council meetings. | |

| Module No. 5:  Valuations of Goods and Services Under GST | 09 |
|---|---|

Introduction to Valuation under GST, Meaning and Types of Consideration: a) Consideration received through money b) Consideration not received in money c) Consideration received fully in money, valuation rules for supply of goods and services:

1) General Valuation Rules; 2) Special Valuation Rules; Other cases for valuation of supply, imported services, imported goods, valuation for discount. Transaction Value: Meaning and conditions for transaction value, inclusive transaction value, and exclusive

discount excluded from transaction value. Problems on GST.

**Skill Development Activities:**

1.  Prepare a tax invoice under the GST Act.
2.  Write the procedure for registration under GST.
3.  Prepare a chart showing rates of GST.

4.  Compute taxable value and tax liability with imaginary figures under CGST,SGST and IGST.
5.  List out the exempted Goods and Services under GST.
6.  Analyse the custom duties rates of last five years.
7.  Any other activities, which are relevant to the course.

**Text Books:**

1.  V.S.Datey, Goods and Services Taxes, Taxman.
2.  Sathpal Puliana, M. A. Maniyar, Glimpse of Goods and Service Tax, KarnatakaLaw Journal Publications, Bangalore.
3.  Pullani and Maniyar, Goods and Service Tax, Published by Law Journal,Bangalore.
4.  H.C. Mehrotra and V.P. Agarwal, Goods and Services Tax.
5.  H.C. Mehotra and S.P. Goyal, Goods and Services Tax.
6.  Ghousia Khatoon, C.M. Naveen Kumar and S.N. Venkatesh, Goods and ServicesTax, Himalaya Publishing House, Bangalore.

**Note: Latest edition of text books may be used.**

**Weblinks:** https://www.gst.gov.in
https://gstcouncil.gov.in
https://en.wikipedia.org/wiki/Goods_and_Services_Tax_(India)

## Course Articulation Matrix - 23VOCCOM01

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | PO 11 | PO 12 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|
| CO1 | 2 | 1 | - | - | - | 1 | 1 | 1 | - | 1 | - | 2 |
| CO2 | 2 | 1 | - | - | - | 1 | 1 | 1 | - | 1 | - | 2 |
| CO3 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| CO4 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| Wtd. Avg. | 2 | 1.5 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |

| Course Code: 233616 | Course Title:   Advanced Financial Management |
|---|---|
| Course Credits: 4 .(L:T:P): 4:0:0 | Teaching Hours/Week: 04 Hours |
| Total Contact Hours: 60 Hours | Formative Assessment Marks: 40 |
| Exam Duration: 2 1/2 Hours | Semester End Examination Marks: 60 |

**Course Objective:** To acquaint the students with the knowledge of advanced financial planning and results.

**Course Outcomes:**
**CO1-** Knowledge of the overall cost of capital.
**CO2-** Comprehend the different advanced capital budgeting techniques.
**CO3-** Know the importance of dividend decisions, mergers and acquisition.
**CO4-** Enable the ethical and governance issues in financial management

| Syllabus: | Hours |
|---|---|
| **Module No. 1: Cost of Capital and Capital Structure Theories** | 12 |

**Cost of Capital**: Meaning and Definition – Significance of Cost of Capital – Types of Capital – Computation of Cost of Capital – Specific Cost – Cost of Debt – Cost of Preference Share Capital – Cost of Equity Share Capital – Weighted Average Cost of Capital – Problems.

**Theories of capital structures**: The Net Income Approach, The Net Operating Income Approach, Traditional Approach and MM Hypothesis – Problems.

| **Module No. 2: Risk Analysis in Capital Budgeting** | 12 |
|---|---|

Risk Analysis – Types of Risks – Risk and Uncertainty – Techniques of Measuring Risks – Risk adjusted Discount Rate Approach – Certainty Equivalent Approach – Sensitivity Analysis - Probability Approach - Standard Deviation and Co-efficient of Variation – Decision Tree Analysis – Problems. .

| **Module No. 3:  Dividend Theories** | 12 |
|---|---|

Introduction - Dividend Decisions: Meaning - Types of Dividends – Types of Dividends Polices – Significance of Stable Dividend Policy - Determinants of Dividend Policy; Dividend Theories: Theories of Relevance – Walter's Model and Gordon's Model and Theory of Irrelevance – The Miller-Modigliani (MM) Hypothesis - Problems.

| **Module No. 4: Mergers and Acquisitions** | 14 |
|---|---|

Meaning - Reasons – Types of Combinations - Types of Merger – Motives and Benefits of Merger – Financial Evaluation of a Merger - Merger Negotiations – Leverage buyout, Management Buyout Meaning and Significance of P/E Ratio. Problems on Exchange Ratios based on Assets Approach, Earnings Approach and Market Value Approach and Impact of Merger on EPS ,Market Price and Market capitalization.

| Module No. 5: Ethical and Governance Issues | 10 |
|---|---|
| Introduction to Ethical and Governance Issues: Fundamental Principles, Ethical Issues in Financial Management, Agency Relationship, Transaction Cost Theory, Governance Structures and Policies, Social and Environmental Issues, Purpose and Content of an Integrated Report. | |

**Skill Development Activities:**
1. Visit an organisation in your town and collect data about the financial objectives.
2. Compute the specific cost and Weighted average cost of capital of an Organisation, you have visited.
3. Case analysis of some live merger reported in business magazines.
4. Meet the financial manager of any company, discuss ethical issues in financialmanagement.
5. Collect the data relating to dividend policies practices by any two companies.
6. Any other activities, which are relevant to the course.

**Text Books:**
1. I M Pandey, Financial management, Vikas publications, New Delhi.
2. Abrish Guptha, Financial management, Pearson.
3. Khan & Jain, Basic Financial Management, TMH, New Delhi.
4. S N Maheshwari, Principles of Financial Management, Sulthan Chand & Sons, NewDelhi.
5. Chandra & Chandra D Bose, Fundamentals of Financial Management, PHI, New Delhi.
6. B.Mariyappa, Advanced Financial Management, Himalaya Publishing House, NewDelhi.
7. Ravi M Kishore, Financial Management, Taxman Publications
8. Prasanna Chandra, Financial Management, Theory and Practice, Tata McGraw Hill.

**Note**: Latest edition of text books may be used

Weblinks: https://en.wikipedia.org/wiki/Financial_management
- https://www.managementstudyguide.com/financial-management.htm
https://www.oracle.com/in/erp/financials/financial-management

## Course Articulation Matrix - 233616

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 1 | - | - | - | 1 | - | 1 | 1 | 1 | 1 | 1 |
| CO2 | 2 | 2 | 1 | 1 | 2 | 1 | - | 1 | 2 | 2 | 2 | 3 |
| CO3 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 3 |
| CO4 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 3 |
| Wtd. Avg. | 2 | 1.75 | 1.6 | 1.6 | 2 | 2 | 1 | 1 | 1.75 | 1.25 | 1.75 | 2.5 |

| Course Code: 233617 | Course Title:   Income Tax Law & Practice - II |
|---|---|
| Course Credits: 4 .(L:T:P): 4:0:0 | Teaching Hours/Week: 04 Hours |
| Total Contact Hours: 60 Hours | Formative Assessment Marks: 40 |
| Exam Duration: 2 1/2 Hours | Semester End Examination Marks: 60 |

**Course Objective:** To gain the knowledge of tax payments in the new regime.

**Course Outcomes:**
**CO1-** Knowledge of computation in income from business and otherProfession.
**CO2-** Procedure of tax deduction and advance tax ruling.
**CO3-** Compute the income from other sources.
**CO4-** To acquire the knowledge of assessment procedure and to know the power of
       incometax authorities.

| Syllabus: | Hours |
|---|---|
| **Module No. 1:  Profits and Gains of Business and Profession** | **14** |
| Introduction-Meaning and definition of Business, Profession and Vocation. - Expenses Expressly allowed - Expenses Expressly Disallowed - Allowable losses - Expressly disallowed expenses and lossess, Expenses allowed on payment basis. Problems on computation of income from business of a sole trading concern - Problems on computation of income from profession: Medical Practitioner - Advocate and Chartered Accountants. | |
| **Module No. 2:  Tax Deduction at Sources & Advance Tax Ruling** | **12** |
| Introduction - Meaning of TDS - Provisions regarding TDS - TDS to be made from Salaries - Filing of Quarterly statement – Theory and Problems; Advance Tax: Meaning of advance tax - Computation of advance tax - Instalment of advance tax and due dates. **Deductions** under Section 80C, 80CCC, 80CCD, 80CCG, 80D, 80DD, 80DDB, 80E, 80G, 80GG, 80TTA and 80U as per old regime. (Individuals only). | |
| **Module No. 3:  Income from other Sources** | **12** |
| Introduction - Incomes taxable under Head income other sources – Securities -Types of Securities - Rules for Grossing up. Ex-interest and cum-interest securities. Bond Washing Transactions - Computation of Income from other Sources. | |
| **Module No. 4:  Set Off and Carry Forward of Losses & Assessment of individuals.** | **10** |
| Introduction – Provisions of Set off and Carry Forward of Losses (Theory only) - Computation of Total Income and tax liability of an Individual. | |

| Module No. 5: Assessment Procedure and Income Tax Authorities: | 12 |
|---|---|

Introduction - Due date of filing returns, Filing of returns by different assesses, E-filing of returns, Types of Assessment, Permanent Account Number -Meaning, Procedure for obtaining PAN and transactions were quoting of PAN is compulsory. Income Tax Authorities their Powers and duties.

**Skill Development activities:**
1. Visit any chartered accountant office and identify the procedure involved inthe computation of income from profession.
2. List out the different types of capital assets and identify the procedure involved in the computation of tax for the same.
3. List out the steps involved in the computation of income tax from othersources and critically examine the same.
4. Identify the Due date for filing the returns and rate of taxes applicable forindividuals.
5. Draw an organization chart of Income Tax department in your locality.
6. Any other activities, which are relevant to the course.

**Text Books:**
1. Mehrotra H.C and Goyal, Direct taxes, Sahithya Bhavan Publication, Agra.
2. Vinod Singhania, Direct Taxes, Taxman Publication Private Ltd, NewDelhi.
3. Gaur and Narang, Law and practice of Income Tax, KalyaniPublications, Ludhiana.

**Note: Latest edition of text books may be used.**

Weblinks: https://www.sultanchandandsons.com/book/575/income-tax-%E2%80%93-law-and-practice
https://www.gacrkl.ac.in/studymaterial/gacr-ug-com-c6.pdf
https://www.icsi.edu/docs/webmodules/Publications/4.%20Tax%20Laws%20and%20Practice.

## Course Articulation Matrix - 233617

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 1 | 1 | - | - | 1 | - | 1 | - | - | - | 1 |
| CO2 | 2 | 1 | - | - | - | 1 | 1 | 1 | - | 1 | - | 1 |
| CO3 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| CO4 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 2 |
| Wtd. Avg. | 2 | 1.5 | 1.6 | 1 | 2 | 1 | 1.3 | 1 | 1 | 1.3 | 2 | 1.5 |

| Course Code: 233618 | Course Title:    Management Accounting |
|---|---|
| Course Credits: 4 .(L:T:P): 4:0:0 | Teaching Hours/Week: 04 Hours |
| Total Contact Hours: 60 Hours | Formative Assessment Marks: 40 |
| Exam Duration: 2 1/2 Hours | Semester End Examination Marks: 60 |

**Course Objective:**  To understand the procedures of maintaining accounts in an organization.

**Course Outcomes:**
**CO1-** Knowledge of the significance of management accounting.
**CO2-** Analyze and interpret the corporate financial statements by using various techniques.
**CO3-** Compare the financial performance of corporates through ratio analysis and cash flow.
**CO4-** Acquaint the knowledge of marginal costing.

| Syllabus: | Hours |
|---|---|
| **Module No. 1:    Management Accounting** | **12** |
| Introduction – Concept – Meaning and Definition - Significance - Scope - Objectives and Functions - Difference between Financial Accounting, Cost Accounting  and Management Accounting - Advantages and Limitations of Management Accounting -Management Accountant: Role and Functions of Management Accountant. | |
| **Module  No. 2:  Financial Statements Analysis and Interpretation** | **12** |
| Introduction – Meaning and Nature of financial statements - Limitations of financial statements - Essentials of a good financial statement. Analysis and interpretations- Meaning and definition of Financial of analysis, types of analysis, Techniques of Financial Analysis- Comparative Statements, Common Size Statements and Trend Analysis -Problems. | |
| **Module  No.  3:  Ratio Analysis** | **14** |
| Introduction - Meaning and Definition of Ratio Analysis, Uses & Limitations of Ratio Analysis –Classification of ratios: Liquidity ratios: Current ratio, Liquid ratio and Absolute liquid ratio; Solvency ratios: Debt equity ratio, Proprietary ratio and Capital gearing ratio - Earning per share and return on capital employed; Profitability ratios: Gross profit ratio - Net profit ratio – Operating ratio, and Operating profit ratio. Turnover ratios: Inventory turnover ratio - Debtors turnover ratio Debt collection period - Creditors turnover ratio -Debt payment period, Assets turnover ratio, Earnings per share and Price Earnings Ratio. Problems on Ratio Analysis - Preparation of financialstatements with the help of Accounting Ratios. | |

| Module No. 4:     Cash flow statement | 12 |
|---|---|
| Introduction- Meaning and Definition, Merits and Demerits, differences between Fund flow and cash flow statements. Provisions of Ind AS 7.Procedure of cash flow statement Concept of cash and cash equivalent. Classification of Cash flows, Preparation of cash flow statement as per Ind AS 7 (indirect method only). Problems. | |
| **Module No. 5: Marginal Costing** | **10** |
| Definition, basic concepts, assumptions, marginal cost statements, contributions break even analysis contributions, PV ratios, margin of safety and decision areas. | |

**Skill Development Activities:**

1. Meet Management accountant and discuss his role in decision making in an Enterprise.
2. Collect financial statements of any one corporate entity for two year and preparea comparative statement and analyse the financial position.
3. Collect financial statements of any one corporate entity, analyse the same byusing ratio analysis.
4. Prepare a cash flow statement
5. Meet the management accountant, discuss the steps involved in managementaudit.
6. Collect reports of any two corporates, analyse the management review and governance of the same.
7. Any other activities, which are relevant to the course.

**Text Books:**

1. Study Materials of ICAI on Management Accounting (Updated)
2. Study Materials of ICMAI on Management Accounting
3. Charles T. Horngren, Gary L. Sundem, Dave Burgstahler, Jeff O. Schatzberg, Introduction to Management Accounting, Pearson Education.
4. Khan, M.Y. and Jain, P.K. Management Accounting. McGraw Hill Education.
5. Arora, M.N. Management Accounting, Vikas Publishing House, New Delhi
6. Maheshwari, S.N. and S.N. Mittal, Management Accounting. Shree Mahavir BookDepot, New Delhi.

**Note: Latest edition of text books may be used.**

Weblinks: https://en.wikipedia.org/wiki/Management_accounting
https://www.investopedia.com/terms/m/managerialaccounting
https://www.businessnewsdaily.com/16202-management-accounting

## Course Articulation Matrix - 233618

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | PO 11 | PO 12 |
|-------|-----|-----|-----|------|-----|-----|-----|-----|-----|-------|-------|-------|
| CO1 | 2 | - | - | 1 | - | 1 | - | 1 | 1 | 1 | - | 2 |
| CO2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| CO3 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| CO4 | 2 | - | - | 1 | - | 1 | - | 1 | 1 | 1 | - | 2 |
| Wtd. Avg. | 2 | 2 | 1.5 | 1.25 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |

| Course Code: 23DSECOM06 | Course Title: Indian Accounting Standards-2 |
|---|---|
| Course Credits: 3 .(L:T:P): 3:0:0 | Teaching Hours/Week: 03 Hours |
| Total Contact Hours: 45 Hours | Formative Assessment Marks: 40 |
| Exam Duration: 2 1/2 Hours | Semester End Examination Marks: 60 |

**Course Objective:** To understand the different upgraded accounting standards.

**Course Outcomes**

**CO1-** Knowledge of preparing the consolidated financial statements as per INDAS.
**CO2-** Learn the disclosures in the financial statements.
**CO3-** Know how about accounting policies.
**CO4-** Analyze the Revenue based accounting standard.

| Syllabus | Hours |
|---|---|
| **Module-1 Consolidated Financial Statement (Ind AS 110)** | **9** |
| Meaning and Definition- Holding Company and Subsidiary Company, Steps in Preparation of consolidated Financial Statements, Capital profit, Revenue profit, Non-controlling Interest and Goodwill or Capital Reserve and Unreleased profit, and mutual indebtedness. Problems on Preparation of Consolidated Balance Sheet. | |
| **Module No. 2 Disclosures in the Financial Statements** | **9** |
| Employee benefits (Ind As 19) Earnings per Share (Ind AS 33) Lease (Ind AS 116), Interim Financial Reporting (Ind AS 34) Share-based Payment(Ind AS 102 ). | |
| **Module No. 3 Measurement Based on Accounting Policies** | **9** |
| Accounting Policies, Changes in Accounting Estimates and Errors (Ind AS 8),first time adoption of Ind As (Ind As 101) Fair Value Measurement- (Ind AS 113) Accounting for Government Grants and Disclosure of Government Assistance((Ind AS 20)) and Share Based Payment (Ind AS 102) | |
| **Module No. 4 Accounting and Reporting of Financial Instruments** | **10** |
| Presentation of Financial Instruments (Ind AS 32) – Meaning, Financial Assets, Financial Liabilities - Presentation Recognition and Measurement of financial Instruments (Ind AS 39) – Initial and Subsequent Recognition and measurement of Financial Assets and Financial Liabilities, Derecognition of Financial Assets and Financial Liabilities- Disclosures of Financial Instruments (Ind AS 107) | |
| **Module No. 5 Revenue based accounting standard** | **8** |
| Revenue from Contracts with Customers (Ind AS 115), Fair Value Measurement(Ind AS 113) Contract, Practical Provision s and problems on the above standards. | |

**Skill Development Activities:**

1. Prepare consolidated Balance sheet with imaginary figures.
2. Make a list of Indian Accounting Standards
3. Make disclosures of any five Indian Accounting Standards.
4. Study the compliance with the requirements of Indian Accounting standards as disclosed in the Notes to Accounts in Annual Reports.

**Text Books:**

1. Study material of the Institute of Chartered Accountants of India
2. Anil Kumar, Rajesh Kumar and Mariyappa, Indian Accounting Standards, HPH
3. Miriyala, Ravikanth, Indian Accounting Standards Made Easy, Commercial Law Publishers
4. Dr.A.L.Saini IFRS for India, , Snow white publications.
5. CA Shibarama Tripathy Roadmap to IFRS and Indian Accounting Standards
6. Ghosh T P, IFRS for Finance Executives Taxman Allied Services PrivateLimited.

**Note:** Latest edition of text books may be used

Weblinks: https://www.icai.org/post/indian-accounting-standards-indas
https://icmai.in/upload/Students/Syllabus2016/Ind_AS.pdf
https://www.mca.gov.in/content/mca/global/en/acts-rules/ebooks/accounting-standards.html

## Course Articulation Matrix 23DSECOM06

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | PO 11 | PO 12 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|
| CO1 | 2 | 1 | - | - | 1 | 1 | - | 1 | - | 1 | 1 | 2 |
| CO2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 |
| CO3 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| CO4 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| Wtd. Avg. | 2 | 1.5 | 1.6 | 2 | 1.75 | 1.6 | 1 | 1 | 1.3 | 1.5 | 1.5 | 2 |

| Course Code: 23DSECOM07 | Course Title: Investment Management |
|---|---|
| Course Credits: 3 .(L:T:P): 3:0:0 | Teaching Hours/Week: 03 Hours |
| Total Contact Hours: 45 Hours | Formative Assessment Marks: 40 |
| Exam Duration: 2 1/2 Hours | Semester End Examination Marks: 60 |

**Course Objective:** To understand about the investments in various fields.

**Course Outcomes:**

**CO1-** Knowledge of investments and its instruments.

**CO2-** Comprehend the functioning of secondary market in India.

**CO3-** Gain the concept of risk and return and their relevance in purchasing and selling ofsecurities.

**CO4-** Analyze the company's technical analysis for trading in the share market.

| Syllabus: | Hours |
|---|---|
| **Module No. 1: Concept of Investment** | **07** |
| Introduction - Investment: Attributes, Economic vs. Financial Investment, Investment andspeculation, Features of a good investment, Investment Process. Financial Instruments: Money Market Instruments, Capital Market Instruments, Derivatives. | |
| **Module No. 2:    Fundamental Analysis** | **10** |
| Fundamental analysis-EIC Frame Work, Global Economy, Domestic Economy, Business Cycles,Industry Analysis and Company Analysis. Valuation of securities: Valuation of Bonds and debentures and preference shares, equity shares-no growth rate, normal growth rate and super normal growth rate. | |
| **Module No. 3:    Risk & Return** | **10** |
| Risk and Return Concepts: Concept of Risk, Types of Risk- Systematic risk, Unsystematic risk,Calculation of Risk and returns. Portfolio Risk and Return: Expected returns of a portfolio, Calculation of Portfolio Risk and Return. | |
| **Module No. 4  Technical Analysis** | **08** |
| Technical Analysis – Concept, Theories- Dow Theory, Eliot wave theory. Charts-Types, Trend and Trend Reversal Patterns. Mathematical Indicators – Moving averages, ROC, RSI, and Market Indicators - Market Efficiency and Behavioural Finance: Random walk and Efficient Market Hypothesis, Forms of Market Efficiency, Empirical test for different forms of market efficiency | |

| Module No. 5:      Portfolio Management | 10 |
|---|---|
| Portfolio Management: Meaning, Need, Objectives, process of Portfolio management, Selection of securities and Portfolio analysis. Construction of optimal portfolio using Sharpe's Single Index Model. Portfolio Performance evaluation (Theory only) | |

**Skill Developments Activities:**

1. Collect and compare the data on financial instruments selected for investment from anyfive investors.
2. Open Demat account, learn how to trade in stock market and submit the report onprospectus and challenges of stock trading.
3. Discuss with investors on systematic and unsystematic risk analysis, submit report on thesame.
4. Calculate the intrinsic value of any five bonds listed on BSE / NSE, making necessary assumptions.
5. Summarise the parameters of 'Economy Analysis' of any five countries and give yourinference.
6. Any other activities, which are relevant to the course.

**Text Books:**

1. Bodie ZVI, Kane Alex, Marcus J Alan and Mohanty Pitabas., Investments, Tata McGrawHill Publishing Company Limited, New Delhi.
2. Sharpe F. William, Alexander J Gordon and Bailey V Jeffery, Investments, Prentice Hallof India Private Limited, New Delhi.
3. Fischer E Donald and Jordan J Ronald., Security Analysis and Portfolio Management,Prentice Hall of India Private Limited, New Delhi.
4. Kevin S., Portfolio Management, PHI, New Delhi.
5. Punithavathy Pandian, Security Analysis and Portfolio Management, Vikas PublishingHouse Private Limited, New Delhi.
6. Prasanna Chandra, Investment Analysis and Portfolio Management, Tata McGraw HillPublishing Company Limited, New Delhi.

Weblinks: https://en.wikipedia.org/wiki/Investment_management
https://www.financestrategists.com/wealth-management/investment-management

## Course Articulation Matrix - 23DSECOM07

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | PO 11 | PO 12 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|
| CO1 | 2 | - | - | - | - | 1 | 1 | 1 | 1 | 1 | - | 2 |
| CO2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | - | 2 |
| CO3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 2 |
| CO4 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 2 |
| Wtd. Avg. | 2 | 2 | 2 | 1.6 | 2 | 1.5 | 1 | 1 | 1 | 1.5 | 1 | 2 |

| Course Code: 23DSECOM09 | Course Title:   Cultural Diversity at Work Place |
|---|---|
| Course Credits: 3 .(L:T:P): 3:0:0 | Teaching Hours/Week: 03 Hours |
| Total Contact Hours: 45 Hours | Formative Assessment Marks: 40 |
| Exam Duration: 2 1/2 Hours | Semester End Examination Marks: 60 |

**Course Objectives:** To understand the values and belief of the workforce society

**Course Outcomes:**
**CO1**- Knowledge of the notion of diversity.
**CO2-** Recall the cultural diversity at work place in an organization.
**CO3-** Explore the differences in Culture.
**CO4-** Assess the contemporary organizational strategies for managing workforce diversity.

| Syllabus: | Hours |
|---|---|
| **Module No. 1:     Introduction to Diversity** | **10** |
| Introduction to cultural diversity in organizations, Evolution of Diversity Management, Over View of Diversity, Advantages of Diversity, Identifying characteristics of diversity, Scope-Challenges and issues in diversity management, Understanding the nature of Diversity – Cultural Diversity – Global Organizations- Global Diversity. | |
| **Module  No. 2:     Exploring Differences** | **08** |
| Introduction -Exploring our and others' differences, including sources of our identity. Difference and power: Concepts of prejudice, discrimination, dehumanization and oppression. | |
| **Module  No.  3:  Visions of Diversity and Cross Cultural Management** | **10** |
| Models and visions of diversity in society and organizations: Justice, fairness, and group and individual differences. Cross-Cultural Management: Meaning and Concepts, Frameworks in Cross-Cultural Management: Kluckhohn and Strodtbeck framework, Hofstede's Cultural Dimensions, Trompenaar's Dimensions, Schwartz Value Survey, GLOBE study. | |
| **Module No. 4:     Skills and Competencies** | **08** |
| Skills and competencies for multicultural teams and workplaces/ Organizational assessment and change for diversity and inclusion, Diversity Strategies. Creating Multicultural Organisations. | |

| Module 5: Recent Trends in Diversity Management | 09 |
|---|---|
| Emerging workforce trends–Dual-career couples–Cultural issues in international working on work-life balance–Managing multi-cultural teams: Issues and challenges, Global demographic trends: Impact on diversity management, Social psychological perspective on workforce diversity, Diversity Management in IT organizations Contemporary Issues in Workplace Diversity. | |

**Skill Development Activities:**
1. Visit any MNCs, identify and report on the cultural diversity in an organization.
2. Interact and List out the ways in which dehumanization done in public/ private sector organization.

3. Interact with HR Manager of any MNCs, explore and report on cross culturalmanagement.
4. Explore the benefits of multi-cultural organizations.
5. Examine and report on diversity management in select IT organizations.
6. Any other activities, which are relevant to the course.

**Text Books:**
1. Bell, M.P. (2012). Diversity in organizations (2nd Ed.). Mason, OH: Cengage.
2. Harvey, C.P. & Allard, M.J. (2015). Understanding and managing diversity:Readings, cases, and exercises (6th Ed.). Upper Saddle River, NJ: Pearson.

**Note: Latest edition of text books may be used.**

Weblinks: https://en.wikipedia.org/wiki/Cultural_diversity
https://en.unesco.org/themes/education-sustainable-development/cultural-diversity
https://www.hult.edu/blog/benefits-challenges-cultural-diversity-workplace

## Course Articulation Matrix 23DSECOM09

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| CO2 | 2 | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| CO3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| CO4 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| Wtd. Avg. | 2 | 1.5 | 1.5 | 1.5 | 1..5 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |

| Course Code: 23DSECOM10 | Course Title: Human Resource Analytics |
|---|---|
| Course Credits: 3 .(L:T:P): 3:0:0 | Teaching Hours/Week: 03 Hours |
| Total Contact Hours: 45 Hours | Formative Assessment Marks: 40 |
| Exam Duration: 2 1/2 Hours | Semester End Examination Marks: 60 |

| Course Objective: To understand how to deal with the human resource and their development in an organisation. |
|---|

| Course Outcomes: |
|---|
| CO1- Knowledge of Analytics in Human Resource. |
| CO2- Identify a list of HR metrics relevant to an organization's mission or goals. |
| CO3- Applying the usage of HR analytics to support making data-driven decisions. |
| CO4- Application of analytical techniques to interpret HR data. |

| Syllabus: | Hours |
|---|---|
| **Module No. 1: HR Decision-making and HR Analytics** | **08** |
| Introduction – HR decision making – importance and significance of HR analytics – benefits of HR analytics – Steps to implement HR analytics – HR analytics and changing role of HR managers – aligning human resources to business through HR analytics – HR analytics framework and models – LAMP Framework. | |
| **Module No. 2: HR Business Process and HR Analytics** | **09** |
| Statistics and statistical modelling for HR research and HR decision-making – HR research tools and techniques – data analysis for human resources – parametric and non- parametric tests- HRIS for HR decision-making – HR metrics – recruitment metrics – metrics for training and development function – HR scorecard – HR dashboard | |
| **Module No. 3: Forecasting and Measuring HR value propositions with HR analytics** | **08** |
| Value proposition and HR decisions – Sustainability in HR decisions – HR optimization through analytics – Predictive HR analytics | |
| **Module No. 4: HR analytics and Data** | **12** |
| HR data and data quality – data collection – big data for human resources – transforming HR data into HR information – HR reporting – HR report visualization – performing root cause analysis – datafication of human resources, Excel exercises: Preparing to Build Your Balanced Scorecard, Developing Executive and Operational Dashboards, Pivotal Talent Pools with High Rates of Voluntary Turnover: Voluntary Turnover, Involuntary Turnover, For-Cause Dismissals, and Layoffs | |

| Module 5: | HR Analytics and Predictive Modelling | 08 |
|---|---|---|

Different phases of HR analytics and predictive modelling – data and information for HR predictive analysis – software solutions – predictive analytics tools and techniques –understanding future human resources.

**Skill Development Activities:**
**Course teacher can identify and give the skill development activities.**

**Text Books:**
1. Dipak Kumar Bhattacharya, HR Analytics: Understanding Theories andApplications, SAGE publications, 2017
2. Ron Person, Balanced Scorecards & Operational Dashboards with Microsoft Excel, Wiley Publications.
3. Jac Fitz-enz, The New HR Analytics- Predicting the Economic Value of Your Company's Human Capital Investments, AMACOM.
4. Jac Fitz-enz ,John R. Mattox II, Predictive Analytics for Human Resources, Wiley& SAS Business Series.

**Note: Latest edition of text books may be used.**

Weblinks: https://www.aihr.com/blog/what-is-hr-analytics
https://www.valamis.com/hub/hr-analytics

## Course Articulation Matrix - 23DSECOM10

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | - | 1 | - | 1 | 2 | 1 | 2 | 2 | 2 | - | 2 |
| CO2 | 2 | - | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | - | 2 |
| CO3 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 2 |
| CO4 | 2 | 1 | 1 | - | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 2 |
| Wtd. Avg. | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 2 |

| Course Code: **23DSECOM08** | **Course Title: Customer Relationship Management** |
|---|---|
| **Course Credits: 3 .(L:T:P): 3:0:0** | **Teaching Hours/Week: 03 Hours** |
| **Total Contact Hours: 45 Hours** | **Formative Assessment Marks: 40** |
| **Exam Duration**: 2 1/2 Hours | **Semester End Examination Marks: 60** |

**Course Objective:** To learn about the relationship between a customer and a seller.

**Course Outcomes:**
**CO1-** Awareness of the nuances of customer relationship.
**CO2-** Analysis of the CRM link with the other aspects of marketing.
**CO3-** Knowledge of the Role of CRM in increasing the sales of thecompany.
**CO4-** Imparting the knowledge of marketing strategies and implementations.

| Syllabus: | Hours |
|---|---|
| **Module No. 1:  Evolution of Customer Relationship** | **08** |

Introduction - CRM- Definition, Emergence of CRM Practice, Factors responsible for CRM growth, CRM  process, framework  of CRM, Benefits of CRM, Types of CRM, Scope of CRM, Customer Profitability, Features Trends in CRM , CRM and Cost-Benefit Analysis, CRM and Relationship Marketing.

| **Module  No. 2:  CRM Concepts** | **10** |
|---|---|

Introduction - Customer Value, Customer Expectation, Customer Satisfaction, Customer Centricity, Customer Acquisition, Customer Retention, Customer Loyalty, Customer Lifetime Value. Customer Experience Management, Customer Profitability, Enterprise Marketing Management, Customer Satisfaction Measurements, Web based Customer Support.

| **Module No. 3**:  **Planning for CRM** | **08** |
|---|---|

Introduction -Steps in Planning-Building Customer Centricity, Setting CRM Objectives, Defining Data Requirements, Planning Desired Outputs, Relevant issues while planning the Outputs, Elements of CRM plan, CRM Strategy: The Strategy Development Process, Customer Strategy Grid.

| **Module No. 4:  CRM and Marketing Strategy** | **09** |
|---|---|

Introduction **-** CRM Marketing Initiatives, Sales Force Automation, Campaign Management, Call Centres. Practice of CRM: CRM in Consumer Markets, CRM in Services Sector, CRM in Mass Markets, CRM in Manufacturing Sector.

| Module 5: CRM Planning and Implementation | 10 |
|---|---|
| Introduction - Issues and Problems in implementing CRM, Information Technology tools in CRM, Challenges of CRM Implementation. CRM Implementation Roadmap, Road Map (RM) Performance: Measuring CRM performance, CRM Metrics. | |

1. **Skill Development Activities:**
2. Visit any bank, identify and note customer relationship management by banker.
3. Conduct online survey on customer satisfaction of insurance products of anycompany.
4. Visit any telecommunication retail service outlet, discuss CRM related aspectswith CRM manager.
5. Discuss from any five call centre employees on how their work helps to maintain customer relationship.
6. Prepare report how technology impacts on CRM.
7. Any other activities, which are relevant to the course.

**Text Books:**

1. Francis Buttle, Stan Maklan, Customer Relationship Management: Concepts andTechnologies, 3rd edition, Routledge Publishers, 2015
2. Kumar, V., Reinartz, Werner Customer Relationship Management Concept,Strategy and Tools, 1st edition, Springer Texts, 2014.
3. Jagdish N.Sheth, Atul Parvatiyar & G.Shainesh, "Customer RelationshipManagement", Emerging Concepts, Tools and Application", 2010, TMH
4. Dilip Soman & Sara N-Marandi," Managing Customer Value" 1st edition, 2014, Cambridge.
5. Alok Kumar Rai, "Customer Relationship Management: Concepts and Cases", 2008, PHI.
6. Ken Burnett, the Handbook of Key "Customer Relationship Management", 2010, PearsonEducation.
7. Mukesh Chaturvedi, Abinav Chaturvedi, "Customer Relationship Management-An Indian Perspective", 2010 Excel Books, 2nd edition

**Note: Latest edition of text books may be used.**

Weblinks: https://en.wikipedia.org/wiki/Customer_relationship_management
https://www.businessnewsdaily.com/15957-small-business-customer-relationship-management

# Course Articulation Matrix - 23DSECOM08

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 1 2 |
|-------|-----|-----|-----|-----|-----|-----|------|------|------|-------|-------|--------|
| CO1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 1 | 2 |
| CO2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 2 |
| CO3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 2 |
| CO4 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 2 |
| Wtd. Avg. | 2 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.75 | 1.75 | 2 | 2 | 1 | 1 |

| Course Code: 23VOCCOM02 | Course Title:    Assessment of Non - Individuals and  Filing of ITRs |
|---|---|
| Course Credits:3 .(L:T:P): 2:0:1 | Teaching Hours/Week: 03 Hours |
| Total Contact Hours: 45 Hours | Formative Assessment Marks: 40 |
| Exam Duration: 2 1/2 Hours | Semester End Examination Marks: 60 |

**Course Objectives:** To understand the need of filing the tax.

**Course Outcomes:**
**CO1-** Knowledge to calculate the Depreciation and allowance.
**CO2-** Comprehend the assessment of corporate entities and determine the tax liability.
**CO3-** Assessing the companies with their financial aspect.
**CO4-** Acquaint with the rules and regulations of INDAS.

| Syllabus: | Hours |
|---|---|
| **Module No. 1:  Depreciation and Investment Allowance** | **07** |

Introduction-Meaning of Depreciation, Important points regarding depreciation, Conditions for allowance of Depreciation, Assets eligible for depreciation, important terms for computation of depreciation allowance. Problems.

| **Module  No. 2:     Assessment of Partnership firms** | **08** |
|---|---|

Definition of Partnership, Firm and Partners – Assessment of Firms (Section 184) – Computation of Firm's Business Income – Treatment of Interest, Commission, Remuneration received by partners (Sec 40b). Presumptive taxation (44AD) Problems on Computation of total income and tax liability of firms (Use of available  software package for computation of tax liability, Related Forms and Challans)

| **Module No.  3:  Assessment of Companies.** | **10** |
|---|---|

Introduction-Meaning and Definition of Company-Types of Companies under Income tax Act -–Problems on computation of total income of companies- Including Minimum Alternate Tax (115JB) Applicable Deductions u/s 80IA , 80IB, 80IC, 80G - Problems on Computation of Tax Liability (Use of Software Package-Quick Books/ Electro com)

| **Module No. 4:  Tax Under E-Environment** | **10** |
|---|---|

Filing of Income tax returns (ITR) – Types income tax return forms- benefit of filing ITR- different sections of ITR returns- document required to filing ITR –form 26AS significance returns-Advance Tax Sections-Tax Deducted at Source (TDS)- online payment of tax- problems on Advance Tax and TDS. ] E-filing of return on Income Tax Portal , Verification of ITR.

| Module No. 5: Case laws and amendments | 10 |
|---|---|

Introduction - Recent Amendments in Filing of Returns as per Finance Bill; Recent Case Laws for guidance. Depute the students at least two weeks to any Audit Firm to learn practically the filing of Returns of various kinds of assesses. Like individuals, Firms and

Companies.

1) **Skill Development Activities:**
2) Prepare a chart showing rates of depreciation for different assets.
3) Calculate the Eligible Remuneration to working partners as per Income tax rules with imaginary figures.
4) Narrate the procedure for calculation of Book Profit.
5) Students should able to e-file and understand ITR forms.
6) Any other activities, which are relevant to the course

**Text Books:**
1. Vinod K Singhania – "Direct Taxes - Law and Practice", Taxmann Publications
2. H C Mehrotra and Goyal, "Direct Taxes", Sahitya Bhavan Publications
3. Gaur and Narang ; Direct Taxes, Kalyani Publishers
4. Rajiva S. Mishra –Direct & Indirect Tax 5. Santhil & Santhil : Business taxation.
5. B.Mariyappa Business Tax Himalaya Publication House. New Delhi.

**Note: Latest edition of text books may be used.**

Weblinks: https://www.incometax.gov.in/iec/foportal
https://incometaxindia.gov.in/Pages/tax-services/file-income-tax-return
https://incometaxindiaefiling.gov.in

## Course Articulation Matrix - 23VOCCOM02

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 2 |
| CO2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 2 |
| CO3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 |
| CO4 | 2 | - | - | - | - | 1 | 2 | 1 | 2 | 1 | 1 | 2 |
| Wtd. Avg. | 2 | 1.3 | 1.3 | 1.3 | 1.3 | 1.25 | 1.75 | 1 | 1.75 | 1 | 1 | 2 |

# Course Structure - Internship - VI Sem

| | |
|---|---|
| **Course Code:** 23INTCOM01 | **Course Title:** INTERNSHIP |
| **Course Credits : 03** | **Teaching Hours/Week:** 4 TO 5 WEEKS |
| **Total Contact Hours: 45** | **Formative Assessment Marks:** 20 |
| **Exam Duration:** (Practical) | **Project Report: 30** |

## Course Objectives/ Outcomes

1. The students need to assist and contribute to the team.
2. The students will Learn and gain experience.
3. The students will have Job shadow.
4. The students will take on an increasing amount of responsibility.
5. The students will make a career call.
6. The students need to be professional.
7. The students need to Stay organized.
8. The students should manage their time wisely.
9. The students have to keep track of their projects.
10. Submission of their project.

# Evaluation Pattern of V & VI Sem

C1- Centrally organized internal test              - 20marks

C2- Skill Development activities                 - 20marks

C3- Written examination                        - 60marks

**Total**                                         **- 100marks**

**Conditions of evaluation Process of IA Marks shall be as follows:**

a) The first component (C1) of assessment is for 20% marks. This shall be based on Internal test. This assessment and score process should be completed after completing 50% of syllabus of the courses and within 45 working days of semester program

b). The second component (C2) of assessment is for 20% marks. This shall be based on Skill Development. This assessment and score process should be based on completion of remaining 50% of syllabus of the course of the semester.

c). During the 17th – 19th week of the semester, a semester end examination shall be conducted by the college for each course. This forms the third and final component of assessment (C3) and the maximum marks for the final component will be 60%.

d). In case of a student who has failed to attend the C1 or C2 on a scheduled date, it shall be deemed that the student has dropped the test. However, in case of a student who could not take the test on scheduled date due to genuine reasons, such a candidate may appeal to the Program Coordinator/Principal. The Program Coordinator/Principal in consultation with the concerned teacher shall decide about the genuineness of the case and decide to conduct special test to such candidate on the date fixed by the concerned teacher, but before commencement of the concerned semester end examinations.

e) For assignments, tests, case study analysis etc., of C1 and C2, the students will be provided with answer scripts and Skill development records, graph sheets etc., required for such tests/assignments and these be sealed/signed by the concerned department at the time of conducting tests/assignment /project work etc.

## Evaluation Pattern of VI Sem Internship

| Assessment Criteria | Marks |
|---|---|
| C 1 - Communication Skills/ Presentations | 10 |
| C 2 - Viva Voce | 10 |
| C 3 – Project Report | 30 |
| **Total** | **50** |

# SBRR Mahajana First Grade College (Autonomous)

**Jayalakshmipuram, Mysuru - 570 012 Karnataka, INDIA**
Affiliated to University of Mysore
Re-Accredited by NAAC with 'A' Grade, College with Potential for Excellence

## B. Com V/VI Semester DSC, DSE & Voc

## Question Paper Pattern

**Time: 2 1/2 Hours**                                                    **Max. Marks: 60**

### PART – A

Answer any FIVE of the following questions. Each question carries 2 marks.

**(5x2= 10 Marks)**

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

### PART – B

Answer any **TWO** of the following questions.  Each question carries **10 Marks**.

**(2x10 =20 Marks)**

8. _____
9. _____
10. _____
11. _____

### PART – C

Answer any **TWO** of the following questions.  Each question carries **15 Marks**.

**(2x15 =30 Marks)**

12. _____
13. _____
14. _____
15. _____

Mahajana Education Society (R)

Education to Excel

# SBRR Mahajana First Grade College (Autonomous)

Jayalakshmipuram, Mysuru - 570 012 Karnataka, INDIA

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**Date:** 26-08-2023

## Proceedings of Board of Studies Meeting - 07

The Seventh Board of Studies Meeting was convened on 26th August 2023 in Business Lab at 10:30 am. A total of 07 members were present offline and 02 members were present online for the meeting.

The agenda of the meeting was approval of B. Com V & VI Semester Syllabus as per NEP Regulations framed by BoS in Commerce UoM, Mysuru, for the academic year 2023-24. The Board Members took up the agenda for discussion in detail and the following decisions were made.

➢ **Following Agenda were discussed in the meeting:**
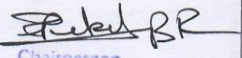
1. Approval of B. Com Course Structure 2023-2024.
2. Approval of B. Com V & VI Sem Syllabus
3. Approval of distribution of FEIA paper in two semesters.
4. Approval of list of Board of Examiner Committee.
5. Approval of Question Paper pattern.
6. Any other matters.

### Approval of B. Com Course Structure 2023-2024.

1. The proposed B. Com Course Structure was approved by the BoS members.
2. Discussed about the Credit of the subject and L:T:P pattern.
3. Discussed about internship in VI semester

➢ **Approval of B. Com V & VI Sem Syllabus:**

o Financial Management- In module 3 sources of finance should be included
o Income Tax-I – Module 5 of V semester to be replaced with module 2 of VI semester
o Auditing- No Changes
o Accounting-I (E)- No Changes

- Finance- FM (E)- No Changes
- Marketing-(E)- No Changes
- Human Resource-(E)- No Changes
- Analytics-BR (E)- No Changes
- Advanced Financial Management- Change in hours of lectures
- Income tax-II - Module 5 of V semester to be replaced with module 2 of VI semester
- Management Accounting- Inclusion of Marginal Costing. Management Audit and Reports on Management was removed.
- Accounting- II (E)- Re-arrangement of modules
- Finance- IM (E)- No Changes
- Marketing-CRM (E)- No Changes
- Human Resource-CD (E)- No Changes
- Analytics-HR (E)- No Changes
- Investment Management - Re-arrangement of modules

- **Approval of list of Board of Examiner Committee.**

  - The proposed BoE members with new inclusions were approved.
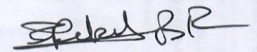
- **Approval of Question Paper pattern.**

  - Same pattern was approved.

- **Approval of any other matters.**

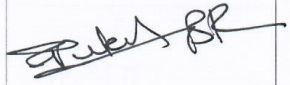  Distribution of FEIA classes into III and IV semester.
  The discussion was successful and BoS meeting concluded by 1:00 pm.

Chairperson
BOS/BOE in Commerce
SBRR Mahajana First Grade College
(Autonomous)
Jayalakshmipuram, Mysuru-570 012

# SBRR Mahajana First Grade College (Autonomous)

## Department of Commerce
## Board of Studies Meeting - Attendance

Date: 26-08-2023

| Sl.No. | Name and Address | Designation | Signature |
|--------|------------------|-------------|-----------|
| 1 | **Major. B.R. NIKIL** Assistant Professor Department of Commerce SBRR Mahajana First Grade College, (**Autonomous**), Jayalakshmipuram, Mysuru -12 | Chairman | |
| 2 | **Dr. NAGARAJA N** Professor DoS in Commerce, University of Mysore, Manasagangothri, Mysuru-570006. | Member | |
| 3 | **Sri. R. RAJESH** Chartered Accountant B S Ravikumar & Associates, Mysuru #73, 2nd Floor, Sri Madhvesha Complex, Nazarbad Main Road, Mysuru-570010. | Member | R. Rajesh |
| 4 | **Dr. SRINIVAS K T** Associate Professor & Chairman Department of Studies in Commerce, Davangere University, Davangere. | Member | —ONLINE— |
| 5 | **Dr. PARAMESHWARA** Associate Professor Department of Commerce, Mangalore University, Konaje Mangalore. | Member | —ONLINE— |

# SBRR Mahajana First Grade College (Autonomous)

Jayalakshmipuram, Mysuru - 570 012 Karnataka, INDIA
Affiliated to University of Mysore
Re-Accredited by NAAC with 'A' Grade, College with Potential for Excellence

## Department of Commerce
## Board of Studies Meeting - Attendance

Date: 26-08-2023

| | | | |
|---|---|---|---|
| 6 | **Smt. NANDINI R MUTTUR**<br>Partner<br>Geartech Solutions, Hebbal Industrial Area, Mysuru | Member | N.R.Muttur |
| 7 | **Mr. N ROOPESH KUMAR**<br>Assistant Professor and Head of the Department. SBRR Mahajana First Grade College (Autonomous),<br>PG centre, Mysuru. | Member | ABSENT |
| 8 | **Smt. REKHA B**<br>Assistant Professor<br>Department of Commerce<br>SBRR Mahajana First Grade College,<br>(**Autonomous**), Jayalakshmipuram,<br>Mysuru -12 | Member | Rekha |
| 9 | **Smt. VASAGI S**<br>Assistant Professor<br>Department of Commerce<br>SBRR Mahajana First Grade College,<br>(**Autonomous**), Jayalakshmipuram,<br>Mysuru -12 | Member | S.V |
| 10 | **Smt. SHAMBHAVI P BHOUNSLE**<br>Assistant Professor<br>Department of Commerce<br>SBRR Mahajana First Grade College,<br>(**Autonomous**), Jayalakshmipuram,<br>Mysuru -12 | Member | Shambhavi |

Chairperson
BOS/BOE in Commerce
SBRR Mahajana First Grade College
(Autonomous)
Jayalakshmipuram, Mysuru-570 012

# DEPARTMENT OF COMPUTER SCIENCE

## Motto

Technology for Transformation

## Vision

Information Technology for Better Future

## Mission

Imparting Quality and Ethical Based Education all the way through Technology

Equipping the students for a Demanding Career

Empowering the students with Professional Touch to become Successful Entrepreneurs

# Program Outcomes (POs) for Bachelor of Science

**PO1: Domain Knowledge -** Acquire and apply knowledge of science in relevant areas.

**PO2: Problem Analysis –** Recognize real-world problems and user's requirements to propose solutions for the same using basic principles of science.

**PO3: Design and Development of Solutions –** Developing solutions and inferences for complex problems using critical and analytical thinking.

**PO4: Investigation & Research** – Ability to formulate hypothesis, augment research questions and identify & refer relevant sources for examining or inspecting technical issues as per their level of understanding and knowledge.

**PO5: Use of Modern Techniques/Tools** – Use digital resources, various software/ platforms and appropriate techniques to interpret concepts of science.

**PO6: Impact of Science on Society** – To prepare competent human resource and to develop scientific attitude at local and global levels for social benefit.

**PO7: Environment and Sustainability** – Apply the knowledge gained for conserving environment and to handle environmental issues with sustainable solutions.

**PO8: Moral and Ethical Values** – Imbibe moral values and professional ethics to maintain the integrality in a professional scenario while being aware of the cultural diversities.

**PO9: Individual and Team Work with Time Management** – Work productively in a team or as an individual while exhibiting time management skills.

**PO10: Communication** – Develop the caliber to convey various concepts of science effectively.

**PO11: Project Management and Finance** – Set up enterprises/companies and build entrepreneurship, project management and finance planning skills.

**PO12: Life-long Learning** – Engage in the art of self-directed learning.

# Objectives: Computer Science

1. To provide foundation of computing principles for using information systems & enterprise software effectively.

2. Help students in analyzing the requirements for system programming, learn modern methods of information processing and its applications.

3. Provide students with an option to specialize in various domains of computers.

4. To produce outstanding computer scientists, who can apply the theoretical knowledge in solving real-time problems and in developing standalone live projects.

5. To build entrepreneurs by developing among students the programming techniques, software developing skills and problem-solving skills.

6. To prepare students who wish to pursue further studies and career in computer science and related subjects.

# List of BoS Members

| Sl. No. | Category | Name & Designation | Address for Communication | e-Mail & Mobile No. |
|---|---|---|---|---|
| 1 | Chairperson | Smt. Shruthy Poonacha<br><br>Assistant Professor & HoD | Department of Computer Science<br><br>SBRR Mahajana First Grade College (A), Jayalakshmipuram, Mysuru - 12 | shruthypoonacha.fgc@mahajana.edu.in<br><br>9886367273 |
| 2 | Member | Smt. Radhika Rani<br><br>Assistant Professor | Department of Computer Science<br><br>SBRR Mahajana First Grade College (A), Jayalakshmipuram, Mysuru - 12 | radhikarani.fgc@mahajana.edu.in<br><br>9538737927 |
| 3 | | Smt. Rachana C R<br><br>Associate Professor | Department of Computer Science<br><br>SBRR Mahajana First Grade College (A), Jayalakshmipuram, Mysuru - 12 | rachanacr@gmail.com<br><br>8095645644 |
| 4 | Nominee by the Vice Chancellor | Smt. Hamsaveni L<br><br>Assosiate Professor | DoS in Computer Science<br><br>Manasagangotri, University of Mysore, Mysuru – 570006 | hamsa1367@gmail.com<br><br>9448665767 |
| 5 | Two Experts from Other University | Dr. Suresh K<br><br>Assistant Professor | Department of Computer Science<br><br>Christ University, Hosur Road, Bengaluru - 560029 | suresh.kalaimani@gmail.com<br><br>9003310571 |
| 6 | | Dr. Lavanya P G<br><br>Assistant Professor | Department of Computer Science<br><br>Government Boy's College (A), Mandya – 571401 | lavanyapggcm@gmail.com<br><br>9448006546 |
| | | | **Note:** Dr. Lavanya P G was transferred to Maharani's Science College, Mysuru in the year 2023. | |

| | | | | |
|---|---|---|---|---|
| 7 | One Person from Industry/ Corporate Sector/Allied Area | Sri. Santhosh Kumar<br><br>Lead Software Engineer | Fidelity Investments<br><br>Manyatha Tech Park, Hebbal Outer Ring Road, Nagwara, Bengaluru - 560045 | santhoshkavempu@gmail.com<br><br>9986979735 |
| 8 | Alumnus | Sri. Mahendra J M<br><br>Senior Associate | Morgan Stanley Advantage Services<br><br>Oberoi Commerz II, Mohan Gokhale Road, We Work, Oberoi Garden City, Goregoan (East), Mumbai - 400063 | jmmahendra.08@gmail.com<br><br>9066849377 |

# Course Structure (NEP)

## Discipline Specific Courses (DSC) and Skill Enhancement Course (SEC)

## III Year

| Course Type, Code and Title | | Hours/Week | | L:T:P (Credits) | Maximum Marks | | | Exam Duration | Total Marks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | IA | | Exam | | |
| | | L | T/P | | C1 | C2 | C3 | | |
| **Computer Science – V Sem** | | | | | | | | | |
| **232549** | **DSC(5) -** Programming in Python | 4 | 0 | **4:0:2** **(6 Credits)** | 20 | 20 | 60 | $2\frac{1}{2}$ **Hrs** | 150 |
| | **DSC(5) Lab -** Python Programming Lab | 0 | 4 | | 10 | 15 | 25 | **3 Hrs** | |
| **232550** | **DSC(6) -** Computer Networks | 4 | 0 | **4:0:2** **(6 Credits)** | 20 | 20 | 60 | $2\frac{1}{2}$ **Hrs** | 150 |
| | **DSC(6) Lab -** Computer Networks Lab | 0 | 4 | | 10 | 15 | 25 | **3 Hrs** | |
| **SEC(3)** | Cyber Security **23CYST94** | 3 | 0 | **3:0:0** **(3 Credits)** | 20 | 30 | 50 | **2 Hrs** | 100 |
| | OR | | | | | | | | |
| | Employability Skills **23EMPCMS01** | 3 | 0 | **3:0:0** **(3 Credits)** | 20 | 30 | 50 | **2 Hrs** | 100 |
| **Computer Science – VI Sem** | | | | | | | | | |
| **232649** | **DSC(7) -** Web Technologies | 4 | 0 | **4:0:2** **(6 Credits)** | 20 | 20 | 60 | $2\frac{1}{2}$ **Hrs** | 150 |
| | **DSC(7) Lab -** Web Technologies Lab (JavaScript, HTML, CSS Lab) | 0 | 4 | | 10 | 15 | 25 | **3 Hrs** | |
| **232650** | **DSC(8) -** Statistical Computing & R Programming | 4 | 0 | **4:0:2** **(6 Credits)** | 20 | 20 | 60 | $2\frac{1}{2}$ **Hrs** | 150 |
| | **DSC(8) Lab -** R Programming Lab | 0 | 4 | | 10 | 15 | 25 | **3 Hrs** | |
| **SEC(4)** | Logical Reasoning **23LORCMS01** | 2 | 0 | **2:0:0** **(2 Credits)** | 20 | 30 | 50 | **2 Hrs** | 100 |
| | OR | | | | | | | | |
| | Internship **23INTCMS01** | **(2 Credits)** **(90 Hours)** | | | 50 | 50 | - | - | 100 |

# DSC(5) Syllabus for B.Sc. Computer Science

**Semester V**

| | |
|---|---|
| **Course Code:** 232549 | **Course Title:**<br>**DSC(5) -** Programming in Python (Theory)<br>**DSC(5) Lab -** Python Programming Lab (Practical) |
| **Course Credits (L:T:P):** 06 (4:0:2) | **Hours of Teaching/Week:** 04 (Theory)<br>04 (Practical) |
| **Total Contact Hours:** 56 Hours (Theory)<br>56 Hours (Practical) | **Formative Assessment Marks:** 40 (Theory)<br>25 (Practical) |
| **Exam Duration:** $2\frac{1}{2}$ Hours (Theory)<br>3 Hours (Practical) | **Semester End Examination Marks:** 60 (Theory)<br>25 (Practical) |

**Course Outcomes (COs):**

**CO1:** Procure Knowledge on Basic Python Programming Concepts and Control Flow.

**CO2:** Design Solutions for Real-time Applications using the concept of Basic & Advanced Data Types in Python.

**CO3:** Develop Efficient Python Applications using Functions, OOP Concepts, File & Exception Handling.

**CO4:** Apply Knowledge Gained on Various Python Libraries for GUI, Data Analysis and Data Visualization.

**Course Content**

| Content | Hours |
|---|---|
| **UNIT – 1** | |
| **Introduction to Features and Applications of Python:** Python Versions; Installation of Python; Python Command Line Mode and Python IDEs.<br>**Python Basics:** Identifiers; Keywords; Data Types; Statements and Expressions; Variables; Python Operators; Precedence and Association; Indentation; Comments; Built-in Functions - Console Input and Console Output; Format Specifiers; Escape Sequences; Type Conversions; Python Libraries; Importing Libraries with Examples; Simple Python Program.<br>**Python Control Flow:** Types of Control Flow; Control Flow Statements - if, if-else, elif, while Loop, break, continue, for Loop Statements; range() and exit() Functions.<br>Skill Based/ Participative/Experiential Learning – Individual Programming Assignment. | **15** |
| **UNIT – 2** | |
| **Strings:** Creating and Storing Strings; str() Function; Accessing String Characters; Operations - Concatenation, Comparison, Slicing and Joining, Traversing; Python String Methods.<br>**Python Sets:** Lists - Creating Lists, Operations, Built-in Functions, Nested Lists; Dictionaries - Creating Dictionaries, Operations, Dictionary Methods; Tuples – Creating, Operations, Built-in Methods.<br>Skill Based/ Participative/Experiential Learning – Quiz. | **14** |
| **UNIT – 3** | |
| **Python Functions:** Definition; Types; Syntax – Defining and Calling Function; Parameters/Arguments – Types, Passing; return Statement; Recursive Functions; Scope and Lifetime of Variables in Functions.<br>**Exception Handling:** Definition – Error, Exception; Types of Errors; Exception Handling using try, except and finally.<br>**File Handling:** File Types; Operations on Files– Create, Open, Read, Write, Close Files; File Names and Paths; Format Operator.<br>**Object Oriented Programming:** Classes - Creating; Objects - Creating, as Arguments, as Return Values; OOPs Concepts – Definition & Examples of Inheritance & Polymorphism. | **13** |

| | |
|---|---|
| Skill Based/ Participative/Experiential Learning – Group Assignment. | |
| **UNIT – 4** | |
| **GU Interface:** Tkinter Module; Window and Widgets; Layout Management - pack, grid and place.<br>**Python SQLite:** SQLite3 Module; SQLite Methods - connect, cursor, execute, close; Connect to Database; Create Table; Operations on Tables- Insert, Select, Update, Delete and Drop Records.<br>**Data Analysis:** NumPy – Introduction; Array Creation using NumPy; Operations on Arrays; Pandas – Introduction; Series and DataFrames; Creating DataFrames from Excel Sheet and .csv File; Operations on DataFrames.<br>**Data Visualization:** Introduction; Matplotlib Library; Different Types of Charts using Pyplot – Line Chart, Bar Chart, Pie Chart and Histogram.<br>Skill Based/ Participative/Experiential Learning – Design a Simple Application using these Concepts. | **14** |

**Text Books:**
1. Introduction to Python Programming: Gowrishankar S et al., 2019, CRC Press.
2. Fluent Python – Clear, Concise and Effective Programming: Luciano Ramalho, 2015, O'Reilly Publications.
3. Building Modern GUIs with tkinter and Python – Building User-Friendly GUI Applications with Ease: Saurabh Chandrakar and Dr. Nilesh B B, BPB Publications.
4. Data Visualization with Python: Mario Döbler, Tim Größmann, 2019, Packt Publishing.

**References:**
1. Think Python - How to Think Like a Computer Scientist: Allen Downey et al., 2nd Edition, 2015, Green Tea Press. (Free Online Link: https://www.greenteapress.com/thinkpython/thinkCSpy.pdf)
2. Advance Core Python Programming: Meenu Kohli, 2021, BPB Publications.
3. Core Python Applications Programming: Wesley J Chun, 3rd Edition, 2012, Prentice Hall Publication.
4. Automate the Boring Stuff: Al Sweigart, 2015, No Starch Press Inc..
5. Data Structures and Program Design using Python: D Malhotra et al., 2021, Mercury Learning and Information LLC.
6. http://www.ibiblio.org/g2swap/byteofpython/read/
7. https://docs.python.org/3/tutorial/index.html
8. https://www.w3schools.com/python/
9. https://www.geeksforgeeks.org/python-programming-language/

# PRACTICAL COMPONENT

## PART A: FUNDAMENTALS OF PYTHON

Write a Python Program to:
1. Implement User I/O Operation.
2. Demonstrate All Arithmetic Operators.
3. Demonstrate various if statements.
4. Demonstrate while loop.
5. Demonstrate for loop with and without range.
6. Demonstrate Identity & Membership Operators.
7. Implement at least 12 Built-in String Methods.
8. Demonstrate the Use of Lists using Built-in Methods.
9. Demonstrate the Use of Dictionaries using Built-in Methods.
10. Demonstrate the Use of Tuples using Built-in Methods.

## PART B: ADVANCED PYTHON PROGRAMMING

Write a Python Program to:
1. Demonstrate a User-Defined Function.
2. Demonstrate Exception Handling.
3. Read & Write on to a File.
4. Demonstrate Object Oriented Programming Concepts.
5. Create a GUI using Tkinter Module.
6. Create SQLite Database and Perform Operations on Tables.
7. Create an Array using NumPy and Perform Array Operations.
8. Create DataFrame from a Spreadsheet using Pandas and Perform DataFrame Operations.
9. Create a Line and Bar Graph using Matplotlib.
10. Create a Pie Chart and Plot a Histogram using Matplotlib.

**Note:** Student has to execute all programs in each part to complete the Lab course.

## Course Articulation Matrix - 232549

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 2 | 3 | 3 | 1 | 2 | - | - | 1 | 1 | 1 | - | 1 |
| CO2 | 1 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | 3 |
| CO3 | 1 | 2 | 2 | - | 2 | - | - | - | - | - | 1 | 3 |
| CO4 | 1 | 2 | 1 | - | 3 | 1 | 1 | 1 | 1 | 2 | 1 | 3 |
| Wtd. Avg. | 1.25 | 2.25 | 2 | 1 | 2.25 | 1 | 1 | 1 | 1 | 1.5 | 1 | 2.5 |

# DSC(6) Syllabus for B.Sc. Computer Science

**Semester V**

| | |
|---|---|
| **Course Code:** 232550 | **Course Title:**<br>**DSC(6) -** Computer Networks (Theory)<br>**DSC(6) Lab -** Computer Networks Lab (Practical) |
| **Course Credits (L:T:P):** 06 (4:0:2) | **Hours of Teaching/Week:** 04 (Theory)<br>04 (Practical) |
| **Total Contact Hours:** 56 Hours (Theory)<br>56 Hours (Practical) | **Formative Assessment Marks:** 40 (Theory)<br>25 (Practical) |
| **Exam Duration:** $2\frac{1}{2}$ Hours (Theory)<br>3 Hours (Practical) | **Semester End Examination Marks:** 60 (Theory)<br>25 (Practical) |

**Course Outcomes (COs):**

**CO1:** Build an Understanding of the Fundamental Concepts of Computer Networking, Identify various Network Topologies and Enumerate the Layers of the OSI Reference Model and TCP/IP.

**CO2:** Familiarize with the use of Physical Layer of a Network Model and Transmission Media & related Terminologies.

**CO3:** Apply Knowledge Gained on Framing, Error Detection & Correction Techniques, Channelization, Access Mechanism, Data Link Control & Protocol and Wired & Wireless LAN.

**CO4:** Identify & Interpret the functions of a Transport & Application Layer & Protocols.

**Course Content**

| Content | Hours |
|---|---|
| **UNIT – 1** | |
| **Introduction to Computer Networks:** Definition; Goals; Structure; Broadcast and Point-To-Point Networks; Network Topology and its various Types; Types of Network; Network software;<br>Design Issues for the Layers; Connection-oriented vs. Connectionless service; Applications of Computer Network; Protocols and Standards; The OSI Reference Model; The TCP/IP Protocol Suite; Comparison between OSI and TCP/IP Reference Model.<br>Skill Based/ Participative/Experiential Learning – Assignment. | **12** |
| **UNIT – 2** | |
| **Physical Layer:** Functions of Physical Layer; Analog and Digital Signals; Transmission Impairment; Data Rate Limits and Performance; Data Transmission Media - Guided Transmission Media, Magnetic Media, Twisted Pairs, Coaxial Cable, Power Lines, Fiber Optics, Wireless Transmission, Electromagnetic Spectrum, Radio Transmission, Microwave Transmission, Infrared Transmission, Light Transmission; Digital Modulation and Multiplexing; Public Switched Telephone Networks; Switching - Circuit Switching, Message Switching and Packet Switching.<br>Skill Based/ Participative/Experiential Learning – Seminar/Quiz. | **15** |
| **UNIT – 3** | |
| **Data Link Layer:** Functions of Data Link Layer; Data Link Control - Framing, Flow and Error Control, Error Detection and Correction, High-Level Data Link Control (HDLC) & Point to Point Protocol (PPP); Channel Allocation Problem; Multiple Access - Radom Access (ALOHA, CSMA, CSMA/CD, CSMA/CA), Controlled Access (Reservation, Polling, Token Passing), Channelization (FDMA, TDMA, CDMA).<br>**Wired & Wireless LAN:** Wired LAN - Ethernet Standards and FDDI; Wireless LAN - IEEE 802.1 Ix and Bluetooth Standards.<br>Skill Based/ Participative/Experiential Learning – Seminar/Quiz. | **15** |

| UNIT – 4 | |
|---|---|
| **Transport Layer:** Functions of Transport Layer; Elements of Transport Protocols - Addressing, Establishing and Releasing Connection; Flow Control & Buffering; Error Control; Multiplexing & De-multiplexing; Crash Recovery. <br> **User Datagram Protocol (UDP):** User Datagram; UDP Operations; Uses of UDP and RPC; Principles of Reliable Data Transfer - Building a Reliable Data Transfer Protocol, Pipelined Reliable Data Transfer Protocol, Go Back-N (GBN), Selective Repeat (SR). <br> **Application Layer:** Functions of Application Layer; Application Layer Protocols - DNS, DHCP, WWW, HTTP, HTTPs, TELNET, FTP, SMTP, POP, IMAP. <br> Skill Based/ Participative/Experiential Learning – Group Assignment. | **14** |

**Text Books:**
1. Computer Networks: Andrew S Tanenbaum, David J Wetherall, 5$^{th}$ Edition, Pearson Education.
2. Data Communication and Networking: Behrouz A Forouzan, 4$^{th}$ Edition, Tata McGraw Hill Publication.

**References:**
1. Computer Networking – A Top-Down Approach: Kuros and Ross, 5$^{th}$ Edition, Pearson Education.
2. Computer Networks – A Systems Approach: Larry L Peterson, Bruce S Davie, 5$^{th}$ Edition, Morgan Kaufmann Publisher, 2011.
3. Data and Computer Communications: William Stallings, 7$^{th}$ Edition, PHI Publications.
4. Data Communication and Computer Networks: Brijendra Singh, PHI Publication.
5. http://highered.mheducation.com/sites/0072967757/index.html

# PRACTICAL COMPONENT

## PART A

1. Prepare Hardware and Software Specification for Basic Computer System and Networking.
2. Study of Different Types of Network Cables and Practically Implement the Cross-Wired Cable and Straight Through Cable using Clamping Tool.
3. Identifying the Networking Devices on a Network.
4. Configure the IP Address of the Computer.
5. Create a Basic Network and Share File and Folders.
6. Study of Basic Network Command and Network Configuration Commands.
7. Installation Process of any Open-Source Network Simulation Software.

## PART B

1. Implement Connecting Two Nodes Using Network Simulator.
2. Implement A Network to Connect Three Nodes considering one Node as a Central Node using Network Simulator.
3. Implement Bus Topology using Network Simulator.
4. Implement Star Topology using Network Simulator.
5. Implement Ring Topology using Network Simulator.
6. Demonstrate the use of Wireless LAN using Network Simulator.
7. Implement FTP (using TCP Bulk Transfer) using Network Simulator.
8. Implement Connecting Multiple Routers & Nodes and Build a Hybrid Topology Network Simulator.
   Links for Open-Source Simulation Software:
   **NS3 Software** - https://www.nsnam.org/releases/ns-3-30/download/
   **Packet Tracer Software** - https://www.netacad.com/courses/packet-tracer
   **GNS3 Software** - https://www.gns3.com/

**Note:** Student has to execute a minimum of 6 programs in each part to complete the Lab course.

## Course Articulation Matrix - 232550

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| CO2 | 3 | 2 | 2 | - | 1 | - | - | - | - | 1 | - | 2 |
| CO3 | 3 | 2 | 2 | - | 1 | - | - | - | - | 1 | - | 2 |
| CO4 | 2 | 2 | 2 | - | 2 | 1 | - | 1 | 1 | 1 | 1 | 2 |
| Wtd. Avg. | 2.5 | 2 | 2 | 1 | 1.5 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |

# SKILL ENHANCEMENT COURSE (SEC)

| | |
|---|---|
| **Course Code:** 23CYST94 | **Course Title:** SEC(3) – Cyber Security |
| **Course Credits (L:T:P):** 03 (3:0:0) | **Hours of Teaching/Week:** 3 Hours |
| **Total Contact Hours:** 42 Hours | **Formative Assessment Marks: 5**0 |
| **Exam Duration: 2** Hours | **Semester End Examination Marks:** 50 |

**Course Outcomes (COs):**
**CO1:** Gain Knowledge on Basics of Cyber Security and its Challenges.
**CO2:** Comprehend the Knowledge gained on Cyber Crimes & Cyber Laws in India.
**CO3:** Analyze and apply knowledge gained on Cyber Security & Laws on Social Media Platforms.

**Course Content**

| | |
|---|---|
| **MODULE – 1: Introduction to Cyber Security** | |
| Defining Cyberspace and Overview of Computer and Web-technology; Architecture of Cyberspace; Communication and Web Technology; Internet; World Wide Web; Advent of Internet; Internet Infrastructure for Data Transfer and Governance; Internet Society; Regulation of Cyberspace; Concept of Cyber Security; Issues and Challenges of Cyber Security. | **14 Hours** |
| **MODULE – 2: Cyber Crime & Cyber Law** | |
| Classification of Cyber Crimes; Common Cyber Crimes - Cyber Crime targeting Computers and Mobiles, Cyber Crime against Women and Children, Financial Frauds, Social Engineering Attacks, Malware and Ransomware Attacks, Zero Day and Zero Click Attacks; Cyber Criminal's Modus-Operandi; Reporting of Cyber Crimes; Remedial and Mitigation Measures; Legal Perspective of Cyber Crime; IT Act 2000 and its Amendments; Cyber Crime and Offences; Organizations dealing with Cyber Crime and Cyber Security in India. | **14 Hours** |
| **MODULE – 3: Social Media Overview & Security** | |
| Introduction to Social Networks; Types of Social Media; Social Media Platforms; Social Media Monitoring; Hashtag; Viral Content; Social Media Marketing; Social Media Privacy; Challenges; Opportunities and Pitfalls in Online Social Network; Security Issues Related to Social Media; Flagging and Reporting of Inappropriate Content; Laws Regarding Posting of Inappropriate Content; Best Practices for the use of Social Media. | **14 Hours** |

**Text Book:**
1. Cyber Crime Impact in the New Millenium: R C Mishra, 2010 Edition, Auther Press.
2. Cyber Security - Understanding Cyber Crimes, Computer Forensics and Legal Perspectives: Sumit Belapure and Nina Godbole, 1st Edition, Wiley India Pvt. Ltd., 2011.

**Reference:**
1. Security in the Digital Age – Social Media Security Threats and Vulnerabilities: Henry A Oliver, Pearson, 2001.
2. Cyber Laws – Intellectual Property & e-Commerce Security: Kumar K, Dominant Publishers.
3. Network Security Bible: Eric Cole et al., 2nd Edition, Wiley India Pvt. Ltd..
4. https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SITA1602.pdf
5. https://mrcet.com/downloads/digital_notes/CSE/III%20Year/CYBER%20SECURITY%20(R2 0A6202).pdf

**NOTE: This Course will be handled by the Department of Computer Science for all Programs offering this Course.**

## Course Articulation Matrix - 23CYST94

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 2 | 1 | 1 | - | 1 | 1 | - | 1 | 1 | 1 | - | 2 |
| CO2 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 2 |
| CO3 | 2 | 2 | 2 | 1 | 2 | 3 | 1 | 3 | 2 | 2 | 1 | 2 |
| Wtd. Avg. | 1.67 | 1.67 | 1.67 | 1 | 1.33 | 2 | 1 | 2 | 1.67 | 1.33 | 1 | 2 |

# SKILL ENHANCEMENT COURSE (SEC)

| | |
|---|---|
| **Course Code:** 23EMPCMS01 | **Course Title:** SEC(3) – Employability Skills |
| **Course Credits (L:T:P):** 03 (3:0:0) | **Hours of Teaching/Week:** 3 Hours |
| **Total Contact Hours:** 42 Hours | **Formative Assessment Marks: 5**0 |
| **Exam Duration: 2** Hours | **Semester End Examination Marks:** 50 |

**Course Outcomes (COs):**

**CO1:** Acquire & Interpret Communication and Behavioral Skills required for Employability.

**CO2:** Procure Critical Skills and IT Literacy required to increase Productivity & Efficiency at Workplace.

**CO3:** Accomplish Skills required to become an Entrepreneur, get Insight on Occupational Health, Safety, Law & Environmental Education.

**Course Content**

| MODULE – 1: Basic Skill Set for Employability | |
|---|---|
| **Communication Skills:** Introduction; Elements of Communication; Perpectives in Communication; Types of Communication; Effective Communication; Basic English Literacy – Functional English, Reading, Writing. <br> **Behavioral Skills:** Personal Strength Analysis – Self Awareness, Articulating Personal Values, Confidence Building; Ethics, Values & Etiquette – Social Relationships & Networks, Acceptance of Peers from different Cultures & Socio-Economic Backgrounds, Collaboration with Team, Characteristics of a Responsible Citizen, Display Professionalism at Work Place. | **13 Hours** |
| **MODULE – 2: Critical Skill Set for Employability** | |
| **Critical Skills:** Interview Skills; Time Management & Planning Skills; Maintaining Efficiency at Workplace; Quality Management; Customer Relationship & Interactions; Handling Setbacks or Rejections and Recover from it with an Action Plan; Value-Based Decisions; Dilemma Situations; Sources & Types of Stress; Stress Management; Grievances & its Management. <br> **IT Literacy:** Basics of Computers – Operating System, Web Browsers, Search Engines, Applications of Computer, e-Mailing Options; Office Software and its Uses; Working with ChatGPT to increase Productivity; e-Commerce; e-Payment; QR/AR Code Generation and Use. | **16 Hours** |
| **MODULE – 3: Entrepreneurship and Occupational Health, Safety, Law & Environmental Education** | |
| **Entrepreneur Skills:** Introduction, Need, Ways to become a Good Entrepreneur, Enabling Environment to become a Good Entrepreneur, Various Govt. Institutions/Schemes promoting Entrepreneurship, Ways to set-up an Enterprise and various aspects involved, Enterprise Maintainance, Learnings from Successful & Unsucessful Entrepreneur examples. <br> **Occupational Health, Safety, Law & Environmental Education:** Occupational Safety, Health & Hygiene; Occupational Hazards – Types & Prevention Method; Environmental Issues & Ethics; Disaster Management; Labor Welfare Legislation, SDGs and its Importance. | **13 Hours** |

**Reference:**
1. English Skills for Technical Students: British Council, Orient Black Swan, 2011.
2. Surrounded by Idiots: Thomas Erickson, The Runaway International Bestseller, 2019.
3. A course in Grammar and Composition: Geetha Nagaraj, Cambridge University Press India Pvt. Ltd..
4. Communication Skills for Professionals: Nira Konar, 3rd Edition, PHI learning Pvt. Ltd..
5. Computer Literacy Basics: Connie Morrison et al., Pearson Publication, 2014.
6. https://ncert.nic.in/vocational/pdf/kees101.pdf
7. https://egyankosh.ac.in/bitstream/123456789/48007/1/Unit-1.pdf
8. https://www.w3schools.com/gen_ai/chatgpt-3-5/index.php
9. https://www.youtube.com/watch?v=5eTKElZLM9Q
10. https://ncert.nic.in/vocational/pdf/kees104.pdf
11. https://www.oecd.org/cfe/leed/Cooney_entrepreneurship_skills_HGF.pdf
12. https://www.researchgate.net/publication/322942645_Developing_Entrepreneurial_Skills_An_Educational_and_Intercultural_Perspective
13. https://www.ilo.org/global/topics/safety-and-health-at-work/areasofwork/occupational-health/lang--en/index.htm
14. https://dgfasli.gov.in/sites/default/files/service_file/Nat-OSH-India-Draft%281%29.pdf
15. https://www.tnteu.ac.in/pdf/environmental.pdf
16. https://www.bdu.ac.in/cde/docs/ebooks/B-Ed/II/ENVIRONMENTAL%20EDUCATION.pdf
17. https://en.wikipedia.org/wiki/Indian_labour_law#:~:text=The%20Minimum%20Wages%20Act%201948,100%25%20of%20the%20total%20wage.
18. https://bharatskills.gov.in/pdf/E_Books/Labor_welfare_legislation.pdf
19. https://sdgs.un.org/goals
20. https://india.un.org/en/sdgs

## Course Articulation Matrix – 23INTCMS01

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 1 | 2 | 2 | - | 2 | 3 | 3 | 2 | 2 | 3 | - | 3 |
| CO2 | 2 | 2 | 2 | - | 3 | 3 | 3 | 2 | 3 | 1 | 3 | 3 |
| CO3 | 1 | 2 | 2 | 1 | 1 | 3 | 3 | 3 | 3 | 1 | 3 | 3 |
| Wtd. Avg. | 1.33 | 2 | 2 | 1 | 2 | 3 | 3 | 2.33 | 2.67 | 1.67 | 3 | 3 |

# DSC(7) Syllabus for B.Sc. Computer Science

**Semester VI**

| Course Code: 232649 | Course Title: <br> **DSC(7) -** Web Technologies (Theory) <br> **DSC(7) Lab -** Web Technologies Lab (JavaScript, HTML, CSS Lab) (Practical) |
|---|---|
| **Course Credits (L:T:P):** 06 (4:0:2) | **Hours of Teaching/Week:** 04 (Theory) <br> 04 (Practical) |
| **Total Contact Hours:** 56 Hours (Theory) <br> 56 Hours (Practical) | **Formative Assessment Marks:** 40 (Theory) <br> 25 (Practical) |
| **Exam Duration:** $2\frac{1}{2}$ Hours (Theory) <br> 3 Hours (Practical) | **Semester End Examination Marks:** 60 (Theory) <br> 25 (Practical) |

**Course Outcomes (COs):**

**CO1:** Acquire knowledge on Internet, WWW & Web Design.

**CO2:** Design & Develop Applications using HTML, CSS & JavaScript.

**CO3:** Implement Servlets & Database Connectivity in Web Application Development.

**CO4:** Optimize Web Application Development with the Knowledge Gained on Web Security.

**Course Content**

| Content | Hours |
|---|---|
| **UNIT – 1** | |
| Introduction and Web Design: Introduction to Internet; WWW and Web 2.0; Web Browsers; Web Protocols and Web Servers; Web Design Principles and Web Site Structure; Client-Server Technologies; Client-Side Tools and Technologies; Server-Side Scripting; URL; MIME; Search Engine; Web Server - Apache, IIS, Proxy Server; HTTP Protocol. <br> HTML: Introduction to HTML & DHTML; Difference between HTML & DHTML; HTML Basics Tags; Formatting Tags in HTML; HTML Page Layout and Navigation Concepts; Semantic Elements in HTML; List; Type of List Tags, Tables and Form Tags in HTML; Multimedia Basics - Images, iFrame, Map Tag; Embedding Audio and Video Clips on a Webpage. <br> Skill Based/ Participative/Experiential Learning – Quiz. | **15** |
| **UNIT – 2** | |
| Introduction to XML: XML Syntax, XML Tree, Elements, Attributes, Namespace, Parser, XSLT DOM, DTD, Schema. <br> Introduction to CSS: CSS Syntax, CSS Selectors, CSS Background Cursor, CSS Text Fonts, CSS List, CSS Tables, CSS Box Modeling, Display Positioning, Floats, CSS Gradients, Shadows, 2D and 3D Transform, Transitions, CSS Animations. <br> Introduction to JavaScript: JavaScript Data Type and Variables, JavaScript Operators, Conditional Statements, Looping Statements, JavaScript Functions, Number, Strings, Arrays, Objects in JavaScript, Window and Frame Objects, Event Handling in JavaScript, Exception Handling, Form Object and DOM, JSON, Browser Object Model. <br> Skill Based/ Participative/Experiential Learning – Simple Application Development. | **16** |
| **UNIT – 3** | |
| Introduction to Servlets: Common Gateway Interface (CGI), Lifecycle of a Servlets, Deploying Servlet, The Servlets API, Reading Servlets Parameters, Reading Initialization Parameters, Handling HTTP Request & Responses, Using Cookies and Sessions, Connecting to a Database using JDBC. <br> Skill Based/ Participative/Experiential Learning – Group Assignment. | **12** |

| UNIT – 4 | |
|---|---|
| Web Security: Authentication Techniques, Design Flaws in Authentication, Implementation Flaws in Authentication, Securing Authentication, Path Traversal Attacks; Injecting into Interpreted Contexts, SQL Injection, NoSQL Injection, XPath Injection, LDAP Injection, XML Injection, HTTP Injection, Mail Service Injection; Types of XSS, <br><br> XSS in Real World, Finding and Exploiting XSS Vulnerabilities, Preventing XSS Attacks. <br> Skill Based/ Participative/Experiential Learning – Case Study. | **13** |

**Text Books:**

1. Programming the World Wide Web: Robert W Sebasta, 4th Edition, Pearson.
2. Web Technologies – HTML, javaScript, PHP, Java, JSP, ASP.NET, XML & AJAX – Black Book: Kogent Learning Solutions Inc., Dreamtech Press, 2009.
3. Web Security for Developers – Real Threats, Practical Defense: Malcolm McDonald, Illustrated Edition, No Starch Press.
4. Internet and Web Application Security: Maike Harwood and Ron Price, 3rd Edition, Jones & Bartlett Learning.

**References:**

1. Web Programming – Building Internet Applications: Chris Bates, 2nd Edition, Wiley Dreamtech Press.
2. Java Server Pages: Hans Bergsten, O'Reilly, SPD.
3. Java Script: D Flanagan, O'Reilly, SPD.
4. Internet and World Wide Web – How to Program: Dietel and Nieto, Pearson.
5. Internet Security – How to Defend Against Attackers on the Web: Mike Harwood, 2nd Edition, Jones & Bartlett Learning.
6. Beginning Web Programming: Jon Duckett, WROX.
7. Web Applications – Concepts and Real-world Design: Knuckles, Wiley-India.
8. https://www.codingninjas.com/studio/library/complete-introduction-to-web-technology
9. https://www.tutorialspoint.com/web_developers_guide/web_basic_concepts.htm
10. https://www.halvorsen.blog/documents/programming/web/web.php

# PRACTICAL COMPONENT

## PART A

1. Design Web Pages for your College containing College Name, Logo, Departments List using href and List Tags.
2. Create a Class Timetable using Table Tag.
3. Write a HTML Code to Design Student Registrations Form for your College Admission
4. Design Web Pages which include Multi-Media Data (Image, Audio, Video, GIFs etc.).
5. Create a Web Page using Frame.
6. Write HTML Code to Develop a webpage having two Frames that divide the Webpage into two equal rows and then divide the row into equal columns. Fill each Frame with a Different Background Color.
7. Write CSS Code to format your ID Card using Inline CSS.
8. Using HTML and CSS, Display Text "Hello India!" on top of an Image of India-Map, using an Overlay.

## PART B

Write JavaScript Program to:
1. Perform Basic Arithmetic Operations.
2. Demonstrate Control Statements.
3. Implement JavaScript Object Concept.
4. Create and Insert Data into an Array.
5. Validate an Email Address.

Using Servlet, Write a Program to:
6. Print System Date & Time.
7. Accept Number from HTML File and Display (Server-side Servlet).
8. Demonstrate the Life-Cycle of a Servlet Application.
9. Create a Dynamic Web Page with DB Connectivity.

**Note:** Student has to execute a minimum of 7 programs in each part to complete the Lab course.

## Course Articulation Matrix - 232649

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-------|------|------|-----|-----|------|-----|-----|------|-----|------|------|------|
| CO1 | 2 | 2 | 2 | - | 3 | 1 | - | 1 | 2 | 1 | - | 2 |
| CO2 | 2 | 2 | 2 | 1 | 2 | - | - | 1 | 2 | 1 | 1 | 2 |
| CO3 | 1 | 1 | 2 | - | 2 | - | - | 1 | 2 | 1 | 1 | 2 |
| CO4 | 1 | 2 | 2 | - | 2 | 1 | 1 | 3 | 2 | 1 | 1 | 2 |
| Wtd. Avg. | 1.5 | 1.75 | 2 | 1 | 2.25 | 1 | 1 | 1.5 | 2 | 1 | 1 | 2 |

# DSC(8) Syllabus for B.Sc. Computer Science

**Semester VI**

| Course Code: 232650 | Course Title: <br> **DSC(8) -** Statistical Computing & R Programming (Theory) <br> **DSC(8) Lab -** R Programming Lab (Practical) |
|---|---|
| **Course Credits (L:T:P):** 06 (4:0:2) | **Hours of Teaching/Week:** 04 (Theory) <br> 04 (Practical) |
| **Total Contact Hours:** 56 Hours (Theory) <br> 56 Hours (Practical) | **Formative Assessment Marks:** 40 (Theory) <br> 25 (Practical) |
| **Exam Duration:** $2\frac{1}{2}$ Hours (Theory) <br> 3 Hours (Practical) | **Semester End Examination Marks:** 60 (Theory) <br> 25 (Practical) |

**Course Outcomes (COs):**

**CO 1:** Design and Develop R Programs using R Constructs.

**CO2:** Acquire Knowledge on Basics of Statistics, Common Probability Distributions and Data Visualization.

**CO 3:** Conduct and Interpret Hypothesis Tests on various Data Sets to Aid Decision Making.

**CO 4:** Implement Simple & Multiple Linear Regression on Data for Procuring Predictive Data and Exert Advanced Graphics on Charts.

**Course Content**

| Content | Hours |
|---|---|
| **UNIT – 1** | |
| **Basic R Programming Concepts:** Introduction of the Language; Identifiers & Constants; Datatypes; Objects/Data Structures in R – Vectors, List, Matrices, Arrays, Data Frames; R Operators; Control Statements – Conditional & Looping; Functions in R Programming; Manipulation Functions – Vectors, Matrix, Strings; Exceptions; Scope of R Variables; Installing & Loading Packages in R; Reading & Writing Files. <br> Skill Based/ Participative/Experiential Learning – Group Discussion. | **15** |
| **UNIT – 2** | |
| **Statistics & Probability:** Basic Data Pre-Processing Techniques; Statistics Basic – Mean, Median, Mode, Standard Deviation, Variance; Probability Basics - Common Probability Distributions; Common Probability Mass Functions - Bernoulli, Binomial, Poisson Distributions; Common Probability Density Functions - Uniform, Normal, Student's T-Distribution. <br> **Basic Data Visualization:** Line Chart, Pie Chart, Histogram & Density Plots, Dot Plots, Box Plots, Scatter Plots. <br> Skill Based/ Participative/Experiential Learning – Activity on Data Collection & Data Pre-Processing. | **13** |
| **UNIT – 3** | |
| **Statistical Testing and Modelling:** Sampling Distributions, Hypothesis Testing, Components of Hypothesis Test, Testing Means, Testing Proportions, Testing Categorical Variables, Errors and Power, Analysis of Variance. <br> Skill Based/ Participative/Experiential Learning – Quiz. | **14** |
| **UNIT – 4** | |
| **Regression & Advanced Plotting:** Data for Modelling – Test & Training Splits, Creating Sample Groups, Data Reduction; Regression - Simple Linear Regression, Multiple Linear Regression, Linear Model Selection and Diagnostics; Advanced Graphics - Plot Customization, Plotting Regions and Margins, Point and Click Coordinate Interaction, Customizing Traditional R Plots, Specialized Text and Label Notation, Defining Colors and Plotting In Higher Dimensions, Representing and Using Colors, 3D Scatter Plots. <br> Skill Based/ Participative/Experiential Learning – Simple Application Development. | **14** |

**Text Books:**

1.  Data Science R – A Step by Step Guide with Visual Illustrations & Examples: Andrew Oleksy, (Independently Published), 2018.
2.  Practical Data Science with R: Nina Zumel and John Mount, Manning, 2014.
3.  Applied Statistics & Probability for Engineers: Bouglas C et al., John Wiley & Sons, 2005.

**References:**

1. The Book of R – A First Course in Programming and Statistics: Tilman M Davies, San Francisco, 2016.
2. Statistical Computing using R Software: Vishwas r Pawgi, Nirali Prakashan Publisher, 2022.
3. https://www.youtube.com/watch?v=KlsYCECWEWE
4. https://www.geeksforgeeks.org/r-tutorial/
5. https://www.tutorialspoint.com/r/index.htm
6. https://www.knowledgehut.com/blog/data-science/probability-and-statistics-for-data-science

# PRACTICAL COMPONENT

## PART A

Write an R Program to:
1. Demonstrate Variables, Constants & Datatypes.
2. Demonstrate R Objects.
3. Demonstrate R Functions.
4. Demonstrate various Operators.
5. Implement a Searching Technique.
6. Implement a Sorting Technique.
7. Demonstrate In-Built Math and String Functions.
8. Demonstrate In-Built Statistical and Probability Functions.

## PART B

Write an R Program to:
1. Perform Linear Algebra Operations on Vectors and Matrices.
2. Demonstrate the Installing and Use of Packages.
3. Load, Manipulate and Analyze Data.
4. Demonstrate various Data Pre-Processing Techniques.
5. Visually Represent Objects by Creating Graphs. (Line Chart, Pie Chart, Histogram & Density Plots, Dot Plots, Box Plots, Scatter Plots**).**
6. Implement Simple & Multiple Linear Regression.
7. Demonstrate Advanced Graphics.

**Note:** Student has to execute a minimum of 6 programs in each part to complete the Lab course.

## Course Articulation Matrix - 232650

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 2 | 2 | 3 | 1 | 2 | - | - | - | 2 | - | - | 2 |
| CO2 | 1 | 2 | 2 | - | 1 | - | - | - | 1 | 1 | - | 3 |
| CO3 | 2 | 2 | 2 | - | 2 | 1 | 1 | 1 | 1 | 1 | - | 3 |
| CO4 | 1 | 2 | 2 | - | 2 | 1 | 1 | - | 1 | 1 | 1 | 3 |
| Wtd. Avg. | 1.5 | 2 | 2.25 | 1 | 1.75 | 1 | 1 | 1 | 1.25 | 1 | 1 | 2.75 |

# SKILL ENHANCEMENT COURSE (SEC)

| | |
|---|---|
| **Course Code:** 23LORCMS01 | **Course Title:** SEC(4) - Logical Reasoning |
| **Course Credits (L:T:P):** 02 (2:0:0) | **Hours of Teaching/Week:** 2 Hours |
| **Total Contact Hours:** 28 Hours | **Formative Assessment Marks:** 50 |
| **Exam Duration: 2** Hour | **Semester End Examination Marks:** 50 |

**Course Outcomes (COs):**

**CO1:** Analyze and Design better Solutions for Day-to-Day Situations/Challenges.
**CO2:** Develop and Interpret Data in an efficient way while Solving Problems.
**CO3:** Apply Critical Thinking to Real-time Situations for better Problem Solutions.

**Course Content**

| MODULE – 1: Arithmetic Reasoning | |
|---|---|
| Analytical Thinking; Syllogistic Logic; Problem Solving; Number System; LCM & HCF; Divisibility Test; Surds & Indices; Logarithms; Ratio, Proportions and Variations; Partnership; Time, Speed and Distance; Work Time Problems. | **10 Hours** |
| **MODULE – 2: Data Interpretation** | |
| Numerical Data Tables; Line Graphs, Bar Charts, Pie Charts, Mix Diagrams; Geometrical Diagrams and other forms of Data Representation. | **09 Hours** |
| **MODULE – 3: Lateral Thinking, Reasoning & Logic** | |
| Verbal and Non-Verbal Logic; Family Tree; Linear Arrangements; Circular and Complex Arrangement; Conditionality and Grouping; Sequencing and Scheduling; Selections; Networks; Venn Diagram in Logical Reasoning. | **09 Hours** |

**Text Books:**
1. A Modern Approach to Verbal and Non-Verbal Reasoning: R S Agarwal, Sultan Chand and Sons, New Delhi.
2. Quantitative Aptitude: R S Agarwal, Sultan Chand and Sons, New Delhi.

**References:**
1. Verbal and Non-Verbal Reasoning: Dr. Ravi Chopra, MacMillan, India.
2. Lateral Thinking: Dr. Edward DeBono, Penguin Books, New Delhi.

## Course Articulation Matrix – 23LORCMS01

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 2 | 3 | 3 | - | 1 | 1 | 1 | - | 1 | 1 | - | 2 |
| **CO2** | 2 | 2 | 2 | 1 | 2 | 1 | - | - | 1 | 2 | 1 | 2 |
| **CO3** | 2 | 3 | 3 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 |
| **Wtd. Avg.** | **2** | **2.67** | **2.67** | **1.5** | **1.33** | **1.33** | **1** | **1** | **1** | **1.33** | **1** | **2** |

| Course Code: 23INTCMS01 | Course Title: SEC(4) - Internship |
|---|---|
| Course Credits: 02 | Hours of Teaching/Week: --- |
| Total Contact Hours: (90 Hours Internship) | Formative Assessment Marks: 100 |

**Note: This course will run as per the guidelines defined by the BoS, Computer Science, University of Mysore, Mysuru.**

**Course Outcomes (COs):**

**CO1:** Integrate Theory and Practice of the area selected for Internship to Explore Career Opportunities prior to Graduation.

**CO2:** Develop Communication, Interpersonal, Work Habits, Attitude and other Critical Skills required for a job.

Internship to be assessed for 100 Marks, C1 to be conducted for 50 Marks & C2 to be conducted for 50 Marks. There will be no C3 for Internship.

## Course Articulation Matrix – 23INTCMS01

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | - | - | 1 | 3 | 3 | 2 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | 2 | 2 |
| Wtd. Avg. | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | 2 | 2 |

# Continuous Internal Assessment/ Evaluation Pattern for DSC

Total marks for each course shall be based on continuous assessments and semester end examinations. The pattern is 40:60 for IA and Semester End Theory Examinations respectively and 50:50 for IA and Semester End Practical Examinations respectively.

| DSC | THEORY | PRACTICAL |
|---|---|---|
| Total Marks | 100 Marks | 50 Marks |
| Continuous Assessment – 1 (C1) | 20 Marks | 10 Marks |
| Continuous Assessment – 2 (C2) | 20 Marks | 15 Marks |
| Semester End Examination (C3) | 60 Marks | 25 Marks |

# Continuous Internal Assessment/ Evaluation Pattern for Internship/Logical Reasoning(SEC)

Total marks for each course shall be based on continuous assessments and semester end examinations. The pattern is 50:50 for IA and Semester End Examinations respectively.

| INTERNSHIP /LOGICAL REASONING (SEC) | THEORY/ PRACTICAL |
|---|---|
| Total Marks | 100 Marks |
| Continuous Assessment – 1 (C1) | 50 Marks |
| Continuous Assessment – 2 (C2) | 50 Marks |

# Continuous Internal Assessment/ Evaluation Pattern for Cyber Security/ Employability Skills (SEC)

Total marks for the course shall be based on continuous assessments and semester end examinations. The pattern is 50:50 for IA and Semester End Examinations respectively.

| SEC | THEORY |
|---|---|
| Total Marks | 100 Marks |
| Continuous Assessment – 1 (C1) | 20 Marks |
| Continuous Assessment – 2 (C2) | 30 Marks |
| Semester End Examination (C3) | 50 Marks |

## Evaluation Process of C1, C2 and C3 Marks shall be as follows:

a) The first component (C1) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, project work etc. This assessment and score process should be completed after completing 50% of syllabus of the course and within 45 working days of semester program.

b) The second component (C2) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, internship/industrial practicum/project work, quiz etc. This assessment and score process should be based on completion of remaining 50% of syllabus of the course of the semester.

c) During the 17th – 19th week of the semester, a semester end examination shall be conducted by the college for each course. This forms the third and final component of assessment (C3) and the maximum marks for the final component will be 60%.

d) In case of a student who has failed to attend the C1 or C2 on a scheduled date, it shall be deemed that the student has dropped the test. However, in case of a student who could not take the test on scheduled date due to genuine reasons, such a candidate may appeal to the principal. The principal in consultation with the concerned teacher shall decide about the genuineness of the case and decide to conduct special test to such candidate on the date fixed by the concerned teacher, but before commencement of the concerned semester end examinations.

e) For assignments, tests, case study analysis etc., of C1 and C2, the students should bring their own answer scripts (A4 size), graph sheets etc., required for such tests/assignments and these be sealed/signed by the concerned department at the time of conducting tests/assignment/project work etc.

f) The outline for continuous assessment activities for Component-I (C1) and Component-II (C2) of a course shall be as under:

| DSC | C1 Marks | C2 Marks | Total Marks |
|---|---|---|---|
| Session Test | 20 | - | 20 |
| Any other Assessment Pedagogy | - | 20 | 20 |
| **Total** | **20** | **20** | **40** |

- For practical course of full credits, seminar shall not be compulsory. In its place, marks shall be awarded for Practical Record Maintenance (the marks is 25 (10 + 15) and 25. Evaluated for a total of 50 Marks).

- Conduct of Test, Seminar, Case study/Assignment etc., can be either in C1 or in C2 component as decided by the college and concerned department/teacher.

- The teachers concerned shall conduct test/seminar/case study etc., The students should be informed about the modalities well in advance. The evaluated courses assignments during component I (C1) and component II (C2) of assessment are immediately provided to the candidates after obtaining acknowledgement in the register by the concerned teacher(s) and maintained by the Department. Before commencement of the semester end examination, the evaluated test, assignment etc., of C1 and C2 shall be obtained back to maintain them till the announcement of the results of the examination of the concerned semester.

g) The marks of the internal assessment shall be published on the notice board of the department/college for information of the students.

h) The internal assessment marks shall be communicated to the CoE at least 10 days before the commencement of the semester end examinations and the CoE shall have access to the records of such periodical assessments.

i) There shall be no minimum in respect of internal assessment marks.

j) Internal assessment marks may be recorded separately. A candidate who has failed or rejected the result, shall retain the internal assessment marks.

# Scheme of Valuation for Practical Examinations

C1 and C2 are internal tests to be conducted during 8th and 16th weeks respectively of the semester. C3 is the semester-end examination conducted for 3 hours. The student will be evaluated on the basis of procedure development and its execution. The student has to compulsorily submit the practical record for evaluation during C2. For C3, the record has to be certified by the Head of the Department.

• The student is evaluated for 25 marks in C1 and C2 as per the following scheme:

    Part-A Program(C1): 10 marks

    Part-B Program(C2): 10 marks + Record: 05 marks = 15 marks

• The student is evaluated for 25 marks in C3 as per the following scheme:

| Assessment Criteria | | Marks |
|---|---|---|
| Program - 1 from Part A | Writing the Program | 10 |
| Program - 2 from Part B | | |
| Execution and Formatting (Any one program: Decided by the External Examiner) | | 10 |
| Viva Voce | | 05 |
| **TOTAL** | | **25** |

# Scheme of Valuation for Internship

C1 and C2 are internal assessments to be conducted during 8th and 16th weeks respectively of the semester. The student will be evaluated on the basis of presentation skills and project development. The student has to compulsorily submit the project report for evaluation during C2. The report has to be certified by the Head of the Department and the Mentor/Supervisor.

The student is evaluated for 50 marks each in C1 and C2 as per the following scheme:

    Project Progress Presentation (C1): 25 marks + Report: 25 marks = 50 marks

    Project Progress Presentation (C2): 25 marks + Report: 25 marks = 50 marks

The Internship report shall be prepared on the following guidelines.

1. Size of the Internship report shall be between 5-10 pages, printed on both sides on A4 paper. The text should be of 12pt to 14pt size, one-half or double spaced for maximum readability.

2. Two copies should be submitted. One copy of the report shall be submitted to the college, duly signed by the Teacher In-Charge, and the other copy shall be retained by the student.

# DSC Computer Science Theory Question Paper Pattern

**Max. Marks:** 60 Marks                                      **Exam Duration:** $2\frac{1}{2}$ Hours

**Instructions: Paper Setting**
- The Question Paper is divided into 2 parts: Part - A and Part – B.
- Part – A: Should consist of 12 Questions (3 Questions from each Unit).
- Part – B: Should consist of 4 Main Questions (1 from Each Unit) with 2 Sub Questions where internal split is permitted.

## PART – A

**Answer any EIGHT Questions. Each Question carries 2 Marks.**                **8Q X 2M = 16 Marks**

1. a.
   b
   c.
   .
   .
   k.
   l.

## PART – B

**Answer ALL the Questions. Each Main carries 11 Marks.**                **4Q X 11M = 44 Marks**

2. a.
   b.
              OR
   c.
   d.

3. a.
   b.
              OR
   c.
   d.

4. a.
   b.
              OR
   c.
   d.

5. a.
   b.
              OR
   c.
   d.

# Cyber Security/ Employability Skills Theory Question Paper Pattern

**Max. Marks:** 50 Marks                                    **Exam Duration:** 2 Hours

**Instructions: Paper Setting**
- The Question Paper is divided into 2 parts: Part – A and Part – B.
- Part – A: Should consist of 12 Sub Questions (4 Questions from each Unit).
- Part – B: Should consist of 3 Main Questions (1 from Each Unit) with 2 Sub Questions where internal split is permitted.

## PART – A

**Answer any TEN Questions. Each Question carries 2 Marks.**          **10Q X 2M = 20 Marks**

1.          a.
   b
   c.
   .
   .
   k.
   l.

## PART – B

**Answer ALL the Questions. Each Main Carries 10 Marks.**          **3Q X 10M = 30 Marks**

2. a.
   b.
           OR
   c.
   d.

3. a.
   b.
           OR
   c.
   d.

4. a.
   b.
           OR
   c.
   d.

# Logical Reasoning (SEC) Theory Question Paper Pattern

**Max. Marks:** 50 Marks                                    **Exam Duration:** 2 Hour

**Instructions: Paper Setting**
- The Question Paper consists of 3 Main Questions.
- Question 1: Should consist of 10 Questions (Multiple Choice Questions – minimum 3 from Each Unit).
- Question 2: Should consist of 3 Questions (1 from Each Unit) where internal choice and internal split is permitted.
- Question 3: Should consist of 3 Questions (1 from Each Unit) where internal split is permitted.

**1. Answer all TEN Questions. Each Question carries 1 Mark.**          **10Q X 1M = 10 Marks**

a.
b.
.
.
.
j.

**2. Answer any TWO Questions. Each Question carries 5 Marks.**          **2Q X 5M = 10 Marks**

a.
b.
c.

**3. Answer ALL Question. Question carries 10 Marks.**          **3Q X 10M = 30 Marks**
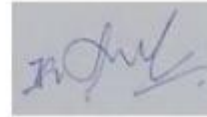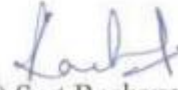
a.
b.
c.

# APPROVED BY THE FOLLOWING BoS MEMBERS

(1) Smt. Hamsaveni L

(2) Dr. Suresh K

(3) Smt. Lavanya P G

(4) Smt. Rachana C R

— ABSENT —

(5) Sri. Santhosh Kumar

(6) Sri. Mahendra J M

(7) Smt. Shruthy Poonacha

(8) Smt. Radhika Rani

SBRRMahajana FirstGradeCollegeMysore

MahajanaEducationSociety(R.
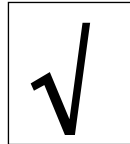)EducationtoExcel

**SBRRMAHAJANAFIRSTGRADECOLLEGE(Autonomous)**

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# BOARDOF STUDIES

# DEPARTMENT OF COMPUTERAPPLICATION

UG   √

PG

# NEPSyllabiforVandVISemesterBCAProgramme

# 2023-24

# DepartmentofComputerApplication

## MOTTO:

### *Technology forBetterFuture*

## VISION:

### *Technologyforall*

## MISSION:

- To enhance students Analytical and Technical skills.

- **To Groom them to handle any Industry related Challenges.**

- To make them sustainable in the ever-changing Technology.

- **To Increase their efficiency in programming**

  **language, coding and      Application**

  **Development.**

## ProgramOutcomes:BCA(3Years)Degree

1. **Domainknowledge:**Gainingadequateknowledgeonbasicprinciplesandapplications.

2. **ProblemAnalysis:**ImprovedreasoningwithstrongmathematicalabilitytoIdentify,formulateandanalyzeproblemsandexhibitingknowledgeondatastructures andalgorithms.

3. **Design and Development of Solutions:** Ability to design and development ofalgorithmic solutions to real world problems and acquiring a minimum knowledgeon statistics and optimization problems. Establishing excellent skills in applyinganddesignstrategiesforsolvingcomplexproblems.

4. **Investigation:**AcquiringsufficientknowledgeinComputerscienceandApplication andable tothinkindependently.

5. **Modern Tool Usage:** Identify, select and use a modern scientific and IT tool ortechnique for modeling, prediction, data analysis and solving problems in the areaofComputer Scienceandequippingwithmoderntools.

6. **ComputerandSociety:**Abilitytoanalyzeimpactsofcomputingonindividuals,organizationsandsociety.

7. **Environmentandsustainability**:Understandtheimpactoftheprofessionalsolutionsinsocietalandenvironmentalcontexts,exhibittheknowledgeofandneedforsustainabledevelopment.

8. **MoralandEthicalvalues:**Exhibitingprofessionalethicstomaintaintheintegralityinaworking environmentandalsohaveconcernonsocietalimpacts.

9. **Individualand Teamwork**: Individualcontributiontoachieveacommongoal.

10. **Communication:**Communicateeffectivelyusingtechnicalterms,abletocomprehend,writeeffectivereports,designdocumentation,makeeffectivepresentations,give andreceiveclearinstructions.

11. **ProjectManagementandFinance:**Practicingandmanagingofexistingprojects,independentandlaunchownprojects.

12. **LifelongLearning:**Continuousindependent learner.

# The objectives of the BCA Program

1. The primary objective of this program is to provide a foundation of computingprinciplesandbusinesspracticesforeffectivelyusing/managinginformationsystemsandenterprisesoftware

2. It helps students analyze the requirements for system development and exposesstudentstobusiness softwareandinformationsystems

3. This course provides students with options tospecialize in legacy applicationsoftware,systemsoftwareor mobile applications

4. To produce outstanding IT professionals who can apply the theoretical knowledgeintopracticeintherealworldanddevelopstandaloneliveprojectsthemselves

5. Toprovideopportunityforthestudyofmodernmethods ofinformationprocessingandits applications.

6. To develop among students, the programming techniques and the problem-solvingskillsthroughprogramming

7. To prepare students who wish to go on to further studies in computer science andrelatedsubjects.

8. To acquaint students to Work effectively with a range of current, standard, OfficeProductivitysoftwareapplications

# Course Structure for III Year

| | | | V SEMESTER | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|

| Course | Course Code | Title | Hours /Week | | Credits | Maximum Marks | | | Exam Duration(Hours) | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | IA | | Exam | | |
| | | | L | T/P | L: T:P | C1 | C2 | C3 | | |
| DSC (13) | 235529 | Design and Analysis of Algorithm | 4 | 0 | 4:0:2 | 20 | 20 | 60 | 2½ | 150 |
| DSC (13) LAB | | Design and Analysis of Algorithm lab | 0 | 4 | | 10 | 15 | 25 | 3 | |
| DSC (14) | 235530 | Statistical Computing and R Programming | 4 | 0 | 4:0:2 | 20 | 20 | 60 | 2½ | 150 |
| DSC(14) LAB | | R Programming lab | 0 | 4 | | 10 | 15 | 25 | 3 | |
| DSC(15) | 235531 | Software Engineering | 4 | 0 | 4:0:0 | 20 | 20 | 60 | 2½ | 100 |
| DSE(1) | 23DSEBCA01 23DSEBCA02 | A. Cloud Computing B. Business Intelligence (any one to be opted) | 3 | 0 | 3:0:0 | 20 | 20 | 60 | 2½ | 100 |
| VOC(1) | 23VOCBCA01 | Digital Marketing | 3 | 0 | 3:0:0 | 20 | 20 | 60 | 2½ | 100 |

| | | | VI SEMESTER | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|

| Course | Course Code | Title | L | T/P | L: T:P | C1 | C2 | C3 | Exam Duration(Hours) | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|
| DSC (16) | 235629 | Artificial Intelligence and Applications | 4 | 0 | 4:0:2 | 20 | 20 | 60 | 2½ | 150 |
| DSC (16) LAB | | Artificial Intelligence and Applications Lab | 0 | 4 | | 10 | 15 | 25 | 3 | |
| DSC (17) | 235630 | PHP and MySQL | 4 | 0 | 4:0:2 | 20 | 20 | 60 | 2½ | 150 |
| DSC(17) LAB | | PHP and MySQL Lab | 0 | 4 | | 10 | 15 | 25 | 3 | |
| PRO | 23PROBCA01 | Project | 0 | 8 | 0:0:4 | 20 | 20 | 60 | 2½ | 100 |
| DSE(2) | 23DSEBCA03 23DSEBCA04 | A. Fundamentals of Data Science B. Mobile Application Development (any one to be opted) | 3 | 0 | 3:0:0 | 20 | 20 | 60 | 2½ | 100 |
| VOC(2) | 23VOCBCA02 | Web Content Management System | 3 | 0 | 3:0:0 | 20 | 20 | 60 | 2½ | 100 |
| INT | 23INTBCA01 | Internship | 2 | 0 | 2:0:0 | 25 | 25 | - | - | 50 |

| Course Code:235529 | Course Title: DSC (13) Design and Analysis of Algorithm<br>DSC(13)-Lab Design and Analysis of Algorithm laboratory |
|---|---|
| CourseCredits:04 | Hours of Teaching/Week:04Theory+4Lab |
| TotalContactHours:60Theory<br><br>60 Practical | FormativeAssessmentMarks:40Theory<br><br><br>FormativeAssessmentMarks:25 Lab |
| ExamDuration:21/2Hours<br><br>3Hours | Semester End<br>ExamMarks:60(Theory)<br>25(Lab) |

**Course Outcomes(COs):**

**CO1:** Understand the fundamental concepts of algorithms and their complexity, including time and space Complexity, worst-case and average-case analysis, and Big-O notation.

**CO2**: Analyze the brute force approach and Decrease and conquer.

**CO3**: Analyze and compare the time and space complexity of algorithms with other algorithmic techniques.

**CO4**: Evaluate the performance of Sorting, Searching, Graph traversal, Decrease-and-Conquer,
Divide-and-Conquer and Greedy Technique and Apply various algorithm design to real-world problems and evaluate their effectiveness

**Course Content**

| Content | Hours |
|---|---|
| **Unit-1** | |
| What is an Algorithm? Fundamentals of Algorithmic problem solving, Fundamentals of the Analysis of Algorithm Efficiency, Analysis Framework, Units for measuring Running time, Orders of Growth Worst-case, Best case and Average-case efficiencies.<br>Asymptotic Notations: Introduction, O-notation, $\Omega$-notation, $\theta$-notation, mathematical analysis of non-recursive algorithms ,mathematical analysis of recursive algorithms. | 15 |

| Unit-2 | |
|---|---|
| Brute Force & Exhaustive Search: Introduction to Brute Force approach, Selection Sort and Bubble Sort, Sequential search. Exhaustive Search- Travelling Salesman Problem and Knapsack Problem, Depth First Search, Breadth First Search. | 15 |
| **Unit-3** | |
| Decrease-and-Conquer: Introduction, Insertion Sort, Topological Sorting Divide-and-Conquer: Introduction, Merge Sort, Quick Sort, Binary Search, Binary Tree traversals and related properties. | 15 |
| **Unit-4** | |
| Greedy Technique: Introduction, Prim's Algorithm ,Kruskal's Algorithm, Dijkstra's Algorithm, Lower-Bound Arguments, Decision Trees, P Problems, NP Problems, NP Complete Problems, Challenges of Numerical Algorithm | 15 |

### Text Books:

1. Introduction to the Design and Analysis of Algorithms, AnanyLevitin:2nd Edition,2009, Pearson,

2. Computer Algorithms/C++, Ellis Horowitz, Sat raj Sahni and Rajasekaran, 2ndEdition,2014, Universities Press.

### Reference:

1. Introduction to Algorithms, Thomas H. Cormen, Charles E. Leiserson, Ronal. Rivest, Clifford Stein,
2. 3rd Edition, PHI.4Designand Analysis of Algorithms, Sridhar, Oxford (Higher Education)

Web Reference:

1. [Algorithm Design and Analysis |My Mooc (my-mooc.com)](my-mooc.com)

2. [Design and analysis of algorithms-Course(nptel.ac.in)](nptel.ac.in)

## Lab Programs

1. Write a program to sort a list of N elements using Selection Sort Technique.
2. Write a program to perform Travelling Salesman Problem
3. Write program to implement Dynamic Programming algorithm for the 0/1Knapsackproblem.
4. Write a program to perform Knapsack Problem using Greedy Solution
5. Write program to implement the DFS and BFS algorithm for a graph.
6. Write a program to find minimum and maximum value in an array using divide and con
7. Write a test program to implement Divide and Conquer Strategy. Eg: Quicksort algorithm for sorting list of integers in ascending order.
8. Write a program to implement Merge sort algorithm for sorting a list of integers in ascending order.
9. Sort a given set of n integer elements using Merge Sort method and compute its time complexity. Run the program for varied values of n> 5000, and record the time taken to sort.
10. Sort a given set of n integer elements using Quick Sort method and compute its time complexity. Run the program for varied values of n> 5000 and record the time take n to sort.
11. Write C program that accepts the vertices and edges for a graph and store sit as an adjacency matrix.
12. Implement function to print In-Degree, Out-Degree and to display that adjacency matrix.
13. Write program to implement backtracking algorithm for solving problems like N queens.
14. Writeaprogramtoimplementthebacktrackingalgorithmforthesumofsubset sproblem
15. Writeprogramtoimplementgreedyalgorithmforjobsequencingwithdeadlin es.
16. WriteprogramtoimplementDynamicProgrammingalgorithmforthe OptimalBinarySearchTreeProblem.
17. WriteaprogramthatimplementsPrim'salgorithmtogenerateminimumcosts panningTree.
18. WriteaprogramthatimplementsKruskal'salgorithmtogenerateminimumco stspanningtree.

### CourseArticulationMatrix-235529

|      | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1  | 2   | 2   | 1   | 2   | 1   | 1   | -   | 1   | -   | 1    | -    | 1    |
| CO2  | 2   | 1   | -   | 2   | -   | 1   | 1   | 1   | 2   | 1    | 1    | 1    |
| CO3  | 2   | 1   | -   | 2   | -   | 1   | -   | 1   | -   | 1    | -    | 1    |
| CO4  | 2   | 1   | 3   | 2   | 1   | 2   | 2   | 1   | 1   | -    | 2    | 1    |
| W. A | 2   | 1.25| 1   | 2   | 0.5 | 1.25| 0.6 | 1   | 0.75| 0.75 | 0.75 | 1    |

| Course Code:235530 | Course Title: DSC (14) Statistical Computing &R Programming R Programming Lab |
|---|---|
| **CourseCredits:**04 | **Hours of Teaching/Week:**04Theory+4Lab |
| **TotalContactHours:**60Theory 60 Practical | **FormativeAssessmentMarks:**40Theory **FormativeAssessmentMarks:**25 Lab |
| **Exam Duration:** 2 $^{1/2}$ Hours 3Hours | **Semester End ExamMarks:**60(Theory) 25(Lab) |

## Course Outcomes:

**CO1:** Explore fundamentals of statistical analysis in the R environment and understand key terminologies, concepts and techniques employed in Statistical Analysis.

**CO2:** Define Calculate Implement Probability and Probability Distributions

to solve a wide variety of problems.

**CO3:** Conduct and interpret a variety of Hypothesis Tests to aid Decision Making.

**CO4:** Understand, Analyze, and Interpret Correlation

Probability and Regression to analyses the under lying

relationships between different variables.

## Course Content

| Content | Hours |
|---|---|
| **Unit-1** | |
| Introduction of 'R' language, numeric, arithmetic, assignment, and vectors, Matrices and Arrays, Non-numeric Values, Lists and Data Frames, Special Values, Classes, and Coercion, Basic Plotting. Reading and writing files, Programming, Calling Functions, Conditions and Loops: standalone statement with illustrations in exercise ,stacking statements, coding loops, Writing Functions, Exceptions, Timings, and Visibility. | 15 |
| **Unit-2** | |
| Statistics And Probability, basic data visualization, probability, cumulative distributions, probability distributions: mass functions, Bernoulli, binomial, Poisson distributions, common probability density functions, uniform, normal& student's distribution. | 15 |

| **Unit-3** | |
|---|---|
| Statistical testing and modelling, sampling distributions, hypothesis testing, components of hypothesis test, testing means, testing proportions, testing categorical variables, errors and power , Analysis of variance. | 15 |
| Unit-4 | |
| Simple linear regression, multiple linear regression, linear model selection and diagnostics. Advanced graphics: plot customization, plotting regions and margins, point and click coordinate interaction, customizing traditional R plots, specialized text and label notation. Defining colors and plotting in higher dimensions, representing and using color, 3D scatterplots. | 15 |

**Text Books:**
1.  "The book of R: A first course in programming and statistics", Tillman M. Davies, San Francisco, 2016.
2.  "Statistical computing using R software", Vishwas R. Pawgi, Nirali prakashan publisher, e1 edition, 2022.

**Web References:**
1.  Home|spoken-tutorial.org
2.  R-Course(swayam2.ac.in)
3.  BestRProgrammingCourses&Certifications[2023]|CourseraOnlineLearning

## Lab Programs
### PART-A

1. Write a R program for different types of data structures in R.

2. Write a R program that include variables, constants, datatypes.

3. Write a R program that include linear algebra operations on vectors and matrices.

4. Write a R Program to create, name, add , delete and update list elements.

5. Write a R Program to create two data frames and perform the following

   a. Combine Vertically two data frames
   b. Combine Horizontally two data frames

6. Write a R program for any visual representation of an object with creating graphs using graphic functions: Plot(), Hist (), Line chart(), Pie(), Boxplot(),Scatterplots().

7. Write a R Program for Quick sort implementation, Binary Search tree.


### PART-B

8. Write a R program to find a factorial using function ().

9. Write a R program to create functions with arguments.


10. Write a R program for calculating cumulative sums, and products, minima maxima and calculus.

11. Write a R program that include different operators, control structures, default values for arguments, returning complex objects.

12. Read the data from csv file, represent it in data frame and find the minimum, maximum, mean, median of all numeric data columns.


13. Write a R program to install and load the scatter plot 3d package.

14. Write a program to create an any application of Linear Regression in multivariate context for predictive purpose.

15. Write a R program for with any data sets containing data frame objects, indexing and sub setting data frames, and employ manipulating and analyzing data.


16. Write a R program for finding stationary distribution of Markanov chains.

**CourseArticulationMatrix-235530**

|  | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| CO1 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | - | - | - | - | 1 |
| CO2 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 3 | - | - | 1 |
| CO3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 3 | 1 | 3 | 3 |
| CO4 | 2 | 2 | 2 | 3 | 1 | 1 | 1 | - | 3 | 1 | 3 | 3 |
| W. A | 2 | 2 | 1.5 | 2 | 1 | 1 | 1 | .5 | 2.25 | .5 | 1.5 | 2 |

| Course Code:235531 | Course Title: DSC(15)Software Engineering |
|---|---|
| CourseCredits:04 | Hours of Teaching/Week:04 Theory |
| TotalContactHours:60Theory | FormativeAssessmentMarks:40Theory |
| Exam Duration: 2 $^{1/2}$ 3 Hours | Semester End ExamMarks:60(Theory) |

## Course Outcomes:

**CO1:** Assess professional and ethical responsibility. Use the techniques, skills and modern engineering tools necessary for software engineering practice.

**CO2:** Design a software system, component or process to meet the desired needs within realistic constraints.

**CO3:** Differentiate system models. Use UML diagrams and apply design patterns.

**CO4:** Illustrate different testing techniques.

| Content | Hours |
|---|---|
| **Unit-1** | |
| **OVERVIEW:** Introduction; Software engineering ethics; Software process models; Process activities; Coping with change; Agile software development: Agile methods; Plan-driven and agile development. | 15 |
| **Unit-2** | |
| **REQUIREMENTS ENGINEERING:** Functional and non-functional requirements; Software requirements document; Requirement's specification; Requirements engineering processes; Requirement's elicitation and analysis; Requirement's validation; Requirements management. | 15 |

| Unit-3 | |
|---|---|
| **SYSTEM MODELING:** Context models; Interaction models- Use case modeling, Sequence diagrams; Structural models- Class diagrams, Generalization, Aggregation; Behavioral Models-Data-driven modeling, Event-driven modeling; Model-driven engineering. **ARCHITECTURAL DESIGN:** Architectural design decisions; Architectural views; Architectural Patterns-Layered architecture, Repository architecture, Client–server architecture Pipe and filter architecture, Introduction to Devops GitHub, Bit Bucket, Jenkins, Puppet. | 15 |
| Unit-4 | |
| **DESIGN AND IMPLEMENTATION**: Object-oriented design using the UML- System context and interactions, Architectural design, Object class identification, Design models, Interface specification; Design patterns; Implementation issues. **SOFTWARE TESTING:** Development testing- Unit testing, Choosing unit test cases, Component testing, Systemtesting.Test-drivendevelopment; Release testing;Usertesting- Alpha, Beta, Acceptance testing. | 15 |

Text Books:
 **1.**"Software Engineering" IanSomerville8thEdition, Pearson Education, 2009.

 **References Books:**
 **1 .** WamanSJawadekar, "Software Engineering Principles and Practice", Tata Mc Graw Hill, 2004.
 **2 .**Roger's.Pressman,"APractitionersApproach",7thEd ition,McGraw-Hill,2007.PJalote,"AnIntegratedApproachtosoftware Engineering",NarosaPublication.

 **Web References:**

1. Software Engineering - Course (nptel.ac.in)

2. Towards a super collaborative software engineering MOOC | Companion Proceedings of the 36th InternationalConference on Software Engineering(acm.org)

**CourseArticulationMatrix235531**

|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 2 | 1 | 3 | 1 | 2 | 3 | 3 | 3 | 2 | 2 | 1 | 2 |
| **CO2** | 1 | 2 | 3 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 3 |
| **CO3** | 1 | 2 | 3 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 3 |
| **CO4** | 1 | 2 | 2 | 3 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 3 |
| **W.A** | 1.25 | 1.75 | 2.75 | 2 | 2 | 1.75 | 1.75 | 1.75 | 2 | 1.5 | 1.75 | 2.75 |

| Course Code:23DSEBCA01 | Course Title: DSE (1)Cloud Computing |
|---|---|
| **CourseCredits:**03 | **Hours of Teaching/Week:**03 Theory |
| **TotalContactHours:**45Theory | **FormativeAssessmentMarks:**40Theory |
| **Exam Duration:** 2 ½ Hours 3Hours | **Semester End ExamMarks:**60(Theory) |

**Course Outcomes(COs):**

CO1: Acquiring knowledge on cloud computing basics, different computing paradigms, applications of cloud in Scientific, Geoscience, Business and Customer applications.

CO2: Analyzing the cloud architecture with different Cloud Service Models and Visualization concept.

CO3: Implementing the cloud application programming, Aneka platform and other management tools in industry such as Amazon Web Service, Google App Engine and Microsoft Azure.

| Content | Hours |
|---|---|
| **Unit-1** | |
| **Introduction:** Different Computing Paradigms- Parallel Computing, Distributed Computing, Cluster Computing, Grid Computing Cloud Computing etc., Comparison of various Computing Technologies; Cloud Computing Basics- What is Cloud Computing History, Characteristic Features, Advantages and Disadvantages, and Applications of Cloud Computing; Trends in Cloud Computing; Leading Cloud Platform Service Providers. **Cloud Applications:** Scientific Applications- Healthcare (ECG Analysis in the Cloud), Geoscience(Satellite Image Processing);Business and Consumer Applications- CRM and ERP, Productivity, Social Networking, Media Applications, Multiplayer Online Gaming. | 15 |

## Unit-2

| | |
|---|---|
| **Cloud Architecture:** Cloud Service Models- Infrastructure as a Service (IaaS),Platform as a Service (PaaS) and Software as a Service (SaaS), Comparison of different Service Models; Cloud Deployment Models- Public Cloud; Private Cloud, Hybrid Cloud, Community Cloud; Cloud Computing Architecture-Layered Architecture of Cloud. <br> Virtualization- Definition, Features of Virtualization; Types of Virtualizations-Hardware Virtualization, Server Virtualization, Application Virtualization,StorageVirtualization,OperatingSystemVirtualization;Virtualizationand CloudComputing, Pros and Cons of Virtualization, Technology Examples- Xen: Para virtualization, VMware: Full Virtualization, Microsoft Hyper-V. | 15 |

## Unit-3

| | |
|---|---|
| **Cloud Application Programming and the Aneka Platform:** Basics of Aneka Cloud Application Platform-Frame work Overview, Anatomy of the Aneka Container; Building Aneka Clouds(Infrastructure Organization, Logical Organization, Private Cloud Deployment Mode, Public Cloud Deployment Mode, Hybrid Cloud Deployment Mode);Cloud Programming and Management <br><br> **Cloud Plat forms in Industry:** Amazon Web Services-Compute Services, Storage Communication Services, Windows Azure Platform Appliance. | 15 |

**Text Books:**

1"Mastering Cloud Computing-Foundations

and Applications Programming" Raj Kumar

Buyya, Christian

Vecchiola,S.ThamaraiSelvi,Elsevier,2013

2 "Cloud Computing Bible", BarrieSosinskyWiley-India,2010

3 "Essentials of Cloud Computing", KChandrashekaranCRCPress,2015

4 "The Basics of Cloud Computing", Derrick
Rountree,IleanaCastrillo:Elsevier,2014

**Web References:**

1.Cloud computing – Course (nptel.ac.in)

2. LearnCloudComputingOnline|edX

**CourseArticulationMatrix-23DSEBCA01**

|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | P0 11 | PO 12 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| CO1 | 1 | - | 1 | 2 | 1 | 2 | 1 | - | 2 | 2 | 1 | 2 |
| CO2 | 1 | - | 1 | - | 2 | 1 | - | - | 2 | 2 | 2 | 2 |
| CO3 | 2 | 1 | 3 | 1 | 3 | 2 | 1 | 1 | 2 | 2 | 2 | 2 |
| W.A | 1.33 | 0.33 | 1.66 | 1 | 2 | 1.66 | 0.66 | 0.33 | 2 | 2 | 1.66 | 2 |

| Course Code:23DSEBCA02 | Course Title: DSE (2)Business Intelligence |
|---|---|
| **CourseCredits:**03 | **Hours of Teaching/Week:**03 Theory |
| **TotalContactHours:**45Theory | **FormativeAssessmentMarks:**40Theory |
| **ExamDuration:**21/2Hours 3 Hours | **Semester End ExamMarks:**60(Theory) |

**Course Outcomes:**

**CO1:** Describe the Decision Support systems and Business Intelligence framework.

**CO2:** Explore knowledge management, explain its activities, approaches and its implementation.

**CO3:** Describe business intelligence, analytics, and decision support systems.

**Course Content**

| Content | Hours |
|---|---|
| **Unit-1** | |
| Information Systems Support for Decision Making, An Early Frame work for Computerized Decision Support, The Concept of Decision Support Systems, A Frame work for Business Intelligence, Business Analytics Overview, Brief Introduction to Big Data Analytics: Introduction and Definitions, Phases of the Decision Making Process: The Intelligence Phase, Design Phase, Choice Phase, Implementation Phase. Decision Support Systems Capabilities, Decision Support Systems Classification, Decision Support Systems Components. | 15 |
| **Unit-2** | |
| Basic Concepts of Neural Networks, Developing Neural Network- Based Systems Illuminating the Black Box of ANN with Sensitivity, Support Vector Machines, A Process Based Approach to the Use of SVM, Nearest Neighbor Method for Prediction, Sentiment Analysis Overview, Sentiment Analysis Applications, Sentiment Analysis Process, Sentiment Analysis: Speech Analytics. Decision Support Systems modeling, Structure of mathematical models for decision support, Decision modeling with spreadsheets. | 15 |
| **Unit-3** | |
| Mathematical programming optimization, Decision Analysis with Decision Tables and Decision Trees, Multi-Criteria Decision Making with Pairwise Comparisons. Automated Decision Systems, The Artificial Intelligence field, Basic concepts of Expert Systems, Applications of Expert Systems, Structure of Expert Systems, Knowledge Engineering, and Development of Expert Systems. | 15 |

**Text Books:**

1. "Business Intelligence and Analytic s: System for Decision Support", Ramesh Sharda, Dursun Delen, Efraim Turban, J. E. Aronson, Ting-Peng Liang, David King,10th Edition, Pearson

**Reference books:**
2. Data Analytics: The Ultimate Beginner's Guide to Data Analytics Paperback – 12   November2017byEdwardMiz

**Web Reference:**
1. Business Analytics For Management Decision -Course (nptel.ac.in)
2. BestBusinessIntelligenceCourses&Certifications[2023]|CourseraOnlineLearning

3. LearnwithMOOCsaboutBusinessIntelligence/BusinessIntelligence|FreeOnlineCourses |My Mooc(my-mooc.com)

## Course Articulation Matrix-23DSEBCA02

|  | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |  | 1 |  | 1 |
| **CO2** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 |
| **CO3** | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 |
| **W. A** | 1 | 1 | 1 | 1.3 | 1 | 1 | 1 | 1 | 1.3 | 1 | 1.3 | 1.7 |

**Course Code:23VOCBCA01**     **Course Title: VOC(1)Digital Marketing**

| | |
|---|---|
| **CourseCredits:**03 | **Hours of Teaching/Week:**03 Theory |
| **TotalContactHours:**45Theory | **FormativeAssessmentMarks:**40Theory |
| **ExamDuration:**2 ½ Hours 3Hours | **Semester End ExamMarks:**60(Theory) |

**Course Outcomes:**

CO1: Acquiring knowledge on fundamental concepts of digital marketing and it's importance, developing strategies, objectives and campaign planning.

CO2: Analyzing social media marketing, advertising, email marketing, content marketing and applying strategies and techniques within each of these digital marketing channels.

CO3: Analyzing mobile marketing and implementing various analytical tools, reporting and data visualization.

**Course Content**

| Content | Hours |
|---|---|
| **Unit-1** | |
| **Introduction to Digital Marketing:** Overview of digital marketing, Evolution of digital marketing, Importance and benefits of digital marketing, Digital marketing channels and platforms **Digital Marketing Strategy and Planning:** Developing a digital marketing strategy, Setting goals and objectives, Budgeting and resource allocation. Campaign planning and execution, Monitoring and adjusting digital marketing campaigns | 15 |

| Unit-2 | |
|---|---|
| **Social Media Marketing:** Overview of social media marketing, Creating and optimizing social media profiles, Social media content strategy, Social media advertising and analytics **Email Marketing:** Introduction to email marketing, Building an email list, Creating effective email campaigns, Email marketing metrics and analytics<br><br>**Content Marketing:** Understanding content marketing, Content strategy and planning, Content creation and distribution, Content promotion and amplification, Content marketing metrics and analytics. | 15 |

| Unit-3 | |
|---|---|
| **Mobile Marketing:** Mobile marketing over view, Mobile advertising strategies, Mobile app marketing, Location-based marketing, Mobile marketing analytics **Analytics and Reporting:** Importance of analytics in digital marketing, Setting up web analytics tools(e.g., Google | 15 |

**Text Books:**

1 "Digital Marketing Strategy: An Integrated Approach to Online Marketing" Simon Kingsnorth.

2 "Email Marketing Rules: How to Weara White Hat, Shoot Straight, and

Win Hearts" by Chad S.White3 "Content Inc.: How Entrepreneurs Use

Content to Build Massive Audiences and Create Radically Successful

Businesses" by Joe Pulizzi

4 "Mobile Marketing: How Mobile Technology is

Revolutionizing Marketing, Communications and Advertising"

by Daniel Rowles

5 "WebAnalytics2.0:The Art of Online Accountability and

Science of Customer Centricity" by Avinash Kaushik

**Web Reference:**

1.Digital Marketing - Course (swayam2.ac.in)

2. Learn Digital Marketing With Online Courses and Programs |ed X

3. Learn with MOOC about Digital Marketing and Marketing | Free Online Courses| My Mooc(my-mooc.com)

**Course Articulation Matrix-23VOCBCA01**

|      | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | P0 11 | PO 12 |
|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|
| CO1  | 2    | 1    | 2    | 1    | 1    | 2    | 1    | 2    | 2    | 1     | 1     | 2     |
| CO2  | 1    | 1    | 1    | 2    | 2    | 3    | 2    | 2    | 2    | 3     | 1     | 1     |
| CO3  | 1    | 2    | 2    | 2    | 3    | 1    | 1    | 1    | 3    | 2     | 1     | 2     |
| W.A  | 1.33 | 1.33 | 1.66 | 1.66 | 2    | 2    | 1.33 | 1.66 | 2.33 | 2     | 1     | 1.66  |

| Course Code:235629 | Course Title: DSC(16)Artificial Intelligence and Application |
|---|---|
| **CourseCredits:**04 | **Hours of Teaching/Week:**04 Theory |
| **TotalContactHours:**60Theory | **FormativeAssessmentMarks:**40Theory |
| **ExamDuration:**$2^{1/2}$ Hours<br><br>3 Hours | **Semester End ExamMarks:**60(Theory) |

## Course Outcomes:

**CO1:** Understand the historical perspective of AI and its foundations**.**
 **CO2:** Implement the basic principles and strategies of AI towards problem solving.
**CO3:** Apply approaches of knowledge representation.
**CO4:** Differentiate the various forms of learning. Illustrate the different applications of AI.

### Course Content

| Content | Hours |
|---|---|
| **Unit-1** | |
| **Introduction-** What is Artificial Intelligence, Foundations of AI, History , AI - Past, Present and Future. Intelligent Agents-Environments-Specifying the task environment, Properties of task environments, Agent based programs-Structure of Agents , Types of agents- Simplereflexagents,Model-basedreflexagents,Goal-basedagents;andUtility-basedagent | 15 |
| **Unit-2** | |
| **Problem Solving by Searching**-Problem-Solving Agents, Well-defined problems and solutions, examples Problems, Searching for Solutions, Uninformed Search Strategies-Breadth-first search,<br>Uniform-cost search, Depth-first search, Depth-limited search, Iterative deepening depth-first search, Bidirectional search, Greedy best-first search, A* Search, AO*search Informed(Heuristic)Search Strategies, Heuristic Functions | 15 |
| **Unit-3** | |
| **KnowledgeRepresentation-**Knowledge-BasedAgents,TheWumpusWorld,Logic,Propositional  Logic, Propositional Theorem Proving, Effective Propositional Model Checking, Agents Based on Propositional Logic, First-Order Logic-Syntax and Semantics of First-Order Logic, Using First-Order Logic, Unification and Lifting Forward Chaining, Backward Chaining. | 15 |
| **Unit-4** | |
| **Learning–** Forms of Learning, Supervised Learning, Machine Learning – Decision Trees, Regression and Classification with Linear Models.<br>**Applications of AI**-Text Classification and Information Retrieval. | 15 |

**Text Books:**
**1.** Artificial Intelligence A Modern Approach, Stuart Russel, PeterNorvig:2nd Edition, Pearson Education,2003
**2.** "Machine Learning", TomMitchell1st Edition, McGraw-Hill,2017
**3.** Artificial Intelligence, Elaine Rich, Kevin Knight, ShivashankarBNairTataMcGrawHill3rdedition,2013
**Web Reference:**
  1. An Introduction to Artificial Intelligence –Course (nptel.ac.in)
  2. ArtificialIntelligencePoweredMOOCs:ABriefSurvey|IEEEConferencePublication|IEEEXplore
  3. TowardsAI-poweredpersonalizationinMOOClearning- PMC(nih.gov)

### Course Articulation Matrix-235629

|       | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|-------|------|------|------|------|------|------|------|------|------|-------|-------|-------|
| CO1   | 2    | 1    | 1    | 2    | 1    | 2    | 1    | 1    | 2    | 2     | 1     | 3     |
| CO2   | 1    | 3    | 2    | 1    | 2    | 2    | 2    | 1    | 2    | 2     | 1     | 2     |
| CO3   | 2    | 1    | 1    | 1    | 3    | 2    | 1    | 1    | 2    | 1     | 1     | 2     |
| CO4   | 2    | 1    | 1    | 2    | 3    | 2    | 2    | 1    | 2    | 2     | 1     | 3     |
| W.A   | 1.7  | 1.5  | 1.2  | 1.5  | 2.2  | 2    | 1.5  | 1    | 2    | 1.75  | 2     | 2.5   |

## Lab Programs

1. Write a program to implement breadth first search using python.

2. Write a program to implement depth first search using python.

3. Write a program to implement 8-puzzle problem using python

4. Write a program to implement n-queens problem using python.

5. Write a program to implement alpha-beta pruning using python.

6. Write a program to implement forward chaining algorithm.

7. Write a program to implement backward chaining algorithm.

8. Write a program to implement k-Nearest Neighbour algorithm to classify the Iris data
set. Print both correct and wrong predictions.

9. Train a random sample data using linear regression model and plot the graph

10. Implement the naïve Bayesian classifier for a sample training data set stored as a .csv
file. Compute the accuracy of the classifier, considering few test data sets.

11. Demonstrate the working of SVM classifier for a suitable data set(e.g., Iris dataset)

12. Build a sample binary image classification model (cat and dog)

| Course Code:235630 | Course Title: DSC (17) PHP & MYSQL PHP & MYSQL LAB |
|---|---|
| **CourseCredits:**04 | **Hours of Teaching/Week:**04 Theory |
| **TotalContactHours:**60Theory **60 Lab** | **FormativeAssessmentMarks:**40Theory **FormativeAssessmentMarks:25 Lab** |
| **ExamDuration:**2$^{1/2}$Hours 3Hours | **Semester End ExamMarks:**60(Theory) 25 (Lab) |

## Course Outcomes(COs):

**CO1:** Illustrate the basic Concepts of PHP.

**CO2:** Understanding the Function and applying Object oriented programming techniques.

**CO3:** Organizing PHP concepts in creating the HTML forms.

**CO4:** Programming a Database using PHP with MySQL.

| Units | Contents | Hours |
|---|---|---|
| Unit-1 | **Introduction to PHP:** Introduction to PHP, History and Features of PHP, Installation & Configuration of PHP, Embedding PHP code in Your Web Pages, Understanding PHP, HTML and White Space, Writing Comments in PHP, Sending Data to the Web Browser, Datatypes in PHP, Key words in PHP, Using Variables, Constants in PHP, Expressions in PHP, Operators in PHP. **Programming with PHP:** Conditional statements: if, if-else, switch, The '?'Operator, Looping statements: while Loop, do-while Loop, for Loop. | 15 |
| Unit-2 | **Using Functions  Class- Objects, Forms in PHP:** Functions in PHP, Function definition, Creating and invoking user-defined functions, Formal parameters versus actual parameters, Function and variable scope, Recursion, Library functions, Date and Time Functions. **Class &Objects in PHP:** What is Class & Object, Creating and accessing a Class & Object, Object properties, object methods, | 15 |

| Unit-3 | **Arrays in PHP:** Introduction- What is Array? Creating Arrays, Accessing Array elements, Types of Arrays: Indexed v/s Associative arrays, Multidimensional arrays - Creating Array, Accessing Array, Manipulating Arrays, Displaying array, Using Array Functions, Including and Requiring Files- use of Include() and Require(),Implicit and Explicit Casting in PHP. <br> **Strings in PHP:** What is String? Creating and Declaring String, String Functions, Application program on sending Email. <br> **Form Handling:** Creating HTML Form, Handling HTML Form data in PHP. | **15** |
|---|---|---|
| Unit-4 | **Database Handling Using PHP with MySQL:** Introduction to MySQL: Database terms, Data Types. **Accessing MySQL –**Using MySQL Client and Using php My Admin, MySQL Commands, Using **PHP with MySQL:** PHP MySQL Functions, connecting to MySQL and Selecting the Database,ExecutingSimpleQueries,RetrievingQueryResults, CountingReturnedRecords,UpdatingRecordswithPHP. | **15** |

**References**
**1.** PHP & MySQL for Dynamic Web Sites- Fourth Edition By Larry Ullman.
**2.** Learning PHP, MySQL and Java Script By Robin Nixon–O"REILLY
   Publications
**3.**Programming PHP By Rasmus Lerdorf, Kevin Tatroe, Peter Mac Intyre
4.SAMSTeachYourselfPHPin24hours, Author: Matt Zandstra, Sams Publishing.

**Web References:**
**1**DatabaseManagement System – Course (nptel.ac.in)

2. BuildingWebApplicationsinPHP|MyMooc(my-mooc.com)

# Lab Programs

1 Write a PHP script to print "hello world".

2 Write a PHP script to find odd or even number from given number.

3 Write a PHP script to find maximum of three numbers.

4 Write a PHP script to swap two numbers.

5 Write a PHP script to find the factorial of a number.

6 Write a PHP script to check whether given number is palindrome or not.

7 Write a PHP script to reverse a given number and calculate its sum

8 Write a PHP script to generate a Fibonacci series   using Recursive function

9 Write a PHP script to implement at least seven string functions.

10 Write a PHP program to insert new item in array on any position in PHP.

11 Write a PHP script to implement constructor and destructor

12 Write a PHP script to implement form handling using get method.

13 Write a PHP script to implement form handling using post method

14  Write a PHP script that receive form in put by the method post to check the number is prime or not

15  Write a PHP script that receive string as a for  min output

16  Write a PHP script to compute addition of two matrices as a form input.

17  Write a PHP script to show the functionality of date and time function.

18  Write a PHP program to upload a file

19 Write a PHP script to implement database creation

20 Write PHP script to create a table.

21 DevelopaPHPprogramtodesignacollegeadmissionformusingMYSQLdatabase.

## CourseArticulationMatrix-235630

|  | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 |
| CO2 | 2 | 2 | 2 | 1 | 2 | 1 | - | - | 1 | 2 | 2 | 2 |
| CO3 | 2 | 2 | 3 | - | 2 | 1 | - | - | 2 | 2 | 2 | 3 |
| CO4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 3 |
| W.A | 1.7 | 1.7 | 2.2 | 1.3 | 1.7 | 1.25 | 1.5 | 1 | 1.5 | 2 | 2 | 2 |

| Course Code:23DSEBCA03 | Course Title: DSE(3)Fundamentals of Data Science |
|---|---|
| CourseCredits:03 | Hours of Teaching/Week:03 Theory |
| TotalContactHours:45Theory | FormativeAssessmentMarks:40Theory |
| ExamDuration:2 ½ Hours  3Hours | Semester End ExamMarks:60(Theory) |

**Course Outcomes:**

**CO1:** Understand the Concepts of Data

**CO2:** Understanding data pre-processing and mining frequent patterns.

**CO3:** Analyzing the classification and clustering methods.

| Units | Contents | Hours |
|---|---|---|
| Unit-1 | Data Mining: Introduction, Data Mining Definitions, Knowledge Discovery in Databases (KDD) Vs Data Mining, DBMS Vs Data Mining, DM techniques, Problems, Issues and Challenges in DM, DM applications. | 15 |
| Unit-2 | Data Warehouse: Introduction, Definition, Multidimensional Data Model, Data Cleaning, Data Integration and transformation, Data reduction, Discretization. Mining Frequent Patterns: Basic Concept–Frequent Item Set Mining Methods –A priori and Frequent Pattern Growth(FP Growth) algorithms-Mining Association Rules | 15 |
| Unit-3 | Classification: Basic Concepts, Issues, Algorithms: Decision Tree Induction. Bayes Classification Methods, Rule-Based Classification, Lazy Learners (or Learning from your Neighbours), k Nearest Neighbors. Prediction - Accuracy- Precision and Recall. Clustering: Cluster Analysis, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Evaluation of Clustering. | 15 |

**Text Books:**

1. "Data Mining Concepts and Techniques" Jiawei Han
and Micheline Kambar –Second Edition Elsevier
Publications
2. "Data Mining Techniques" Arun K Pujari 4th
Edition, Universities Press
**3.**IntroductiontoDataMining, Pang-Ning Tan,
Michael Steinbach, Vipin Kumar: Pearson
Education, 2012.
**4.**Insightin to Data Mining–Theory and Practice, **.**K.P. Soman, Shyam
Diwakar,V.AjayPHI5."Introduction to Data Mining", Pang-Ning Tan,
Michael Steinbach, Vipin Kumar
Pearson Education

Web References:
1. .https://onlinecourses.swayam2.ac.in/cec19_cs01/preview
2. Learn Data Science With Online Courses and Programs| edX

**Course Articulation Matrix-**23DSEBCA03

|       | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|-------|------|------|------|------|------|------|------|------|------|-------|-------|-------|
| **CO1** | 1    | 2    | 2    | 1    | 1    | 1    | 1    | 1    | 1    | 1     | 2     | 3     |
| **CO2** | 2    | 2    | 2    | 2    | 2    | 1    | 1    | 1    | 1    | 2     | 2     | 3     |
| **CO3** | 2    | 2    | 3    | 1    | 2    | 1    | 1    | 1    | 2    | 2     | 2     | 3     |
| **W.A** | 1.6  | 2    | 5    | 1.3  | 1.6  | 1    | 1    | 1    | 1.3  | 1.6   | 2     | 3     |

| Course Code:23DSEBCA04 | Course Title: DSE (4) **Mobile Application Development** |
|---|---|
| **CourseCredits:**03 | **Hours of Teaching/Week:**03 Theory |
| **TotalContactHours:**45Theory | **FormativeAssessmentMarks:**40Theory |
| **Exam Duration:** <br> 2Hours 3Hours | **Semester End ExamMarks:**60(Theory) |

**Course Outcomes:**

CO1: Acquiring knowledge on android development and android studio. Create, test and debug android application by setting up android development environment.

CO2:  Analyzing android application design essentials, android user interface design essential sand techniques for designing and developing sophisticated mobile interfaces.

CO3: Analysis of mobile application for the android operating system and deploy application to the android market place for distribution

**Course Content**

| Content | Hours |
|---|---|
| **Unit -1** | |
| **Android OS design and Features:** Android development framework, SDK features, Installing and running applications on Android Studio, Creating AVDs, Types of Android applications, Best practices in Android programming, Android tools, Building your First Android application. | 15 |

| | |
|---|---|
| **Unit-2**<br><br>**Android Application Design Essentials:** Anatomy of an Android applications Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents, Android Manifest File and its common settings, Using Intent Filter, Permissions.<br><br>**Android User Interface Design Essentials:** User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation. | 15 |
| **Unit-3**<br><br>Testing Android applications, Publishing Android application, Using Android preferences, Managing Application resources in a hierarchy, working with different types of resources.<br><br>**Using Common Android APIs:** Using Android Data and Storage APIs, Managing data using Sqlite, Sharing Data between Applications with Content Providers. | 15 |

**Text Books:**

1 "Android Wireless  Application Development",

 LaurenDarceyandShaneConder,PearsonEducation,2nded.(2011)

2 "ProfessionalAndroid2ApplicationDevelopment", RetoMeier Wiley India Pvt Ltd

3  "Beginning Android", Mark LMurphy Wiley India Pvt Ltd

4 Android Application Development All in one for Dummies by Barry Burd, Edition:I

5 Beginning Android 4 Application Development, Wei-

Meng Lee, Wiley India (Wrox),

20136ProfessionalAndroid4ApplicationDevelopment,Reto

Meier,WileyIndia,(Wrox), 2012

# Web References:

Modern Application Development – Course (nptel.ac.in)

Learn with MOOCs about Mobile     Application Development |Free Online Courses |My Mooc (my-mooc.com)

**COURSEARTICULATIONMATRIX-23DSEBCA04**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | P0 11 | PO 12 |
|------|------|------|------|------|------|-----|------|-----|------|-------|-------|-------|
| CO1 | 2 | 1 | 2 | - | 2 | - | - | - | 1 | - | 1 | 1 |
| CO2 | 2 | 2 | 3 | 2 | 2 | - | 1 | - | 2 | 1 | 1 | 2 |
| CO3 | 2 | 2 | 2 | 2 | 1 | 3 | 1 | 3 | 2 | 3 | 2 | 3 |
| W.A | 2 | 1.66 | 2.33 | 1.33 | 1.66 | 1 | 0.66 | 1 | 1.66 | 1.33 | 1.33 | 2 |

| Course Code:23VOCBCA02 | Course Title: VOC(2)Web Content Management System |
|---|---|
| **CourseCredits:**03 | **Hours of Teaching/Week:**03 Theory |
| **TotalContactHours:**45Theory | **FormativeAssessmentMarks:**40Theory |
| **Exam Duration:** 2 Hours  3Hours | **Semester End ExamMarks:**60(Theory) |

**Course Outcomes:**

CO1: Understanding the content of development basics, Acquiring knowledge on tools for multimedia content development for audio/ video, graphics , animations, presentations, screen casting, editing, and web hosting.

CO2: Analyzing the Host websites and develop content for social media platforms such as wiki and managing a blog site. Analyzing the knowledge on Presentation Software, screen casting tools and techniques.

CO3: Understanding e-publications and virtual reality applications, 2D and 3D Animations Implementations of e-learning platform Moodle and CMS applications Drupal and Joomla

**Course Content**

| Content | Hours |
|---|---|
| **Unit-1** | |
| **Introduction:** Web Content Development and Management, Content Types and Formats, Norms and Guidelines of Content Development, Creating Digital Graphics, Audio Production and Editing, Web Hosting and Managing Multimedia Content, Creating and Maintaining a Wiki Site. | 15 |
| **Unit-2** | |
| **Presentation Software:** Presentation Software Part I, Presentation Software Part II, Screen casting Tools and Techniques, Multilingual Content Development. Planning and Developing Dynamic Web Content Sites, Website Design Using CSS Creating and Maintaining a WIKI Site, Creating and Managing a Blog Site. | 15 |

| Unit-3 | |
|---|---|
| **E- Publication:** E- Publication Concept, E- Pub Tools, Simulation and Virtual Reality Applications, Creating 2D and 3 D Animations. Introduction to Moodle, Creating a New Course and Uploading, Create and Add Assessment, Add and Enroll User and Discussion Forum, ContentManagementSystem:Joomla,ContentManagementSystem:Drupal ,DemoonWebContentManagementSystemTools. | 15 |

**Text Books:**
1 Web Content Management: Systems, Features, and
Best Practices 1st Edition by Deane Barker.
2 Content Management Bible(2ndEdition)2ndEditionbyBobBoiko.
3 Moodle for Learning Management System (LMS): A
Practical and Visual Guidebook of Administrator and
Instructor for Distance Education Paperback–
October12,2020byJamesKoo
4 UsingJoomla:EfficientlyBuildandManageCustomWebsites2ndEditionbyRonSev
erdia

**Additional**
**Reading:**https://onlinecourses.swayam2.ac.in/cec20_lb09/previewhttps://onlinecours
es.swayam2.ac.in/cec20_lb09/previewhttps://onlinecourses.swayam2.ac.in/aic20
_sp32/previewhttps://onlinecourses.swayam2.ac.in/ugc19_lb05/preview

## COURSEARTICULATIONMATRIX-:23VOCBCA02

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | P0 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 1 | 1 | 1 | 2 | 2 | 2 | 1 | - | 2 | 2 | 1 | 2 |
| **CO2** | 1 | 1 | 2 | 1 | 2 | 2 | 1 | - | 2 | 2 | 2 | 2 |
| **CO3** | 2 | 1 | 3 | 1 | 3 | 2 | 1 | 1 | 2 | 2 | 3 | 2 |
| **W.A** | 1.33 | 1 | 2 | 1.33 | 2.33 | 2 | 1 | 0.33 | 2 | 2 | 2 | 2 |

# Internship

**Semester: VI**

| | |
|---|---|
| Course Code: 23INTBCA01 | Course Title: - **Internship** |
| Course Credits: **02** | **Hours of Teaching/Week:** |

| Total Contact Hours: | **Formative Assessment Marks:** |
|---|---|
| **90 Hours Internship** | 50 Marks(C1=25+C2=25) |

**Note: This course will run as per the guidelines defined by the BoS Bachelor of Computer Application, University of Mysore, Mysuru and the same is approved by BoS, Bachelor of Computer Application SBRR Mahajana First Grade College, Mysuru.**

**Course Outcomes (COs):**

**CO1:** Integrate Theory and Practice of the area selected for Internship to Explore Career Opportunities prior to Graduation.

**CO2:** Develop Communication, Interpersonal, Work Habits, Attitude and other Critical Skills required for a job.

## Course Articulation Matrix – 23INTBCA01

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 3 | 3 | 3 | 3 | 3 | - | - | 1 | 3 | 3 | 2 | 2 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | 2 | 2 |
| Weighted Average | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | 2 | 2 |

# Scheme of Valuation for Internship

C1 and C2 are internal assessments to be conducted during 8th and 16th weeks respectively for the semester. The student will be evaluated on the basis of presentation skills and project development. The student has to compulsorily submit the project report for evaluation during C2. The report has to be certified by the Head of the Department and the Mentor/Supervisor.

 • **The student is evaluated for 50marks in C1 and C2 as per the following scheme:**

Project Progress Presentation (**C1**): 25 marks

Project Development and Report (**C2**): 25 marks

| Assessment Criteria | Marks |
|---|---|
| **Project Presentation Skills** | 25 |
| **Project Development Skills and  Report** | 25 |
| Total | **50** |

## Evaluation Pattern

### Theory Evaluation Scheme
### forC1, C2 and C3

|  | Assessment Criteria | Marks | Total |
|---|---|---|---|
| Continuous assessment-1(c1) | Session test | 20 | |
| Continuous assessment-2(c2) | Seminar/Presentation/Assignment/ Activity/Case Study/Field Work/ Project Work/Quiz etc. | 20 | 40 |
| Continuous assessment-3(c3) | Semester End Exam(SEE) | 60 | 60 |
| | | Total | 100 |

### Evaluation Scheme for Lab
### Examination

|  | Assessment Criteria | Marks | Total |
|---|---|---|---|
| Continuous assessment-1(c1) | Test | 10 | |
| Continuous assessment-2(c2) | Test and record assessment | 15 (10 + 05 marks for record) | 25 |
| Continuous assessment-3(c3) | Semester End Exam(SEE) | 25 | 25 |
| | | Total | 50 |

| Assessment Criteria-c3 | | Marks |
|---|---|---|
| Program–1from Part A | Writing the Program and Execution. | 10 |
| Program-2fromPartB | Writing the Program and Execution. | 10 |
| Viva Voce | | 05 |
| Total | | **25** |

Question Paper Pattern for DSC

Instructions: Answer both part-A and Part-B(Max:60Marks)

Part-A

Answer any ten Questions:                                    (10 X 2=20)
1
2
3
.
.
.
(3questions to be given from each unit)

Part-B

(Four questions to be given from each unit
with internal split if required)

Answer all the Questions:                                Max:40marks

13.a)                                                    **(2*5=10)**
   b)

                     OR
   c)
   d)
14.a)                                                    **(2*5=10)**
   b)

                     OR
   c)
   d)
15. a)                                                   (2*5=10)
    b)

                     OR
    c)
   d)

16. a)
    b)

                     OR
                                                         (2*5=10)

   C)
   d)

Question Paper Pattern for DSE/VOC

Instructions: Answer both part-A and Part-B(Max:60Marks)

Part-A

Answer any ten Questions:                                    (10 X 2=20)
1
2
3
.
.
.
1
2
(3questions to be given from each unit)

Part-B

(Four questions to be given from each unit
with internal split if required)

Answer all the Questions:                                    Max:40marks

13.a)                                                         **(2*8=16)**
   b)

                        OR
   c)
   d)
14.a)                                                        **(2*6=12)**
   b)

                        OR
   c)
   d)
15. a)                                                       (2*6=12)
    b)

                        OR
    c)
    d)

# SBRR Mahajana First Grade College

## Question Paper Pattern for Open Elective

Instructions: Answer both part-A and part-B                    (Max:60Marks)

Duration:21/2 Hours

### Part-A

Answer any ten Questions:                    (10 X 2=20

1

2

3

.

.

.

1

2

(4questions to be given from each unit)

### Part-B

(Two questions to be given from each unit with internal split if required)
Answer any Four Questions:                    (10X4=40)

13.

14.

15.

16.

17.

18

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**SBRR MAHAJANA FIRST GRADE COLLEGE (AUTONOMOUS)**
Jayalakshmipuram, Mysuru – 570 012
Affiliated to University of Mysore Re-accredited by NAAC with 'A' Grade
College with Potential for Excellence

# BOARD OF STUDIES (BoS)

## DEPARTMENT OF CRIMINOLOGY AND FORENSIC SCIENCE

**UG** ✓

**PG**

# NEP Syllabi for V and VI Semester B.A

# Criminology and Forensic Science

# 2023-24

# Department of Criminology and Forensic Science

## Motto:

Become great and vanquish all enemies

## Vision:

To develop youth that are imbibed with moral, ethical, social,
& constitutional values.
To also equip students with scientific concepts to vindicate law
& combat crime.

## Mission:

To impart knowledge based on the scientific principles so as to
enable youth to understand crime in all its manifestations;
Device ways and means of controlling crime; and
Reformation and rehabilitation of the offenders by application of
the knowledge derived from cognate branches of the study, for the
benefit of the society.

# Program Outcomes (POs) for Bachelor of Arts

| | |
|---|---|
| **PO1** | **Domain Knowledge:** Inculcation of fundamental concepts, principles, methods and the application of the same in the realm of concerned domain. |
| **PO2** | **Problem Analysis:** This programme enhances the ability to define, identify and analyze appropriate means towards amicable solutions in the given area of Knowledge. |
| **PO3** | **Design & Development of Solutions:** Structuring theoretical knowledge and developing customized designs in terms of – Intervention strategies, Profiling, Reviews, Archives, Marketing strategies, Info-graphics and Approaches for arriving at relevant and desirable solutions. |
| **PO4** | **Research & Investigation**: Knowledge and application of "Research Methods" to investigate domain specific problems and derive scientific conclusions through testing of Hypotheses and relevant findings empirically. |
| **PO5** | **Usage of Modern Tools and Techniques:** Mastery in the academic enclave through skilled handling administering, assessing, validating and interpreting complex phenomena using advanced tools and techniques to create simple and sustainable solutions. |
| **PO6** | **Social Sciences & Society –** Promotes domain specific literacy to illuminate the significance of each discipline and its applicability for the well-being of Society. |
| **PO7** | **Environment and Sustainability:** Contemplate and Introspect prevailing environmental challenges and consequences. Further, channelize initiatives towards sustainability. |
| **PO8** | **Moral and Ethical Values:** Application of Professional Ethics, Humanitarian Values, Accountability and Social Responsibilities in emerging society towards attainment of harmony and co-existence. |
| **PO9** | **Individual and Teamwork:** Imbibe the qualities of Teamwork and function effectively as an emerging leader in the diversified and multidisciplinary areas. |
| **PO10** | **Communication:** Demonstrates Competency in comprehending and conceptualizing discipline specific concepts and ideas and communicates effectively through fluid communication within the professional and social setup. |
| **PO11** | **Economics and Project Management:** Understand the Economic Concept in the context of specific discipline and apply the same through initiating Planning, and Executing the Project Dynamics effectively towards successful Project Management. |
| **PO12** | **Lifelong Learning**: Identify and address their own educational needs in a changing world in ways sufficient to upgrade one's skills and competencies through constant self-evaluation and eternal learning. |

# Objectives: Criminology and Forensic science

1. Crime is one of the major social problems. It has posed a threat to social organization. To maintain peace, harmony and social order scientific approach to this problem is need of the hour. The problem of crime can be effectively tackled with the help of different agencies of Criminal Justice like Police, Prison, Law, Court and various other agencies. The study pertaining to different agencies of Criminal Justice is scientifically studied at the graduation level in Forensic Science and Criminology.

2. The students are exposed in this course on various aspects of Crime, Criminality, Reformation and Rehabilitation of Criminal, Victim of Crime, Victim Compensation, Victim Assistance and Restorative Justice to the parties concerned Victim of Crime, Criminal Law, Forensic Science, Forensic Medicine and Toxicology and other branches.

3. Objectives of the study of this science are to make the students to understand the process of making laws, breaking of the laws, societal reaction to breaking of the laws and modern crimes. To understand the application of science in the identification and analysis of physical clues found at the Crime Scene, Criminal and Victims.

4. To prepare the students to pursue their career in the State and Central Forensic Science Institutes, Law enforcement agencies and Judiciary. To pursue their career in Social Security and Voluntary Organizations and prevent the occurrence of Crime.

5. It is a professional course with emphasis on development of necessary skills for a Criminological profession in police, forensic science, private security management, private detective work, corrections, and Juvenile Institutions.

# List of BoS Members

| Sl. No | Category | Name & Designation | Address for Communication | E-Mail & Mobile No. |
|---|---|---|---|---|
| 1 | Chairperson | Miss. Vidyashree GV Assistant Professor & HOD | Dept of Criminology & Forensic Science SBRR Mahajana First Grade College (Autonomous), Mysuru. | vidyagv7878@gmail.com 9071036072 |
| 2 | Member | Chandan Kumar K Assistant Professor | Dept of Criminology & Forensic Science SBRR Mahajana First Grade College (Autonomous), Mysuru. | chandankumaralbi@gmail.com 9742099365 |
| 3 | University Nominee | Dr. G.B. Aravind Associate Professor | Dept. of Forensic Medicine, JSS Academy of Higher Education &Research, Mysore. | profaravind@gmail.com Mob.9886089317 |
| 4 | Two Experts from other University | Prof. Basavaraj D Masthi Associate Professor & Head | Dept of Criminology & forensic science C. M. Managuli First Grade College, Sindagi | bdmasti@gmail.com Mob.91-9449644221 |
| 4 | Two Experts from other University | Shashidhar. E. S Assistant Professor | Dept. of Forensic Science School Of Science. Jain (Deemed to be) University | es.shashidhar@jainuniversity.ac.in Mob. 91-9845673982 |
| 5 | Member | Dr. Saritha D'souza Reader & Head | Dept of Criminology & forensic science School of Social Work, Roshni Nilaya, Valencia, Mangaluru | sarithavd@sswroshni.in Mob.91-9481014906 |
| 6 | One person from industrial Expert | Dr. Krishnaraju K. K. Deputy Director | Regional Forensic Science Laboratory, Mysore | Mob.91-9448500080 |
| 7 | Alumnus | Francis Devasahayam. B Assistant Professor | Department of Criminology and Forensic science St. Philomena's college, Mysuru | francis91b@gmail.com Mob:9035304313 |

## Criminology & Forensic science –V Sem

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DSC (5)<br><br>DSC (5) Lab | 231572 | Medical Jurisprudence and Toxicology | 4 | 0 | 4:0:2<br>(6 credits) | 20 | 20 | 60 | 2 ½ hrs. | 150 |
| | | **Lab Practical on**- Medico-legal Examination. | 0 | 4 | | 10 | 15 | 25 | 3 hrs. | |
| DSC (6)<br><br>DSC(6)Lab | 231573 | Juvenile Justice | 4 | 0 | 4:0:2<br>(6 credits) | 20 | 20 | 60 | 2 ½ hrs. | 150 |
| | | Fieldwork/ Project/ Dissertation/ Internship | 0 | 4 | | 10 | 15 | 25 | 3 hrs. | |

## Criminology & Forensic science –VI Sem

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DSC (7)<br><br>DSC (7) Lab | 231672 | Forensic Dactyloscopy and DNA Fingerprinting | 4 | 0 | 4:0:2<br>(6credits) | 20 | 20 | 60 | 2 ½ Hrs. | 150 |
| | | Examination of Fingerprints & Footprints | 0 | 4 | | 10 | 15 | 25 | 3 hrs. | |
| DSC (8)<br><br>DSC (8) Lab | 231673 | Corporate Crimes | 4 | 0 | 4:0:2<br>(6credits) | 20 | 20 | 60 | 2 ½ hrs. | 150 |
| | | Examination of Frauds and Corporate Crimes | 0 | 4 | | 10 | 15 | 25 | 3 hrs. | |
| INT | 23INTCRI01 | Internship | 2 | 0 | 2:0:0 | 50 | 50 | - | - | 50 |

# DSC (5) Syllabus for B.A Criminology and Forensic Science

## Semester V

| Course Code: 231572 | Course Title: <br>**DSC (5)** Medical Jurisprudence and Toxicology <br>**DSC (5) Lab-**Medico-legal Examination |
|---|---|
| **Course Credits :**06 (4:0:2) | **Hours of Teaching:** 60(Theory) <br> 60(Practical) |
| **Total Contact Hours:** 60 Hours (Theory) <br> 60 Hours (Practical) | **Formative Assessment Mark**: <br> 40 (Theory) <br> 25(Practical) |
| **Exam Duration**:  2 ½ Hours (Theory) <br> 3 Hours (Practical) | **Semester End Examination Marks:** <br> 60 (Theory) <br> 25 (Practical) |

### Course Out comes (CO's):
**CO1.**Analyse the basics of Medical Jurisprudence and Toxicology

**CO2.** Demonstrate the medico-legal importance of Death.

**CO3.**Determine the effect of toxins on human body.

**CO4.**Familiarize oneself with autopsy and its significance.

| Unit–1Medical Jurisprudence and Toxicology | 15 |
|---|---|

**Chapter- I Introduction to Jurisprudence**
- Meaning and definition
- Legal And Ethical Aspects of Practice of Medicine
- The Indian Medical Council and State Medical Council: Formation, Functions
- Rights, Privileges and Duties of Registered Medical Practitioners.
- Infamous conduct, Professional secrecy and privileged communications, Medical Ethics and prohibition of Torture & care of Torture Victims
- Consent – Its relevance in Medical Practice & medical record maintenance.

**Chapter – II Medical Jurisprudence**
- Medical Negligence and contributory negligence, Precautionary measures and defenses for Medical Practitioners against legal actions, Medical/Doctors indemnity insurance, Consumer Protection Act relevant to medical practice.
- Euthanasia – Current views and dilemmas, Different codes of Medical Ethics and Ethics in Research.
- Common medico-legal problems in Hospital practice, Medico-legal, ethical & social problems in relation to AIDS.

| | |
|---|---|
| **Unit- II Introduction to forensic medicine** | **15** |

**Chapter- 3 Meaning of forensic medicine**
- Definition, Scope Relevant forensic medicine
- History of Forensic Medicine
- Need, Scope, Importance and probative value of medical evidence in Crime Investigation

**Chapter- 4 Medico-Legal considerations of Injuries & Death**
- Meaning & classification and Mechanism of production of Wounds and injuries, Medico-legal aspects
- Thanatology, death, its causes, stages of death, signs of death and changes following death
- Asphyxia and accidents

  Death due to heat, cold, electrocution & Thermal

| | |
|---|---|
| **Unit-III Forensic Toxicology** | **15** |

**Chapter – 5 Introduction to Toxicology**
- Introduction to Toxicology
- Classification of Poisons
- General consideration and Laws in relation to poisons / Narcotic drugs and Psychotropic substances Act,
- Basics of Environmental and Industrial Toxicology in relation to Health & Ecology

**Chapter- 6 Corrosive & Irritant Poisons:**
- Inorganic Corrosives- Sulphuric, Nitric & Hydrochloric Acid
- Organic Corrosives- Phenol, Oxalic Acid
- Inorganic Non-Metallic Irritants- Phosphorus, Halogens
- Inorganic Metallic Irritants - Arsenic, Lead, Mercury, Copper
- Organic Vegetable Irritants - Abrus, Castor, Croton, Calotropis, Semi carpus, Ergot.
- Organic Animal Irritants – Snake Bite, Scorpion & other common insect bites diagnosis and Management; Medico legal Aspects

| | |
|---|---|
| **Unit-IV Major Poisons** | **15** |

**Chapter -7 Neurotoxic**
- Inebriates- Ethyl Alcohol, Methyl Alcohol
- Somniferous and Sedative Hypnotics – Opium and Derivatives, Barbiturates Deliriants Datura, Cannabis, Cocaine.
- Insecticides/ Pesticides/ Agrochemical- Organo-phosphorus Compounds. Organochlorides, Carbamates Pyrethroids, Aluminum phosphide.
- Spinal Poisons- Strychnine
- Peripheral Poisons- Curare

**Chapter -8 Asphyxiants and Other Poisons**

- ASPHYXIANTS (GASES)- Carbon monoxide, Carbon Dioxide, Cyanogen's and Cyanides
- CARDIAC POISONS- Oleanders, Aconite, Tobacco
- DOMESTIC/ HOUSEHOLD POISONS: Kerosene, Detergents, Disinfectants, Cosmetics, Rodenticide mothballs etc. .
- THERAPEUTIC DRUG TOXICITY/ POISONING BY MEDICINES- Salicylates, Paracetamol, Newer derivatives of sedative
- FOOD POISONING-Bacterial, Viral.

## Text Books:

1. Andrew R.W. Jackson, Julie M Jackson, 2011, " Forensic Science", Pearson Education Limited.
2. B.S. Nabar, 2001, forensic science in Crime Investigation", Asia law House.
3. J C Upshaw Downs, Anjali Ranadive, Swienton , 2002, "Ethics in Forensic Science, Academic Press Publications.
4. Jay A Siegel, Kathey Mirakovits, 2013, " Forensic Science: The Basics", CRC press.
5. Jim Fraser, Robin Williams, 2013,"Hand book of Forensic Science", Routldge publications.
6. Max. M. Houck, Jay A Siegal,2010, "Fundamentals of Forensic Science" Academic Press.
7. Andrew R.W. Jackson, Julie M Jackson, 2011, " Forensic Science", Pearson Education Limited.
8. J C Upshaw Downs, Anjali Ranadive, Swienton, 2002, "Ethics in Forensic Science, Academic Press Publications.
9. Forensic Medicine & Toxicology – Krishna vij
10. Forensic Medicine & Toxicology – V V Pillay

## Digital References:

- https://study.com/academy/lesson/physical-evidence-definition-types-law.html
- https://www.forensicpage.com/
- https://www.legalserviceindia.co m/legal/article-8572-types-and-significance-of-physicalevidence.html
- http://www.forensic-evidence.com/
- http://www.ncjrs.gov/App/AbstractDB/AbstractDBSearch.aspx

**Pedagogy:** Lecture, Assignments, Interactive Sessions, ICT, Group Discussion

# Content of Lab Practical Courses DSC- Credits:02

**Marks: 25+25=50**

## List of practical to be conducted

1. Blood grouping
2. Preliminary Examination of Blood
3. Confirmatory test for blood
4. Medico-legal Aspects of Homicidal, Suicidal and Accidental.
5. Examination of human skeleton.
6. Identification of Sex and Age through Bone remains.
7. Examination of different wounds and Injuries.
8. Examination of hair
9. Morphology of hair
10. Examination and Comparison of Natural and Synthetic fibers

**References**
1 Andrew R.W. Jackson, Julie M Jackson, 2011, " Forensic Science", Pearson Education Limited.
2 B.S. Nabar , 2001, forensic science in Crime Investigation", Asia law House.
3 J C Upshaw Downs, Anjali Ranadive, Swienton, 2002, "Ethics in Forensic Science, Academic Press Publications.

## Course Articulation Matrix -231572

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 1 | 1 | - | 2 | 1 | 2 | 1 | 1 | 1 | 2 |
| CO2 | 2 | 2 | 2 | 3 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 2 |
| CO3 | 3 | 2 | 2 | 2 | 1 | - | 2 | 1 | 1 | 2 | 1 | 2 |
| CO4 | 2 | 3 | 2 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 2 |
| Weighted Average | 2.5 | 2.5 | 1.75 | 2.25 | 1 | 1 | 1.25 | 2 | 1 | 1.5 | 1 | 2 |

## DSC (6) Syllabus for B.A Criminology and Forensic Science

| | |
|---|---|
| **Course Code**:231573 | **Course Title**: DSC **(6)** Juvenile Justice |
| **Course Credits:**06 (4:0:2) | **Hours of Teaching:**60 (Theory)<br>60 (Practical) |
| **Total Contact Hours:**<br>60 Hours (Theory)<br>60 Hours (Practical) | **Formative Assessment Mark**:<br>40 (Theory)<br>25(Practical) |
| **Exam Duration**: 2 ½ Hours (Theory)<br>3 Hours (Practical) | **Semester End Examination Marks:**<br>60(Theory)<br>25 (Practical) |

## Course outcomes (CO's):

**CO1:** Analyze the definition of juvenile delinquency and its brief history.

**CO2:** Explain the current situation of JD in India in comparison to developed countries.

**CO3:** Recognize the various deviancy theories.

**CO4:** Develop the knowledge regarding the relevant laws, institutions dealing with juvenile deviants

| Content of Theory Course | 60Hr |
|---|---|
| **Unit- I Introduction to Juvenile Justice** | **15** |

**Chapter- 1 Meaning and Definition**
- Juvenile Justice.
- Deviance.
- International perspectives on juveniles (in developing countries).

**Chapter 2 Rights of the Child.**
- Basic rights – Child rights as human rights – United Nations Convention on the Rights of the Child (UNCRC)
- Legal protection for children – Fundamental rights as defined by the Constitution of India.
- National Commission for protection of child rights – State Commission for the protection of child rights.

| Unit- II Theories of Juvenile Deviancy. | 15 |
| --- | --- |

**Chapter – 3 General Factors**
- Economic Factors
- Social Factors
- Psychological Factors
- Genetic factors

**Chapter- 4 Specific Factors.**
- Street gangs and deviancy as a result of Differential Association.
- Social Disorganization, Broken Homes and Deviancy.
- Broken Window Theory of Deviancy.
- Impact of mass media on juveniles: Bandura and Imitation Theory,

| Unit-III Laws Relating to Deviant Behavior of Juveniles. | 15 |
| --- | --- |

**Chapter – 5 History of Juvenile Justice Act.**

- Early History of JJ in India up to 2015: Joint Family system and typical Varnashram beliefs and duty towards children.
- Juvenile Justice introduced by the British-on-British model at the provincial level in India.
- Apprenticeship Act, Reformatory Schools Act, Children Acts of 1920s and 1930s; Borstal Schools Acts, Central Children Act 1960, JJ Act 1986, JJ Act 2000, JJ Act 2015 (care and protection act).

**Chapter- 6 Legal frameworks.**

- Conceptual clarity on Legal frameworks (POCSO, ITPA, Child Labour Act, Information Technology Act, Child Marriage Act)
- Familiarization of various other laws relating to children in India.
Identifying appropriate practitioners/stakeholders (includes special educators, translators, interpreters, psychologists and psychiatrists).

| Unit-IV Institutions in India for Children's. | 15 |
|---|---|

**Chapter -7 Institutions in India for Children in Conflict with Law (CICWL)**
- Juvenile Justice Board (JJB): Composition of the Board – Powers, functions and responsibility.
- Procedure in relation to children in conflict with law – Special focus on Section 15 (Preliminary assessment in heinous offences).
- Powers of children's court – Observation homes – Special home – Borstal school – Special juvenile police unit – Managing the unrest of children in child care institutions – Managing deviant behaviour in juvenile justice institutions.

**Chapter – 8 Institutions in India for Children in Need of Care and Protection (CINOCAP)**
- Child Welfare Committee (CWC): Composition of the Committee, Powers, functions and responsibility.
- Procedure in relation to children in need of care and protection – Open shelter – Place of safety – Foster care – Children's/Shelter homes – Institutions' roles (public/private) – Adoption and sponsorship of children.

**Chapter – 9 Juvenile Justice Process.**
- Pre-trial, trial and sentencing – Probation – Juvenile deterrence practices – Rehabilitation and social re-integration – After care programs – Nature and role of diversion programs – Disposition process
- Social Investigation and Reporting and its impact on rehabilitation – Individua Care Plan (ICP) – Legal and ethical role, Communication skills and attitudes (move away from apathy to empathy) of Practitioners (Special Juvenile Police Unit) in pre-trial and during trial for timely disposition of cases and forensic investigations/interviewing
- Role of families/guardians (support persons) in the trial and post-trial process – Repatriation – Child friendly atmosphere to be initiated and implemented in courts (JJB and CWC) and police stations – Best practices (Local and International) – Do's and Don'ts.

**Text Books:**

1. 1 Krishna Pal Malik (2011) "Penology, Victimology, and Correctional Administration in India' Allahabad Law Agency, Hariyana
2. 2 Siegel J Larry (2006) "Criminology 9th Edition" Thomas Publications, USA.
3. 3 Johnson, H. M., (1960), 'Sociology: A Systematic Introduction', Allied Pub. New Delhi.
4. 4 Ashoka (2014) "Samagra Aparadha Vidhnyana" Sudha Publications, India.
5. 5 Amberley R. Buxton, Susan Rodger, Anne L. Cummings and Alan W. Leschied (2006). The change process in clients with high needs. Canadian Journal of Counseling.
6. 6 Johnson, H. M., (1960), 'Sociology: A Systematic Introduction', Allied Pub. New Delhi.
7. Youth offending and Restorative Justice – Tim Newburn


E-Resources:
- https://sg.inflibnet.ac.in/bitstream/10603/222579/4/04_chapter%201.pdf
- https://study.com/academy/lesson/what-is-juvenile-delinquency-definition-theories-facts.html 21/10/2019
- https://shodhgangotri.inflibnet.ac.in/handle/123456789/3412
- https://en.wikipedia.org/wiki/Child_abuse
- https://www.unicef.org/child-rights-convention/child-rights-why-they-matter
-
https://shodhganga.inflibnet.ac.in/bitstream/10603/66825/19/19_conclusion%20and%20suggestions.pdf


**Pedagogy:** Lecture, Assignments, Interactive Sessions, ICT, Group Discussion

**DSC (6) Syllabus for B.A Criminology and Forensic Science (Basic and Honors)**

| | |
|---|---|
| **Course Code**:231573 | **Course Title**:<br>**DSC (6)** FIELDWORK/ PROJECT/ DISSERTATION/ INTERNSHIP (Practical) |
| **Course Credits :**02(2:0:0) | **Hours of Teaching/ Week:**4 |
| **Total Contact Hours: 60** Hours | **Formative Assessment Mark** :25 |
| **Exam Duration**3 Hours (Practical) | **Semester End Examination Marks:  25** |

### Practical Content

### SUGGESTED TOPICS
1. Crime in urban and rural areas.
2. Railway crimes.
3. Study on violent crimes.
4. Prison administration.
5. Police administration.
6. Police training.
7. Police-Community relations
8. Police help-line.
9. Forest crimes.
10. Criminal personality tendencies- groups; tribes.
11. P.O. Act- released offenders on probation.
12. Prisoners Act- Released convicts.
13. Victims of Crime.
14. Communal violence.
15. Juveniles in conflict with law.
16. Child labor.
17. Drug abuse
18. Voluntary agencies.
19. Ragging.
20. Economic offences.
21. Cybercrimes.
22. Prostitution- sex workers.
23. Human Rights.
24. Female criminality.
25. Crimes against women.
26. Crimes against children.
27. Mass media and crime.
28. Case Studies.
29. Pornography.
30. Crimes against weaker sections.
31. Habitual Criminals
32. Consumer Protection.

**Note:  Fieldwork/ Project/ Dissertation/ Internship a student can choose any related topics pertaining to the field of Criminology & Forensic Science other than the mentioned above.**

**STUDY METHODOLOGY:** The students are given an option to select one of the above-mentioned topics. During the allocated session, the topic will have to be studied and a specific methodology is to be followed;

1. Selection of the topic
2. Study the topic to evolve the statement of the problem
3. Literature survey
4. Methodology
5. Collection of data or information on the institution or case (depending upon the topic and method)
6. Analysis and interpretation of the data.
7. Findings and conclusions.
Each of the students will be assigned a study supervisor.
The pedagogy to be followed is to mentor the student, review progress and suggest corrections.
The student will have to attend the designated classes and the teacher assigned will conduct the contact session in relation to the research methods to his/her assigned students.
The designated classes for the field work will be mentioned in the college and department time table.
The contact sessions will be deemed to be a part of the practical workload of the designated teacher.
Finalization and submission of the report will have to take place at least one week before the scheduled university practical examination.
The report shall contain letters of permission from the institutions and endorsement thereof as to having visited the institution for collection of information.
The copies of the filled in questionnaires will have to be submitted in a separate file in case if the student has used the survey method.
The reports shall be evaluated at the term end examination, conducted by the University of Mysore.
The evaluation will also be based upon the viva-voce, in relation to the report.

## Course Articulation Matrix –231573

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 2 | 1 | - | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 |
| CO2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 |
| CO3 | 2 | 2 | 2 | 3 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 |
| CO4 | 1 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 2 |
| Weighted Average | 1.75 | 2.25 | 1.75 | 2.33 | 1.5 | 1.5 | 1.5 | 1.5 | 2 | 2.25 | 1.75 | 1.75 |

# DSC (7) Syllabus for B.A Criminology and Forensic Science

**Semester VI:**

| Course Code: 231672 | Course Title: |
|---|---|
| | **DSC (7)** Forensic Dactyloscopy and DNA Fingerprinting (Theory) |
| | **DSC (7)** Examination of Fingerprints & Footprints (Practical) |
| **Course Credits :** 06 (4:0:2) | **Hours of Teaching:** 60 (Theory) |
| | 60 (Practical) |
| **Total Contact Hours:** | **Formative Assessment Mark:** |
| 60 Hours (Theory) | 40 (Theory) |
| 60 Hours (Practical) | 25 (Practical) |
| **Exam Duration:** 2 ½ Hours (Theory) | **Semester End Examination Marks:** |
| 3 Hours (Practical) | 60 (Theory) |
| | 25 (Practical) |

## Course Outcomes (COs):

CO1: Recognizing the significance of DNA and the forensic dactyloscopy idea.

CO2: Educating oneself on the tenets and laws of individuality.

CO3: Gaining better knowledge on crimes, scams, and the methods used to investigate them in India.

CO4: In order to understand the forensic significance of forensic dactyloscopy and DNA in criminal justice systems

| Content of Theory course | Hours |
|---|---|
| **Unit-I: Introduction to Dactyloscopy** | **15** |

**Chapter-1 Meaning of Dactyloscopy**

- Meaning and Scope; Print Science, Importance of Print Science,
- Morphology of Finger prints and Footprints, Embryogenesis.
- Basic Features and Principles of Fingerprints
- Historical Development of Print Science.
- Organization of State and Central Finger print Bureaus,
- Dermatological formation and Diseases influence on the damages of fingerprints, Biometric unique ness, and Finger prints as Evidence.

**Chapter-2 Classification of Finger Prints Patterns**

- Meaning and importance of classification of fingerprint patterns.
- Explaining various types of classification of Fingerprints;
- Henry classification and its examination,
- Secondary classification system,
- Subsecondary classificationn system,
- Secondary sub secondary classification system,
- Key classification
- Final classification and Single digit classification system
- Fingerprint Patterns: Fingerprint Peculiarities / Minutiae and Characteristic

**Chapter-3 Significance of palm prints**

- Significance of palmprints, ATD Angle, Shape, Size of Palms, Ridge Tracing, Biometric Minutiae.
- Poro scopy and Edgeoscopy, Characteristics of pores–size, position and latent print formation of pores.

| **Unit-II Development of Finger Prints.** | **15** |
|---|---|

**Chapter–4 Development of Finger Prints**
- Types of Chance Prints at Scene of Crime
- Location and preservation of chance print at scene of crime.

**Chapter-5PhysicalMethodsforLatentFingerprintDevelopment**
- Powder Methods: Regular: - Black powder and white powder. Metallic: Aluminum powder and Magnetic black powder. Fluorescent: Greene scent and pink scent fluorescent powders.
- Iodine Fuming& Cyanoacrylate.

**Chapter-6ChemicalandPhotography Methods for Fingerprint Development**
- Gentian Violet and Silver Nitrate Method.
- Ninhydrin Method etc.
- Recording of Latent Prints and Visible prints by Slanting Photograph.

**Chapter-7 Biometric, Digital Imaging and Green Methods**
- Forensic application of Biometrics, Biometric Impression on Scanner/Live Scans.
- Application of digital imaging process in Fingerprint science.

AFIS application in Finger Print Bureau, Application of Alternate light sources (ALS) in finger print detection

| **Unit-III Foot Prints** | **15** |
|---|---|

**Chapter-8Developmentof Foot Prints**
- Meaning, Types, Importance
- Tracing of surface footprints,
- Casting and lifting of surface and sub-sunken footprints
- Gait pattern analysis–
- Determination of Sex, Height, Age of a person

  Gait pattern analysis

| **Unit-IV DNA Finger Prints** | **15** |
|---|---|

**Chapter-9MeaningandImportanceof DNA profile**
- Meaning of DNA Finger Prints and Scopes
- Importance of DNA profile
- Legal procedure for conducting DNA profile
- Circumstances of usage of DNA Profile

**Chapter–10LegalprovisionsofDNAprofile.**
- Source of DNA: Body Fluids, Hair, Skin Tissues and Nail etc.
- Role of DNA is Sexual offence cases

### References

1 Andrew R.W.Jackson, Julie M Jackson, 2011, " Forensic Science", Pearson Education Limited.

3 J C Upshaw Downs, Anjali Ranadive, Swienton , 2002, "Ethics in Forensic Science, Academic

Press Publications.

4 Jay A Siegel, KatheyMirakovits, 2013, " Forensic Science: The Basics", CRC press.

5 Jim Fraser, Robin Williams, 2013,"Hand book of Forensic Science", Routldge publications.

6 Max.M.Houck, Jay A Siegal,2010, "Fundamentals of Forensic Science" Academic Press.

7 Andrew R.W.Jackson, Julie M Jackson, 2011, " Forensic Science", Pearson Education Limited.

9 J C Upshaw Downs, Anjali Ranadive, Swienton, 2002, "Ethics in Forensic Science, Academic

Press Publications.

11. Walls H. J. (2nd Ed. 2008), – Forensic Science: An Introduction to Scientific Crime Detection,

Universal Law Publishing Co. Pvt. Ltd. New Delhi-33

12. Forensic Science in Criminal Investigation and Trials, B. R. Sharma

13. John Townsend, 2008, "Forensic Evidence: Prints", Crabtree Publishing House

14. Bumbrah, G. S.; Small particle reagent (SPR) method fordetection of latent fingermarks: A

review. Egyptian Journal ofForensic Sciences 2016, 6, 328. [CrossRef]

15. Linda L Klepinger, 2006, "Fundamentals of Forensic Anthropolgy", John wiley and sons.

## DigitalReference

https://www.britannica.com/topic/dactyloscopyhttps://forensicfield.blog/dactyloscopy/https://www.researchgate.net/publication/355065615_Fingerprint_Development_Techniques_A_Reviewhttps://www.wiley.com/en-us/Fingerprint+Development+Techniques:+Theory+and+Application-p9781119992615https://www.ijert.org/an-advanced-method-fingerprint-recognition-and-analysis-for-all-investigationindustrial-applicationshttps://www.taylorfrancis.com/chapters/mono/10.1201/9781420004347-7/methods-latentfingerprint-development-ashim-datta-henry-lee-robert-ramotowski-gaensslenhttps://www.sciencedirect.com/science/article/abs/pii/0031320395001069#:~:text=Fingerprints%20are%20classified%20into%20five,loop%2C%20right%20loop%20and%20whorl.https://www.cse.msu.edu/~cse802/Papers/802_FPClassification.pdf

**Pedagogy:** Lecture, Assignments, Interactive Sessions, ICT, Group Discussion

**Semester-VI**

**Content of Lab Practical Course DSC**

**Credits:02 Marks: 25+25=50**

**List of Experiments to be conducted**

1. Recording of fingerprints – Pattern analysis,
2. Identification of Ridge characteristics,
3. Ridge tracing &amp; ridge counting, Comparison of fingerprints
4. Developing latent fingerprints – Physical methods &amp
5. Developing latent fingerprints – Chemical Methods
6. Recording of foot prints
7. Identification of Gait patterns
8. Tracing of surface footprints
9. Casting method of Sunken footprints.
10. Recording of fingerprint using iodine fuming method.

**Pedagogy**: Conduct experiments, applying forensic techniques

## Course Articulation Matrix-231672

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 2 | 2 | 3 | 3 | 2 | 1 | 2 | 2 | 1 | 2 | 3 |
| CO2 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| Weighted Average | 2.25 | 2.5 | 2.5 | 3 | 4 | 2.5 | 2 | 2 | 2.25 | 2 | 2.5 | 2.75 |

**DSC (8) Syllabus for B.A Criminology and Forensic Science**

**Semester VI**

| Course Code:231673 | Course Title: <br> **DSC (8)** Corporate Crimes (Theory) <br> **DSC (8)** Examination of Frauds and Corporate Crimes (Practical) |
|---|---|
| **Course Credits :** 06 (4:0:2) | **Hours of Teaching:** 60 (Theory) <br> 60 (Practical) |
| **Total Contact Hours:** <br> 60 Hours (Theory) <br> 60 Hours (Practical) | **Formative Assessment Mark:** 40(Theory) <br> 25(Practical) |
| **Exam Duration**: 2 ½ Hours (Theory) <br> 3 Hours (Practical) | **Semester End Examination Marks:** <br> 60 (Theory) <br> 40 (Practical) |

**Course Outcomes (COs):**

**CO1:** Recognize what corporate crimes are, how they work, and what they do.

**CO2**: Explain the basic elements and major scope, types of Corporate Crimes.

**CO3**: Identifying the different corporate crimes that have occurred in India.

**CO4**: Getting familiar with India's corporate crime laws and prevention strategies.

| Content of Theory Course | Hours |
|---|---|
| **Unit-1 Introduction Corporate Crimes** | 15Hrs |

**Chapter-1 Nature of Corporate Crime**
- Meaning and Definition of Corporate Crimes.
- Various Types of Corporate Crimes
- Famous Cases of Corporate Crimes

**Chapter-2 Forms of Corporate Crimes**
- Bankruptcy related Frauds
- Exploiting assets and scams
- Mortgage Frauds
- Share Sale Frauds

| Unit-2 Corporate Frauds | 15Hrs |
|---|---|

**Chapter-3 Various kinds of Corporate Frauds in India.**
- Meaning & Definition of Fraud
- Types of Fraud- Individual & Corporate
- Characteristics of Fraud
- Trends of Scams: National &Globa

Perspective

**Chapter-4 Fraud in Banking Sector**
- Definition & Scope of Fraud in Banking Sector
- Banking Impersonation

**Chapter-5 Types of Frauds**
- Fraud against accounts
- Fraud against Card (Debit/Credit)
- Electronic Fraud and Miscellaneous Fraud

| Unit-3 Introduction to Insurance Frauds | **15 Hrs** |
|---|---|

**Chapter-6 Meaning of Insurance Frauds**
- Definition, Nature & Scope of Insurance
- Losses due to Insurance Frauds.

**Chapter-7 Types of Insurance Frauds**
- Property Insurance
- Motor Vehicle Insurance
- Health Insurance
- Role of Investigation in Insurance Frauds

| Unit-4 Prevention of Corporate Crimes | **15 Hrs** |
|---|---|

**Chapter-8 Measures in preventing Corporate Crimes in India**
- Laws, Regulation and Supervision
- Corporate Governance

**Chapter-9 Private Sector in India**
- Governance of Private Sectors in India.
- Laws, Regulation and Supervision
- Suspicious Transaction reporting

**Text Books:**

1 Anabui, Farad and sabotage, Jaico Publishing House. Kakabadse, Andrew, 2004, Corporate
2 Blum Richard H, 1972, Deleivers and Deceived, Charles, C. Thomas Publishers.
3 Bologna, Jack, 1984, Corporate Fraud, Butterworth Publishers.
4 Celia Wells, "Corporations and Criminal Responsibility".
5 Essential Commodities Act, 1955, 2005, Universal Law Publishing Co. Pvt. Ltd.
6 Ghosh Murrain, 1979, Black money – The case for India, Subarna Rekha, Calcutta.
7 Green Timothy, 1977, The Smuggling Business, Aldus Books, London. Internationally, Kogan Pagr Ltd.
8 Lal Bhure, 2003, Money Laundering: An insight into the dark world of Financial Frauds, Siddharth Publications.
9 Nabhi's Income Tax Guidelines and Mini Ready Reeckoner, 2009, Anabhi Publication Bare Acts:
10 Pitchandi Nand Sivamurthy A, 1985, Insurance Frauds, the Indian Soceity of Criminology, Department of Psychology, Madras.

**DigitalReference:**

- https://www.britannica.com/topic/corporate-crime
- https://www.financierworldwide.com/roundtable-corporate-fraud-nov22#.ZDZkwPZBzIU
- https://www.weforum.org/communities/gfc-on-good-governance
- https://gppreview.com/2022/12/12/criminal-liability-of-corporations-in-india-an-environmental-perspective/
- https://www.datavisor.com/wiki/types-of-bank-frauds/
- https://www.investopedia.com/terms/i/insurance-fraud.asp
- https://www.iii.org/article/background-on-insurance-fraud

**Pedagogy:** Lecture, Assignments, Interactive Sessions, ICT, Group Discussion

## Course Articulation Matrix- 231673

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 2 | 2 | 3 | 3 | 2 | 1 | 3 | 3 | 2 | 3 | 3 |
| CO2 | 2 | 2 | 3 | 3 | 3 | 2 | 1 | 3 | 3 | 2 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 |
| Weighted Average | 2.5 | 2.5 | 2.75 | 3 | 3 | 2.5 | 1 | 3 | 3 | 2.5 | 3 | 3 |

**Semester-VI**
**Content of Lab Practical Course DSC**
**Credits:02    Marks: 25+25=50**

1. To analysis the Famous Indian Corporate Crimes.
2. Examination and Identification of the Forged Check Books
3. Examination and Identification of the Forged affidavits and other Government Documents
4. Counterfeit of Notes and Coins.
5. Examination of Forged Signature
6. Evaluate and study of preventive measures towards Frauds in local and national banks (Plastic
   Cards, E-transactions, Gold and other ornaments)
7. Examination of Peculiar Characteristics of Different Documents like: Income Tax Returns,
   Insurance Bonds, E-certificates and E-documents.
8. Explore cases of corporate environmental crimes, such as illegal dumping or pollution.
9. The media's coverage of corporate crime
10. To find common themes and disparities, compare and contrast corporate crimes across other businesses,
    such as the pharmaceutical, financial, or energy sectors.

**References**

1 LNJN National Institute of Criminology and Forensic Science, "A Forensic Guide for Crime Investigators – Standard Operating Procedures", LNJN NICFS, 2016.
2 Cory Altheide and Halan Carvey; "Digital Forensics with Open Source Tools", Syngress Publication.
3 Sherri Davidoff and Jonathan Ham; "Network Forensics – Tracking Hackers through Cyberspace", Pearson Publications, 2012.

# INTERNSHIP

## Semester: VI

| | |
|---|---|
| **Course Code**: 23INTCRI01 | **Course Title**:<br>**SEC**: INTERNSHIP |
| **Course Credits:** 02 (0:0:2) | **Hours of Teaching/ Week:** |
| **Total Contact Hours: 90** Hours | **Formative Assessment Mark**:100<br>Marks (C1= 50 + C2= 50) |

**Note: This course will run as per the guidelines defined by the BoS Criminology and Forensic Science, University of Mysore, Mysuru, and the same is approved by BoS, Criminology and Forensic Science SBRR Mahajana First Grade College, Mysuru.**

**Course Outcomes (COs):**
**CO1:** Integrate Theory and Practice of the area selected for Internship to Explore Career Opportunities before Graduation.
**CO2:** Develop Communication, Interpersonal, Work Habits, Attitude, and other Critical Skills required for a job.

### Course Articulation Matrix – 23INTCRI01

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 3 | 3 | 3 | 3 | 3 | 2 | - | 2 | 3 | 3 | 2 | 2 |
| **CO 2** | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | 2 | 2 |
| **Weighted Average** | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1.5 | 3 | 3 | 2 | 2 |

## Scheme of Valuation for Internship

C1 and C2 are internal assessments to be conducted during 8th and 16th weeks respectively for the semester. The student will be evaluated on the basis of presentation skills and project development. The student has to compulsorily submit the project report for evaluation during C2. The report has to be certified by the Head of the Department and the Mentor/Supervisor.

**The student is evaluated for 100marks in C1 and C2 as per the following scheme:**

| Assessment Criteria | Marks |
|---|---|
| Project Presentation Skills | 50 |
| Project Development Skills and report | 50 |
| **Total** | **100** |

# Continuous Formative Evaluation/Internal Assessment (DSC)

Total marks for each course shall be based on continuous assessments and semester end Examination. The patterns is 40:60 for IA and Semester End theory Examinations respectively and 50:50 for IA and Semester End Practical Examinations respectively.

| Theory | | Practical |
|---|---|---|
| **Total Marks** | 100 Marks | 50 Marks |
| **Continuous Assessment-1(C1)** | 20 Marks | 10 Marks |
| **Continuous Assessment-2(C2)** | 20 Marks | 15 Marks |
| **Semester End Examination (C3)** | 60 Marks | 25 Marks |

**Evaluation Process of IA Marks Shall be as follows:**

**a)** The first component (C1) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, project work etc. This assessment and score process should be completed after completing 50% of syllabus of the courses and within 45 working days of semester program

**b)** The second component (C2) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, internship/industrial practicum/project work, quiz etc. This assessment and score process should be based on completion of remaining 50% of syllabus of the course of the semester.

**c)** During the 17th – 19th week of the semester, a semester end examination shall be conducted by the college for each course. This forms the third and final component of assessment (C3) and the maximum marks for the final component will be 60%.

**d)** In case of a student who has failed to attend the C1 or C2 on a scheduled date, it shall be deemed that the student has dropped the test. However, in case of a student who could not take the test on scheduled date due to genuine reasons, such a candidate may appeal to the Program Coordinator/Principal. The Program Coordinator/Principal in consultation with the concerned teacher shall decide about the genuineness of the case and decide to conduct special test to such candidate on the date fixed by the concerned teacher, but before commencement of the concerned semester end examinations.

**e)** For assignments, tests, case study analysis etc., of C1 and C2, the students should bring their own answer scripts (A4 size), graph sheets etc., required for such tests/assignments and these be sealed/signed by the concerned department at the time of conducting tests/assignment /project work etc.

The outline for continuous assessment activities for Component-I (C1) and Component-II (C2) of a course Shall be as under:

| | C1 Marks | C2 Marks | Total Marks |
|---|---|---|---|
| **Session Test** | 10 Marks | 10 Marks | 20 Marks |
| **Seminar/Presentation/Assignment/Activity/Case Study/Field Work/Project Work/Quiz etc.** | 10 Marks | 10 Marks | 20 Marks |
| **Total** | 20 Marks | 20 Marks | 40 Marks |

For practical course of full credits, seminar shall not be compulsory. In its place, marks shall be awarded for Practical Record Maintenance (the ratio is 25 (10 + 15):25).

Conduct of Test, Seminar, Case study/Assignment etc., can be either in C1 or in C2 component as decided by the college and concerned department/teacher.

The teachers concerned shall conduct test/seminar/case study etc., The students should be informed about the modalities well in advance. The evaluated courses assignments during component I (C1) and component II (C2) of assessment are immediately provided to the candidates after obtaining acknowledgement in the register by the concerned teacher(s) and maintained by the Department. Before commencement of the semester end examination, the evaluated test, assignment etc., of C1 and C2 shall be obtained back to maintain them till the announcement of the results of the examination of the concerned semester.

The marks of the internal assessment shall be published on the notice board of the department/college for information of the students.

The internal assessment marks shall be communicated to the CoE at least 10 days before the commencement of the examinations and the CoE shall have access to the records of such periodical assessments.

There shall be no minimum in respect of internal assessment marks.

Internal assessment marks may be recorded separately. A candidate who has failed or rejected the result, shall retain the internal assessment marks.

## Scheme of Valuation for Practical Examinations-V&VI Semester

C1 and C2 are internal tests to be conducted during 8th and 16th weeks respectively of the semester. C3 is the semester-end examination conducted for 3hours. The student will be evaluated on the basis of Procedure development and its execution. The student has to compulsorily submit the practical record for Evaluation during C2. For C3, the record has to be certified by the Head of the Department.
• The student is evaluated for 25 marks in C1 and C2 as per the following scheme:
Part-A Practical Exercises (C1): 10 marks
Part-B Practical Exercises (C2): 10 marks + Record: 05 marks = 15 marks
• The student is evaluated for 25 marks in C3 as per the following scheme:

| Assessment Criteria | Marks |
|---|---|
| Any Three Questions Decided by the External Examiner | 10+10+05 |
| **Total** | 25 |

# DSC Theory Question Paper Pattern
## For V &VI Semester

**Max Marks: 60**                                    **Times:2 ½ Hours**

**Instruction: Paper setting**
- The Question Paper is divided into 3 parts: Part-A, Part-B and Part-C
- Part-A, Part-B, Part-C With Internal Choice.(Short, Medium and Long answer question)
- Part-A Each Question Carries 2 Marks and student has to answer 5 out of 7questions.
- Part-B Each Question Carries 5 Marks and student has to answer 4 out of 8 questions.
- Part-C Each Question Carries 10 Marks and student has to answer 3 out of 5 questions.

## Part-A

I   **Answers any FIVE questions of the following in about 50 words      5x2=10**
   a.
   b.
   c.
   d.
   e.
   f.
   g.

## Part- B

II.   **Answer any FOUR questions of the following in about 300 words      4x5=20**
   2.
   3.
   4.
   5.
   6.
   7.
   8.
   9.
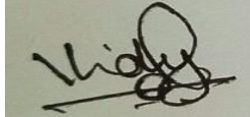
## Part-C

III.   **Answer any THREE questions of the following in about 500 words  3x10=30**
   10.
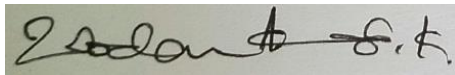
   11.

   12.

   13.

   14.

# Department of Criminology and Forensic Science, BoS Meeting – 12.09.2023
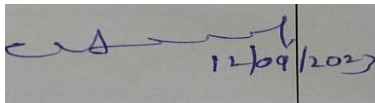
1. Vidyashree GV
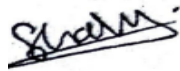
2. Chandan Kumar C

3. Dr. G.B Arvind

4. Shashidhar. E

5. Prof. Basavaraj D Masthi

   Absent

6. Dr. Sarita D' ssouza

   Absent

7. Dr. Krishnaraju.K

   Absent

8. Fancis Devasahayam B

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## BOARD OF STUDIES (BoS)

## DEPARTMENT OF ECONOMICS

UG | √ |

PG | |

## NEP Syllabi for V and VI Semester BA Economics

## 2023-24

# DEPARTMENT OF ECONOMICS

## Motto

Economics for Empowerment and Enhancement

## Vision

To prepare Students for successful careers as applied economists

Through fine tuning of minds & to make them understand and analyze the

Dynamics of Economic changes

## Mission

Providing a sound theoretical base to develop quantitative aptitude,

to substantiate theoretical learning

Exposure to practical aspects of Present day economic challenges

| POs | Details of the Programme Outcomes (POs) |
|---|---|
| PO1 | **Domain Knowledge:** Inculcation of fundamental concepts, principles, methods and the application of the same in the realm of concerned domain. |
| PO2 | **Problem Analysis:** This programme enhances the ability to define, identify and analyze appropriate means towards amicable solutions in the given area of Knowledge. |
| PO3 | **Design & Development of Solutions:** Structuring theoretical knowledge and developing customized designs in terms of – Intervention strategies, Profiling, Reviews, Archives, Marketing strategies, Info-graphics and Approaches for arriving at relevant and desirable solutions. |
| PO4 | **Research & Investigation**: Knowledge and application of "Research Methods" to investigate domain specific problems and derive scientific conclusions through testing of Hypotheses and relevant findings empirically. |
| PO5 | **Usage of Modern Tools and Techniques:** Mastery in the academic enclave through skilled handling administering, assessing, validating and interpreting complex phenomena using advanced tools and techniques to create simple and sustainable solutions. |
| PO6 | **Social Sciences & Society –** Promotes domain specific literacy to illuminate the significance of each discipline and its applicability for the well-being of Society. |
| PO7 | **Environment and Sustainability:** Contemplate and Introspect prevailing environmental challenges and consequences. Further, channelize initiatives towards sustainability. |
| PO8 | **Moral and Ethical Values:** Application of Professional Ethics, Humanitarian Values, Accountability and Social Responsibilities in emerging society towards attainment of harmony and co-existence. |
| PO9 | **Individual and Teamwork:** Imbibe the qualities of Teamwork and function effectively as an emerging leader in the diversified and multidisciplinary areas. |
| PO10 | **Communication:** Demonstrates Competency in comprehending and conceptualizing discipline specific concepts and ideas and communicates effectively through fluid communication within the professional and social setup. |
| PO11 | **Economics and Project Management:** Understand the Economic Concept in the context of specific discipline and apply the same through initiating Planning, and Executing the Project Dynamics effectively towards successful Project Management. |
| PO12 | **Lifelong Learning**: Identify and address their own educational needs in a changing world in ways sufficient to upgrade one's skills and competencies through constant self-evaluation and eternal learning. |

# Department of Economics - List of Board of Studies Members

| Sl. No. | Category | Name | Designation | Address for communication | E-mail and Mobile No. |
|---|---|---|---|---|---|
| 01 | **University Nominee** | **Dr. Navitha Thimmaiah** | Professor | DoS in Economics & Cooperation, UoM, Mysuru. | navithaprasad @gmail.com +919036180571 |
| 02 | **HoD & Faculty of the Department** | **Venkatalakshmi M N** | Associate Professor | SBRR Mahajana First Grade College, Jayalakshmipuram, Mysuru -12 | venkatalakshmi mn.fgc@mahaj ana.edu.in +91 9448472024 |
| | | **Dr.Pushparani  P G** | Assistant Professor | SBRR Mahajana First Grade College, Jayalakshmipuram, Mysuru - 12 | pushparanimfgc @gmail.com +91 9945094843 |
| | | **Siddappa R** | Assistant Professor | SBRR Mahajana First Grade College, Jayalakshmipuram, Mysuru - 12 | mnsh1611@gm ail.com +91 8050365338 |
| | | **Chaluvegowda S M** | Assistant Professor | SBRR Mahajana First Grade College, Jayalakshmipuram, Mysuru - 12 | Chaluvegowda2 5@gmail.com +918217310214 |
| 03 | **Two Experts from other University** | **Dr. Ramakrishna B M** | Professor | University college,Hampanaka tta, (A Constituent college of Mangalore University ) Mangaluru-575001 | rama_bmr@yah oo.co.in +91 9448427705 |
| | | **Dr. E. Thippeswamy** | Professor | Field Marshal K. M. Cariappa College, (A Constituent college of Mangalore University ) Madikeri-571201 | ethippeswamy @yahoo.com +91 9448639972 |
| 04 | **Alumnus** | **Dr. Roopa Patavardhan** | Alumnae & Assistant Professor | School of Business studies and social sciences, Christ (Deemed to be University) Hulimavu, Bengaluru-76 | roopa.patavardh an@christunive rsity.in +91 9901997086 |
| 05 | **Industry Expert** | **Nikhil Maruthi** | Stakeholder & LLP Partner | Merako Media Pvt Ltd Mysuru | nikhilmaruthi26 @gmail.com +91 9650266082 |

# Year-wise Programme Structure (NEP 2020)

## Discipline Specific Courses (DSC)
## V & VI Semester BA

| Course, Type, Code and Title | | Hour/Week | | Credits | Maximum Marks | | | Exam Duration | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | IA | | Exam | | |
| | | L | T/P | L: T:P | C1 | C2 | C3 | | Marks |
| **Economics – V Sem BA** | | | | | | | | | |
| **DSC (9)** 231537 | Public Economics | 4 | 0 | 4:0:0 | 20 | 20 | 60 | $2\frac{1}{2}$ Hours | 100 |
| **DSC (10)** 231538 | Development Economics | 4 | 0 | 4:0:0 | 20 | 20 | 60 | $2\frac{1}{2}$ Hours | 100 |
| **DSC (11)** 231539 | Indian Banking and Finance | 4 | 0 | 4:0:0 | 20 | 20 | 60 | $2\frac{1}{2}$ Hours | 100 |
| **DSC (11.1)** 231540 | Economics of Human Resource management | 4 | 0 | 4:0:0 | 20 | 20 | 60 | $2\frac{1}{2}$ Hours | 100 |
| **SEC (5)** **23 EMP ECO01** | Employability Skills | 2 | 0/1 | 2:0:1 | 20 | 20 | 60 | $2\frac{1}{2}$ Hours | 100 |

# Economics – VI Sem BA

| Course, Type, Code and Title | | Hour/ Week | | Credits | Maximum Marks | | | Exam Duration | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | IA | | Exam | | |
| | | L | T/P | L: T:P | C1 | C2 | C3 | | Marks |
| | | | | | | | | | |
| DSC (12) 231637 | International Economics | 4 | 0 | 4:0:0 | 20 | 20 | 60 | $2\frac{1}{2}$ Hours | 100 |
| DSC (13) 231638 | Indian Public Finance | 4 | 0 | 4:0:0 | 20 | 20 | 60 | $2\frac{1}{2}$ Hours | 100 |
| DSC (14) 231639 | Environmental Economics | 4 | 0 | 4:0:0 | 20 | 20 | 60 | $2\frac{1}{2}$ Hours | 100 |
| DSC (14.1) 231640 | Economic Thoughts of B R Ambedkar | 4 | 0 | 4:0:0 | 20 | 20 | 60 | $2\frac{1}{2}$ Hours | 100 |
| INT | Internship 23INTECO01 | 2 | 0 | 2:0:0 | 50 | 50 | - | - | 100 |

# V Semester BA

| | |
|---|---|
| **Course Code:** 231537 | **Course Title:** DSC (9): Public Economics |
| **Course Credit (L:T:P):** 4 (4:0:0) | **Teaching Hours/Week:** 4 Hours |
| **Total Contact Hours:** 60 Hours | **Formative Assessment Marks:** 40 |
| **Duration of Exam:** $2\frac{1}{2}$ Hours | **Summative Assessment Marks:** 60 |

**Course Outcomes (COs):**

CO1. Comprehend the introductory concepts of Public Finance & analyse the causes of market failure and corrective actions

CO2. Examine the impact, incidence and shifting of tax and Study the Economic Effects of tax on production, distribution and other effects

CO3. Enable the students to identify the Principles and Effects of Public Expenditure, public debt & Sources of Public Borrowing and Burden of Public Debt

CO4. Identify the Economic and functional classification of the budget; to acquaint with the advantages and disadvantages of Deficit Financing.

| Modules | Description | 60 Hours |
|---|---|---|
| **Module-I** | **Introduction to Public Economics** | **15** |
| | Public Economics: Meaning, definitions, Scope and Significance, Public Finance and Private Finance: Meaning, and Distinction; Public good and private good: Meaning and Distinction, Principle of Maximum Social Advantage, Externalities: Meaning and its Role, Market Failure: Meaning, causes. Market failure and role of government | |
| **Practicum** | Group Discussions on Public Finance and private finance; public good and private good<br>Assignment on Market failure and government intervention | |
| **Module II** | **Public Revenue and Public Expenditure** | **18** |
| | Meaning and sources of revenue; Taxation –Cannons of taxation, Characteristics of a sound tax system, Impact, Incidence- Division of Tax burden, Shifting of tax, Economic Effects of tax on production, distribution and other effects, Progressive and Regressive, Proportional Tax, Direct and Indirect Taxes –Merits and Demerits.<br>Public Expenditure; Meaning, Classification & Cannons, Reasons for the growth of public expenditure, Wagner's law of increasing state activities, Effects of public expenditure: Production, Distribution &Other effects. | |

| | | |
|---|---|---|
| **Practicum** | Mini-project/study to ascertain the impact of GST on retailers/wholesalers in your vicinity<br>A case study on the taxable capacity of the different sections of society in the vicinity Assignment on Effects of public expenditure: Production, Distribution & Other Effects | |
| **Module III** | **Public Debt** | **12** |
| | Public Debt: Meaning, Types & Effects**;** Sources of Public Borrowing; Burden of Public Debt - Classical/ Ricardian views and Keynesian views (in brief); Causes of the Rise in Public Debt**;** Methods of debt redemption. | |
| **Practicum** | Studying the burden of public debt through a project/ case study Assignment on Debt Management | |
| **Module IV** | **Public Budget, Fiscal Policy and Fiscal Deficit** | **15** |
| | Budget: Meaning, process & Types of budget, Economic and functional, classification of the budget; Balanced and unbalanced budget, Types of Budget Deficits; Fiscal Policy: Meaning, objectives & Tools; Fiscal deficit: Meaning, Computation, Deficit Financing: Meaning, Advantages and Disadvantages | |
| **Practicum:** | Calculation of various types of budget deficit using the budget data Group discussion on the advantages and disadvantages of deficit financing | |

| **References** |
|---|
| Lekhi R.K., Joginder Singh (2018) Public Finance, Kalyani publication, New Delhi |
| Tyagi B.P. (2014) Public Finance published by Jaya Prakash Nath and CO, Meerut |
| Hindriks J. and G. Myles (2006): Intermediate Public Economics, MIT Press. |
| Bhatia H L (2018): Public Finance. Vikas Publishing House. |
| Musgrave, R.A. (1989), The Theory of Public Finance, McGraw Hill |
| Musgrave R.A. and P.B. Musgrave (1989), Public Finance in Theory and Practice, McGraw Hill, |

**Web links:**
- https://www.geeksforgeeks.org/difference-between-public-finance-and-private-finance/
- https://en.wikipedia.org/wiki/Market_failure
- https://www.economicsdiscussion.net/government/taxation/canons-of-taxation-meaning-types-and-characteristics/17428
- http://www.eagri.org/eagri50/AECO141/lec16.pd
- https://www.studyiq.com/articles/fiscal-policy/
- https://www.wallstreetmojo.com/public-debt

**Course Articulation Matrix:** 231537

| PO's / CO's | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 2 |
| CO2 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 |
| CO3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 2 |
| CO4 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 2 |
| Weighted Average | 2.75 | 2.25 | 2 | 2.5 | 2.25 | 2 | 2 | 1.75 | 1 | 2.25 | 1.5 | 2 |

## V Semester BA

| Course Code: 231538 | Course Title: DSC (10): Development Economics |
|---|---|
| Course Credit (L:T:P): 4 (4:0:0) | Teaching Hours/Week: 4 Hours |
| Total Contact Hours: 60 Hours | Formative Assessment Marks: 40 |
| Duration of Exam: $2\frac{1}{2}$ Hours | Summative Assessment Marks: 60 |

**Course Outcomes (COs):**

- CO1. Examine the basic concepts and measurements of Development.
- CO2. Acquire the knowledge with some classical and partial theories of Development economics and identify the differences.
- CO3. Identify the distinction between Developed and Developing Countries.
- CO4. Analyse and tackle the Development issues effectively.

| MODULES | DESCRIPTION | 60 Hrs |
|---|---|---|
| **Module I** | **Introduction to Economic Development** | **14** |
| | Concept - Definitions - Distinction between Economic Growth and Development - Indicators of Growth and Development, Measures of Economic Development: Gross National Product (GNP) - Physical Quality of Life Index (PQLI), Human Development Index (HDI), Happiness Index, Multi-Dimensional Poverty Index(MDPI). | |
| **Practicum:** | Assignment on various indicators of growth and development Group discussions about the characteristic features of different countries and theirdevelopment levels | |
| **Module II** | **General Theories of Economic Growth and Development** | **16** |
| | Adam Smith's Theory, David Ricardo's Theory, T.R. Malthus' Theory, Karl Marx'sTheory, Schumpeter's Theory and Rostow's Growth Theory - Harrod-Domar Model(in brief). | |
| **Practicum:** | Assignment on different theories and their relevance to developing Countries, Debate on present stage of India's growth and estimated stage it may reach by 2047 | |

| Module III | Partial Theories of Economic Development | 16 |
|---|---|---|
| | Lewis Labour Surplus Model – Harris Todaro model of Migration (in brief) Rodan's Big Push Theory - Lieberstein's Critical Minimum Effort Approach - Balanced Vs. Unbalanced Growth, Factors in the Development Process - Capital Accumulation - Capital-Output Ratio - Technology and Economic Development. | |
| Practicum: | Group Discussion on Balanced and unbalanced growth strategies in Developed anddeveloping countries Assignment on the Factors in the Development Process Capital Accumulation | |

| Module IV | Sustainable Development | 14 |
|---|---|---|
| | Inclusive Development - Millennium Development Goals - Sustainable DevelopmentGoals, Targets and Achievements with reference to India. | |
| Practicum | Seminar on  MDGs and SDGs and the challenges | |

| References | |
|---|---|
| 1 | Higgins Benjamin & W.W. Norton Economic Development New York & Company. Inc. |
| 2 | Mishra S.K and Puri V.K, Economic Development and Planning, Himalaya Pub., House, Mumbai. |
| 3 | Taneja M.L. and Meier G. M, Economics of Development and Planning, S. Chand and Co, New Delhi. |
| 4 | Thirlwall A.P. Growth and Development: With Special Reference to Developing Economies, PalgraveMacmillan, New York. |
| 5 | Todoaro. M.P & Orient Longman Economic Development in the Third World, United Kingdom |
| 6 | Sustainable Development Reports |

**Web links:**

- https://www.shiksha.com/online-courses/articles/difference-between-economic-growth-and-economic-development/
- http://www2.harpercollege.edu/mhealy/g101ilec/intro/eco/ecomea/ecomeafr.htm
- https://www.youtube.com/watch?v=DevD4b7HQ7U
- http://www.ebookbou.edu.bd/Books/Text/SOB/MBA/mba_4334/Unit-02.pdf
- https://www.un.org/en/chronicle/article/w-arthur-lewis-pioneer-development-economics
- https://en.wikipedia.org/wiki/Sustainable_development

**Course Articulation Matrix-**231538

| PO's CO's | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| **CO2** | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 3 | 2 |
| **CO3** | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 3 | 2 |
| **CO4** | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 |
| **Weighted Average** | 2.75 | 2.25 | 2.75 | 2.25 | 2.5 | 2.25 | 2.25 | 2.25 | 1.5 | 2 | 2.75 | 2.25 |

## V Semester BA

| Course Code: 231539 | Course Title DSC (11): Indian Banking and Finance |
|---|---|
| Course Credit (L:T:P): 4 (4:0:0) | Teaching Hours/Week: 4 Hours |
| Total Contact Hours: 60 Hours | Formative Assessment Marks: 40 |
| Duration of Exam: $2\frac{1}{2}$ Hours | Summative Assessment Marks: 60 |

**Course Outcomes (COs):**

- CO1. Identifying the basics structure of Indian banking and the role of banks in monetary policy.

- CO2. Analyze the functioning of banks and different types of accounts and other services offeredby banks.

- CO3 Evaluate recent developments in the Indian banking sector, including digital banking,payment banks, and non-performing assets.

- CO4. Analyze the challenges faced by Indian banks and the implications of banking reforms for the Indian economy. Develop critical thinking and analytical skills in evaluating various financial products and services banks and capital markets offer.

| MODULES | DESCRIPTION | 60 Hours |
|---|---|---|
| Module I | **Introduction to banking: India** | 15 |
| | Indian Banks: Evolution, Structure: Public sector, private sector, Foreign, Cooperative, RRB, Small finance banks, Payment banks; Role and importance of banks in the Indian economy; Commercial bank: Meaning and Functions; Central Bank: Meaning and Functions;Issues in banking sector; NPA crisis. | |
| Practicum | Compare and contrast the different types of banks, highlighting their strengths andweaknesses- Presentation. Conduct a class discussion and compare and contrast the different scenarios on various loans, highlighting the risks involved and the measures taken by banks to manage theserisks. | |
| Module II | **Banking services** | 15 |
| | Banking services: Types of bank accounts; Account opening and importance of KYC; Bank loans; types, Documents required; eligibility, interest rates, maturity; Other services: Locker facility, payment and remittance services; debit cards, credit cards; ATMs; internet and mobile banking; Modern banking products: Insurance on deposits and loans, Investment services in capital market-stocks, bonds and mutual funds. | |

| Practicum | Group discussion on bank accounts and loan products and making recommendation to different classes ,Comparison of banking services by visiting bank branches |
|---|---|

| Module III | Modern Banking | 15 |
|---|---|---|
| | Modern banking facilities; Digital banking; Digital Wallets; Digital account opening; Biometrics; contact less payment system; instant payments; personal finance management tools; Use of artificial intelligence and machine learning in banks; Cyber security in banking; Credit scoring. | |
| Practicum: | Survey bank customers to understand their usage and satisfaction levels with digital banking services.<br><br>Analyze the adoption rates of digital banking services across different age groups anddemographic segments | |
| Module IV | Financial Market | 15 |
| | Introduction to Indian financial markets; Equity markets and stock exchanges; Debt markets and bond markets; Currency markets and forex trading; Commodity markets and trading; Capital market: Meaning and its products; Risk in capital market investments; Role of SEBI, Fin-tech . | |
| Practicum | Debate: Investing in capital market products.<br>Assignment on Indian financial markets | |

| References | |
|---|---|
| 1 | Khan, M. Y. (2019). Indian Financial System (11th ed.). McGraw Hill Education (India) PrivateLimited. |
| 2 | RBI (2022) report on the trend and Progress of Banking in India |
| 3 | Pathak, B. V. (2018). Indian financial system. Pearson Education |
| 4 | Principles and Practices of Banking (2023), Indian Institute of Banking & Finance (IIBF),MacMillian |
| 5 | Shekhar, K. C. & Shekhar, L. (2013). Banking Theory and Practice, 21st Edition |
| 6 | Taxman's Digital Banking, Indian Institute of Banking & Finance (IIBF), Bharati Law House |
| 7 | Reserve Bank of India. (2017). Basic Financial Literacy Guide. |
| 8 | Securities and Exchange Board of India. (2021). Handbook of Statistics on Indian Securities Market. |
| 9 | Financial Education Handbook (2021) National Centre for Financial Education (NCFE) |
| 10 | Investor Education material by National Stock Exchange |

**Web links:**

- https://www.toppr.com/guides/general-awareness/banks/introduction-to-banks/#:~:text=Banking%20in%20India%20has%20been,see%20the%20introduction%20of%20Banks.
- https://www.bankbazaar.com/home-loan/different-types-of-bank-loans-in-india.html
- https://www.nseindia.com/invest/how-to-invest-in-capital-market
- https://www.nseindia.com/invest/how-to-invest-in-capital-market
- https://www.sebi.gov.in/reports-and-statistics/publications/dec-2022/handbook-of-statistics- 2021_66158.html
- https://en.wikipedia.org/wiki/Bank
- https://www.brainkart.com/article/Modern-Banking-Services_35371/
- https://www.investopedia.com/terms/f/financial-market.asp

**Course Articulation Matrix** - 231539

| POs<br>COs | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | P 09 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| **CO2** | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| **CO3** | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 |
| **CO4** | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 |
| **Weighted Average** | 3 | 2.75 | 2.75 | 2 | 2.75 | 2 | 2 | 2.5 | 2 | 2 | 2.5 | 2.75 |

## V Semester BA

| Course Code: 231540 | Course Title DSC (11.1): Economics of Human Resource Management |
|---|---|
| Course Credit (L:T:P): 4 (4:0:0) | Teaching Hours/Week: 4 Hours |
| Total Contact Hours: 60 Hours | Formative Assessment Marks: 40 |
| Duration of Exam: $2\frac{1}{2}$ Hours | Summative Assessment Marks: 60 |

**Course Outcomes (COs):**

- CO1. Acquire the knowledge about meaning, nature, scope and value of the contemporary approach to humanresource management with reference to Economics.
- CO2. Evaluation of an organisation of a human resource management functionary in anestablishment, and to identify attributes of a successful personnel manager.
- CO3. Imparting knowledge and techniques in human resource planning, Job-Analysis, and Job-Design.
- CO4. Analysis of the importance and methods adopted for training and development of employees in the workplace.

| MODULES | DESCRIPTION | 60 Hours |
|---|---|---|
| Module I | **Introduction to Human Resource Management** | 15 |
| | Human Resource Management: Concept, Nature, scope, objectives, importance, functions of Human Resource Management with reference to Economics; Characteristics of a Human Resource Manager, HRD - Responsibility of managers. | |
| Practicum | Group Discussions on Human Resource Management as a Profession. Assignment on Qualities of Personnel Manager | |
| Module II | **Procurement of Human Resources** | 15 |
| | Human Resource Planning – Concept and objectives, importance, process, problems and guidelines; Job Design and Analysis: Concept, process, job description and job specification; Recruitment and Selection Meaning and process of recruitment, recruitment policy and organization, techniques of recruitment. | |
| Practicum | Assignment on recruitment and Group discussion on Techniques of Recruitment | |

| Module III | Training and Job Evaluation | 15 |
|---|---|---|
| | Training: Concept, objectives, importance; identifying training needs. Designing training programs, methods of training, advantages and limitations, methods of job evaluation, Wage and Salary Administration. Objectives and principles, essentials of sound wage structure, factors affecting wages, methods of wage payment, and wage policy in India. | |
| Practicum | Project on training and job evaluation | |
| Module IV | Performance Appraisal | 15 |
| | Performance appraisal: Concept, objectives, problems, methods and techniques, interview, Transfers, promotions and separations. Purpose of job changes, concept and objectives of transfers. Types of transfer, transfer policy, concept and basis of promotion, promotion policy, demotion, types of separations. | |
| Practicum | Seminar on transfers and promotions Group discussion on Performance appraisal | |

| References | |
|---|---|
| 1 | Koontz, Weirich & Aryasri, (2004) Principles of Management, Tata McGraw-Hill, New Delhi, |
| 2 | Tripathi & Reddy, (2008) Principles of Management, Tata McGraw-Hill, New Delhi, Laurie |
| 3 | Meenakshi Gupta, (2009) Principles of Management, PHI Learning, New Delhi, |
| 4 | Gupta (2016), Human resource Management. S Chand Publisher. New Delhi |
| 5 | Aswathappa K. (2020) Human resource Management, Tata Mc Graw Hill Publishing Co. Ltd. |
| 6 | Prasad L. M, (2017) Organisational Behaviour, S. Chand Publishers, New Delhi. |

**Web links:**

- https://www.whatishumanresource.com/human-resource-management

- https://www.mbaknol.com/human-resource-management/human-resource-planning/

- https://www.economicsdiscussion.net/human-resource-management/human-resource-planning

- https://www.shrm.org/resourcesandtools/tools-and-samples/policies/pages/recruitment-selection-

- https://www.managementstudyguide.com/performance-appraisal.htm
  https://www.businessmanagementideas.com/human-resource-management-2/transfers-of-

**Course Articulation Matrix** -  231540

| POs<br>COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | P09 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 |
| **CO2** | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 |
| **CO3** | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 3 |
| **CO4** | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| **Weighted Average** | 2.75 | 3 | 2.5 | 2.25 | 3 | 2 | 2 | 2.75 | 2.25 | 2.5 | 2.75 | 2.5 |

## V Semester BA

| Course Code: (23EMPECO01) | Course Title:(SEC-5)Employability Skills |
|---|---|
| Course Credit (L:T:P): 3 (2:0:1) | Teaching Hours/Week: 3 Hours |
| Total Contact Hours: 45 Hours | Formative Assessment Marks: 40 |
| Duration of Exam: $2\frac{1}{2}$ Hours | Summative Assessment Marks: 60 |

**Pedagogy:** Classroom lectures, Activities based learning, Practice Questions, Tutorial Classes, Group discussions, Mock Tests, etc.,

**Course Outcomes: (Cos)**
- Develop systematic problem-solving abilities.
- Enhance verbal and non-verbal reasoning skills.
- Improve numerical and analytical abilities.
- Enhance English language and communication skills.

| Syllabus: | |
|---|---|
| **Module No. 1:    General Orientation on all Competitive Exams** | **5** |
| Overview of Competitive Exams for Government Recruitment in India - Introduction, Eligibility Criteria, Exam Pattern, Syllabus, and Resources. | |
| **Module No. 2:    Quantitative Aptitude** | **15** |
| Number system, HCF &LCM, Ratio and Proportion, Averages, Ages, Percentages, Partnerships, Time, Speed and Distance, Profit and Loss, Data Interpretation, Problems based on Simple interest, Compound interest, Clocks, and Calendars. | |
| **Module No. 3: Verbal and Nonverbal Reasoning** | **15** |
| Verbal Reasoning: Data analysis, Data sufficiency, Decision making, coding & decoding, Blood relations, Puzzle tests, Direction sense test, Problems based on Venn Diagram/Syllogisms, Non-Verbal Reasoning: Analogy, Water images, mirror images, embedded figures, Completion of Pattern, Paper folding, Cubes & dice, Figure Formation & Analysis. | |
| **Module No. 4: English Language and Comprehension Solving** | **10** |
| Vocabulary, English Grammar, Verbal Ability, Sentence Structure, Spot the Error, Fill in the Blanks, Idioms & Phrases, Cloze Passages, and Comprehension Passages. | |

**Skill Development Activities:**
Various activity-based learning methods such as problem-solving exercises, case studies, role-playing, debates, group discussions, mock tests, and assessments can be conducted, in addition to any other relevant activities for the course to ensure effective learning.

References:

- Latest editions of books such as Quantitative Aptitude for Competitive Examinations,
- Modern Approach to Verbal and Non-Verbal Reasoning,
- Quick Learning Objective General English - R.S.Agarwal,  Arihant Publications,

**Web links:**

- List of Government Competitive Exams, Jobs & Vacancies (exampur.com)
- https://www.safalta.chttps://www.javatpoint.com/aptitude/quantitative
- https://free.aicte-india.org/Quantitative-Aptitude-Basics.php
- https://onlinecourses.nptel.ac.in/noc20_hs19/preview
- https://www.udemy.com/course/reasoning-verbal-non-verbal/
- https://www.careerride.com/mcq/logical-reasoning-quantitative-aptitude-mcq-questions
- https://www.admitkard.com/blog/analytical-reasoning/

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**Course Articulation Matrix** -   23EMPECO01

| POs COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | P09 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 2 | 3 | 1 | 2 | 2 | 1 | 2 | 2 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| Weighted Average | 3 | 3 | 2.75 | 2.75 | 3 | 1.75 | 2 | 2 | 1.75 | 2 | 2.75 | 2 |

**Pedagogy (For DSC Papers)**

| Formative Assessment | |
|---|---|
| **Assessment Occasion/ type** | **Weightage in Marks** |
| Internal Test | 50% |
| Assignment | 20% |
| Presentation/Project | 30% |
| Total | 100 |
| *Formative Assessment as per University guidelines are compulsory* | |

**Evaluation process for IA Marks**

| FORMATIVE ASSESSMENT | | | |
|---|---|---|---|
| | C1 | C2 | Total |
| Assessment Occasion/type | | | |
| Internal Test | 10 | 10 | 20 |
| Assignment/seminar | 5 | - | 05 |
| Quiz/GD | 5 | - | 05 |
| Presentation/Project etc | - | 10 | 10 |
| Total | 20 | 20 | 40 |
| Semester End Exam Theory | | | 60 |

**Evaluation process for IA Marks ( for SEC- Employability Skills)**

| FORMATIVE ASSESSMENT | | | |
|---|---|---|---|
| | C1 | C2 | Total |
| **Assessment Occasion/type** | | | |
| Class Test | 20 | - | 20 |
| Assignment/seminar | - | 20 | 20 |
| Total | 20 | 20 | 40 |
| Semester End Exam Theory | | | 60 |

## QUESTION PAPER PATTERN (C3) FOR DSC Papers

**Maximum Marks:** 60 **Duration:** $2\frac{1}{2}$ Hours

## PART -A

**Answer any Five of the following**                                5X2 =10

Sl. No. 1
  a.
  b.
  c.
  d.
  e.
  f.
  g.
  h.

## PART - B

**Answer any Six of the following:**                                6X5 =30

Sl. No. 2 to 10

## PART - C

**Answer any Two of the following:**                                2X10 =20

Sl. No. 11 to 14

=================

**QUESTION PAPER PATTERN (C3) FOR SEC (Employability Skills)**

**Maximum Marks:** 60 **Duration:** $2\frac{1}{2}$ Hours

## PART -A

**Answer any Five of the following**                                    5X2 =10

   Sl. No. 1
   a.
   b.
   c.
   d.
   e.
   f.
   g.
   h.

## PART - B

**Answer any Six of the following:**                                    6X5 =30

   Sl. No. 2 to 10

## PART - C

**Answer any Two of the following:**                                    2X10 =20

   Sl. No. 11 to 14

=======================

**VI SEMESTER BA**

| | | | |
|---|---|---|---|
| **Course Code:** 231637 | | **Course Title:** DSC(12) : International Economics | |
| **Course Credit (L:T:P):** 4 (4:0:0) | | **Teaching Hours/Week:** 4 Hours | |
| **Total Contact Hours:** 60 Hours | | **Formative Assessment Marks:** 40 | |
| **Duration of Exam:** $2\frac{1}{2}$ Hours | | **Summative Assessment Marks:** 60 | |

**Course Outcomes (COs):** After the successful completion of the course, the student will be able to:

- CO1. Understand the international trade theories and their application in international trade
- CO2. Explain the concept of terms of trade and demonstrate the effect of trade barriers; and displaythe ability to analyse the stages of economic integration
- CO3. Understand the concept of BoP and assess the BoP position and examine the changes in forexrate
- CO4. Analyse the role of International trade and financial institutions & Demonstrate good inter-personal and communication skills through class participation and contributing to critical discussion on trade issues

| MODULES | DESCRIPTION | 60 Hours |
|---|---|---|
| **Module I** | **International Trade Theories** | **15** |
| | Meaning and Importance of International trade; Differences between Internal andInternational Trade; Trade Theories: Mercantilist view; Absolute cost and comparative cost advantage theories; Haberler's Opportunity cost theory; Hecksher-Ohlin theory; Leontief's paradox | |
| **Practicum** | Assignment on Ricardo's Comparative cost advantage and Leontief's paradox | |
| **Module II** | **Terms of Trade and Trade Policy** | **17** |
| | Terms of trade- Concepts, Factors determining Terms of Trade; Trade Policy: Free trade v/s Protection; Tariffs: Types and effects; Quotas;Anti-dumping. | |
| **Practicum** | Debate: Free trade v/s Protection<br>Mini project: Trace the evolution of India towards Economic Integration | |
| **Module III** | **Balance of Payments and Capital Flows** | **13** |

| | Balance of Payments: Concept, Components; Disequilibrium in Balance of Payments: Causes and Measures to correct disequilibrium; Foreign Exchange rate: Meaning and types; determination of Foreign exchange rate: Demand for and Supply of Forex; Purchasing Power Parity (PPP) theory; Capital Flows: Meaning, concept and types of Foreign Investment; Forms of FDI; Advantages and disadvantages of FDI. |
|---|---|
| **Practicum** | Prepare India's Balance of Payment statement using recent Economic Survey Assignment on Forms of FDI |

| **Module IV** | **International Financial Institutions and Trade Organisations** | **15** |
|---|---|---|
| | Bretton Woods Institutions: IMF and IBRD - IDA and IFC: Organization, Objectives, Functions. Evolution of WTO: GATT – principles and objectives; WTO: Organization, Objectives, Functions, Agreements and current issues | |
| **Practicum:** | Group Discussion: Effectiveness of IMF and IBRD in developing countries <br> Seminar: Agreements of WTO or current issues of WTO | |

| **References** | |
|---|---|
| 1 | Sodersten. B. (1993): International Economics, MacMillan, 3 Edition, London, |
| 2 | Salvatore, D. (2016): International Economies, 12 Edition, Wiley Publication |
| 3 | Vaish, M. C. and Sudama Singh (1980): International Economics, 3 Edition, Oxford and IBH Publication, New Delhi. |
| 4 | Carbaugh, R. J. (1999): International Economics, International Thompson Publishing, New York |
| 5 | Dana, M. S. (2000): International Economics: Study Guide and work Book, 5. Edition, Routledge Publishers, London. |
| 6 | Kenen, P. B. (1994). The International Economy, Cambridge University Press, London. |
| 7 | Krugman, P.R. and M. Obstfeld (1994): International Economics: Theory and Policy Addison-Wesley Publications. |
| 8 | Jackson, JD. (1998) The World Trading System, Cambridge University Press, Mass. Cherunilam, International Economics, TMH, New Delhi. |
| 9 | D M Mithani, International Economics, Himalaya, Mumbai. |
| 10 | Jhingan M.L.(2016): International Economics, Vrinda Publications Pvt Ltd-Delhi |
| 11 | Dwivedi D.N. (2013): International Economics Theory & Policy, Vikas Publishing House Pv.t Ltd. |
| 12 | K.C. Rana & K.N. Verma (2017): International Economics ;Vishal Publishing Co. |
| 13 | Krishnamurthy H.R (2013) : Antararashtreeya Arthashastra ; (Kannada version), Sapna, Bengaluru |

**Weblinks:**
- https://www.economicshelp.org/blog/58802/trade/the-importance-of-international-trade/
- https://www.economicsdiscussion.net/haberlers-opportunity-cost-theory/haberlers-opportunity-cost-theory-with-assumptions-economics/30770
- https://www.yourarticlelibrary.com/trade-2/7-major-factors-affecting-the-terms-of-trade-economics/11061
- https://testbook.com/banking-awareness/balance-of-payment
- https://www.imf.org/en/About/Factsheets/Sheets/2022/IMF-World-Bank-New
- https://www.wto.org/english/thewto_e/whatis_e/tif_e/utw_chap2_e.pdf

**Course Articulation Matrix-** 231637

| PO's / CO's | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 |
| CO2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 |
| Weighted Average | 3 | 2.75 | 2.5 | 2.25 | 2.5 | 1.75 | 2.25 | 1.75 | 2 | 2 | 2 | 1.75 |

| Course Code: 231638 | Course Title: DSC (13): Indian Public Finance |
|---|---|
| Course Credit (L:T:P): 4 (4:0:0) | Teaching Hours/Week: 4 Hours |
| Total Contact Hours: 60 Hours | Formative Assessment Marks: 40 |
| Duration of Exam: $2\frac{1}{2}$ Hours | Summative Assessment Marks: 60 |

**Course Outcomes (COs):**

- CO1. Identify the structure of Indian Public Finance & trace the Source and nature of public revenue and expenditure
- CO2. Evaluate the Budget and different concept of deficits
- CO3. Gain Knowledge about the Principles of Public Debt and its management
- CO4. Examine the fiscal and monetary policy, their tools and importance including

    the Indian federal financing system and FinancialCommissions.

| MODULES | DESCRIPTION | 60 Hours |
|---|---|---|
| **Module I** | **Public Revenue** | **18** |
|  | **Direct Tax Revenue -** Trends and Patterns of Tax Revenue in India; Direct Tax in India; Personal Income Tax Rates and Slabs; Corporate Tax.<br> **Indirect Tax Revenue -** Indirect Taxes in India – Earlier Taxes- VAT and MODVAT; Goods and Services Tax (GST)- Objectives and Classification<br>of GST, Tax Rates of GST; Trends and Patterns of GST; Impact of GST onIndian Economy; Tax Reform Commissions. |  |
| **Practicum** | Collection and analysis of data on Direct tax<br>Collection and analysis of GST from<br>businesses |  |
| **Module II** | **Public Expenditure** | **15** |
|  | **Revenue Expenditure -** Classification of Public Expenditure in India; Revenue Account Expenditure- Trends and Patterns; Capital Account Expenditure-Trends and Patterns; Fiscal Responsibility and Budget Management (FRBM) Act; Impact of Public Expenditure on Indian Economy; Expenditure Reforms Commission (ERC) in India; **Union Budget and Its Analysis -** Meaning and Classification of Budgets; Zero- Based Budget; Composition of Union Budget; Union Budget Analysis<br>(current one); Different Concepts of Deficits- Revenue, Fiscal and Primary Deficits(in brief). |  |
| **Practicum** | Analysis of Union Budget (Current one)Group Discussion on Budget Deficits |  |

| Module III | **Public Debt and Its Management** | **14** |
|---|---|---|
| | **Public Borrowings and Debt –** Meaning of Public Debt; Trends and Patterns of Central Government Debt; Main Characteristics of Indian Public Debt; Causes of Public Debt in India; **Burden of Public Debt and Management in India -** Meaning of Burden of Public Debt; Importance of Public Debt Management; Principles of Public Debt Management; Repayment of Public Debt in India; Impact of Public Debt on Indian Economy. | |
| Practicum | Assignment to write on Indian Public Dent and sources of repayment <br> Group Discussion on Burden of Public Debt | |
| Module IV | **Fiscal and Monetary Policies and Federal Finance in India** | **13** |
| | Fiscal and Monetary Policy in India: trends in fiscal deficits. <br> **Indian Federal Finance -** Meaning and Importance- Allocation of Resources- Division of Functions and Resources; Principles of Federal Finance; Current Finance Commission and its Recommendations. | |
| Practicum | Group Discussion about the Role of Fiscal and Monetary Policies incontrolling inflation <br> Assignment to write the State List, Union List and Concurrent list | |

| **References** | |
|---|---|
| 1 | Bhatia H L (2021): Public Finance, S. Chand and Co., New Delhi. |
| 2 | Lekhi R.K (2020): *Public Finance*, Kalyani Publishers, New Delhi. |
| 3 | Musgrave R.A and Musgrave P.A (2017): *Public Finance in Theory and Practice*, Mcgraw- Hill <br><br> Kogakusha, Tokyo. |
| 4 | Om Prakash 2021): (*ic Public Economics: Theory a practice*, Vishal Publishing Co. Ludhiana. |
| 5 | S.K. Singh (2019): *Public Economics: Theory and Practice* S. Chand and Co., New Delhi. |
| 6 | Tyagi, B.P (2018)*: Public Finance*, Jai Prakash Nath and Company, Meerut, India. |

**Web links:**

- http://www.simplynotes.in/e-notes/mcomb-com/public-finance/tax
- https://cleartax.in/s/gst-law-goods-and-services-tax
- https://prepp.in/news/e-492-components-of-budget-indian-economy-notes#:~:text=the%20government%20budget%3F-,Answer%3A,expenses%20covered%20by%20that%20revenue.
- https://www.yourarticlelibrary.com/economics/public-expenditure-meaning-importance-classification-and-other-details/38100
- https://prepp.in/news/e-492-public-debt-indian-economy-notes
- https://www.shaalaa.com/question-bank-solutions/explain-the-principles-of-federal-finance-federal-finance_223404

**Course Articulation Matrix -**231638

| POs<br>COs | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | P0 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 2 |
| CO2 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 2 |
| CO3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 2 |
| CO4 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Weighted Average | 3 | 2.75 | 2.75 | 2.75 | 3 | 2.5 | 2 | 2.5 | 2 | 2 | 2.75 | 2 |

**VI SEMESTER BA**

| | | | |
|---|---|---|---|
| **Course Code:** 231639 | | **Course Title:** DSC14: Environmental Economics | |
| **Course Credit (L:T:P):** 4 (4:0:0) | | **Teaching Hours/Week:** 4 Hours | |
| **Total Contact Hours:** 60 Hours | | **Formative Assessment Marks:** 40 | |
| **Duration of Exam:** $2\frac{1}{2}$ Hours | | **Summative Assessment Marks:** 60 | |

**Course Outcomes (COs):**

- CO1. Examine the linkages between Environmental Degradation and Economic Development
- CO2. Develop an informed view regarding the potential of economics to help societies achieve theirenvironmental goals
- CO3. Evaluate the role of Citizens and NGOs in Environmental Protection.
- CO4. Analyze environmental problems and to assess environmental policies

| MODULES | DESCRIPTION | 60 Hours |
|---|---|---|
| **Module I** | **Environment and Ecology** | **15** |
| | Meaning, Nature and Scope of Economics of Environment; Linkages between Environment and the Economy; Environmental Kuznets curve; Environmental Stress; Population and Environment; Poverty and Environment; Meaning and elements of ecology; Biotic and Abiotic components; Material Balanced Principle (Entropy law); Rio Summit; Green Accounting. | |
| **Practicum**: | Making charts relating to SDGs or Assignments on environment-economy linkages at the local level. | |
| **Module II** | **Natural Resources Scarcity and Conservation** | **15** |
| | Meaning and Characteristics of Renewable and Non-renewable resources;Non-Renewable Resources and the problem of depletion ; Resource Scarcity and Economic Growth (Limits to Growth Model); Energy and Economic Development; Energy resources and their Pricing; Alternative energy sources; Conservation of Natural Resources- 3Rs – Reduce, Reuse and Recycling Measures | |
| **Practicum:** | Identifying local resources; Project on resource conservation (esp. water) at the College level; Discussion on Limits to Growth | |
| **Module III** | **Environmental Pollution** | **15** |
| | Types of Pollution –Air, Water, Soil, Noise - Causes and consequences.<br>Climate change, Global warming, Greenhouse Effect-Ozone depletion- Carbon footprint. Environmental hazards: rivers, land: floods, drought, acid rain. Environmental impact assessment (cost-benefit analysis). | |

| Practicum: | Visiting the Pollution Control Board office and observing its functions | |
|---|---|---|
| **Module IV** | **Environmental Policy and Regulations** | **15** |
| | Environmental regulatory system in India; Pollution Control Boards and their Functions; Provisions of the Environmental Protection Act, 1986;Environmental Movements in India (Chipko); Role of Citizens and NGOs in Environmental Protection. Global agenda for environmentalprotection. | |
| **Practicum**: | Assignments on types of pollution in local areas; Seminars on climate change and its consequences; visiting the Pollution Control Board officeand observing its functions | |

| **References** |
|---|
| Bhattacharya, R.N (Ed) (2001), *Environmental Economics: An Indian Perspective*, Oxford University Press. |
| Karpagam M. (1993), *Environmental Economics*, Sterling Publishers, New Delhi. |
| Shankar, U, (2001), *Environmental Economics*, Oxford University Press, New Delhi. |
| Singh, Katar and Anil Shisodia (2007): *Environmental Economics: Theory and Applications*, SagePublications, New Delhi |
| Mahajan V.S (2003): *Environmental Protection – Challenges & Issues*, Deep & Deep Publishers New Delhi |
| Sengupta, R.P. (Ed.) (2001), *Ecology and economics: An Approach to Sustainable Development*, Oxford University Press, New Delhi. |
| Nick Hanley, Jason F, Shogren and Ben White (2005): *Environmental Economics in Theory and Practice*, Macmillan India Ltd. |

**Web links**

- https://www.geeksforgeeks.org/link-between-the-economy-and-the-environment-of-a-country/

- https://www.slideshare.net/Sharin1234/material-balance-model

- https://www.environmentalpollution.in/energy/characteristics-of-renewable-and-nonrenewable-

- https://education.nationalgeographic.org/resource/alternative-energy-use/

- https://www.vedantu.com/biology/types-of-pollution

- https://www.mondaq.com/india/waste-management/624836/environment-laws-in-india

## Course Articulation Matrix - 231639

| PO's<br>CO's | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO 8 | P0 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 |
| CO2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 3 |
| CO3 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 3 |
| CO4 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 2 |
| Weighted Average | 2.25 | 2.25 | 2.25 | 2.25 | 2.75 | 2.25 | 2.5 | 3 | 2 | 2 | 2 | 2.75 |

**VI SEMESTER BA**

| | |
|---|---|
| **Course Code:** 231640 | **Course Title:** DSC14.1: Economic Thoughts of B R Ambedkar |
| **Course Credit (L:T:P):** 4 (4:0:0) | **Teaching Hours/Week:** 4 Hours |
| **Total Contact Hours:** 60 Hours | **Formative Assessment Marks:** 40 |
| **Duration of Exam:** $2\frac{1}{2}$ Hours | **Summative Assessment Marks:** 60 |

**Course Outcomes**
- CO1. derive inspiration from the life and works of B R Ambedkar
- CO2. Appreciate the socio-economic scenario during Ambedkar' period and compare it with presentday
- CO3. Comprehend the contributions of Ambedkar on various economic aspects
- CO4. Assess the economic views of Ambedkar in the light of present-day socio-economic problems & develop the traits of critical thinking.
- 

| MODULES | DESCRIPTION | 60 Hours |
|---|---|---|
| Module I | **Ambedkar's views on Economy, Society and Equity** | 15 |
| | Brief outline of Ambedkar's life and career; Ambedkar's views on: a) economy and society; b) role of state c) Socialism and State Socialism; d) Women Empowerment , e) Objectives of economy: growth & equity; Socio-economic inequality: Economics of Caste, discrimination and deprivation; reforms suggested there in by Dr Ambedkar: Constitutional Provisions: Hindu code Bill | |
| Practicum | Assignment: Socio-economic inequality and status of affirmative actions in India | |
| Module II | **Thoughts of Ambedkar on Agriculture** | 15 |
| | Ambedkar's views on: Agrarian Economy; Consolidation of land holdings and land revenue; Comparison with Ricardian view; Collective farming; views on land-ownership and landlessness; Nationalization of land and ceiling on land holdings; Surplus labour utilisation in agriculture and capital formation; | |
| Practicum | Mini Project: Using the Agriculture census data,chart the average size of operational holdings (by group) for different social classes in your tehsils and district (for2001-2 and 2015-16); compare with the corresponding figures of state and nation. | |

| Module III | Ambedkar on Industrialisation and Planning | 15 |
|---|---|---|
| | Ideas on Industrialisation; views on types of industries Labour: views on labour exploitation and labour reforms; Social security Planning: Measures to develop Irrigation and Power sector: River linking; | |
| Practicum | Debate 1): Small & cottage industries of rural areas v/s large scale industries in urban areas <br> Debate 2) Industrialize or perish v/s Industrialize and perish | |

| Module IV | Ambedkar's contribution to Fiscal and Monetary Economics | 15 |
|---|---|---|
| | Fiscal Economics: study of sources of revenue; canons of expenditure Monetary Economics: Price stability and exchange rate stability; Currencyreforms. | |
| Practicum | Seminar: Ambedkar's views on 'The Problem of Rupee' | |

**References (In order of importance of usage)**

| 1 | Heggade O D (1998) - Economic Thoughts of B R Ambedkar |
|---|---|
| 2 | Heggade O D – Ambedkar Vichara Dhare, Arjun Pub. House, Mysuru |
| 3 | Speeches and writing of Dr. B R Ambedkar, W R Mujawar (4 Volumes) |
| 4 | Dr. Ambedkar Bhashanagalu & Barahagalu - Vol 1, Vol.2 Part 1& 2, Vol 3, Vol 6 Part 1& 2, Vol 10 Part 1, 2, & 3, Vol 12 part 2, Pub by Govt of Karnataka |
| 5 | Nagar and Nagar ( 2010), Economic Thoughts and Policy of Dr. B. R. Ambedkar |
| 6 | Permaiah, P.K and Sateesh Reddy (1994) – Dr Ambedkar's Economic Philosophy, Delta Pub, NewDelhi |
| 7 | Dongre M K – Economic Thought of Dr B R Ambedkar |
| 8 | Ramaiah Reddy (ed) (1987)- Dr B R Amdedkar's Economic Philosophy |
| 9 | Sukhadeo Thorat(1998), Ambedkar's Role in Economic Planning and Water Policy, Shipra Publications, New Delhi. |
| 10 | Ambedkar B. R. (1936) Annihilation of Caste, Government of Maharashtra, Writings and Speeches ofDr B R Ambedkar, Volume 1, Mumbai. |

**Web links:**

- https://www.brambedkar.in/annihilation-of-caste/
- drambedkar.co.in/wp-content/uploads/books/category1/13the-problem-of-the-rupee.pdf
- https://www.mea.gov.in/Images/attach/amb/Volume_01.pdf
- https://indiacsr.in/dr-babasaheb-ambedkars-thoughts-on-agriculture/
- https://www.moneycontrol.com/news/opinion/opinion-why-ambedkars-views-on-education-and-industry-are-relevant-today-3258761.html

**Course Articulation Matrix -** 231640

| PO's<br>CO's | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | P0 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 3 |
| CO3 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| Weighted Average | 2 | 2.25 | 2 | 2 | 2.5 | 2.5 | 2.25 | 2.25 | 2 | 2 | 2.25 | 2.25 |

## Pedagogy (For DSC Papers)

| Formative Assessment | |
|---|---|
| **Assessment Occasion/ type** | **Weightage in Marks** |
| Internal Test | 50% |
| Assignment | 20% |
| Presentation/Project | 30% |
| Total | 100 |
| *Formative Assessment as per University guidelines are compulsory* | |

## Evaluation process for IA Marks

| FORMATIVE ASSESSMENT | | | |
|---|---|---|---|
| | C1 | C2 | Total |
| Assessment Occasion/type | | | |
| Internal Test | 10 | 10 | 20 |
| Assignment/seminar | 5 | - | 05 |
| Quiz/GD | 5 | - | 05 |
| Presentation/Project etc. | - | 10 | 10 |
| Total | 20 | 20 | 40 |
| Semester End Exam Theory | | | 60 |

**QUESTION PAPER PATTERN (C3) for DSC Papers**

**Maximum Marks:** 60 **Duration:** $2\frac{1}{2}$ Hours

## PART -A

**Answer any Five of the following** 5X2 =10

**Sl. No. 1**
 **a.**
 **b.**
 **c.**
 **d.**
 **e.**
 **f.**
 **g.**
 **h.**

## PART - B

**Answer any Six of the following:** 6X5 =30

**Sl. No. 2 to 10**

## PART - C

**Answer any Two of the following:** 2X10 =20

**Sl. No. 11 to 14**

=================

# Internship

**Semester: VI**

| | |
|---|---|
| **Course Code: 23INTECO01** | **Course Title:** SEC(2) **-** Internship |
| **Course Credits:** 02 | **Hours of Teaching/Week:** |
| **Total Contact Hours:** 90 Hours Internship | **Formative Assessment Marks:** 100 Marks (C1=50+C2=50) |

**Note:** This course will run as per the guidelines defined by the University of Mysore, Mysuru and the same is approved by BoS, Economics, SBRR Mahajana First Grade College, (A) Mysuru.

**Course Outcomes (COs):**

**CO1:** Integrate Theory and Practice of the area selected for Internship to Explore Career Opportunities prior to Graduation.

**CO2:** Sharpen the domain knowledge and provide core competency skills by developing Communication, Interpersonal, Work Habits, Attitude and other Critical Skills required for a job.

### Course Articulation Matrix – 23INTECO01

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 |
| **CO 2** | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 |
| **Weighted Average** | 3 | 3 | 3 | 3 | 3 | 2.5 | 2 | 2 | 3 | 3 | 3 | 2.5 |

## Scheme of Valuation for Internship

C1 and C2 are internal assessments to be conducted during 8th and 16th weeks respectively for the semester. The student will be evaluated on the basis of presentation skills and project development. The student has to compulsorily submit the project report for evaluation during C2. The report has to be certified by the Head of the Department and the Mentor/Supervisor.

**The student is evaluated for 100 marks in C1 and C2 as per the following scheme:**

Project Progress Presentation (**C1**): 50 marks

Project Development and Report (**C2**): 50 marks

| Assessment Criteria | Marks |
|---|---|
| Project Presentation Skills | 50 |
| Project Development Skills and  Report | 50 |
| **Total** | **100** |

# Proceedings of the BOS Meeting

**Academic Year:** 2023-24

**Name: BoS –** I Meeting

**Date:** 26.08.2023

**Time:** 10:30 AM

**Place:** AVC- 3, SBRR Mahajana First Grade College (A), Mysuru.

**Total Number of Members:** 07 + 01

(07 Members attended the offline meeting, and one of the Members joined the meeting through Virtual mode)

**Agenda:**

1. Making necessary and appropriate changes in the syllabi of V &VI Semester BA and to seek the approval for the same. (DSC Papers)

2. Seeking approval for the Question paper pattern for V & VI Sem BA Program

3. Seeking approval for the List of Examiners for the year 2023-24

4. Seeking approval for the implementation of OBE for the various courses of V &VI Semester BA program

5. Seeking approval for Employability skills and Internship courses (SEC) for V & VI Semester BA classes respectively.

**Proceedings of the Meeting:**

1. BOS Meeting in Economics was started at 10.30am in AVC-3, with the presence of all the panel members

2. HoD welcomed all the members and briefed about the implementation of OBE for the various courses of V &VI Semester BA

3. Made a mention that syllabi of V &VI Sem BA Programme may be changed only to the extent of 20 to 25% as per the instruction of Parent University.

4. It was resolved by the members that the title of the units, chapters and Credits of the courses to be retained without any modifications.

5. Employability skills (SEC) for V Sem and Internship for VI Sem BA Students shall be taught as per the Curriculum notified by the UoM, Mysuru.

6. Some suitable changes were suggested by the members with respect to some of the topics which were repeated in the course DSC-9 & DSC -11

Course titles, chapter titles, number of teaching hours and credits have been retained. Some minor changes have been incorporated with respect to sub topics of the syllabus.

**Changes incorporated in the syllabus of V & VI Sem BA:**

- Under V Sem BA DSC-9 in Module-2 topics like Taxable capacity and Principles of public expenditure have been removed.
- In module-3 the Post Keynesian views and in module-4 Process of budget have been removed. MDPI has been included
- Under DSC-10, in module -1, Inequality and poverty, its meaning as well as causes and Human Poverty index have been removed.
- In module-2 the experts suggested to teach the Harrod – Domar Model in brief.
- In module-3 Migration theory: Harris Todaro Model is included.
- Under DSC-11, the topics removed from module-1 are Credit creation and Monetary policy.
- In module-2, impact of Global events on Indian banks & Investment services in capital market have been removed.
- Under VI Sem DSC-12, All modules retained without any modification
- Under DSC-13, in module-2, Budget and its analysis have been removed.
- Under DSC-14, module-3 and Module-4 same topics are repeated under both the modules. Hence, university nominee of our BOS Prof. Navitha Thimmaiah has suggested to copy the syllabus modified by the University of Mysore.

  7. Implementation of OBE for various courses of V & VI Sem BA Program has been approved
  8. Sought the approval for the Question paper pattern of V & VI Sem BA Program
  9. List of Examiners for the Year 2023-24 also approved.

**Note:**
- Syllabus of V and VI semester BA are subject to changes based on the syllabus provided by parent university, accordingly some minor changes are likely to be made in the DSC of both the semesters.
- During V Semester, DSC 9,10 & 11will be offered for one set of students, alternatively, DSC -9,10 & 12 will be offered for another set of students. Same is applicable to VI sem BA Program. However, DSC-9 & 10 are compulsory Courses.

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# Dept. of Economics

## Approved List of Examiners for 2023-24

| Sl. No. | Name | Designation | Address for communication |
|---|---|---|---|
| 01 | Venkatalakshmi M N | HoD & Associate Professor | SBRR Mahajana First Grade College'J L Puram, Mysuru-12 |
| 02 | Dr.Pushparani P G | Assistant Professor | SBRR Mahajana First Grade College'J L Puram, Mysuru-12 |
| 03 | Siddappa R | Assistant Professor | SBRR Mahajana First Grade College'J L Puram, Mysuru-12 |
| 04 | Chaluve Gowda S M | Assistant Professor | SBRR Mahajana First Grade College'J L Puram, Mysuru-12 |
| 05 | Prof. Sujatha Devi | Associate Professor | St. Philomina's College (A) |
| 06 | Dr.Naga Bhushan R | Associate Professor | GFG College, Kuvempunagar. Mysuru. |
| 07 | Dr. Praveen Saldana | Assistant Professor | St. Philomina's College (A) |
| 08 | Prof. Puttashetty | Associate Professor | GFG College, Hunsuru Mysuru |
| 09 | Prof. Jagadish B | Associate Professor | GFG College Nanjangud Tq, Mysuru. |
| 10 | Prof. Chamaraju K | Associate Professor | GFG College, Gundlu pet |
| 11 | Smt.Lakshmi S S | Assistant Professor | GFG College, Bannur, T.Narasipura (T)Mysuru-571101 |
| 12 | Dr. Puttaraju | Associate Professor | GFGC, Kuvempunagar, Mysuru |
| 13 | Smt. Vijayalakshmi G | Assistant Professor | Maharani's Arts College For Women, Mysuru |
| 14 | Smt. Soumya | Assistant Professor | St. Philomina's College(A) |
| 15 | Dr. Rashmi | Associate Professor | Maharaja College, UOM, Mysuru. |

| 16 | Prof. Puttaswame Gowda | Associate Professor | Bharathi College Bharthi Nagara ,Mandya. |
|----|------------------------|---------------------|------------------------------------------|
| 17 | Dr.Shashi Kala | Assistant Professor | Maharani's Arts College For Women, Mysuru |
| 18 | Dr. T Ramesh | Associate Professor | Basudev Somani College,Kuvempu nagar, Mysuru-23 |
| 19 | Dr. Kiran S P | Assistant Professor | H K Veeranna gowda Degree College, Maddur- 571428 |
| 20 | Prof. Muralidhar K D | Associate Professor | GFGC for Women, M G Road,Hassan-573201 |
| 21 | Dr. Prakash N | Associate Professor | Maharanies Arts college for Women. Mysuru-570005 |
| 22 | Prof. Madhusudhan | Assistant Professor | Boys FGC, Autonomous, Mandya |
| 23 | Dr. Shruthi G | Assistant Professor | Teresian College, Mysuru - 11 |
| 24 | Dr. Shivaprasad E | Assistant Professor | Maddaneshwara First Grade College, Kabballi |
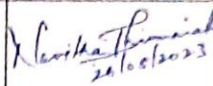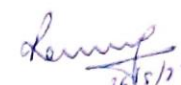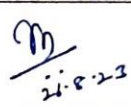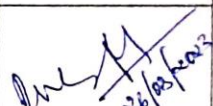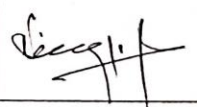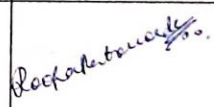
## Board of Studies - Department of Economics – 2023-24

| Sl. No. | Designation | Name | Signature |
|---|---|---|---|
| 01 | University Nominee | Dr. Navitha Thimmaiah, Professor of Economics DoS in Economics & Cooperation, UoM, Mysuru. | |
| 02 | Subject expert | Dr. Ramakrishna B M Professor of Economics University college Hampanakatta (Constituent college of Mangalore University ) Mangaluru-575001 | |
| 03 | Subject expert | Dr. E. Thippeswamy Professor of Economics Field Marshal K. M. Cariappa College (Constituent college of Mangalore University ) Madikeri-571201 | online mode |
| 04 | HoD & Faculty Member | Venkatalakshmi M N Associate Professor, SBRR Mahajana First Grade College, Jayalakshmipuram, Mysuru -12 | |
| 05 | Faculty Member | Dr. Pushparani P G Assistant Professor SBRR Mahajana First Grade College, Jayalakshmipuram, Mysuru -12 | |
| 06 | Faculty Member | Siddappa R Assistant Professor SBRR Mahajana First Grade College, Jayalakshmipuram, Mysuru -12 | |
| 07 | Faculty Member | Chaluvegowda S M Assistant Professor SBRR Mahajana First Grade College, Jayalakshmipuram, Mysuru -12 | |
| 08 | Subject Expert & Alumnus | Dr. Roopa Patavardhan Assistant Professor School of Business studies and Social Sciences, Christ(Deemed to be University) Hulimavu, Bengaluru-76 | |
| 09 | Industry Person | Nikhil Maruthi Stake Holder LLP Partner,Solution Infinite Media Pvt.Ltd, T-301, Chicago Avenue, Cunningham Road,Opp.Fortis Hospital, Bengaluru-560001 | ABSENT |

Mahajana Education Society (R.)

Education to Excel

**SBRR MAHAJANA FIRST GRADE COLLEGE (Autonomous)**

Jayalakshmipuram, Mysuru – 570 012

Affiliated to University of Mysore Re-accredited by NAAC with 'A' Grade

College with Potential for Excellence

# BOARD OF STUDIES (BoS)

## DEPARTMENT OF ENGLISH

**UG**  ☑

**PG**  ☐

## NEP Syllabi

## V and VI Semester BA Optional English

## 2023-24

# DEPARTMENT OF ENGLISH

## Motto

Write better, speak better

## Vision

To mould the students to confront the global challenge

## Mission

To inculcate values to become better
human beings through literature

# Program Outcomes (POs) for Bachelor of Arts

PO1 **Domain knowledge:** Acquire knowledge of management theories and practices with special focus on professional accounting and finance.

PO2 **Problem Analysis:** Identify, formulate and analyze complex business problems in a structured approach to focus upon real issues.

PO3 **Design/Development of Solutions:** Developing solutions by using critical thinking and analytical reasoning with appropriate qualitative, quantitative techniques and software applications in solving business and research problems.

PO4 **Investigation and Research:** Implementation of research methods to investigate specific business problems and draw conclusions.

PO5 **Use of Modern Techniques/Tools:** Ability to analyze and interpret data using mathematical, statistical, ICT and risk management techniques to solve business problems.

PO6 **Business and Society**: Entrepreneurs/Managers with socio-economic value system.

PO7 **Environment and Sustainability:** Contemplate and Introspect prevailing environmental challenges and channelize inclination towards sustainable development.

PO8 **Moral and Ethical Values:** Assimilate ethical, value based leadership skills and moral principles.

PO9 **Individual and Team Work:** Ability to perform as an individual or leader in diverse settings.

PO10 **Communication:** Harness communication and leadership skills effectively to adapt to the growing business world.

PO11 **Project Management and Finance:** Design methods and process; apply skills and knowledge to complete projects in accordance with project acceptance criteria and financial considerations.

PO12 **Lifelong Learning:** Evolve and improve as an individual by updating knowledge to enable oneself to thrive in social and professional life.

# List of Board of Studies Members

| Sl. No. | Category | Name and Designation | Address for Communication | E-mail and Mobile No. |
|---|---|---|---|---|
| 1 | HoD & Chairman | Sri Manjunath K R Assistant Professor | SBRR Mahajana First Grade College (A), Mysore | manjunathkr.fgc@ mahajana.edu.in 9448493596 |
| 2 | Faculty Member | Ms. Geetha D Assistant Professor | SBRR Mahajana First Grade College, Mysore | geethalit@rediffmail.com 9945653221 |
| 3 | Two Experts from external university | 1. Dr. Nataraj G Assistant Professor | DoS in English, KSOU, Mysuru | nataraj.g.ukkalagere@ gmail.com 9741219820 |
| | | 2. Dr. B.N. Shreekerthy Assistant Professor | DoS in English, Jnanabharathi, University of Bangalore, Bengaluru | drskeerthy@gmail.com 9739012854 |
| 4 | Nominee by the Vice Chancellor | Dr. Vanamala S M Associate Professor | Mandya P G Centre, Mandya | vanamalasm861@gmail.com 9449789748 |
| 5 | Alumnus | Ms. Spoorthi C S Assistant Professor | St. Joseph's College, Hunsuru | cssporrthi@gmail.com 8867091969 |

## Course Structure (NEP)

## DSC Optional English

## III Year

| Course Code, Course Type and Title | L:T:P | Credits | Teaching Hours per Week | Total No. of Hrs | Maximum Marks | | | Total Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | IA | | Exam | | |
| | | | | | C1 | C2 | C3 | | |
| **V Semester** | | | | | | | | | |
| **231579** **DSC(9)** Literary Criticism | 4:0:0 | 4 | 04 | 60 | 20 | 20 | 60 | 100 | 2½ |
| **231580** **DSC(10)** Subaltern Studies | 4:0:0 | 4 | 04 | 60 | 20 | 20 | 60 | 100 | 2½ |
| **231581** **DSC(11)** Life Narratives | 4:0:0 | 4 | 04 | 60 | 20 | 20 | 60 | 100 | 2½ |
| **VI Semester** | | | | | | | | | |
| **231679** **DSC(12)** Post-Colonial Studies | 4:0:0 | 4 | 04 | 60 | 20 | 20 | 60 | 100 | 2½ |
| **231680** **DSC(13)** Introduction to the History of the English Language | 4:0:0 | 4 | 04 | 60 | 20 | 20 | 60 | 100 | 2½ |
| **231681** **DSC(14)** Women's Writing | 4:0:0 | 4 | 04 | 60 | 20 | 20 | 60 | 100 | 2½ |

:

**Objectives:**

1. Explore texts and contexts of writings and readings from varied spaces in English Literature.

2. Connect liberal arts, humanities and social sciences through a multidimensional curriculum.

3. Develop the students' ability to read, process, think critically and independently.

4. Establish necessary skills of interpreting analyzing a text for a multidisciplinary approach towards higher studies and research.

5. Develop in students an inclusive outlook to inculcate ethical and moral values for a sense of social commitment.

6. Introduce multiple areas of writings in English language and translations in English.

7. Train students in skills for a relevant career in literary field – creative writing, translation and publishing.

8. To equip students with qualities of sympathy and empathy for lifelong learning.

:

# English Optional Syllabus

**For Undergraduate Programs offered in B A Optional English**

**Syllabus for V Semester**

**Title of the Paper – DSC(9), Literary Criticism**

| | |
|---|---|
| **Semester V** <br> **Course Code: 231579** | **Title: DSC(9) Literary Criticism** |
| **Course Credits:** 04 (4:0:0) | **Hours of Teaching/Week:** 04 |
| **Total Contact Hours: 60** Hours | **Formative Assessment Marks:** 40 |
| **Exam Duration:** 2½ Hours | **Semester End Examination Marks:** 60 |

**Course Outcomes :**

**CO1** Define key critical terms and concepts and familiarize themselves with key literary critics and their contributions to the field of criticism.

**CO2** Explore major literary movements and paradigms and understand how they shaped literary criticism during different historical contexts

**CO3** Analyze different methods and approaches used in literary criticism.

**CO4** Reflect on the relevance of literary criticism in the contemporary world, acknowledging its impact on the interpretation and appreciation of literature in different cultural and intellectual contexts.

| **Content of Course 9: Literary Criticism** | **60 Hrs** |
|---|---|
| **Unit- 1  Introduction to Criticism** | **15 Hrs** |
| What is Criticism? Meaning, Definitions, Functions, Methods of Criticism. <br> **Introduction to the following critics**: <br> Philip Sydney, John Dryden, Alexander Pope, Samuel Johnson, William Wordsworth, S T Coleridge, P B Shelley, Mathew Arnold, D H  Lawrence, Virginia Woolf, T S Eliot, F R Leavis, IA Richards | |
| **Unit – 2  Classical Criticism** | **15 Hrs** |
| • Aristotle's Concept of Tragedy <br> • Longinus Concept of Sublime | |
| **Unit – 3  Romantic Criticism** | **15 Hrs** |
| • Coleridge's 'Concept of Imagination <br> • Preface to the Lyrical Ballads - William Wordsworth <br> • Walter Pater's Essay on Style from *Appreciations* | |
| **Unit – 4  Modern Criticism** | **15 Hrs** |
| • Why the Novel Matters - D H Lawrence <br> • Metaphysical Poets - T S Eliot <br> • Four of Kinds of Meaning - IA Richards | |

**Books recommended and Suggested Reading**

1. Adams, Hazard. *Critical Theory Since Plato.* New York, Harcourt Brace Jovanovich, 1971.
2. Baldick, Chris. *The Oxford Dictionary of Literary Terms.* Oxford: Oxford University Press, 2001.
3. Barry, Peter. *Beginning Theory: An Introduction to Literary and Cultural Theory.* New Delhi: Viva Books, 2008.
4. Habib, M.A. R. *A History of Literary Criticism: From Plato to the Present.* London: Blackwell, 2005.
5. https://www.egyankosh.ac.in/bitstream/123456789/22610/1/Unit-1.pdf

**Pedagogy**: Lectures, Seminar, Role play, Group Discussion

| Formative Assessment | |
|---|---|
| **Assessment Type** | **Weightage in Marks** |
| Internal Test | 20 |
| Oral Test/ Assignments/ Surveys/ Interviews | 20 |
| **Total** | 40 |

Formative Assessment =  40 Marks

Term End Examination = 60 Marks

Total = 100 Marks

### Course Articulation Matrix - 231579

| POs / COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | 1 | 1 | 1 | 2 | 2 | 3 | 2 | 3 | - | 3 |
| **CO2** | 3 | 3 | 2 | 2 | 1 | 3 | 1 | 3 | 3 | 3 | 1 | 3 |
| **CO3** | 3 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 3 | 1 | 3 |
| **CO4** | 3 | 2 | 2 | 1 | 2 | 3 | 1 | 3 | 2 | 3 | - | 3 |
| **WA** | **3** | **2.5** | **1.75** | **1.25** | **1.25** | **2.5** | **1.25** | **2.5** | **2.5** | **3** | **0.5** | **3** |

# English Optional Syllabus

## For Undergraduate Programs offered in B A Optional English
### Syllabus for V Semester
### Title of the Paper – DSC(10),  Subaltern Studies

| | |
|---|---|
| **Semester V**<br>**Course Code: 231580** | **Title: DSC(10) Subaltern Studies** |
| **Course Credits:** 04 (4:0:0) | **Hours of Teaching/Week:** 04 |
| **Total Contact Hours: 60** Hours | **Formative Assessment Marks:** 40 |
| **Exam Duration:** 2½  Hours | **Semester End Examination Marks:** 60 |

**Course Outcomes:**

**CO1** A critical insight into subaltern consciousness and engaging critically with issues of subalternity, caste, and historiography in postcolonial contexts.

**CO2** Develop the ability to analyze and interpret complex socio-cultural narratives, fostering a deeper understanding of the novel's themes, characters, and their relevance in the context of gender dynamics and societal structures in rural India.

**CO3** Appreciate the role of drama as a medium for examining human complexities and identifying various manifestations of patriarchy and its impact on the lives of women

**CO4** Understand the nature of Dalit life and writing and explore the relationship between literature and activism for a change in society

| **Content of Course 10: Subaltern Studies** | **60 Hrs** |
|---|---|
| **Unit- 1**                 **Introduction** | **15 Hrs** |
| <ul><li>Annihilation of Caste (Essay) - Dr. B.R. Ambedkar</li><li>Caste and Subaltern Consciousness - Partha Chatterjee</li><li>On Some Aspects of Historiography of Colonial India - Ranajit Guha</li></ul> | |
| **Unit – 2**               **Fiction** | **15 Hrs** |
| <ul><li>*Rudaali* - Mahasweta Devi</li></ul> | |
| **Unit – 3**               **Play** | **15 Hrs** |
| <ul><li>*Jokumaraswamy* - Chandrashekhara Kambara</li></ul> | |
| **Unit – 4**               **Prose** | **15 Hrs** |
| <ul><li>*Karukku* - Bama</li></ul> | |

**Books recommended and Suggested Reading**

1. Guha, Ranajit (ed.). *A Subaltern Studies Reader.* Oxford University Press, Delhi, 2000.
2. Guha, Ranajit (ed.). *Subaltern Studies: Writings on South Asian History and Society.* OUP, New Delhi, 1982
3. Chakrabarty, Dipesh. "Subaltern Studies in Retrospect and Reminiscence," *South Asia: Journal of South Asian Studies,* vol. 38, no. 1,2015
4. Spivak, Gayatri Chakravorty, *Can the Subaltern Speak? Reflections on the Hist01Y of an Idea,* 1988.
5. https://in.video.search.yahoo.com/search/video?fr=mcafee&ei=UTF-8&p=subaltern+studies&vm=r&type=E210IN714G0#id=2&vid=009b23c72c4a14ec4c343295c7fa25d5&action=view
6. https://egyankosh.ac.in/bitstream/123456789/44479/1/Unit-25.pdf
7. https://www.youtube.com/watch?v=fwBparioJuU

**Pedagogy**: Lectures, Seminar, Role play, Group Discussion

| Formative Assessment | |
|---|---|
| **Assessment Type** | **Weightage in Marks** |
| Internal Test | 20 |
| Oral Test/ Assignments/ Surveys/ Interviews | 20 |
| **Total** | 40 |

Formative Assessment =  40 Marks

Term End Examination = 60 Marks

Total = 100 Marks

## Course Articulation Matrix – 231580

| POs / COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 1 | 2 | 2 | 3 | 1 | 3 | 2 | 3 | - | 3 |
| CO2 | 3 | 3 | 1 | 2 | 2 | 3 | 1 | 3 | 3 | 3 | 1 | 3 |
| CO3 | 3 | 3 | 1 | 2 | 1 | 3 | 1 | 3 | 3 | 3 | 1 | 3 |
| CO4 | 3 | 3 | 1 | 2 | 1 | 3 | 1 | 3 | 3 | 3 | - | 3 |
| WA | 3 | 3 | 1.25 | 2 | 1.5 | 3 | 1.23 | 3 | 2.75 | 3 | 0.5 | 3 |

# English Optional Syllabus

**For Undergraduate Programs offered in B A Optional English**

**Syllabus for V Semester**

**Title of the Paper – DSC(11), Life Narratives**

| | |
|---|---|
| **Semester V** <br> **Course Code: 231581** | **Title: DSC(11) Life Narratives** |
| **Course Credits:** 04 (4:0:0) | **Hours of Teaching/Week:** 04 |
| **Total Contact Hours: 60** Hours | **Formative Assessment Marks:** 40 |
| **Exam Duration:** 2½ Hours | **Semester End Examination Marks:** 60 |

**Course Outcomes:**

**CO1** Demonstrate a comprehensive understanding of various forms of life narratives, including autobiographies, biographies memoirs, and diaries.

**CO2** Analyze the cultural and societal contexts that shaped Mary Kom's life and career, fostering an understanding of the broader issues of gender, identity, and sports in India.

**CO3** Demonstrate advanced skills in textual analysis and interpretation, allowing them to critically engage with the narrative styles, themes, and perspectives presented in these autobiographical works.

**CO4** Recognize the value of biographical literature in providing insights into the lives and motivations of influential figures in history.

| Content of Course 11: Life Narratives | 60 Hrs |
|---|---|
| **Unit- 1**          **Introduction to Life Narratives** | **15 Hrs** |
| • What are Life Narratives? - Genres of Life Writings- <br> • "Introduction" to *The New Critical Idiom: Autobiography* – Linda Anderson | |
| **Unit – 2**          **Autobiography** | **15 Hrs** |
| • *Unbreakable* - M C Mary Kom | |
| **Unit – 3**          **Memoirs & Diaries** | **15 Hrs** |
| • *Memoirs of My Working Life* (Chapter 6)- Sir M Visvesvaraya <br> • *My Dateless Diary* - R. K. Narayan | |
| **Unit – 4**          **Biography** | **15 Hrs** |
| • C. *V.Raman: A Biography* - Uma Parameswaran | |

**Books recommended and Suggested Reading**

- Anderson, Linda. *Autobiography.* Routledge, London, 2011.
- Anderson, Linda. *Women and Autobiography in the Twentieth Century: Remembered Futures.* Prentice hall, Harvester Wheatsheaf, London, 1997.

- Andrews, William L, and Douglas Taylor. *Richard Wright's Black Boy (American Hunger): A Casebook.* Oxford University Press, New York, 2003.
- Baggerman et al (eds.). *Controlling Time and Shaping the Self: Developments in Autobiographical Writing since the Sixteenth Century.* Brill, Leiden, 2011.
- Lejeune, Philippe. *On Autobiography.* U of Minnesota P, Minneapolis, 1988.
- Lionett, Francoise. *Autobiographical Voices:Race, Gender, Self-Portraiture.* Cornell UP, Ithaca, 1991
- Smith, Sidonie A. & Julia Watson, eds. *Reading Autobiography: A Guide for Interpreting Life Narratives.* U of Minnesota P, Minneapolis, 2001.
- Weintraub, Karl J. *The Value of the Individual: Self and Circumstance in Autobiography.* Chicago UP, Chicago, 1982.
- https://www.researchgate.net/publication/349212173_Rupkatha_My_Dateless
- https://rupkatha.com/V12/n3/v12n327.pdf

**Pedagogy**: Lectures, Seminar, Role play, Group Discussion

| Formative Assessment | |
|---|---|
| **Assessment Type** | **Weightage in Marks** |
| Internal Test | 20 |
| Oral Test/ Assignments/ Surveys/ Interviews | 20 |
| **Total** | 40 |

## Course Articulation Matrix - 231581

| POs / COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | - | - | 1 | 1 | 1 | 3 | 3 | 3 | - | 3 |
| **CO2** | 3 | 3 | - | 1 | 1 | 1 | 1 | 3 | 3 | 3 | - | 3 |
| **CO3** | 3 | 3 | 1 | 2 | 1 | 1 | 1 | 3 | 3 | 3 | 1 | 3 |
| **CO4** | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 1 | 3 |
| **WA** | **3** | **2.75** | **0.75** | **1** | **1** | **1** | **1** | **3** | **3** | **3** | **0.5** | **3** |

**V Semester BA Optional English**
**(For students admitted to the First Semester in 2021-22)**
**Question Paper Pattern For DSC Papers (9,10 & 11)**

Time: 2½ hours                                                                                      Marks : 60

### Unit – 1

**1.** Answer **FIVE** of the following in a word, phrase or sentence (out of Eight)  **(5x1=5)**
   a.
   b.
   c.
   d.
   e.
   f.
   g.
   h.


**2.** Write **Short Notes on Two** of the following (out of Four)                        **(2x5=10)**
   a.
   b.
   c.
   d.

### Unit – 2

**3.** Answer **Three** of the following in about a page each (out of Four)           **(3x5=15)**
   a.
   b.
   c.
   d.

### Unit – 3

**4.** Answer **Three** of the following in about a page each (out of Four)           **(3x5=15)**
   a.
   b.
   c.
   d.

### Unit – 4

**5.** Answer **Three** of the following in about a page each (out of Four)           **(3x5=15)**
   a.
   b.
   c.
   d.


** *** **

# English Optional Syllabus

**For Undergraduate Programs offered in B A Optional English**

**Syllabus for VI Semester**

**Title of the Paper – DSC(12), Postcolonial Studies**

| Semester VI<br>Course Code: 231679 | Title: DSC(12) Postcolonial Studies |
|---|---|
| Course Credits: 04 (4:0:0) | Hours of Teaching/Week: 04 |
| Total Contact Hours: 60 Hours | Formative Assessment Marks: 40 |
| Exam Duration: 2½ Hours | Semester End Examination Marks: 60 |

**Course Outcomes:**

**CO1** Define key critical terms and concepts relating to Postcolonialism

**CO2** Develop advanced skills in textual analysis and critical thinking, allowing them to engage with complex literary and theoretical texts in the field of postcolonial studies.

**CO3** Ability to critically analyze literary and non-literary texts, identifying the underlying themes, symbols, and rhetorical strategies used by the authors to convey their messages.

**CO4** Ability to explore the consequences of cultural collision and the struggle for identity in a changing world and appreciation for the values and traditions of an indigenous culture

| Content of Course 12: Postcolonial Studies | 60 Hrs |
|---|---|
| **Unit- 1**            **Introduction to Postcolonial Studies** | **15 Hrs** |
| • Key Concepts: Colonial Discourse, Colonialism, Decolonization, Hegemony, Hybridity, Imperialism, Nationalism, Orientalism, Postcolonialism, the Subaltern Text: *Minutes on Indian Education -* Macaulay | |
| **Unit – 2**            **Essays on Postcolonial Studies** | **15 Hrs** |
| • "The Beginnings of English Literary Study in British India" – Gauri Vishwanathan<br>• "On National Cultures" from *The Wretched of the Earth* - Frantz Fanon (Source: *Literature in The Modern World: Critical Essays and Documents* Edited by Dennis-Walder)<br>• Introduction to *Colonialism/Postcolonialism* - Ania Loomba | |
| **Unit – 3**            **Postcolonial Texts and Talks** | **15 Hrs** |
| • *The Danger of a Single Story* - Chimamanda Adichie (TED Talk, Transcript) Source: https://www.hohschools.org/cms/lib/NYO19 13703/Centricitv/Domain/817/English%2012%20Summer%20Reading%20 %202018.pdf<br>• Toba Tek Singh (short story) - Saadat Hasan Manto<br>• Caste Out (poem) - Meena Kandasamy | |
| **Unit – 4**            **Fiction** | **15 Hrs** |
| • *Things Fall Apart* – Chinua Achebe | |

**Books recommended and Suggested Reading**

- Abrams M H, and Harpham. *A Glossary of Literary Terms.* Cengage Learning, New Delhi, 2014.
- Barry, Peter. *Beginning theory: An introduction to literary and cultural theory. MUp,* Manchester, 2017.
- Vincent B. , et al., *The Norton Anthology of Theory and Criticism,* WW Norton and Company, London, 2018.
- https://www.postcolonialweb.org/courses/related.html
- https://www.youtube.com/watch?v=tLCUd33l6y8  (Things  Fall Apart lecture1 )
- https://www.youtube.com/watch?v=59TO8tX5gIY (Things Fall Apart lecture 2)

 **Pedagogy**: Lectures, Seminar, Role play, Group Discussion

| Formative Assessment | |
|---|---|
| **Assessment Type** | **Weightage in Marks** |
| Internal Test | 20 |
| Oral Test/ Assignments/ Surveys/  Interviews | 20 |
| **Total** | 40 |

## Course Articulation Matrix - 231679

| POs / COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 3 | 1 | 3 |
| CO2 | 3 | 3 | 3 | 1 | 1 | 2 | 1 | 3 | 1 | 3 | 1 | 3 |
| CO3 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 3 | 1 | 3 | 1 | 3 |
| CO4 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 3 | 1 | 3 | 1 | 3 |
| WA | 3 | 2.25 | 2.25 | 1.25 | 1.25 | 1.25 | 1 | 2.75 | 1.25 | 3 | 1 | 3 |

# English Optional Syllabus

## For Undergraduate Programs offered in B A Optional English
## Syllabus for VI Semester
### Title of the Paper – DSC(13), Introduction to the History of the English Language

| | |
|---|---|
| **Semester VI** **Course Code: 231680** | **Title: DSC(13) Introduction to the History of the English Language** |
| **Course Credits:** 04 (4:0:0) | **Hours of Teaching/Week:** 04 |
| **Total Contact Hours: 60** Hours | **Formative Assessment Marks:** 40 |
| **Exam Duration:** 2½ Hours | **Semester End Examination Marks:** 60 |

**Course Outcomes:**

**CO1**  Identify and explain key milestones in the evolution of the English language, tracing its journey from its earliest forms to the present.

**CO2**  An in-depth understanding of the growth of the English language under the influence of various other languages including Latin and French.

**CO3**  Recognize the significance of Bible translators in shaping the English language and assess the contributions of significant writers in defining and promoting standard English.

**C04**  Appreciate the complexity of the evolution of the English language and analyze how cinema, electronic, digital, and social media have influenced the contemporary English language, exploring the impact of technology and popular culture.

| **Content of Course 13: Introduction to the History of the English Language** | **60 Hrs** |
|---|---|
| **Unit- 1**           **Origin of the English Language** | **15 Hrs** |
| Language Families Indo-European Family of Languages English as part of the Germanic Family Landmarks in the Development of the English Language | |
| **Unit – 2**           **Influences on English Vocabulary** | **15 Hrs** |
| **Latin Influence** Medium, Equivalent, Index, Genius, Scribe, Church, Memento, Ego, Complex, Legitimate, Vacuum, Minimum, Status, Fungus, Species.  **Greek Influence** Graph, Phone, Character, Chorus, Academy, Bible, Harmony, Ecstasy, Nymph, Tragedy, Tyrant, Theatre, Irony, Alphabet, Drama, Elegy, Pathos, Epic, Theory, Museum, Hyphen, Dogma, Psychology, Neurology | |

| | | |
|---|---|---|
| **French Influence** | | |
| Court, Chancellor, Warden, Guardian, Guarantee, Warrant, Prior, Baptist. Cardinal, Castel, Chapel, Grace, Service, Ballet, Champagne, Naive, Soup, Penchant, Profile, Restaurant, Menu, Chef, Baton. **Other Influences** Scandinavia: Fellow, Wrong, Urge, Outlaw, Snare, Hit, Take, Root, They, Their, Them, Skill, Wing, Ugly, Sky, Weak, Loan, Both, Bleak, Same, Husband, ill. India: Nirvana, Swastika, Karma, Ahimsa, Sahib, Nawab, Mongoose, Bungalow, Vishnu, Bangle, Shampoo, Khushi, Khaki, Juggernaut, Catamaran, Cheroot. **Arab** Algebra, Cipher, Zenith, Saffron, Admiral, Cotton, Amber, Assassin, Magazine, Fakir, Imam, Madrasah, Harem, Gazelle. | |
| **Unit – 3** **Makers of the English Language** | **15 Hrs** |
| • Bible Translators, William Shakespeare, Edmund Spenser, John Milton, Dr. Johnson, William Wordsworth | |
| **Unit – 4** **English Language Development** | **15 Hrs** |
| Development of Spelling and Pronunciation; Development of English; Dictionaries; Standard English; English as World Language; Varieties of English; Influence of Radio and Television on the English language; Influence of Cinema and Pop Culture on the English Language; Influence of social media on the English language | |

**Books recommended and Suggested Reading**

- Wrenn C. L. *The English Language.* Vikas Publishing, India, 2022.
- Baugh A. C. *A History of English Language.* Routledge, India, 2012.
- Emerson and Oliver Farrar. *An Outline History of the English Language.* MacMillan, New York, 1906.
- Crystal David. *English as a Global Language.* Cambridge University Press, New York, 1997.
- https://docenti.unimc.it/carla.cucina/teaching/2017/17413/files/baugh-cable-a-history-of-the-english-language

**Pedagogy**: Lectures, Seminar, Role play, Group Discussion

| **Formative Assessment** | |
|---|---|
| **Assessment Type** | **Weightage in Marks** |
| Internal Test | 20 |
| Oral Test/ Assignments/ Surveys/ Interviews | 20 |
| **Total** | 40 |

**Course Articulation Matrix – 231680**

| POs / COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 3 | 1 | 3 | 1 | 1 | 1 | 3 | 1 | 3 | - | 3 |
| CO2 | 3 | 3 | 1 | 2 | 1 | 1 | 1 | 3 | 2 | 3 | - | 3 |
| CO3 | 3 | 3 | 1 | 3 | 1 | 1 | 1 | 3 | 2 | 3 | 1 | 3 |
| CO4 | 3 | 3 | 1 | 2 | 1 | 1 | 1 | 3 | 2 | 3 | 1 | 3 |
| WA | 3 | 3 | 1 | 2.5 | 1 | 1 | 1 | 3 | 1.75 | 3 | 0.5 | 3 |

# English Optional Syllabus
## For Undergraduate Programs offered in B A Optional English
## Syllabus for VI Semester
## Title of the Paper – DSC(14), Women's Writing

| | |
|---|---|
| **Semester VI** <br> **Course Code: 231681** | **Title: DSC(14) Women's Writing** |
| **Course Credits:** 04 (4:0:0) | **Hours of Teaching/Week:** 04 |
| **Total Contact Hours: 60** Hours | **Formative Assessment Marks:** 40 |
| **Exam Duration:** 2½ Hours | **Semester End Examination Marks:** 60 |

## Course Outcomes

**CO1** Understand the historical and cultural context of women's writing in India from early times to modern times and analyze the challenges and constraints faced by women writers during this period.

**CO2** Interpret the poetic works of women writers from diverse cultural backgrounds to discuss the themes of gender, identity, and empowerment in the poems.

**CO3** Evaluate the role of women writers in reshaping the genre of short fiction.

**CO4** Reflect on the significance of <u>That Long Silence</u> as a work of feminist literature in the Indian context.

| **Content of Course 14: Women's Writing** | **60 Hrs** |
|---|---|
| **Unit- 1**         **Introduction to Women's Writing** | **15 Hrs** |
| <ul><li>Introduction to *Women Writing in India: 600 B. C. to the Early Twentieth Century* - Susie Tharu and K Lalitha – Eds</li><li>Chapter One - *A Room of One's Own* - Virginia Woolf</li></ul> | |
| **Unit – 2**         **Poems** | **15 Hrs** |
| <ul><li>Palanquin Bearers - Sarojini Naidu</li><li>She - Lakshmi Kannan</li><li>Women Like Me - Maram Al-Massri</li><li>Phenomenal Woman - Maya Angelou</li><li>Flying Inside Your Own Body - Margaret Atwood</li></ul> | |
| **Unit – 3**         **Short Stories** | **15 Hrs** |
| <ul><li>"Two Words" - Isabel Allende</li><li>"Interpreter of Maladies" - Jhumpa Lahiri</li><li>"Theft" - Katherine Anne Porter</li><li>"Jungle Major" - Temsula Ao</li></ul> | |
| **Unit – 4**         **Novel** | **15 Hrs** |
| <ul><li>*That Long Silence* - Shashi Deshpande</li></ul> | |

**Books recommended and Suggested Reading**

- Lalita Ke, Susie J. Tharu, editors. *Women Writing in India: 600 R.C. to the early twentieth century.* Feminist Press, New York, 1991.
- Woolf Virginia. *A Room of One's Own.* Hogarth Press, London, 1929.
- Simone de Beauvoir. *The Second Sex.* Penguin Random House, New York, 1972.
- Gilbert Sandra M and Susan Guber, editors. *The Madwoman in the Attic: The Woman Writer and the Nineteenth-Century Literary Imagination.* Yale University Press, New Heaven Conn. and London, 2000.
- Elaine Showalter, *A Literature of Their Own.* Princeton University Press, USA,1999.
- Essay to be read: Helen Carr, "A History of Women's Writing" and Mary Eagleton, "Literary Representations of Women" https://mthoyibi.files.wordpress.com/2011/09/05-history-of-feminist-literarycriticism gill-plain-andsus. pdf
- https://oyc.yale.edu/english/engl-300/lecture-20
- https://ijcrt.org/papers/IJCRT2302227.pdf
- https://www.researchpublish.com/upload/book/Indian%20Feminism%20in%20Shashi-7572.pdf

**Pedagogy**: Lectures, Seminar, Role play, Group Discussion

| Formative Assessment | |
|---|---|
| **Assessment Type** | **Weightage in Marks** |
| Internal Test | 20 |
| Oral Test/ Assignments/ Surveys/ Interviews | 20 |
| **Total** | 40 |

## Course Articulation Matrix – 231681

| POs / COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 2 | 1 | 1 | 2 | 2 | 1 | 3 | 1 | 3 | 1 | 3 |
| **CO2** | 3 | 3 | 1 | 1 | 2 | 2 | 1 | 3 | 2 | 3 | 1 | 3 |
| **CO3** | 3 | 3 | 2 | 2 | 1 | 3 | 1 | 3 | 2 | 3 | 1 | 3 |
| **CO4** | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 3 | 2 | 3 | 1 | 3 |
| **WA** | **3** | **2.75** | **1.75** | **1.75** | **1.5** | **2** | **1** | **3** | **1.75** | **3** | **1** | **3** |

**(For students admitted to the First Semester in 2021-22)**
**Question Paper Pattern For DSC Paper (12)**

Time: 2½ hours                                                                                    Marks : 60

## Unit – 1

**1.** Answer **FIVE** of the following in a word, phrase or sentence (out of Eight)  **(5x1=5)**

   a.
   b.
   c.
   d.
   e.
   f.
   g.
   h.


**2.** Write **Short Notes on Two** of the following (out of Four)                    **(2x5=10)**

   a.
   b.
   c.
   d.

## Unit – 2

**3.** Answer **Three** of the following in about a page each (out of Four)          **(3x5=15)**

   a .
   b.
   c.
   d.

## Unit – 3

**4.** Answer **Three** of the following in about a page each (out of Four)          **(3x5=15)**

   a .
   b.
   c.
   d.


## Unit – 4

**5.**  Answer **Three** of the following in about a page each (out of Four)          **(3x5=15)**

   a .
   b.
   c.
   d.


** *** **

**VI Semester BA Optional English**
**(For students admitted to the First Semester in 2021-22)**
**Question Paper Pattern for DSC (13)**

**Introduction to the History of the English Language**

Time: 2½ hours                                                                    Marks : 60

**Unit – 1**

**1.** Write **Short Notes** on **THREE** of the following (out of Four)          **(3x5=15)**

   a.
   b.
   c.
   d.

**Unit – 2**

**2.** Identify the origin of **FIFTEEN** of the following words (out of Twenty)  **(15x1=15)**

| a) | e) | i) | m) |
|----|----|----|----|
| b) | f) | j) | n) |
| c) | g) | k) | o) |
| d) | h) | l) | p) |

**Unit – 3**

**3.** Answer **Three** of the following in about a page each (out of Four)          **(3x5=15)**

   a .
   b.
   c.
   d.

**Unit – 4**

**4.** Answer **Three** of the following in about a page each (out of Four)          **(3x5=15)**

   a .
   b.
   c.
   d.

** *** **

**VI Semester BA Optional English**
**(For students admitted to the First Semester in 2021-22)**
**Question Paper Pattern for DSC (14)**

Time: 2½ hours                                                                                          Marks : 60

**Unit – 1**

1. Write **Five** of the following in a word, phrase or sentence (out of Eight; from
   Women Writing in India)                                                                    **(5x1=5)**
   a.
   b.
   c.
   d.
   e.
   f.
   g.
   h.

2. Write **Short Notes** on **Two** of the following (out of Four; from *A Room of One's Own*)

                                                                                                                    **(2x5=10)**

   a.
   b.
   c.
   d.

**Unit – 2**

3. Answer **Three** of the following in about page each (out of Four)          **(3x5=15)**
   a.
   b.
   c.
   d.

**Unit – 3**

4. Answer **Three** of the following in about a page each (out of Four)          **(3x5=15)**
   a.
   b.
   c.
   d.

**Unit – 4**

5. Answer **Three** of the following in about a page each (out of Four)          **(3x5=15)**
   a.
   b.
   c.
   d.

** *** **

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# English Syllabus 2023-24
## Board of Studies

| Sl. No. | Name and address | Designation | Signature |
|---|---|---|---|
| 01 | Manjunath K R<br>HoD – Department of English<br>SBRR Mahajana First Grade College<br>Mysuru<br>manjunathkr.fgc@mahajana.edu.in | Chairman | K.R. Manjunath |
| 02 | Dr. Vanamala S M<br>Associate Professor<br>Mandya P G Centre<br>Mob. 9449789748<br>vanamalasm861@gmail.com | Member | S.M.Vanamala<br>7/9/23 |
| 03 | Dr. Nataraj G<br>Assistant Professor<br>DoS in English, KSOU, Mysuru<br>Mob. 9741219820<br>nataraj.g.ukkalagere@gmail.com | Member | Absent |
| 04 | Dr. B.N. Shreekeerthy<br>Assistant Professor<br>DoS in English<br>Jnanabharathi, University of<br>Bangalore, Bengaluru<br>Mob. 9739012854<br>drskeerthy@gmail.com | Member | ONLINE |
| 05 | Smt. Geetha D<br>Assistant Professor<br>Department of English<br>SBRR Mahajana First Grade College,<br>Mysuru<br>Mob. 9945653221<br>geethalit@rediffmail.com | Member | DGeetha<br>7/9/23 |
| 06 | Ms. Spoorthi C S<br>Assistant Professor<br>St. Joseph's College, Hunsuru<br>Mob. 8867091969<br>csspoorthi@gmail.com | Member | Absent |

Mahajana Education Society (R.)

Educationto Excel

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Jayalakshmipuram,Mysuru – 570 012

Affiliated to University of Mysore Re-accredited by NAAC with 'A' Grade

Collegewith Potential for Excellence

# BOARDOF STUDIES(BoS)

## DEPARTMENTOF GEOGRAPHY

**UG** ✓

**PG** ☐

# NEP Syllabi for V and VI Semester B.A.Geography

# 2023-24

# DEPARTMENT OFGEOGRAPHY

## MOTTO

Down to Earth Awareness

## VISION

To make a centre of excellence in Geographic information fora balanced development

# MISSION

To spread the awareness of Geographic base and to Develop Geographic consciousness among younger generations for understanding and creating a healthierPhysical and Cultural Environment.

# ProgramOutcomes(POs)forBachelorofArts

| POs | Details of the Programme Outcomes (POs) |
|---|---|
| PO1 | **Domain Knowledge:** Inculcation of fundamental concepts, principles, methods and the application of the same in the realm of concerned domain. |
| PO2 | **Problem Analysis:** This programme enhances the ability to define, identify and analyze appropriate means towards amicable solutions in the given area of Knowledge. |
| PO3 | **Design & Development of Solutions:** Structuring theoretical knowledge and developing customized designs in terms of – Intervention strategies, Profiling, Reviews, Archives, Marketing strategies, Info-graphics and Approaches for arriving at relevant and desirable solutions. |
| PO4 | **Research & Investigation**: Knowledge and application of "Research Methods" to investigate domain specific problems and derive scientific conclusions through testing of Hypotheses and relevant findings empirically. |
| PO5 | **Usage of Modern Tools and Techniques:** Mastery in the academic enclave through skilled handling administering, assessing, validating and interpreting complex phenomena using advanced tools and techniques to create simple and sustainable solutions. |
| PO6 | **Social Sciences & Society –** Promotes domain specific literacy to illuminate the significance of each discipline and its applicability for the well-being of Society. |
| PO7 | **Environment and Sustainability:** Contemplate and Introspect prevailing environmental challenges and consequences. Further, channelize initiatives towards sustainability. |
| PO8 | **Moral and Ethical Values:** Application of Professional Ethics, Humanitarian Values, Accountability and Social Responsibilities in emerging society towards attainment of harmony and co-existence. |
| PO9 | **Individual and Teamwork:** Imbibe the qualities of Teamwork and function effectively as an emerging leader in the diversified and multidisciplinary areas. |
| PO10 | **Communication:** Demonstrates Competency in comprehending and conceptualizing discipline specific concepts and ideas and communicates effectively through fluid communication within the professional and social setup. |
| PO11 | **Economics and Project Management:** Understand the Economic Concept in the context of specific discipline and apply the same through initiating Planning, and Executing the Project Dynamics effectively towards successful Project Management. |
| PO12 | **Lifelong Learning**: Identify and address their own educational needs in a changing world in ways sufficient to upgrade one's skills and competencies through constant self-evaluation and eternal learning. |

## ListofBoS Members

| Sl. No. | Category | Name &Designation | Address forCommunication | E-mail&MobileNo. |
|---|---|---|---|---|
| 1 | Chairperson | **Dr.K.K.Somashekara** Assistant Professor & HoD | Department of Geography SBRR Mahajana FirstGrade College (A),Jayalakshmipuram, Mysuru –12 | somashekarkk.fgc@mahajana. edu.in 9035456449 |
| 2 | Member | **Dr. Doddarasaiah. G** Assistant Professor | Department of Geography SBRR Mahajana First Grade College (A),Jayalakshmipuram, Mysuru -12 | gdurs2014@gmail.com, Mobile: 8892963344 |
| 3 | Member | **Siddaraju. C. S** Assistant Professor | Department of Geography SBRRMahajanaFirstGrade College (A),Jayalakshmipuram,Mysuru -12 | sidducs1981@gmail.com, Mobile: 9141481046 |
| 4 | Nomineebythe ViceChancellor | **Dr. B.Chandrashekara** Professor | Department of studies in Geography, Manasagangothri University of Mysore, Myso | chandrubuom@gmail.com, Mob: 9448912063 |
| 5 | Expertsfrom OtherUniversity | **Dr. Srinivas** Associate Professor | Department of Geography Govt. First Grade College, Kengeri, University of Bangalore Bengaluru | yadavaniseena@gmail.com, Mob: 9845286949 |
| 6 | Expertsfrom OtherUniversity | **Dr.Amarendra. K.N Principal** | HoD, Department of Geography Sri Siddaganga First Grade College Nelamangala Rural, Bangalore University | knamarnath2010@gmail.com, Mobile: 9008046170 |
| 7 | Alumnus | **Ms. Sreeja** Assistant Teacher | Excel Public School ,Koorgalli Industrial Area, Belwadi Post, Mysuru, Karnataka 570018 | shree-shreeja@yahoo.com Mobile - 7204220808 |
| 8 | One PersonfromIndustry/CorporateSector/AlliedArea | **Ravi. R.** Global Agency | # 471, D.Subbaiah Road, K.R.Mohalla, Near Ramaswamy Circle, Mysuru-570004 | ravi_coop1978@yahoo.com Mobile: 9900143297 |

# Year-wiseStructure(NEP2020): Geography
## Discipline Specific Courses (DSC) andInternship

## III Year

| Course Type,Codeand Title | | Hours/ Week | | Credits | Maximum Marks | | | Exam Duration | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | IA | Exam | | |
| | | L | T/P | L:T:P | C1 | C2 | C3 | | Marks |
| | **Geography– V Semester** | | | | | | | | |
| DSC (5) 231544 | **Population Resources and Dynamics** | 4 | 0 | 4:0:0 | 20 | 20 | 60 | $2\frac{1}{2}$Hours | 100 |
| DSC(5) - Lab | **Techniques in Population Geography** | 0 | 4 | 0:0:2 | 10 | 15 | 25 (FA) | 3Hours | 50 |
| | | | | | | | 25 (SA) | | |
| DSC (6) 231545 | **Fundamentals of Remote Sensing** | 4 | 0 | 4:0:0 | 20 | 20 | 60 | $2\frac{1}{2}$Hours | 100 |
| DSC (6)- Lab | **Satellite Images,Interpretation and Aerial Photography** | 0 | 4 | 0:0:2 | 10 | 15 | 25 (FA) | 3Hours | 50 |
| | | | | | | | 25 (SA) | | |
| | **Geography–VISemester** | | | | | | | | |
| DSC (7) 231644 | **Environmental Geography** | 4 | 0 | 4:0:0 | 20 | 20 | 60 | $2\frac{1}{2}$Hours | 100 |
| DSC(7)- Lab | **Methods in Environmental Geography** | 0 | 4 | 0:0:2 | 10 | 15 | 25 (FA) | 3Hours | 50 |
| | | | | | | | 25 (SA) | | |
| DSC (8) 231645 | **Fundamentals of Geographical Information System** | 4 | 0 | 4:0:0 | 20 | 20 | 60 | $2\frac{1}{2}$Hours | 100 |
| DSC (8)- Lab | **Digital Mapping Techniques in GIS** | 0 | 4 | 0:0:2 | 10 | 15 | 25 (FA) | 3Hours | 50 |
| | | | | | | | 25 (SA) | | |
| **INT** | Internship **23INTGEO01** | 2 | 0 | 2:0:0 | 25 | 25 | ------ | ---- | 50 |

## SyllabusDSC (5) Syllabus forB.A. Geography (Basicand Honors)

### SemesterV

| | |
|---|---|
| **CourseCode:**231544 | **CourseTitle: Population Resources and Dynamics** |
| **CourseCredits:**06 (4:0:2) | **HoursofTeaching/Week:**04(Theory)+04(Practical) |
| **TotalContactHours:** 60Hours(Theory) 60Hours(Practical) | **FormativeAssessmentMarks:** 40(Theory) 25(Practical) |
| **Exam Duration:**$2\frac{1}{2}$Hours (Theory) 3 Hours(Practical) | **SemesterEndExaminationMarks:**60(Theory) 25(Practical) |

## CourseOutcomes (COs)

CO1: Comprehend criticallythe skills on the demographic composition of a country.

CO2: Examine the dynamics of Geographical Population and Migration

CO3: Evaluate the population resources.

CO4:Analyze population growth issues and challenges&apply various technologies in Representation of demographic data

| Content | Hours |
|---|---|
| **UNIT -1 Introduction** | |
| Nature and Scope of Population Geography, Population Geography and Demography, Approaches to study population Geography, Sources of population data.<br><br>World Population: Distribution- patterns, Population growth, Density of population, population determinants with comparison to India. | 15 |
| **UNIT -2Demographic Change** | |
| Concepts of over, under & optimum population; Components of Population Change.<br><br>Fertility and Mortality:Concepts, measures of fertility and mortality, determinants and world patterns of fertility and mortality.<br>Demographic Attributes and Demographic Transition.<br>Theories of Population Growth: T.R.Malthusand David Ricardo<br>**Assignment**: Students must prepare a report relating to population change in their own area and submit a report. | 15 |
| **UNIT –3 Migration** | |
| Meaning, types, causes, consequences.<br>Theories of Migration:Theory of migration by Ravenstein and comprehensive theory by Lee.<br>Population composition and characteristics- Age, Sex, rural-urbanandoccupational structure.<br>**Case Study**: Students need to visit nearby village and get to know how and why migration takes place and submit a report. | 15 |
| **UNIT -4 Population as Resource** | |

| World Population Resource Regions. Social well-being and quality of life; population as a social capital. Contemporary Issues - Ageing of Population; Declining Sex Ratio, Population policies in developed and developing countries. Population Policiesin India. Human Development Index (HDI) | 15 |
|---|---|

**References:**
1.Chandna R.C. (2009), Geography of Population, Kalyani Publishers, Aneari Road, Daryaganj, New Delhi.
2.Majid Hussain (1999), Human Geography, Rawat publications, Jaipur.
3.Trewartha GT. (1959) A Geography of Population, world Patterns, John Wiley and Sons Inc. New York.
4.Ghosh BN. (1987) Fundamentals of population Geography s, sterling publishing company, New Delhi
5.Jhingan ML. B.K. Bhat, JN Deasi (2003) Demography, Urinda Publishers Pvt. Ltd. Delhi
6.R.K. Tripati ((2000) Population geography, commonwealth publishers, New Delhi.
7.Kayastha SL. (1998) Geography of Population, Rawat publications, jaipur.
8.Clerk I (1984) Geography of populations, approaches and applications, pergamon press, Oxford, UK.
9.Ritu Malik (2013), Changes in population Dynamics, Sanjay Prakashan
10.Prthvish Nag, G.C.Debnath (2021), Population Geography, Bharti Prakashan, Varanasi
11. B.M.Bharathi, Janasankyaadhyayana


**Website links:**

1. https://censusindia.gov.in/census.website/

2. https://mea.gov.in/icm.htm

3. https://population.un.org/wpp/

4. https://www.popcouncil.org/research/india

5. https://www.cdc.gov/csels/dsepd/ss1978/lesson3/section3.html

# DSC-(5)-Lab
## Techniques in Population Geography

| Content of the Practical Course | | Hours |
|---|---|---|
| Exercise 1 | **Sources of population data:** Census of India, UNPD (united nations population division), birth and death registry VSS (Vital statistics survey), NSS (National Sample Survey), NFHS (National Family and Health Survey) | **15** |
| Exercise 2 | **Population distribution and density:**<br>a) Thematic maps for population Distribution-patterns (dot map, Choropleth maps).<br>b) Calculation of Population Growth rate-(Bar Graphs)<br>c) Calculation of population projection, arithmetic method<br>d) Calculation of population Density, arithmetic density and agriculture density. | **15** |
| Exercise 3 | **Calculation of different types of fertility and mortality rates for any one region**<br>Eg: India / Karnataka /District, using the Census of India latest data.<br>a) Crude birth rate<br>b) General fertility rate, Total fertility rate<br>c) Crude death rate/ Mortality rate, Infant mortality rate<br>d) Age-specific mortality rate<br>e) Sex-specific mortality rate | **15** |
| Exercise 4 | **Thematic maps for Population composition:** construction of population pyramids for Age, Sex, Rural and Urban, on outline map Eg: India / Karnataka /District, using the Census of India latest data | **15** |

**Reference:**
1. R.L.Singh-Practicals in Geography
2. M.F.Karennanavar&Nanjannanavar.S-PrayogikaBhoogolashastra
3. Dr.Ranganath-PrayogikaBhoogolashastra
4. MohammadIzharHassan- Population GeographyA Systematic Exposition1st Edition
5. Suzanne Davies Withers-Population Geography
6. Dr. Raj KumarPatel-Population GeographyManglam Publications
7. De Blij, Why Geography Matters, x.
8. Thomas M. Poulson, Nations and States: A Geographic Background to World Affairs (Englewood Cliffs, NJ: Prentice Hall, 1995).
9. Martin Ira Glassner, Political Geography, 2nd ed. (New York: John Wiley, 1996).
10. Ronald J. Johnston, Peter J. Taylor, and Michael J. Watts, The Geographies of Global Change (Oxford: Blackwell, 1995).

**Webiste links:**

1. https://population.un.org/wpp/

2. https://www.popcouncil.org/research/india

3.https://www.cdc.gov/csels/dsepd/ss1978/lesson3/section3.html

4. See www.census.gov/rdo/data/009919.html

5. http://www.environicsanalytics.ca

6. https://www.eolss.net › sample-chapters

## CourseArticulationMatrix-231544

|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 2 | 1 | 1 | - | 2 | 2 | 2 | - | 1 | - | 2 |
| CO2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO3 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | - | 2 |
| CO4 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 |
| **Weighted Average** | **2** | **2** | **1** | **1.75** | **1** | **1.75** | **2** | **1.5** | **1** | **1.5** | **0.75** | **2** |

# SyllabusDSC (6) Syllabus forB.A. Geography (Basicand Honors)

**SemesterV**

| | |
|---|---|
| **CourseCode:**231545 | **CourseTitle: Fundamentals of Remote Sensing** |
| **CourseCredits:**06 (4:0:2) | **HoursofTeaching/Week:**04(Theory)+04 (Practical) |
| **TotalContactHours:** 60Hours(Theory) 60Hours(Practical) | **FormativeAssessmentMarks:** 40(Theory)                                25(Practical) |
| **Exam Duration:**$2\frac{1}{2}$Hours (Theory) 3 Hours(Practical) | **SemesterEndExaminationMarks:**60(Theory) 25(Practical) |

## CourseOutcomes(COs)

CO1: Interpret the components, history of remote sensing and the types of remote sensors and their platforms

CO2: Interpret aerial photographs and identify the digital and analog data.

CO3: Evaluate the applications of remote sensing and the new satellite programs of India.

CO4: Analyze the ground truth verification using Google Earth and evaluate its usefulness

| Content | Hours |
|---|---|
| **UNIT -1 Introduction to Remote Sensing** | |
| Definition and Components, History of Remote Sensing, Electromagnetic Magnetic Spectrum, Interaction of EMR with the atmosphere and with the surface feature, Atmospheric window, spectral reflectance of land covers (minerals, rocks, water, vegetation, and urban area). | **15** |
| **UNIT -2Sensors & Platforms** | |
| Types of orbits-sun-synchronous and geosynchronous, Sources of energy, Classification of remote sensors - Active, Passive, Electro-mechanical and optical sensors. Resolution concept - Spectral, Radiometric, and temporal resolution. Platform types and characteristics Launch of space vehicles. Angular characteristics-FOV and IFOV, pushbroom and whiskbroom cameras, Panchromatic, multispectral, hyperspectral scanners, and geometric characteristics of the imageries. **Assignment**: Students need to prepare a report on how satellite images are captured, processed, and distributed to the end users by citing Bhuvan, ISRO, ISAC, NRSC, and SGC Websites. | **15** |
| **UNIT –3 Aerial Photography** | |
| Elements, Types and interpretation of Aerial photography, Principles, Classification of Aerial photographs based on Height and Tilt, Scales, Components of camera, film, Aerial platforms. Elements of Aerial photo interpretation, Digital and Analog data, Image formats, Stereo pairs, | **15** |

| | |
|---|---|
| Applications of Aerial Photography. | |
| **UNIT -4 Applications of Remote Sensing** | |
| Indian remote sensing Centers and their activities, new satellite programs of India. Different Satellites and their Application in Land Resources, Meteorology, and Hydrology. Ground truth verification using Google Earth. Field Activity: Students need to visit a nearby village and get to know how remote sensing images and real world looks and submit a report. | **15** |

**Reference:**
1. Lillesand T. Mand Kiefer R.W (2021), Remote Sensing and Image interpretation, 7th Edition, John Wiley & Sons, Canada.
2. Jensen J. R, (2012), Remote Sensing of Environment: An Earth Resources Perspective, 2nd Edition, Pearson Education, Upper Saddle River, Prentice Hall, New Jersey.
3. ElachiCandvanZyl J .J, (2006), Introduction to the Physics and Techniques of Remote Sensing, John Wiley & Sons, Canada.
4. Joseph G, (2005), Fundamentals of Remote Sensing, 2nd Edition, Universities Press (India) Pvt Ltd, Hyderabad
5. Narayan LRA, (1999), Remote Sensing and its Applications, Universities Press (India) Pvt Ltd, Hyderabad.
6. Rampal K. K, (1999), Handbook of Aerial Photography and Interpretation, Concept Publishing Co, New Delhi
7. Avery T. E and Berlin G.L, (1992), Fundamentals of Remote Sensing and Air Photo Interpretation, 5th Edition, Prentice Hall, New Jersey.
8. Sabins, F.F. Jr, (1987), Remote Sensing; Principles and Interpretation, 2nd Edition, W.H. Freeman and Co, New York.
9. Jensen, John R., (2005), Introductory Digital Image Processing, 3rd Ed., Upper Saddle River, NJ: Prentice Hall, 526 pages.

**Website links:**
1. Projections: https://map-projections.net/imglist.php
2. https://webapps.itc.utwente.nl/librarywww/papers_2009/general/principlesremotesensing.
3. Pdf http://earthobsevatory.nasa.gov/Library/RemoteSensing
4. https://bhuvan.nrsc.gov.in/home/index.php
5. https://map-projections.net/imglist.php

# DSC(6)-Lab
## Satellite ImagesInterpretation and Aerial Photography

| Content of the Practical Course | | Hours |
|---|---|---|
| Exercise 1 | **Basics:**<br>1. Basic information of the image (projection histogram, layers, pixel)<br>2. Visual interpretation: colour, texture, association, pattern,tone, shape.<br>3. Satellite Products and Band Characteristics, band combination | 15 |
| Exercise 2 | **Satellite Images:**<br>1. Satellite image downloading portals, Bhuvan, USGS explorer.<br>2. Image Enhancement: Radiometric, spatial enhancement<br>3. Layers Stacking Students need to prepare a report on how satellite images are captured, processed and distribution to the end users by citing Bhuvan, ISRO, ISAC,NRSC,USGC Websites. | 15 |
| Exercise 3 | **Pre-Processing:**<br>1. Geometric and Radiometric Correction<br>2. Spectral enhancement: Spectral Indices, NDVI<br>3. Image Classification: Supervised and Unsupervised<br>4. Change Detection | 15 |
| Exercise 4 | **Aerial Photography:**<br>1.Determinants of scales<br>2. Types of Scales<br>3.Conversion of Scales and interpretation through stereoscope | 15 |

**Reference:**
1. Elachi Candvan Zyl J .J, (2006), Introduction to the Physics and Techniques of Remote Sensing, John Wiley & Sons, Canada.
2. Joseph G, (2005), Fundamentals of Remote Sensing, 2nd Edition, Universities Press (India) Pvt Ltd, Hyderabad
3. Narayan LRA, (1999), Remote Sensing and its Applications, Universities Press (India) Pvt Ltd, Hyderabad.
4. Rampal K. K, (1999), Handbook of Aerial Photography and Interpretation, Concept Publishing Co, New Delhi
5. David P. Paine, James D. KiserJohn Wiley & Sons, 25-Apr-2003 -
6. David P Paine and James D Kiser Publisher: John Wiley & Sons
7. Richards, J.A., 1986, Digital Image Processing, Springer-Verlag: New York.

**Website links:**

1. https://bhuvan.nrsc.gov.in/home/index.php
2. https://map-projections.net/imglist.php
3. https://pivotid.uvu.edu › papersCollection › Book
4. https://www.accessengineeringlibrary.com › chapter4
5. https://www.scribd.com › Ebooks › Earth Sciences
6. https://www.nhbs.com › aerial-photography-and-imag.

## CourseArticulationMatrix-231545

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 2 | 2 | 1 | 2 | - | 2 | - | 1 | - | 2 | 2 |
| CO2 | 2 | 2 | 1 | 1 | 2 | - | 2 | - | 1 | - | 1 | 2 |
| CO3 | 2 | 1 | 1 | 1 | 1 | - | 1 | - | 1 | 1 | 1 | 2 |
| CO4 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | - | 1 | 1 | - | 2 |
| **Weighted Average** | **2** | **1.75** | **1.25** | **1** | **1.75** | **0.25** | **1.75** | **-** | **1** | **0.50** | **1** | **2** |

# SyllabusDSC (7) Syllabus forB.A. Geography (Basicand Honors)

## SemesterVI

| | |
|---|---|
| **CourseCode:**231644 | **CourseTitle: Environmental Geography** |
| **CourseCredits:**06 (4:0:2) | **HoursofTeaching/Week:**04(Theory)+04 (Practical) |
| **TotalContactHours:** 60Hours(Theory) 60Hours(Practical) | **FormativeAssessmentMarks:** 40(Theory) 25(Practical) |
| **Exam Duration:**$2\frac{1}{2}$Hours (Theory) 3 Hours(Practical) | **SemesterEndExaminationMarks:**60(Theory) 25(Practical) |

## CourseOutcomes(COs)

CO1. Comprehend the interdisciplinary nature and the relationship between man and the Environment.

CO2. Analyze the functioning of ecosystems andits impact on human activity and global ecological changes.

CO3. Evaluate man-made changes like pollution, environmental hazards, and the depletion of natural resources.

CO4. Examine Environmental policy, impact assessment and conservation measures.

| Content | Hours |
|---|---|
| **UNIT -1 Introduction to Environment Geography** | |
| Nature and Interdisciplinary Aspect of Environmental Geography. Ecological Approaches. Definition and meaning of environment. Habitat. Ecological Niche. Biosphere and Biodiversity; bio-diversity and sustainable development. Biomes – major Biomes of the world. Man and Environmental Relationships. | **15** |
| **UNIT -2Ecosystem** | |
| Structure and Functioning of Ecosystem, Pond as an Ecosystem, ecosystem management and conservation; Principle of ecology; human ecological adaptation; influence of man on ecology and environment. Global and regional ecological change & imbalance. Food Chains, Food Webs, Food Pyramid. | **15** |
| **UNIT –3 Man-Induced Changes in Environment** | |
| Environmental Pollution, i.e., Air, Water, Noise; Solid Waste with special reference to India. Environmental Hazards, i.e., earth as Warehouses, Flood, Famines, Land Slides, Avalanches, Forest Fires, Impact of Green Revolution and Extinction of Species. Man-Made Ecosystem - Urban, Ecotourism, National Parks and Sanctuaries. Depletion of Ozone, Green House Effect and Acid Rain. | **15** |

| | |
|---|---|
| **UNIT -4 Principles of Environmental Management:**<br><br>Environmental Policy of India, (post-2000 AD). Environment Impact Assessment (EIA). Global Summits & Agencies of Environment Conservation. Environmental degradation, management and conservation. Problems of Deforestation and conservation measures. Environmental policy; environmental hazards and remedial measures. Environmental Education and Legislation. | **15** |

**References**

1. Strahler A.N. (1968) The Earth Sciences, Harper International Education, New York.

2. Richard H.B. (2004) Physical Geography, Heinmann Simple Services, Rupa& Company, New Delhi

3. Robinson H. (1982) Bio Geography, ELBS, New York.

4. Healey I.N. and Moore P.D. (1973) Biogeography, Backwell Oxford, U.k

5. Strahler A.N. and Strahler A.H. (1973) Environmental Geo Science, Hamilton, California, USA.

6. Savindra Singh (2004) Environmental Geography, PrayogPustakBhawan, Allahabad, India.

7. Paul Selman (2000) Environmental Planning, Sage Publications, New Delhi

8. Cheryl Simon Silve& Ruth S. De Fries (1991) One Earth One Future-Our chaining Global Environment, National Academy of Sciences, Affiliated to East-West Press Pvt. Ltd. New Delhi.

9. Strahler A.N. and Strahler A.H. (1977) Geography and Man's Environment, John Wiley & Sons, New York

10. Goldsmith Edward et al. (1988) The Earth Report – The Essential Guide to Global Issues, Price Stern Solan Inc. California, USA

11. Y.K. Sharma (2020), Narain's Environmental Geography (Resource and Development), Lakshmi Narain Agarwal

12. H.M. Saxena (2021), Environmental Geography, Rawat Publications

13. Strahler A.N. (1968) The Earth Sciences, Harper International Education, New York.

14. Richard H.B. (2004) Physical Geography, Heinmann Simple Services, Rupa& Company, New Delhi

15. Robinson H. (1982) Bio Geography, ELBS, New York.

16. Healey I.N. and Moore P.D. (1973) Bio-Geography, Backwell Oxford, U.K.

17. Strahler A.N. and Strahler A.H. (1973) Environmental Geo Science, Hamilton, California, USA.

18. Savindra Singh (2004) Environmental Geography, PrayogPustakBhawan, Allahabad, India.

19. Paul Selman (2000) Environmental Planning, Sage Publications, New Delhi

20. Cheryl Simon Silve& Ruth S. De Fries (1991) One Earth One Future-Our chaining

Global Environment, National Academy of Sciences, Affiliated to East-West Press Pvt. Ltd. New Delhi.

21. Strahler A.N. and Strahler A.H. (1977) Geography and Man's Environment, John Wiley & Sons, New York

**Website links:**

**1.** https://moef.gov.in/en/

2. http://environmentclearance.nic.in/

3. https://ndma.gov.in/

4. https://bhuvan.nrsc.gov.in/home/index.php

5. http://www.indiaenvironmentportal.org.in/

### DSC(7)-Lab
### Methods in Environmental Geography

| Content of the Practical Course | | |
|---|---|---|
| **Exercise 1** | 1. List out Biotic and Abiotic elements in the local region.<br>2. Identify and map micro-Biomes in the local region and study the biodiversity of the place. | **15** |
| **Exercise 2** | 3. List some ecosystem management and conservation methods in the local region for water bodies,<br>4. mapping of water bodies,<br>5. Mapping of bore wells.<br>6. Map the polluting points in the local area and their influence of man on local environment. | **15** |
| **Exercise 3** | 7. Mapping of Waste disposal sites<br>8. Suitability of the site for waste disposal (with reference to height, location, land use, land value, slope, | **15** |
| **Exercise 4** | 9. Mapping of parks and open spaces in the neighborhood.<br>10. Mapping of areas in the neighborhood where crowding is prevalent and type of land use around such places.<br><br>**Note:** Educational/Study tour is mandatory. Each student should submit tour report for internal assessment. | **15** |

**Materials required for the practical survey:**
   a) **Use boundary map of the neighborhood area and GPS (Field Mapping)**
   b) **Google earth can also be used** for **mapping neighborhood area.**

**Reference:**
   1. Noel Castree, David Demeritt, Diana Liverman and Bruce Rhoads -A Companion to Environmental Geography
   2. Walter A. RosenbaumEnvironmental Politics and Policy

3. Savindra Singh (2004) Environmental Geography, Prayog Pustak Bhawan, Allahabad, India.
4. Paul Selman (2000) Environmental Planning, Sage Publications, New Delhi
5. Environmental Pollution Consequences and Measures: Chaurasia. B.P
6. Environmental Geography: Saxena, H.M
7. Ecology and Environment: Sharma P.D
8. Environmental Geography: S.S. Nanjannanavar (Kan.Version)
9. Agarwal K.C: Environmental Biology, Nidhi Publishers Ltd, 2001
10. MathurH.S: Environmental Resources; The crisis of Development
11. 3. OdumE.P: Fundamentals of Ecology, WB Saunders Co, London, 1971
12. 4. Dash M.C: Fundamentals of Ecology, Tata McGraw Hill New Delhi 2002

**Web links and Video Content**
1.https://patnawomenscollege.in
2. https://byjus.com/biology/ecosystem
3. http://www.pcpolytechnic.com/mechanical
4. http://egyankosh.ac.in/bitstream

## CourseArticulationMatrix-231644

|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | - | 2 |
| CO2 | 2 | 2 | - | 1 | - | 1 | 2 | 2 | 1 | 1 | 2 | 2 |
| CO3 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | - | 2 |
| CO4 | 2 | 2 | - | - | 1 | - | 2 | 1 | - | - | - | 2 |
| Weighted Average | 2 | 1.75 | 0.75 | 0.75 | 0.75 | 1 | 2 | 1.75 | 0.75 | 0.75 | 0.25 | 2 |

# SyllabusDSC (8) Syllabus forB.A. Geography (Basicand Honors)

**SemesterVI**

| | |
|---|---|
| **CourseCode:**231645 | **CourseTitle: Fundamentals of Geographic Information Systems** |
| **CourseCredits:**06 (4:0:2) | **HoursofTeaching/Week:**04(Theory)+04 (Practical) |
| **TotalContactHours:** 60Hours(Theory) 60Hours(Practical) | **FormativeAssessmentMarks:** 40(Theory) 25(Practical) |
| **Exam Duration:**$2\frac{1}{2}$Hours (Theory) 3 Hours(Practical) | **SemesterEndExaminationMarks:**60(Theory) 25(Practical) |

## CourseOutcomes(COs)

CO1: Study the definition, components and interdisciplinary domains of GIS.

CO2: Apply geodesy and spatial mathematics for measuring distances and coordinates.

CO3: Analyze the spatial data structures, sources, errors& scales for precision & accuracy.

CO4: Execute geo-processing and visualization techniques including spatial and non-spatial queries.

| Content | Hours |
|---|---|
| **UNIT -1 Introduction** | |
| Definition, scope of GIS in digital world; Components, functionalities, merits and demerits, global market. Interdisciplinary domains and its integration with GIS | **15** |
| **UNIT -2Geodesy and Spatial Mathematics** | |
| Meaning, scope of geodesy, geographical coordinates, latitude, longitudes; Datum: WGS-84, vs NAD-32. UTM; Aerial Distance measurement using Geographic and projected coordinates, Area, Perimeter, length by coordinates and various international measures. **Assignment:** students need to prepare hand drawn maps with the help of graticules. | **15** |
| **UNIT –3 Data and Scale** | |
| Spatial Data and its structures; Sources and Types of data collection. Data errors and relationships. Large Scale vs Small Scale; Generalization; precision and accuracy of data.. | 15 |
| **UNIT -4 Geo-processing and Visualization** | |
| Spatial and Non-Spatial Queries; Proximity analysis, Preparation of Terrain and Surface models. Hotspot and density mapping. Types of maps, thematic maps and its types, relief maps, flow maps and cartograms. Tabulations: Graphs and Pivot tables. **Case Study:** Students need to collect available spatial and non-spatial data of all the talukas of their districts from online resources. | 15 |

**References**

1. Ian Heywood (2011), An Introduction to Geographical Information Systems, Pearson
2. Aronoff, S. (1989), Geographic Information Systems: A Management Perspective, Geocarto International: Vol. 4, No. 4, pp. 58-58.
3. Elangovan, K. (2006), GIS - Fundamentals, Applications, and Implementations, Nipa
4. Chang, Kang – Tsung (2015), Introduction to Geographical Information Systems, McGraw-Hill Education
5. Bhatta, B. (2011), Remote Sensing and GIS, Oxford
6. Sharma, H.S. (2006), Mathematical Modelling in Geographical Information System, Global Positioning System and Digital Cartography – New Delhi, India
7. Spatial Analysis and Location-Allocation Models - Ghosh, A. and G. Rushton (1987)
8. Geographic Information Systems and Cartographic Modelling - Tomlin, C.D. (1990)
9. Geographic Information Systems and Science – Paul A. Longley, et.al. (2015)
10. Geographic Information Systems and Environmental Modelling - Clarke, C.,K. (2002)
11. An Introduction to Geographical Information Systems, 3rd Edition- Ian Heywood, Sarah Cornelius, Steve Carver (2009)
12. Concepts and Techniques of Geographic Information Systems- Chor Pang Lo, Albert K.W. Yeung (2016
13 MN DeMers -Fundamentals of Geographic Information Systems

**Web resources:**

1. IIRS MOOC programme: https://isat.iirs.gov.in/mooc.php
2. https://webapps.itc.utwente.nl/librarywww/papers2009/general/principlesgis.
3. https://www.geos.ed.ac.uk/~gisteac/gis_book_abridged/
4. https://www.usgs.gov/faqs/what-geographic-information-system-gis
5. https://www.sanfoundry.com/best-reference-books-fundamentals-geographic-information-systems.
6. https://www.google.com/search?q=Fundamentals+of+Geographic

# DSC(8)-Lab
# Digital Mapping Techniques in GIS

| Content of the Practical Course | | |
|---|---|---|
| **Exercise 1** | 1. Getting familiar with datums and projections. 2. Georeference base maps (SOI Toposheet and Cadastral maps and others) 3. Geographical Transformation (WGS84 to UTM and UTM to WGS84) 4. Map, Map Scale, Precision and Accuracy of GIS data | 15 |
| **Exercise 2** | **Geospatial Data Creation** 1. Creation of Shape file and Geodatabases 2. Digitization features such as settlements, roads, water bodies etc 3. Topographical corrections and rectification of errors 4. Validation of Spatial and nonspatial data, QC/QA | 15 |
| **Exercise 3** | **Attribute management** 1. Working with Census Data 2. Working with GPS Data 3. Working Thematic Products (BHUVAN, KGIS, GSI;BHUKOSH) | 15 |
| **Exercise 4** | **Mapping and Visualization** 1. Symbolization of data 2. Mapping Elements 3. Thematic mapping and interpretation 4. Basis Geoprocessing tools and modeling | 15 |

**Reference:**

1. An Introduction to Mapping Technologies ByPatrick McHaffie, Sungsoon Hwang, Cassie Follett.
2. Gretchen N. Peterson GIS CartographyA Guide to Effective Map Design, Third Edition
3. United Nations New York, 2000-Handbook on geographic information systems and digital mapping
4. ScienceDirect- Using digital mapping techniques, cartographers can collect and maintain an inventory ...
5. Gretchen N. Peterson GIS Cartography: A Guide to Effective Map Design
6. Bradley A. Shellito. Introduction to geospatial technologies
7. Victor Mesev. Integration of GIS and remote sensing
8. Diana Stuart Sinton and Jennifer J. Lund. Understanding place : GIS and mapping across the curriculum.
9. Otto Huisman and Rolf A .de by-principles **of** Geographic Information Systems

**Web resources:**

1. https://pubs.usgs.gov/of/2008/1385/pdf/ofr2008-1385.pdf
2. https://unstats.un.org/unsd/publication/seriesf/seriesf_79e.pdf
3. https://www.manage.gov.in › studymaterial › gis
4. https://www.sciencedirect.com › topics › digital-mapping
5. https://researchguides.dartmouth.edu/gis/books
6. https://webapps.itc.utwente.nl/librarywww/papers_2009/general/principlesgis.

## CourseArticulationMatrix-231645

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | - | 1 | - | 1 | - | 2 | - | 1 | 1 | - | 2 |
| CO2 | 2 | - | 1 | - | 2 | - | 2 | - | 2 | - | - | 2 |
| CO3 | 2 | 1 | 1 | 1 | 1 | - | 2 | - | - | - | - | 2 |
| CO4 | 2 | 1 | 1 | - | 1 | - | 2 | - | - | -- | - | 2 |
| Weighted Average | 2 | 0.50 | 1 | 0.25 | 1.25 | - | 2 | - | 0.75 | 0.25 | - | 2 |

# Internship

**Semester: VI**

| | |
|---|---|
| **Course Code: 23INTGEO01** | **Course Title: -** Internship |
| **Course Credits:** 02 | **Hours of Teaching/Week:** 3 Weeks in the end of semester |
| **Total Contact Hours:** 90 Hours Internship | **Formative Assessment Marks:** 50 Marks(C1=25+C2=25) |

**Note: This course will run as per the guidelines defined by the Committee represented by the University of Mysore, Mysuru and the same is approved by BoS, Geography, SBRR Mahajana First Grade College, Mysuru.**

## Course Outcomes (COs):

**CO1:** Integrate Theory and Practice of the area selected for Internship and to Explore Career Opportunities prior to Graduation.

**CO2:** Develop Communication, Interpersonal Skills, Work Habits and knowledge of the geography required for a job.

## Course Articulation Matrix –23INTGEO01

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| **CO 2** | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| **Weighted Average** | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |

## Scheme of Evaluation for Internship

C1 and C2 are internal assessments to be conducted during 8th and 16th weeks respectively for the semester. The student will be evaluated on the basis of presentation skills and project development. The student has to compulsorily submit the project report for evaluation during C2. The report has to be certified by the Head of the Department and the Mentor/Supervisor.

| Assessment Criteria | Marks |
|---|---|
| Project Presentation Skills and Report   -  C1 | 25 |
| Project Development Skills and  Report -  C2 | 25 |
| **Total** | **50** |

# Scheme of Valuation for Practical Examinations-
# V & VI Semester

C1andC2areinternalteststobeconductedduring8thand16thweeksrespectivelyofthesemester. C3isthe semester-end examination conducted for $2\frac{1}{2}$Hours. The student will be evaluated on the basis ofprocedure development and its execution. The student has to compulsorily submit the practical record forevaluationduring C2.For C3, therecord has tobecertified bytheHead of the Department.

- The student is evaluated for 25 marks in C1 and C2 as per

  the following scheme:

- Part-APractical Exercises (C1): 05marks

- Part-BPractical Exercises (C2):05marks+Record: Marks10marks+ Case Study:05=25marks

- Thestudentisevaluatedfor25marksinC3asper thefollowingscheme:

**V Semester**

| Assessment Criteria | Marks |
|---|---|
| Thematic Maps/Remote Sensing | 04 |
| Arithmetic method/Sensor and Platform | 04 |
| Density Maps/Arial Photography | 04 |
| Maps Projections/Application of remote sensing | 04 |
| Drawing of Projection/Google maps | 09 |
| **Total** | **25** |

**VI Semester**

| Assessment Criteria | Marks |
|---|---|
| Identification Maps/Geographical Coordinates | 04 |
| Identify Mapping/Geodesy mathematics | 04 |
| Mapping sites/Data and Scale | 04 |
| Mapping of neighborhood/Geoprocessing | 04 |
| Mapping Areas/GIS Thematic Maps | 09 |
| **Total** | **25** |

# Continuous Formative Evaluation
## Internal Assessment/Exams-V and VI Semester

Totalmarksforeachcourseshallbebasedoncontinuousassessmentsandsemesterend examinations. The patterns 40:60forIAandSemesterendTheoryExaminationsrespectivelyand50:50forIAandSemesterendPractical Examinations respectively.

| | THEORY | PRACTICAL |
|---|---|---|
| **TotalMarks** | 100Marks | 50Marks |
| **ContinuousAssessment –1(C1)** | 20Marks | 10Marks |
| **ContinuousAssessment –2(C2)** | 20Marks | 15Marks |
| **SemesterEndExamination(C3)** | 60Marks | 25Marks |

**Evaluation ProcessofIAMarksshallbeasfollows:**

a) Thefirstcomponent(C1)ofassessmentisfor20%marks.Thisshallbebased ontest,assignment,seminar,case study, field work, project work etc. This assessment and score process should be completed aftercompleting50%of syllabus ofthe courses and within 45 working days ofsemester program.

b) The second component (C2) of assessment is for 20% marks. This shall be based on test, assignment,seminar,casestudy,fieldwork,internship/industrial practicum/projectwork,quizetc.
   Thisassessmentand process should be based oncompletion ofremaining 50%of syllabusofthe course of thesemester.

c) Duringthe17th–19th weekofthesemester,asemesterendexaminationshallbeconductedbythecollege of each course.Thisforthethirdandfinalcomponentofassessment (C3)and themaximummarksforthefinal component will be60%.

d) In case of a student who has failed to attend the C1 or C2 on a scheduled date, it shall be deemed that thestudent has dropped the test. However, in case of a student who could not take the test on scheduled datedue to genuine reasons, such a candidate may appeal to the Program Coordinator/Principal. The ProgramCoordinator/Principalinconsultationwiththeconcernedteachershalldecidea boutthe genuine emeses of the case and decide to conduct special test to such candidate on the date fixed by the concerned teacher, butbefore commencement ofthe concerned semester end examinations.

e) For assignments, tests, case study analysis etc., of C1 and C2, the students should bring their own answer scripts (A4 size), graph sheets etc., required for such tests/assignments and these be sealed/signed by the concerned department at the time of conducting tests/ assignment /project work etc.

f) The outline for continuous assessment activities for Component-I(C1)and Component-II(C2) of a course Shall be as under:

| | C1Marks | C2Marks | TotalMarks |
|---|---|---|---|
| **SessionTest** | 10 | 10 | 20 |
| **Seminar/Presentation/Assignment/Activity** | 10 | - | 10 |
| **Case Study/FieldWork/ProjectWork/ Quizetc.** | - | 10 | 10 |
| **Total** | **20** | **20** | **40** |

- For practical course of full credits, seminar shall not be compulsory. In its place, marks shall be awardedforPractical Record Maintenance(theratio is 25 (10+15):25).

- ConductofTest,Seminar,Casestudy/Assignmentetc.,canbeeitherinC1orinC2componentasdecidedbythe collegeandconcerneddepartment/teacher.

- The teachers concerned shall conduct test/seminar/case study etc., the students should be informed aboutthemodalitieswellinadvance.TheevaluatedcoursesassignmentsduringcomponentI(C1)andcomponentII(C2)ofassessmentareimmediatelyprovided tothecandidatesafterobtainingacknowledgement in the register by the concerned teacher(s) and maintained by the Department. Beforecommencementofthesemesterendexamination,theevaluatedtest,assignmentetc.,ofC1andC2shallbe obtained back to maintain them till the announcement of the results of the examination of the concernedsemester.

g) The marks of the internal assessment shall be published on the notice board of the department/college forinformation of thestudents.

h)Theinternalassessmentmarksshallbecommunicatedtotheconduct at least10daysbeforethecommencementoftheexaminations andtheexaminations shallbeaccesstotherecords of such periodical assessments.

i) There shall be no minimum in respect of internal assessment marks.

j) Internal assessment marks may be recorded separately. A candidate, who has failed or rejected the result,shallretain the internalassessment marks.

# DSC Theory Question Paper Pattern

**Max. Marks:** 60Marks                    **ExamDuration:** $2\frac{1}{2}$Hours

## Instructions: Paper Setting

The Theory exam shall be conducted for 60 Marks and it consists of 3 Sections namely

- TheQuestionPaper isdivided into3 parts:Part–A,Part– B and Part- C
- Section A, Section B, Section C with internal choices. (Short, Medium and Long answer questions).
- Section A - Each question carries 2 marks and student has to answer 4 out of 6 questions.
- Section B - Each question carries 5 marks and student has to answer4 out of 6 questions, and
- Section C - Each question carries 08 marks and student has to answer 4 out of 6 questions.

# DSCTheory QuestionPaperPattern

**B.A GEOGRAPHY (For Vand VI Semester) 2023 Onwards**

**ExamDuration:** $2\frac{1}{2}$Hours        **Max. Marks: 60**

**Part-A**

**I. Answer any Four of the following questions.**        **2X4=08**

1)………………………………………………………………………………

2)………………………………………………………………………………

3)………………………………………………………………………………

4)………………………………………………………………………………

5)………………………………………………………………………………

6)………………………………………………………………………………

**Part-B**

**II. Answer any Four of the following questions.**        **5X4=20**

7)………………………………………………………………………………

8)………………………………………………………………………………

9)………………………………………………………………………………

10)………………………………………………………………………………

11)………………………………………………………………………………

12)………………………………………………………………………………

**Part –C**

**III. Answer any Fourof the following questions.**        **8X4=32**

13)………………………………………………………………………………

14)………………………………………………………………………………

15)………………………………………………………………………………

16)………………………………………………………………………………

17)………………………………………………………………………………

18)………………………………………………………………………………

Education Society (R)

Education to Excel

# SBRR Mahajana First Grade College

## (Autonomous)

Jayalakshmipuram, Mysuru – 570 012 Karnataka, INDIA

Affiliated to University of Mysore,

Re-Accredited by NAAC with 'A' Grade, College with Potential for Excellence

# BOARD OF STUDIES (BoS)

# DEPARTMENT OF History

**UG** ☑

**PG** ☐

# NEP Syllabi for

# V & VI Semester BA- History

# 2023-24

# DEPARTMENT OF History

## Motto

History for future

## Vision

Orienting the students to imbibe
Indian Culture and values through History

## Mission

- To organize field visits to Historical places, Historical monuments, Excavation Sites, History museums, Conservation laboratory etc, which provides experiential learning.

- To take up special projects like conservation of monuments, heritage buildings etc.

- To organize exhibitions related to numismatics and philately

- To organize special lectures remembering National leaders, Martyrs and renowned personalities.

**Name of the Degree program: B.A.**                    **Discipline Course:  History**

| POs | Programme Outcomes (POs) |
|---|---|
| PO1 | **Domain Knowledge:** Inculcation of fundamental concepts, principles, methods and the application of the same in the realm of concerned domain. |
| PO2 | **Problem Analysis:**  This programme enhances the ability to define, identify and analyze appropriate means towards amicable solutions in the given area of Knowledge. |
| PO3 | **Design & Development of Solutions:**  Structuring theoretical knowledge and developing customized designs in terms of – Intervention strategies, Profiling, Reviews, Archives, Marketing strategies, Info-graphics and Approaches for arriving at relevant and desirable solutions. |
| PO4 | **Research & Investigation**: Knowledge and application of "Research Methods" to investigate domain specific problems and derive scientific conclusions through testing of Hypotheses and relevant findings empirically. |
| PO5 | **Usage of Modern Tools and Techniques:**  Mastery in the academic enclave through skilled handling administering, assessing, validating and interpreting complex phenomena using advanced tools and techniques to create simple and sustainable solutions. |
| PO6 | **Social Sciences & Society –** Promotes domain specific literacy to illuminate the significance of each discipline and its applicability for the well-being of Society. |
| PO7 | **Environment and Sustainability:** Contemplate and Introspect prevailing environmental challenges and consequences. Further, channelize initiatives towards sustainability. |
| PO8 | **Moral and Ethical Values:** Application of Professional Ethics, Humanitarian Values, Accountability and Social Responsibilities in emerging society towards attainment of harmony and co-existence. |
| PO9 | **Individual and Teamwork:** Imbibe the qualities of Teamwork and function effectively as an emerging leader in the diversified and multidisciplinary areas. |
| PO10 | **Communication:** Demonstrates Competency in comprehending and conceptualizing discipline specific concepts and ideas and communicates effectively through fluid communication within the professional and social setup. |
| PO11 | **Economics and Project Management:** Understand the Economic Concept in the context of specific discipline and apply the same through initiating Planning, and Executing the Project Dynamics effectively towards successful Project Management. |
| PO12 | **Lifelong Learning**: Identify and address their own educational needs in a changing world in ways sufficient to upgrade one's skills and competencies through constant self-evaluation and eternal learning. |

# Department of History

## List of Board of Studies Members

| Sl.No. | Name | Designation |
|--------|------|-------------|
| 1 | **Mr. Dr. Sreedhara H**<br>HoD & Assistant Professor<br>SBRR Mahajana First Grade College<br>(Autonomous), Jayalakshmipuram, Mysuru<br>Email: sreedharah79@gmail.com<br>**Cell: +91 9901041470** | **Chairperson** |
| 2 | **Dr. Nandeesha A.R.**<br>Assistant Professor<br>SBRR Mahajana First Grade College<br>(Autonomous), Jayalakshmipuram, Mysuru<br>nandishar7@gmail.com<br>**Cell: +91 9113060911** | **Member** |
| 3 | **Dr. K. Sadashiva**<br>Prof & Chairman<br>DOS History, Manasagangothri, Mysore<br>sadashivak@gmail.com<br>**Mobile : +91 9886153778** | **VC Nominee** |
| 4 | **Dr. Raghava B**<br>Associate Professor<br>Field Marshal K M Cariappa College<br>Mangalore University<br>Madikeri, Kodagu-571201<br>desire.crb@gmail.com<br>**Mobile : +91 9448721205** | **Expert from other University** |
| 5 | **Dr. Shambhulingamurthy H M**<br>Associate Professor, Sahyadri Arts College<br>Kuvempu University, Shivamogga-577203.<br>shambhulingamurthyhm@gmail.com<br>**Mobile : +91 8494999300** | **Expert from other University** |
| 6 | **Manjunatha H L**<br>Senior Asst. Director<br>Karnataka State Divisional Archives Office,<br>Mysuru-560008<br>rajmanjuhlm@gmail.com<br>**Mobile : +91 9483017571** | **Expert from Regional Archive, Mysuru** |

# Course Structure & Pattern of Exam BA-History Discipline
## (NEP Syllabus V &VI Semester)

| Sem | Course Type | Course Code | Course Title | Credits | L | T | P |
|-----|-------------|-------------|--------------|---------|---|---|---|
| **V** | DSC-9 | 231529 | History of Karnataka (From 11<sup>th</sup>Centure to 1761 CE) | 4 | 4 | 0 | 0 |
| | DSC-10 | 231530 | India and Its Neighbors ( 1947-2020) | 4 | 4 | 0 | 0 |
| | DSC-11 | 231531 | Colonialism and Nationalism in Asia | 4 | 4 | 0 | 0 |

| Sem | Course Type | Course Code | Course Title | Credits | L | T | P |
|-----|-------------|-------------|--------------|---------|---|---|---|
| **VI** | DSC-12 | 231629 | History of Karnataka (From 1761-1956) | 4 | 4 | 0 | 0 |
| | DSC-13 | 231630 | Regional History-Modern Mysore (1881-1947) | 4 | 4 | 0 | 0 |
| | DSC-14 | 231631 | History of China and Japan | 4 | 4 | 0 | 0 |
| | **INT** | **23INTHIS01** | **Internship** | **2** | **2** | **0** | **0** |

## Pattern of Examination

| Semester | Course Type | Course Title | Total Marks | IA Test/ Viva C1 | IA Assignment/ Semina C2 | Exam C3 |
|----------|-------------|--------------|-------------|------------------|--------------------------|---------|
| **V** | **DSC-9** | History of Karnataka (From 11<sup>th</sup> Centure to 1761 CE) | 100 | 20 | 20 | 60 |
| | **DSC-10** | India and Its Neighbors ( 1947-2020) | 100 | 20 | 20 | 60 |
| | **DSC-11** | Colonialism and Nationalism in Asia | 100 | 20 | 20 | 60 |
| **VI** | **DSC-12** | History of Karnataka (From 1761-1956) | 100 | 20 | 20 | 60 |
| | **DSC-13** | Regional History-Modern Mysore (1881-1947) | 100 | 20 | 20 | 60 |
| | **DSC-14** | History of China and Japan | 100 | 20 | 20 | 60 |
| | **23INTHIS01** | **Internship** | **100** | **50** | **50** | **-** |

**DSC-9 History of Karnataka (From 11th Century to 1761 CE)**

| Course Title: **History of Karnataka (From11[th]Century  to 1761 CE)** | |
|---|---|
| Total Contact Hours: 60 | Course Credits: 4 |
| Formative Assessment Marks: 40 | Duration of ESA/Exam: 60 |
| Syllabus Authors: BOS (UG) | Summative Assessment Marks: 100 |

### Course Outcomes (COs):

**CO 1 :** To understand how Chaluckyas of Kalyana came to power, significant progress in polity, cultural both in the Art &Architecture during the rule of Kalachuris and Hoysalas.

**CO 2 :** To know the establishment of Vijayanagara Empire and Bahammani kingdom and they  played a great role in the history of Karnataka

**CO 3 :** To learn about the strong Muslim shahi states, Wadeyar Dynasty founded as a  feudatory principality & it's turning point in the history of Karnataka

# III BA–V Semester

## Course Code: 231529

**DSC-9** Title of the Course: History of Karnataka (From 11<sup>th</sup> Century to 1761 CE)

| Course1 | | Course 2 | |
|---|---|---|---|
| **Number of Theory Credits** | **Number of lecture hours/semester** | **Number of Theory Credits** | **Number of lecture hours/semester** |
| **4** | **60** | **4** | **60** |

| Content of Course-1 | 60 Hrs |
|---|---|
| **Unit–I Kalachuries, Seunas and Basaveshwara** | **19** |
| **Chapter 1**: Introduction-Survey of the sources - Karnataka at the beginning of the 11<sup>th</sup> century and socio-political conditions. | **08** |
| **Chapter 2**: Disintegration of Kalyani Chalukyas and the rise of Kalachuries and Seunas. | **06** |
| **Chapter 3**: Basaveshwara and Veershaiva Movement - His Socio-Political Ideas and Social reforms. | **05** |
| **Unit-II Hoysalas, Vijayanagara Empire and Post-Vijayanagara** | **26** |
| **Chapter 4**: Foundation of the Hoysala dynasty – Early Hoysalas – Vishnuvardhana-Ballala II-Ballala III- Downfall of the Hoysalas - Hoysala state and society – cultural contributions. | **08** |
| **Chapter 5**: Establishment of Vijayanagara Empire – Sources-origin – Sangamas - Harihara & Bukkaraya - Devaraya II & his achievements – Tuluvas - Krishnadevaraya and his achievements – Achyutharaya – Aliya Ramaraya – Disintegration of Vijayanagara Empire - Administration, society, economy and cultural contributions of Vijayanagara Empire. | **10** |

| | |
|---|---|
| **Chapter 6**: Talikote and after – causes for the battle of Talikote – Aravidu dynasty – Nayaks of Keladi –Shivappanayaka-Palegars of Chitradurga – Madakarinayaka V-Yelahanka Nadu Prabhus– Kempegowda II-HariDasa Movement - Kanakadasa and Purandaradasa. | **08** |
| **Unit-III Bahmanis, Shahis and Early Wodeyars** | **15** |
| **Chapter 7**: Foundation of the Bahmani state – Sources – origin – early rulers – Ala-ud-din – Muhammad Shan I – Mahamud Gawan – Downfall of Bahamnis - Administration - social life – economy - art and architecture – Sufi Movement – Syed Mohammad and Khwaja Bhande Nawaz | **05** |
| **Chapter 8**: AdilShahis of Bijapur and BaridShais of Bidar – Yusuf Adilshahi and Qasim Barid Shahi – Contributions of Adil and Barid Shahis – downfall of Adilshahis and BaridShahis | **06** |
| **Chapter 9**: Early Wodiyars – ChikkadevarajaWodiyar – Consolidation of his kingdom – Relations with Mughals and Marathas – Administration and Literary Contributions. | **04** |

**Historical Maps:**

1) Hoysala Empire under Vishnuvardhana
2) Vijayanagara Empire under Krishnadevaraya
3) Bahamani Kingdom under Mohammed Gawan
4) Princely Mysore under ChikkadevarajaWodeyar

➢ **Historical Places**:

1.Beluru  2.Halebidu  3.Somanathapura  4.Kudalasangama

5. Karawar  6.Udupi  7.Mysuru  8. Srirangapatna 9. Hampi

10. Raichur  11. Mangaluru  12. Bidar  13. Gulbarga  14. Bijapur

15. Talikote  16. Ahmmednagar  17. Talakadu  18. Bengaluru

19. Yalanduru 20. Tumkur.

## Books for Study and Reference:

1) Burton Stein, Vijayanagara, Cambridge University Press, 1990.

2) K.N. Chithis, Keladi Polity, Dharwad, 1977.

3) H.K. Sherwani, History of Deccan, Rept., Delhi, 1980.

4) R.Champakalaxami, Kesavan Veluthat and T.R. Venugopalan, ed., State and Society in pre-Modern South India, Thristur, 2003.

5) Hayavadana Rao C, History of Mysore (2 vols), 1927-30

6) HayavadanaRao, C (ed.,) Mysore Gazetteer, (5vols), !950.

7) Joyser, G.R.  History of Mysore and the Yadava Dynasty, 1950.

8) Krishna Rao, P., Brief History of Mysore, 1868.

9) Krishna Rao, Madras District Gazetter, Bellary District. 1904.

10) Dr. Suryanath U. Kamath – A Concise History of Karnataka

11) Dr. Suryanath U. Kamath – KarnatakadaSankshiptaIthihasa

12) Prof. B. Parameshwara – Karnataka ItihasaParichaya

13) Prof. Lokappa Gowda – Adhunika Karnataka Itihasa

14) KNA – Karnataka Itihaasa

15) Prof. Chandrashekarappa - Karnataka Itihaasa

## Weblinks:

16) chanakyakanajs.com/2022/pdf-karn

17) edutubekannada..com/2022/09/Karnataka

18) indianculture.gov.in/ebooks/cultural

19) books.google.ru/books/about

20) Karnataka.com/history

**Course Articulation Matrix - Course Code: 231529**

| COs/POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 3 | 3 | 2 | 1 | 2 |
| CO2 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 3 | 2 | 2 | - | 2 |
| CO3 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| Wtd. Avg. | 2.66 | 2 | 1.66 | 1 | 2 | 1 | 1 | 2.66 | 2.33 | 1.66 | 1 | 2 |

**Course Code: 231530**

**DSC-10  India and its Neighbors (1947 to 2020)**

| Course Title: **India and its Neighbors (1947 to 2020)** | |
| --- | --- |
| Total Contact Hours:60 | Course Credits: 4 |
| Formative Assessment Marks: 40 | Duration of   ESA/Exam: 60 |
| Syllabus Authors: BOS (UG) | Summative Assessment Marks: 100 |

**Course Outcomes (COs):**

**CO 1:** To Acquire knowledge of India & its Neighbors, foreign policy, the highs and lows of  India's foreign relations.

**CO 2:** To comprehend the role of Indian Ocean, SAARC, SAPTA and National development.

**CO 3:** To recognize India's trends in relations and challenges, opportunities & future prospects.

DSC-10 : Title of the Course: India and its Neighbors (1947 to 2020)

| Course Title: **India and its Neighbors (1947 to 2020)** | |
|---|---|
| Total Contact Hours: 60 | Course Credits: 4 |
| Formative Assessment Marks: 40 | Duration of ESA/Exam: 60 |
| Syllabus Authors: BOS (UG) | Summative Assessment Marks:100 |

| Content of Course 2 | 60 Hrs |
|---|---|
| **Unit–I   Afghanistan, Pakistan and Bangladesh** | 22 |
| **Chapter No : 1 India and Afghanistan** <br> History of Indo-Afghan Relations- Its geo-strategic importance - Developmental partnership - Instability in Afghanistan – Taliban and Terrorism - Role of India's bilateral relation. | 06 |
| **Chapter  2: India and Pakistan** <br> Colonial Legacies - Two nation theory - India Pakistan Wars - Areas of conflict -  Kashmir and Border issues - Nuclear Policy of India and Pakistan - Cross Border terrorism -  water dispute - Bus diplomacy. | 10 |
| **Chapter 3: India and Bangladesh** <br> Colonial Legacies - The role of India in Bangla Liberation War -Areas of Cooperation and Crisis- Border Issues - Water disputes: Teesta water issue and Ganga river. | 06 |
| **Unit–II Myanmar, Bhutan and Nepal** | 22 |
| **Chapter 4: India and Myanmar** <br> India - Mynmar Relationship - Scope forcooperation between North East India & Myanmar - Rohingya issue - Insurgency in the North EasternStates. | 07 |
| **Chapter 5: India and Bhutan** <br>  Bhutan's Geographical Significance- Political Significance - India- Bhutan Friendship Treaty - Objection of Bhutan to India's Motor Vehicle | 09 |

| | |
|---|---|
| Agreement: Areas of Cooperation- Trade, Economic Assistance: Water Resources, Border Management: Educational and Cultural Cooperation. | |
| **Chapter 6: India and Nepal**<br>Historic India Nepal relations - Post Independence India and Nepal: Economic<br>Cooperation - The Issue of Water and Hydropower Cooperation. | **06** |
| **Unit-III Srilanka, Maldieves and Mauritius** | **16** |
| **Chapter 7: Historical Background of Indo -Sri Lanka Relations:**<br>**Cultural Relations-** Geographical and Strategic Importance -Issues<br>– The Fishermen Issue- Ethnic problem in Sri Lanka – Tamil Eelam<br>Movement - LTTE - Peace Process – IPKF. | **06** |
| **Chapter 8: India and Maldieves**<br>Background of India-Maldives Relations - Political and Cultural ties -<br>Political relations -Bilateral Assistance- Tsunami Related Assistance-<br>India Maldives Relations: Challenges. | **06** |
| **Chapter 9: India and Mauritius**<br>India – Mauritius Bilateral Relations – Historical - Cultural – Trade –<br>Foreign Direct Investment– Military Cooperation – Operation Lal Dora. | **04** |

**\*No Historical Maps**

**\*Books for Study and Reference:**

1) Bhandhari, C.P. Foreign Policy of India. New Delhi: Sterling publishers, 1977.

2) Bipan Chandra et. Al. India after Independence. 1947-2000. New Delhi: PenguinBooks, 2000

3) Chatterjee.ANeighbours, Major Powers and Indian Foreign Policy. New Delhi. TheOrient Blackswan, 2017.

4) Dixit, J.N, Indian Foreign Policy and its Neighbours. New Delhi: Gyan PublishingHouse, 2001

5) Dutt, V.P, India's Foreign Policy in Changing World. New Delhi: Vikas PublishingHouse, 2003

6) JayapalanN, India and her neighbours. New Delhi: Atlantic Publishers, 2000

7) Robin Blackburn (ed.), Explosion in Subcontinent India, Pakistan, Bangladesh AndCeylon, Harmountsworth: Penguin, 1975.

8) Avatar Singh Bhasin, India in Sri Lanka between Lion and Tiger, New Delhi,Manas Publication, 2004.

9) UrmilaPhadnis, Ethnicity and Nation Building in South Asia, New Delhi: Sage publications, 1989.

➤ **Weblinks**

1) Careerpower.in/neighboring-countries

2) India.gov.in/topics/foreign-affairs

3) Byjus.com/govt-exams/neighboring-countries

4) Studyiq.com/articles/neighboringcountries

5) Textbook.com/ias-preparation/relation

**Course Articulation Matrix – 231530**

| COs/POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | - | 2 |
| CO2 | 2 | 1 | - | - | - | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| CO3 | 2 | 1 | 1 | 1 | - | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| Wtd. Avg. | 2.33 | 1 | 1 | 1 | 1 | 1.33 | 1 | 2 | 2 | 1 | 1 | 2 |

**Course Code: 231531**

**DSC-11   Colonialism and Nationalism in Asia**

| Course Title: Colonialism and Nationalism in Asia | |
|---|---|
| Total Contact Hours: 60 | Course Credits: 4 |
| Formative Assessment Marks: 40 | Duration of ESA/Exam: 60 |
| Syllabus Authors: BOS(UG) | Summative Assessment Marks: 100 |

## Course  Outcomes (COs):

**CO 1:** To understand about the familiarities with history of modern Asia.

**CO 2:** To get an acquainted with Colonialism & Nationalism & its effects in Asia.

**CO 3:** To acquire knowledge of Global Crisis and historical movements.

## Paper No.5.3 DSC-11 Colonialism and Nationalism in Asia

| Content of Course - 3 | 60 Hrs |
|---|---|
| Unit-I Indo-China and Indonesia | 22 |
| **Chapter 1:** Historical Background – French Colonisation in Indo-China – Growth of Nationalism – The Communist Movement – Role of Ho Chih Minh in Vietnamese Struggle for independence . | 8 |
| **Chapter 2:** Geneva Conference – Vietnam after 1954 – 1976. | 4 |
| **Chapter 3:** Indonesia – Historical Background – Coming of Europeans - Dutch Colonisation – Growth of Nationalism in Indonesia – Early struggles against Dutch domination – Role of Dr. Sukarno – Japanese aggression of Indonesia (1942-45) – Final phase of freedom struggle – 1945-49 – Indonesia since 1949 – Bandung Conference – 1955 | 10 |
| **Unit-II Turkey & Iran** | 22 |
| **Chapter 4:** Turkey – Historical Background – European Colonial interests and wrecking of the Ottoman Empire – Crimean War – Treaty of Sanstefano – Berlin Congress – Autocratic Rule of Abdul Hamid II – Growth of Turkish Nationalism –Young Turk Movement. | 8 |
| **Chapter 5:** Turkey and Balkan Crisis – I World War – Treaty of Sevres and Laussane – Modernisation of Turkey – Musthafa Kemal Pasha – Kemalism – II World War. | 5 |
| **Chapter 6:** Iran – Coming of Europeans – Anglo Russian interests in Iran– The Tobacco Revolt of 1890-92 – Constitutional Revolution of 1906 – Shuster Incident – Iran and the first world war – the rise of modern State with Reza Shah Pehlavi (1925 – 1941) – Mohammad Shahapur Rezashah Pehlavi – Oil crisis – Fall of Dr. Mussadeq. | 9 |
| **Unit III – Arabs and Israel** | 16 |
| **Chapter 7:** European Colonial interests in Arabia – Growth of Arab Nationalism – Wahabi Movement – Pan Islamic Movement – Jamaluddin Afghani – Syrian Literary Renaissance – Young Arabs – | 5 |

| | |
|---|---|
| Arabs and First World War. | |
| **Chapter 8:** Israel – Historical Background – Zionist movement – Dr. Chaim Weizman – Balfour Declaration – (1917) Migration of Jews – White Paper – (1939) – United Nations Plan – Creation of Israel - Arab – Israel Conflict – Arab League – Palestine Liberation Organization. | **7** |
| **Chapter 9:** Important Historical Places: Jakarta – Bandung – Hanoi - Constantinople – Ankara – Tehran - Tel Aviv - Jerusalem – Damascus – Madina–Beirut –Bhagdad –Mecca – Cairo. | **4** |

### Books for Study and Reference:

1. M.E. Yapp, The Making of Modern Near East 1792-1923 – Longman – Harlow-1987
2. Janet Afary-The Iranian Constitutional Revolution – 1906-1911
3. Abrahmanian Ervand-Iran between Two Revolutions prince ton University Press – 1952
4. Cyrus Ghani -Iran and Rise of Reza Shah. From Qajar Collapse to Pahlavi Power – I.B.Tawis, London-1998.
5. Sardesai D.R.-South East Asia- Past and Present, New Delhi-Vikas-1981
6. Norman Stone - Turkey a short History
7. Panikar K M - Asia and western dominance
8. Recklips - A short History of modern Indonesia
9. Sardesai - South East Asia - Past and Present
10. Herald M Vinanke - The Short History of South East Asia
11. D T Joshi - The Outline of Asian History
12. Lokappa Gowda- Adhunika Asia
13. KNA – Adhunika Asia
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➢ **Weblinks**

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5) **en.wikipedia.org/ wikipedia.org/wikihistory-of**
6) **En.wikipedia.ru/wiki/nationalism**

## Course Articulation Matrix - 231531

| COs/ POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | - | 2 |
| CO2 | 2 | 1 | - | - | - | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| CO3 | 2 | 1 | 1 | 1 | - | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| Weighted Average | 2.33 | 1 | 1 | 1 | 1 | 1.33 | 1 | 2 | 2 | 1 | 1 | 2 |

**Course Code: 231629**

**DSC-12  History of Karnataka (From 1761-1956 )**

| Course Title: **History of Karnataka (From 1761-1956 )** | |
|---|---|
| TotalContact Hours: 60 | CourseCredits: 4 |
| Formative Assessment Marks:40 | Duration of ESA/Exam:60 |
| Syllabus Authors: BOS(UG) | Summative Assessment Marks:100 |

## Course Outcomes (COs):

**CO 1:** To know about the history of modern Mysore, especially rule of Wodeyars and muslim dictators.

**CO 2:** To get acquainted with nature of colonial rule in Mysore &Coorg.

**CO3:** To comprehend how the Kannadigas played a role in the Karnataka freedom movement.

**Course Code: 231629**

**DSC-12 Title of the Course:  History of Karnataka (From 1761-1956 )**

| Course - 1 | | Course– 2 | |
|---|---|---|---|
| **Number of Theory Credits** | **Number of lecture hours/semester** | **Number of Theory Credits** | **Number of lecture hours/semester** |
| 4 | 60 | 4 | 60 |

| **Content of Course - 1** | **60 Hrs** |
|---|---|
| **Unit–I Introduction** | **23** |
| **Chapter 1** :Introduction – Survey of the sources – Rise and fall of Haider Ali and Tipu Sultan – Early life of Haider Ali and Tipu Sultan – Anglo-Mysore wars and their effects – Fall of Tipu Sultan – Modernization of administration and economy – Cultural contribution of Haidar Ali and Tipu Sultan. | **10** |
| **Chapter 2**: Treaty of 1799 and Role of Rani Lakshmamanni  – Confronting Colonialism – Mysore under KrishnarajaWadiyar III. | **06** |
| **Chapter 3:** Commissioners' rule in Mysore – Mark Cubbon and Bowring in Mysore – Their reforms – Restoration in Mysore – Attempts towards modernization in Mysore. | **07** |
| **Unit–II Colonialism in Karnataka** | **18** |
| **Chapter 4:** Colonialism in Mysore – Indirect rule in Mysore and Coorg as protectorates. | **06** |
| **Chapter 5:** Colonialism in Hyderabad Karnataka - Territories under colonial rule -Hyderabad Karnataka under the  Nizams – Mahaboob Ali Khan – His socio-political reforms. | **06** |
| **Chapter 6:** Territories under colonial rule – British Karnataka - Bombay Karnataka. | **06** |
| **Unit-III  Nationalism in Karnataka** | **19** |

| | |
|---|---|
| **Chapter 7:** Impact of the rebellion of 1857 on Karnataka - Bedas of Halagali against anti-arms Act – Venkatappa Nayaka of Surapura – Babasahebof Naragunda – Bhimaraoof Mundaragi – effects of the struggle. | **05** |
| **Chapter 8:** Rise of nationalism and awakening in Mysore, Hyderabad Karnataka and Bombay Karnataka – Influence of Tilak and Gandhi – Response to swadeshi and non-cooperation movements in Karnataka – Belgaum congress session (1924) -Satygraha campaigns in Karnataka (1930-34) – Quit India movement in Karnataka. Accession of Karnataka territories into Indian Union – 1947-48. | **10** |
| **Chapter 9:** Unification movement in Karnataka – factors – views of different committees (Dhar, JVP, and SRC) - contributions of various Kannada organizations – Role of Kannada literature and journalism – Formation of Karnataka – 1956. | **04** |

➢ **Historical Map & Places**

1) Bidar  2) Gulbarga  3) Bijapur  4) Belguam  5) Bagalkot
6) Dharwad  7) Hubli  8) Batkala  9) Udupi  10) Mangalore

11) Kopala  12) Raichur 13) Bellary  14) Mysuru  15) Srirangapatna

16) Bangalore17) Thirichinapali 18) Madras 19) Dindigal  20) Hyderabad

**Books for Study and Reference :**

1. K. Sherwani, History of Deccan, Rept., Delhi, 1980.
2. R. Campakalaxami, KesavanVeluthat and T.R. Venugopalan, ed., State and Society in pre-modern South India, Thrisur, 2003.
4. Bowring L.B., Haidar Ali &TippuSultanand the Struggle with Muslim Powers  1893.
5. F.Hamilton Buchanan, A Journey from Madras through the countries of Mysore ,Canara, Malabar, 1807.
6. Campbel J.M., (ed) Begaum District Gazetteer. 1884
7. Campbel J.M.,(ed)  Bijapur District Gazetteer. 1884.
8. Campbel J.M.,(ed) Canara District Gazetteer, (part1-2) 1883.

9.  Dharwad District Gazzetter, 1884.

10. Coorg and its Rajah (By an officer), 1857, London.

11. HayavadanaRao. C, History of Mysore (2vols), 1927-30

12. HayavadanaRao.  (ed.,) Mysore Gazetteer, (5vols), !950.

13. Joyser, G.R.  History of Mysore and the Yadava Dynasty, 1950.

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15.  Krishna Rao  Madras District Gazetter, Bellary District. 1904.

16.  I.M. Muthanna, A Tiny Model State of South India: Coorg. 1955.

17. Rice B.L., Mysore and Coorg Gazetteer (3 vols.)1896-97.

18. Chandrashaker. S, Dimensions of Socio-Political Changes in Mysore

19. I.M. Muthanna–  History of Karnataka: History, Administration & Culture

20 . Dr. B.SheikAlI-  Ground work of Karnataka History

21. Dr. Suryanath U. Kamath – A Concise History of Karnataka

22. Dr. Suryanath U. Kamath – KarnatakadaSankshiptaIthihasa

23. Prof. B. Parameshwara – Karnataka ItihasaParichaya

24. Prof. LokappaGowda – Adhunika Karnataka Itihasa

25. KNA – Karnataka Itihaasa

26. Prof. Chandrashekarappa - Karnataka Itihaasa

> **Weblinks**

    1) En.wikipedia.org/wiki/

    2) En.academic.com

    3) Vdoc.pub/documents

    4) Pdfsearches.com/modern-history

## Course Articulation Matrix - Course Code: 231629

| COs/ POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 3 | 3 | 2 | 1 | 2 |
| CO2 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 3 | 2 | 2 | - | 2 |
| CO3 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| Wtd. Avg. | 2.66 | 2 | 1.66 | 1 | 2 | 1 | 1 | 2.66 | 2.33 | 1.66 | 1 | 2 |

**Course Code: 231630**

**DSC-13  Regional History - Modern Mysore (1881-1947)**

| Course Title: Regional History-Modern Mysore (1881-1947) | |
|---|---|
| Total Contact Hours:60 | Course Credits: 4 |
| Formative Assessment Marks:40 | Duration of ESA/Exam: 60 |
| Syllabus Authors: BOS(UG) | Summative Assessment Marks: 100 |

### Course Outcomes(COs):

**CO 1 :**   To acquire knowledge about the history of modern Mysore.

**CO 2 :**   To understand the role of British commissioners in princely state of Mysore.

**CO3 :**   To learn the rise & Growth of Backward class & National movement in Mysore.

**Course Code: 231630**

**DSC-13 Title of the Course: Regional History - Modern Mysore (1881-1947)**

| Course - 1 | | Cours– 2 | |
|---|---|---|---|
| Number of Theory Credits | Number of lecture hours / semester | Number of Theory Credits | Number of lecture hours/semester |
| 4 | 60 | 4 | 60 |

| Content of Course 2 | 60 Hrs |
|---|---|
| **Unit–I Archaeological Sites** | 21 |
| **Chapter 1: Introduction to Modern Mysore** – Survey of Literature – The Rendition Act of 1881 and its main provisions -A Progressive monarch : Chamaraja Wodeyar X (1881- 1894) –Dewan Rangacharlu – Administrative Reforms – Development of Education – Establishment of Representative Assembly– Railway – Famines and their impact | 10 |
| **Chapter 2: Dewan SheshadriIyer** —Development of Agriculture and Industries – Railway- Social Reforms – Infant Marriage Prevention Regulation – Development of Education – Introduction of Mysore Civil Service Exams | 07 |
| **Chapter 3: Vanivilasa Sannidhana** – Regency Rule (1894 -1902) – Shivanasamudra Hydro Electric Power Plant –VanivilasaSagara (Marikanive Project). | 04 |
| **Unit-II** | 21 |
| **Chapter 4: Rajarshi Nalvadi Krishnaraja Wodeyar (1902 -40)** – Nalvadi's vision of Modern Mysore – Development of Education – Establishment of University of Mysore -Nalvadi and Social Justice – Leslie Miller Committee – Introduction of Reservation for Non-Brahmins – Construction of KRS dam. | 08 |
| **Chapter 5: Dewan Sir M Vishweshwaraiah (1912- 18)** – Developmental Policies and Modernization Programmes – Industrialization - Progress in | 08 |

| | |
|---|---|
| Agriculture, Education, Railway, Health and Sanitation. | |
| **Chapter 6: DewanMirza Ismail (1926 - 1941)** – Developmental Policies – Administrative Reforms – Constitutional Reforms – Growth of Local Bodies – Progress in Agriculture, Industries, Electricity -Trade and Commerce – Education – Health and Sanitation – Brindavan Garden. | **05** |
| **Unit-III** | **18** |
| **Chapter 7: Jayachamaraja Wodeyar (1940-47)** –His Contribution to Literature and Music – Dewans N. Madhavarao (1940-46) and ArcotRamaswamyModaliyar (1946-49) – Indian National Movement and Indian Union. | **04** |
| **Chapter 8: Regionalism, Casteism and Communalism in Modern Mysore** – Mysore - Madrasi Brahmin Conflict – Caste Consciousness and Caste Associations - Non-Brahmin Movement – Depressed Classes Movement – Communal Disturbances and the role of Muslim League. | **06** |
| **Chapter 9: Nationalism in Modern Mysore** — Nationalism during Pre- Gandhian Era –Swadeshi Movement –Non Co-Operation Movement – Belgaum Congress – Civil Disobedience Movement – Forest Satyagrahas – Establishment Mysore Congress – Shivapura Congress Session – Vidhurashwatha Tragedy –Quit India Movement – The Esur Tragedy –Mysore Chalo Movement. | **08** |

> **Historical Map & Places**

1) **Ankola 2) Esuru 3) Harihara 4) Chitradurga 5) Shivamogga 6) Hassan 7) Bhadravati 8) Chamarajanagara 9) Yalanduru 10) Nanjanagudu**

11) **Mysuru 12) Belagola 13) Tumkur 14) Mandya 15) Shivapura 16) Bangalore 17) Kolara 18) Vidhurashwatta 19) Karwara 20) Channapattana**

## Books for Study and Reference:

1. Anitha. M.S, RajarshiNalvadiKrishnarajaWodeyar (Jeevana, SadhanemattuVyaktitva)
2. Bjorn Hettne, The Political Economy of Indirect Rule, Mysore 1881-1947
3. Chandrashaker. S, Dimensions of Socio-Political Changes in Mysore
4. ChinnaswamySosale. N, (Ed), JayachamarajendraOdeyarKaalada Mysore Samsthana
5. Halappa G.S, Freedom Movement in Karnataka
6. James Manor, Political Change in an Indian State, Mysore, 1917-1955
7. Kuppuswamy. B, Backward Class Movement in Karnataka
8. Sadashiva. K, History of Social Legislation in Princely Mysore, 1881-1947
9. Shamarao. M, Modern Mysore, Vol. I&II
10. Sheik Ali. B, (Ed)., Karnataka Charitre, Vol. VI &VII
11. Sundara. A, (Ed), ItihasamattuPuratattva, Kannada VishayaVishwakosha
12. SuryanathKamath, Karnataka state Gazetteer, Vol.I-III
13. Dr. Suryanath U. Kamath – A Concise History of Karnataka
14. Dr. Suryanath U. Kamath – KarnatakadaSankshiptaIthihasa
15. Prof. B. Parameshwara – Karnataka ItihasaParichaya
16. Prof. LokappaGowda – Adhunika Karnataka Itihasa
17. KNA – Karnataka Itihaasa
18. Prof. Chandrashekarappa - Karnataka Itihaasa

➢ **Weblinks**

1) En.wikipedia.org/wiki/
2) En.academic.com
3) Vdoc.pub/documents
4) Pdfsearches.com/modern-history

### Course Articulation Matrix - Course Code: 231630

| COs/ POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 3 | 3 | 2 | 1 | 2 |
| CO2 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 3 | 2 | 2 | - | 2 |
| CO3 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| Weighted Average | 2.66 | 2 | 1.66 | 1 | 2 | 1 | 1 | 2.66 | 2.33 | 1.66 | 1 | 2 |

**III BA – VI Semester**

**Course Code: 231631**

**DSC-14 History of China and Japan**

| Course Title: **History of China and Japan** | |
|---|---|
| Total Contact Hours:60 | Course Credits: 4 |
| Formative Assessment Marks:40 | Duration of ESA/Exam:60 |
| SyllabusAuthors:BOS(UG) | SummativeAssessmentMarks:100 |

## Course Outcomes(COs):

**CO 1 :** To get acquainted how to transform the Chinese society from traditional to modern culture.

**CO2 :** To comprehend how the Chinese were united towards the foreign colonial powers& defeated them.

**CO 3 :** To get knowledge in critical thinking & identify historical themes in modern east Asia.

**Course Code: 231631**

**DSC-14** Title: History of China and Japan

| Course - 1 | | Course– 2 | |
|---|---|---|---|
| **Number of Theory Credits** | **Number of lecture hours/semester** | **Number of Theory Credits** | **Number of lecture hours/semester** |
| **4** | **60** | **4** | **60** |

| **Content of Course - 3** | **60 Hrs** |
|---|---|
| **Unit–I Imperialism and china during the 19<sup>th</sup> century** | **21** |
| **Chapter 1:Chinese feudalism:**Gentry, bureaucracy and peasantry, the Confucian value system: Sino centrism; the canton commercial system. | **06** |
| **Chapter 2: The Transformation of China into an informal colony;** the opium wars; the unequal treaties; the scramble for concessions; finance imperialism; The open door policy. | **07** |
| **Chapter3:Agrarian and popular Movement:** Taiping and yi Ho Tuan: Attempts at self-Strengthening (Tzu-Chiang): Reforms of 1860-95;1890 and Boxar Rebellion of 1900. | **08** |
| **Unit-II The Emergence of Nationalism and Communism in China** | **20** |
| **Chapter 4:The Revolution of 1911:** causes, nature and significance the local composition of the Revolution; Sun Yat-Sen and his contributions. The formation of the Republic; Yuan Shihkai; May Fourth Movement of 1919: nature and significance. | **10** |
| **Chapter5: Formation of CCP;** (China Communist Party) and the Kuomintang (Nationalist Party KMT); The First united Front. | **05** |
| **Chapter6:The Communist movement in China:** the Jiangxi period and the rise of Mao Tse Tung and communist China. | **05** |
| **Unit– III Japan** | **19** |

| | |
|---|---|
| **Chapter 7: Japan in 19ᵗʰ Century** - Transition from feudalism to capitalism; Western Contact - The Perry Mission; Meiji Restoration: its nature and significance; Political Reorganization; Military Reforms; Social, Cultural and educational & Economic reforms; Meiji Constitution. | **08** |
| **Chapter 8 : Japanese Imperialism :**<br>(a) China    (b) Manchuria    (C) Korea. | **06** |
| **Chapter9:Democracy and Militarism/Fascism:** Popular / People's Rights Movement, Nature of Political Parties: Rise of Militarism - Nature and Significance, Second world war; American Occupation; Post-war changes in Japan. | **05** |

**Books for Study and Reference**

1. Clyde and Beers: The Far East

2. H.M. Vinacke: A History of the far East in Modern Times.

3. K.S. Latoureete: A Short History of the Far East

4. B. Sheik Ali and B. Muddachari: A Short History of Modern Asia (1900-1960)

5. Y. Immanuel Hsu: The Rise of Modern China.

6. Nathaniel Prefer : the Far East: A Modern History

7. Benjamin J. Schwartz: Mao and the Rise of Chinese communism.

8. George Allen: A Short Economic History of Jagan

9. Kenneth B. Pyle: the Making of Modern Japan

10.. ಕೆ.ಎಸ್ ಶಿವಣ್ಣ: ಆಧುನಿಕ ಚೀನಾ ಜಪಾನ್

11.ಆರ್.ಜಿ. ಶಿವಣ್ಣ: ಆಧುನಿಕ ಏಷ್ಯಾ ಇತಿಹಾಸ.

12.Prof. Lokappa -  Gowda – Adunika AisaIthihasa

13.KNA – Adhunika  Aisa
14.Phalaksha – Adhunika Aisa
15.Phalaksha – Prapanchada SamagraIthihasa

➢ **Weblinks**

1) en.wikipedia.org/wiki/china-japan

2) en.wikipedia.org/wiki/history-of-EastAsia

3) en.wikipedia.org/wiki/china

4) en.wikipedia.org/wiki/first-sino-japan war

**5)** en.wikipedia.org/wiki/ categary-china

**Course Articulation Matrix -  231631**

| COs/ POS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | - | 2 |
| **CO2** | 2 | 1 | - | - | - | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| **CO3** | 2 | 1 | 1 | 1 | - | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| **Weighted Average** | 2.33 | 1 | 1 | 1 | 1 | 1.33 | 1 | 2 | 2 | 1 | 1 | 2 |

# Pedagogy

- Lecture Method – Class Room Teaching
- Learning Through Project work
- Collaborative learning strategies
- Use of Resources like Audio- Visual aids, Films, Documentaries
- Visit to Historical Sites, Museums etc.
- ICT Supplemented Teaching
- Seminars/ Guest/ Special Lectures
- Group Discussions

# Modes of Assignment

- Individual Assignments
- Project work
- Written Test
- Documentaries

**Assessment:**

**Weightage for assessments (in percentage)**

| Formative Assessment | | |
|---|---|---|
| **Internal Assessment** | | **Theory Part Semester End Examination** |
| Internal Test | 10 | |
| Assignment / Book Review | 10 | |
| Seminar with Group Discussion | 10 | 60 |
| Viva Voice | 10 | |
| **Total** | **40** | |
| **Grand Total** | | **100** |

**SCHEME OF EXAMINATION**
**B.A- History  (NEP)**
**( DSC With 4 Credits- (No. of Papers- 3)**
**V and VI Semester of B.A., (C1-20, C2-20, C3-60 Total=100 Marks)**

**SCHEME OF EXAMINATION for 100 Marks**
(Each paper shall have two components)

| | | | | |
|---|---|---|---|---|
| I. | Internal Assessment | - | **40** Marks | |
| II. | Theory Component | - | **60** Marks | |
| | | Total - | **100** Marks | |

I. **Internal Assessment in Each paper shall have the following sub components.**

| | | | |
|---|---|---|---|
| A) Internal Test | - | **10** Marks | |
| B) Assignment/Book Review | - | **10** Marks | |
| C) Seminar with Group Discussion | - | **10** Marks | |
| D) Viva Voice | - | **10** Marks | |

Total  **- 40 Marks**

II. **Theory Component**

The theory question paper shall have **Four** parts and the maximum duration of the theory part shall be $2\frac{1}{2}$ **Hours**

NOTE:

Question papers shall have one Extra-long Answer Question Carrying 10 marks exclusively  for the **visually impaired candidates**, provided such candidates are enrolled in the course. In that case the extra Question should be printed at the end of the question paper super scribed with "Note".

**The theory question paper shall havefour parts and the maximum duration of the theory part shall be $2\frac{1}{2}$ Hours and it shall be as follows:**

# PATTERN OF QUESTION PAPER FOR V&VI SEMESTERS

## HISTORY – DSC (NEP)

**Max Marks: 60**

**Time: $2\frac{1}{2}$Hours**

**Instructions: All PARTS are Mandatory.** (ಎಲ್ಲಾ ಭಾಗಗಳು ಕಡ್ಡಾಯ)

### PART – A / ಭಾಗ – ಎ

**Answer ALL the following Questions in ONE Sentence each.**     **10x1=10**
ಕೆಳಕಂಡ ಎಲ್ಲಾ ಪ್ರಶ್ನೆಗಳಿಗೂ ಒಂದು ವಾಕ್ಯದಲ್ಲಿ ಉತ್ತರಿಸಿ.

1. a.
   b.
   c.
   d
   e.
   f.
   g.
   h.
   i.
   j.

### PART – B / ಭಾಗ – ಬಿ

**Answer any FOUR of the following Questions**     **4x5=20**
ಕೆಳಕಂಡ ಯಾವುದಾದರೂ ನಾಲ್ಕು ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿ.
2
3
4
5
6
7

### PART – C / ಭಾಗ – ಸಿ

**Answer anyThree of the following Questions**     **2x10=20**
ಕೆಳಕಂಡ ಯಾವುದಾದರೂ ಮೂರು ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿ.

8
9
10
11.
12. Map Question.
**NOTE: Attending MAP Question is Mandatory.**     **4+6=10**

**Note: One Essay Question given for Blind Students instead of Map Question.**

# Internship

**Semester: VI**

| Course Code: 23INTHIS01 | Course Title: SEC(2) - Internship |
|---|---|
| Course Credits: 02 | Hours of Teaching/Week: |
| Total Contact Hours: 90 Hours Internship | Formative Assessment Marks: 100 Marks (C1=50+C2=50) |

**Note:** This course will run as per the guidelines defined by the University of Mysore, Mysuru and the same is approved by BoS, Economics, SBRR Mahajana First Grade College, (A) Mysuru.

**Course Outcomes (COs):**

**CO1:** Integrate Theory and Practice of the area selected for Internship to Explore Career Opportunities prior to Graduation.

**CO2:** Sharpen the domain knowledge and provide core competency skills by developing Communication, Interpersonal, Work Habits, Attitude and other Critical Skills required for a job.

## Course Articulation Matrix –23INTHIS01

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 |
| Weighted Average | 3 | 3 | 3 | 3 | 3 | 2.5 | 2 | 2 | 3 | 3 | 3 | 2.5 |

## Scheme of Valuation for Internship

C1 and C2 are internal assessments to be conducted during 8th and 16th weeks respectively for the semester. The student will be evaluated on the basis of presentation skills and project development. The student has to compulsorily submit the project report for evaluation during C2. The report has to be certified by the Head of the Department and the Mentor/Supervisor.

**The student is evaluated for 100 Marks in C1 and C2 as per the following scheme:**

Project Progress Presentation (**C1**):     50 marks

Project Development and Report (**C2**): 50 marks

| Assessment Criteria | Marks |
|---|---|
| **Project Presentation Skills** | 50 |
| **Project Development Skills and  Report** | 50 |
| **Total** | **100** |

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# DEPARTMENT OF JOURNALIM AND MASS COMMUNICATION

## Motto

*Feed the watchdog, build the safe society*

## Vision

*To inspire successive generations of talented Individuals to become*

*dedicated Journalists*

## Mission

**Provides students with the intellectual, interpretive and Practical skills they need to function as professionals. With state-of-the-art technology. We have created an environment for hands-on teaching and learning. Internships are vital to the educational experience and students may choose from a wide range of opportunities in print, television, radio and Internet media from around the region.**

# Program Outcomes (POs) for Bachelor of Arts

**PO 1**    : **Domain Knowledge:** Inculcation of fundamental concepts, principles, methods and the application of the same in the realm of concerned domain

**PO 2**    :. **Problem Analysis:** This program enhances the ability to define, identify and analyze appropriate means towards amicable solutions in the given area of Knowledge

**PO 3**    :. **Design & Development of Solutions:** Structuring theoretical knowledge and developing customized designs in terms of – Intervention strategies, Profiling, Reviews, Archives, Marketing strategies, Info-graphics and Approaches for arriving at relevant and desirable solutions

**PO 4**    :. **Research & Investigation**: Knowledge and application of "Research Methods" to investigate domain specific problems and derive scientific conclusions through testing of Hypotheses and relevant findings empirically

**PO 5**    :. **Usage of Modern Tools and Techniques:** Mastery in the academic enclave through skilled handling administering, assessing, validating and interpreting complex phenomena using advanced tools and techniques to create simple and sustainable solutions

**PO 6**    :. **Social Sciences & Society –** Promotes domain specific literacy to illuminate the significance of each discipline and its applicability for the well-being of Society

**PO 7**    :. **Environment and Sustainability:** Contemplate and Introspect prevailing environmental challenges and consequences. Further, channelize initiatives towards sustainability

**PO 8**    : **Moral and Ethical Values:** Application of Professional Ethics, Humanitarian Values, Accountability and Social Responsibilities in emerging society towards attainment of harmony and co-existence

**PO 9**    : **Individual and Teamwork:** Imbibe the qualities of Teamwork and function effectively as an emerging leader in the diversified and multidisciplinary areas.

**PO 10**    : **Communication:** Demonstrates Competency in comprehending and conceptualizing discipline specific concepts and ideas and communicates effectively through fluid communication within the professional and social setup.

**PO 11**    : **Economics and Project Management:** Understand the Economic Concept in the context of specific discipline and apply the same through initiating Planning, and Executing the Project Dynamics effectively towards successful Project Management

**PO 12**    : **Lifelong Learning**: Identify and address their own educational needs in a changing world in ways sufficient to upgrade one's skills and competencies through constant self-evaluation and eternal learning.

# List of BoS Members

| Sl. No. | Category | Name & Designation Smt./Sri | Address for Communication | E-mail & Mobile No. |
|---|---|---|---|---|
| 1 | Chairperson | Swathy H J Assistant Professor & HoD | Department of Journalism And MassCommunication SBRR Mahajana First Grade College (A), Jayalakshmipuram, Mysuru - 12 | swathy0704@gmail.com 9483394998 |
| 2 | Member | Swarrna Assistant Professor | Department of Journalism And Mass Communication SBRR Mahajana First Grade College (A), Jayalakshmipuram, Mysuru - 12 | swarnamahesh2468@gmail.com 9731093401 |
| 3 | Two Experts from Other University | Dr.Mahadevaswamy K N HoD & Assistant Professor | Dept. of Journalism Sahyadri Arts College Kuvempu University, BH Road, Shivamogga – 577303 | knmswamy@gmail.com 9483796169 |
| 4 | | Dr. Shailesh Raj Urs G.B. Assistant Professor | Department of Journalism and Mass Communication, Karnataka State Open University | shaileshrajurs@gmail.com 9448672473 |
| 5 | Nominee by the Vice Chancellor | Dr. Sapna M.S Chairman & Professor | DoS in Journalism And Mass Communication Manasagangotri, University of Mysore, Mysuru – 570006 | splashsapna@gmail.com 9845485234 |
| 6 | Alumnus | Sindhu Nagaraj Sub-Editor, 'The Hindu' | No.859 & 860, Kasturi Buildings Anna Salai, Mount Road Chennai - 600002 | sindhu0411@gmail.com 9916595072 |
| 7 | Media Industry | Mahendra C. K Editor-in-Chief | Editor-in-Chief Prathinidhi' Kannada Daily News paper | cvgudi@gmail.com 9886076957 |

# Course Structure (NEP 2020)

## Discipline Specific Courses (DSC) and SEC

## III Year

| Course Type, Code and Name | | Hours/Week | | Credits | Maximum Marks | | | Exam Duration | Total Marks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | IA | | Exam | | |
| | | L | T/P | L:T:P | C1 | C2 | C3 | | |
| **Journalism And Mass Communication – V Semester** | | | | | | | | | |
| **DSC(5) 231558** | Introduction To Communication | 4 | 0 | 4:0:2 (6credits) | 20 | 20 | 60 | 2 ½ Hours | 150 |
| **DSC(5)- Lab** | Theory based Practical's on Introduction To Communication | 0 | 4 | | 10 | 15 | 25 | 3 Hours | |
| **DSC(6) 231559** | Media Law And Ethics | 4 | 0 | 4:0:2 (6credits) | 20 | 20 | 60 | 2 ½ Hours | 150 |
| **DSC(6)- Lab** | Theory based Practical's on Media Laws And Ethics | 0 | 4 | | 10 | 15 | 25 | 3 Hours | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Journalism And Mass Communication – VI Semester** | | | | | | | | |
| **DSC(7) 231658** | Fundamentals of Radio And Television | **4** | **0** | **4:0:2** (6credits) | **20** | **20** | **60** | **2 ½ Hours** | **150** |
| **DSC(7)- Lab** | Theory based Practical's on Fundamentals of Radio And Television | **0** | **4** | | **10** | **15** | **25** | **3 Hours** | |
| **DSC(8) 231659** | Advertising And Corporate Communication | **4** | **0** | **4:0:2** (6credits) | **20** | **20** | **60** | **2 ½ Hours** | **150** |
| **DSC(8)- Lab** | Theory based Practical's on Advertising And Corporate Communication | **0** | **4** | | **10** | **15** | **25** | **3 Hours** | |
| **INT** | **23INTJOU01** | **2** | **0** | **2:0:0** | **50** | **50** | **-** | **-** | **100** |

## DSC(5) Journalism And Mass Communication Syllabus for B.A

## (Basic and Honors)

**Semester: V**

| Course Code: 231558 | Course Title:<br>DSC(5) : Introduction To Communication<br>DSC(5) : Lab :Theory based Practical's on Introduction To Communication |
|---|---|
| **Course Credits:**<br><br>06 (4:0:2) | **Hours of Teaching/Week:**<br>04 (Theory) + 04 (Practical) |
| **Total Contact Hours:**<br>60 Hours (Theory)<br>60 Hours (Practical) | **Formative Assessment Marks:**<br>40 (Theory)<br>25 (Practical) |
| **Exam Duration:**<br>2 ½ Hours (Theory)<br>3 Hours (Practical) | **Semester End Examination Marks:**<br>60 (Theory)<br>25 (Practical) |

**Course Outcomes (COs):**

**CO1 :** Demonstrate knowledge and understanding of the communication and theories

**CO2 :** Demonstrate awareness of the diversity of approaches to understanding communication

**CO3 :** Culture in both historical and contemporary contexts and approaches.

**CO4:** Exposure to Technology oriented skills.

**Course Content**

| Content | Hours |
|---|---|
| **UNIT – 1** | |
| **Definition, Nature and Scope of Communication:** Process of Communication, Barriers of Communication, Understanding Communication Through Models - Reviewing Aristotle's Model, Shannon-Weaver Model, Harold Lasswell Model, Wilbur Schramm Model and New Comb's Model, SMCR Model. | **15** |
| **UNIT – 2** | |
| **Types of Communication:** Verbal and Non-Verbal Communications, Difference Between Verbal and Non-Verbal Communication, Types of Non-Verbal Communication - Sign Language, Object Language, Body Language - Para Language, Touch, Space, Time and Silence as Non-Verbal Communication, Oral and Written Communication - Essentials of Good Writing, Techniques of Public Speaking. | **15** |
| **UNIT – 3** | |
| **Levels and Limitations of Communication:** Intra-Personal Communication, Inter-Personal Communication, Group Communication, Mass Communication and Mass-line Communication, The Mass Communication in National Development and Cultural Promotion. | **15** |
| **UNIT – 4** | |
| **Introduction to Mass Media:** Mass Media and Society, Types of Mass Media - Print, Electronic (Radio and Television), Folk, New Media, Media Convergence, Contemporary Issues in Mass Media - Fake News, Artificial Intelligence and Media. | **15** |

**Books for References:**

1. Introduction to Mass Keval J Kumar Jaico 4th 1994 Communication .
2. Introduction to Mass Stanley J. Baran New York: 2nd 2002 Communication McGraw Hill.

3. Communication C.S. Rayadu Himalaya 9th 2010 Publishing House, Mumbai

4. Mass Communication Denis McQuail Sage Publication 6th 2010

. 5. Communication Denis McQuail & Singapore: 2nd 1981

6. An Introduction to Lynn H. & Turner Cambridge 1st 2019 Communication West University Press

7. The Dynamics of Joseph R. McGraw Hill, 12th 2013 Mass Communication Dominick

**Weblinks:**

1. https://home.snu.edu/~jsmith/library/body/v25.pdf
2. https://extension.illinois.edu/commit/quick-tips
3. https://unm5.unm.edu/5-research-COMMUNICATION-skills.html
4. https://pdfkeys.com/download/2537297-Basic%20Communication%20Skills%20Spc%202016%20Tripod%20Com.pdf
5. https://in.indeed.com/career-advice/career-development/english-communication-skills
6. https://dictionary.cambridge.org/example/english/basic-communication
7. https://ec.europa.eu/research/participants/documents/downloadPublic?documentIds=080166e5b388a831&appId=PPGMS

**Practical/Lab Work**

1. Practicing formal and informal letter writing
2. Writing articles for newspapers
3  Resume writing
3. Writing Middles for editorial page
4. AI News Reading
5  Group Discussion And Paper Presentation

**Course Articulation Matrix - 231558**

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 3 | 2 | 2 | 2 | 3 | 2 | 1 | 2 | 2 | 3 | 1 | 2 |
| CO 2 | 2 | 3 | 2 | 2 | 2 | 3 | 1 | 2 | 3 | 3 | 1 | 3 |
| CO 3 | 2 | 2 | 1 | 2 | 2 | 3 | 2 | 1 | 3 | 3 | 2 | 2 |
| CO 4 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 1 | 3 |
| Weighted Average | 2.25 | 2.25 | 2.0 | 2.0 | 2.5 | 2.5 | 1.5 | 1.75 | 2.5 | 3.0 | 1.25 | 2.5 |

# DSC(6) Journalism And Mass Communication Syllabus for B.A

## (Basic and Honors)

**Semester V**

| Course Code: 231559 | Course Title: DSC(6) : Media Laws And Ethics DSC(6) Lab : Theory based Practical's on Media Laws And Ethics |
|---|---|
| Course Credits: 06 (4:0:2) | Hours of Teaching/Week: 04 (Theory) + 04 (Practical) |
| Total Contact Hours: 60 Hours (Theory) 60 Hours (Practical) | Formative Assessment Marks: 40 (Theory) 25 (Practical) |
| Exam Duration: 2 ½ Hours (Theory) 3 Hours (Practical) | Semester End Examination Marks: 60 (Theory) 25 (Practical) |

**Course Outcomes (COs):**

**CO 1:** Fundamentals of Media Laws and Ethics

**CO 2:** To maintain Journalistic standards and practices in a variety of newsgathering settings

**CO 3:** Ethical considerations Journalists face and how they make decisions in those areas.

**CO 4:** Aware about Professional Bodies

**Course Content**

| Content | Hours |
|---|---|
| **UNIT – 1** | |
| **Concept of Freedom of Speech**: Press during Emergency of 1975, Press Freedom in Indian Constitution- Article 19 (1)(a ), Article 19 (2), Hate Speech, World Press Freedom Index. Case Studies. | **15** |
| **UNIT – 2** | |
| **Laws:** Code of Ethics for Journalists, Defamation, Censorship, Sedition, Obscenity, Right to Privacy Law of Parliamentary Privileges 1971, Cyber Laws. Case Studies. | **15** |
| **UNIT – 3** | |
| **Acts:** Contempt of Court Act 1971, Right to Information Act 2005, The Official Secrets Act 1923, The Copyright Act 1957, Working Journalists Act 1955, Information Technology Act 2000, Case Studies. | **15** |
| **UNIT – 4** | |
| **Professional Bodies and Committees**: RNI, Press Commissions Press Council of India - Structure, Functions and Significance, Prasar Bharati, Chanda Committee, Varghese Committee, Paswan Committee, BRAI, TRAI, BCCC, ASCI, NBA. | **15** |

**Books for References:**

1. Alia,V. (2004). Media Ethics and Social Change. New York: Routledge.

2. Sanders, K. (2003). Ethics and Journalism. New Delhi: Sage
3. Journalism Ethics: Moral Responsibility in the Media. Pearson Education
4. Meyers, C. (Ed.). (2010). Journalism Ethics: A philosophical approach. University

5 Pavlik,J. (2008). Media in the digital age. New York: Columbia

   UniversityPress.
6. Plaisance, P.L. (2009). Media Ethics: Key principles for responsible practice, New
7. Price, M.E., Verhulst, S.G. and Morgan, L. (Ed.) (2013). Routledge handbook of
   media law. New York: Routledge.
8. Rosenstiel,T. and Mitchell.A. (Eds.) (2003). thinking clearly: Cases in Journalistic Making. New York: Columbia University Press.

**Weblinks:**

1..https://www.dmlp.org/legal-guide/linking-copyrighted-materials

2.https://desikaanoon.in/media-law-and-ethics/

3..https://www.routledge.com/Media-Law-and-Ethics/Moore-Murray-Youm/p/book/9780367748562

4.https://www.igi-global.com/book/media-law-ethics-policy-digital/171726

5.https://www.bbc.co.uk/bitesize/guides/zyt282p/revision/2

**Practical/Lab Work**

1. File an RTI application and prepare a news report
2. Present a case study of Defamation on media
3. Present a case study of Hate Speech
4. Present a case study of Contempt of Court on media
5. Present a case study on violation of Parliamentary Privileges by media

## Course Articulation Matrix - 231559

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 2 | 2 | 1 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 1 | 2 |
| CO 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 1 | 2 | 1 | 3 |
| CO 3 | 3 | 2 | 2 | 3 | 3 | 3 | 1 | 3 | 2 | 3 | 2 | 3 |
| CO 4 | 2 | 2 | 3 | 2 | 3 | 3 | 1 | 3 | 3 | 2 | 1 | 3 |
| Weighted Average | 2.5 | 2.0 | 2.0 | 2.25 | 2.5 | 3.0 | 1.5 | 3.0 | 2.0 | 2.25 | 1.25 | 2.75 |

# DSC(7) Journalism And Mass Communication Syllabus for B.A

## (Basic and Honors)

**Semester: VI**

| | |
|---|---|
| **Course Code:** 231658 | **Course Title:**<br>DSC(7) : Fundamentals of Radio And Television<br>DSC(7) Lab :Theory based Practical's on Fundamentals of Radio And Television |
| **Course Credits:**<br><br>06 (4:0:2) | **Hours of Teaching/Week:**<br>04 (Theory) + 04 (Practical) |
| **Total Contact Hours:**<br>60 Hours (Theory)<br>60 Hours (Practical) | **Formative Assessment Marks:**<br>40 (Theory)<br>25 (Practical) |
| **Exam Duration:**<br>2 ½ Hours (Theory)<br>3 Hours (Practical) | **Semester End Examination Marks:**<br>60 (Theory)<br>25 (Practical) |

**Course Outcomes (COs):**

**CO1:** Discuss the past and present status of Radio

**CO2:** Discuss the past and present status of Television

**CO3:** Enhancing skills behind audio and video production

**CO4:** Highlight the techniques of program production in Radio and Television

**Course Content**

| Content | Hours |
|---|---|
| **UNIT – 1** | |
| Introduction to Radio: Nature and Characteristics of Radio, Evolution of Radio in India, Types of Radio Stations *(AM/FM),* Organizational Structure of AIR and Private Radio, Community Radio, Formats of Radio Programme, Present Status of Radio in India, Impact and Reach of Radio. | **15** |
| **UNIT – 2** | |
| Introduction to Television: Nature and Characteristics of Television, Growth of Television in India, Public and Private Television Channels, Regional Channels, Television Program Formats. | **15** |
| **UNIT – 3** | |
| Audio-Visual Media Presentation: Effective Communication Skills for Radio and Television, Presentation Techniques - Voice Modulation, Appearance, Facial Expression and Body Language. | **15** |
| **UNIT – 4** | |
| Script Writing for Radio and Television: Writing Skills for Broadcast and Telecast Media, Importance and Principles of Scripting, Various Elements of Script for Radio and Television, Script Formats, Style Sheet and Grammar. | **15** |

**Books for References:**

1. Mastering Cliff Truesdell Wiley Publishing, pt 2017 Digital Audio Production Inc.
2. Audio Production Worktext: David Reese, Focal Press 1st 2009Concepts,Techniques, and Lynne Gross, Equipment Brian Gross
3. Television Production Zettl Wadsworth Pub Co 12th 2012 Handbook
4. F. M. Ste Writing for Television, Robert Hilliard Taxmann 11th New Media Publications Private Limited
5. Video Production Vasuki Oxford University 2nd 2013 Belavadi Press

**Weblinks:**

1.https://learn.org/directory/category/Media_Related_Communication/Communications_Technician/Television_and_Radio_Broadcasting.html
2.https://prasarbharati.gov.in/broadcasting-system/

3. https://www.flexiprep.com/NIOS-Notes/Senior-Secondary/Mass-Communication/NIOS-Class-12-Mass-Communication-Ch-13-Television-in-India.html
4. https://pib.gov.in/newsite/printrelease.aspx?relid=169932
5. https://www.migration.lt/radio-and-television

**Practical/Lab Work**

1. Prepare a Script for Radio Announcements
2. Prepare a Script for Radio Jingles
3. Prepare an Advertisement Script for Radio
4. Script writing and News Reading for Television (2 min)
5. Prepare Interview Script for Television

# Course Articulation Matrix – 231658

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 3 | 2 | 2 | 2 | 3 | 3 | 1 | 1 | 2 | 3 | 2 | 1 |
| CO 2 | 3 | 2 | 2 | 2 | 3 | 2 | 1 | 1 | 2 | 3 | 2 | 1 |
| CO 3 | 2 | 2 | 2 | 2 | 3 | 2 | 1 | 2 | 3 | 3 | 2 | 3 |
| CO 4 | 2 | 2 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 3 | 2 | 3 |
| Weighted Average | 2.5 | 2.0 | 2.0 | 2.0 | 3.0 | 2.5 | 1.0 | 1.5 | 2.5 | 3.0 | 2.0 | 2.0 |

# DSC(8) Journalism And Mass Communication Syllabus for B.A

## (Basic and Honors)

**Semester: VI**

| Course Code: 231659 | Course Title: |
|---|---|
| | DSC(8) : Advertising And Corporate Communications |
| | DSC(8) Lab : Theory based Practical's on Advertising And Corporate Communications |
| **Course Credits:** 06 (4:0:2) | **Hours of Teaching/Week:** 04 (Theory) + 04 (Practical) |
| **Total Contact Hours:** 60 Hours (Theory) 60 Hours (Practical) | **Formative Assessment Marks:** 40 (Theory) 25 (Practical) |
| **Exam Duration:** 2 ½ Hours (Theory) 3 Hours (Practical) | **Semester End Examination Marks:** 60 (Theory) 25 (Practical) |

**Course Outcomes (COs):**

**CO1:** Comphrend students to basic concept of advertising

**CO2:** Orient the students with the concept of copywriting as selling through writing

**CO3:** Train students to generate, develop and express ideas effectively in Corporate Sector

**CO4:** Orient the students about Tools of Corporate Communication

**Course Content**

| Content | Hours |
|---|---|
| **UNIT – 1** | |
| **Understanding Advertising**: Definition, Nature and Scope of Advertising; Role and Functions of Advertising; Evolution of Advertisement in India and World, Current Trends; Advertising as a Tool of Communication; Role of Advertising in Society; Advertisement and Ethics. | **15** |
| **UNIT – 2** | |
| **Types of Advertising:** Types of Advertisements, Advertising Agency - Functions, Types and Structure; Advertising Copy writing for Print and Electronic Media- Headlines, Signature, Slogans and Logos. | **15** |
| **UNIT – 3** | |
| **Introduction to Corporate Communication:** Definition, Nature and Scope of Corporate Communication; Structure of Corporate Organization; Core Functions Corporate Communications ;Corporate Social Responsibility ;Comparison with Public Relations, Advertising, Publicity and Propaganda. | **15** |
| **UNIT – 4** | |
| **Corporate Communication Tools:** Print Media - House Journals, Newsletters, Brochures and Handouts lFlyers; Electronic Media Advertisements and Corporate Films; Digital Media - Social Media, Blogs, Vlogs. | **15** |

**Books for References:**

1. Kleppner, Otto; Fundamentals of Advertising; Prentice Hall; New Jersey. 1980

2. Gupta, Sen; Brand Positioning; Tata McGraw Hill; New Delhi; 1990.

3. Advertising as Communication - Dyer Gillian.

4. Foundations of the Theory and Practice of Advertising - S.A. Chunawalla and F.C. Scythia

5. Cornelissen, Joep; Corporate Communication: A Guide to Theory and Practice; Sage. 2011

**Weblinks**

1. https://www.tutorialspoint.com/advertisement_and_marketing_communications/corporate_communications.htm

2. https://www.shiksha.com/mba/articles/pr-vs-advertising-vs-corporate-communication-courses-colleges-career-jobs-blogId-116385

3. https://www.geeksforgeeks.org/difference-between-corporate-communication-and-marketing-communication/

4. https://aaftonline.com/advertising-pr-branding

5. https://zenmedia.com/blog/communications-vs-pr-vs-marketing/

## Practical/Lab Work

1. Display Advertisement (Product and Service)
2. Classified Advertisements
3. Product Announcement
4. Preparing Brochures
5. Posters & Flyers
6. Photoshop

## Course Articulation Matrix – 231659

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|-------|------|------|------|------|------|------|------|------|------|-------|-------|-------|
| CO 1 | 3 | 2 | 3 | 3 | 3 | 2 | 1 | 3 | 3 | 3 | 3 | 1 |
| CO 2 | 3 | 2 | 3 | 3 | 3 | 2 | 1 | 2 | 3 | 3 | 3 | 1 |
| CO 3 | 3 | 2 | 3 | 2 | 3 | 3 | 1 | 2 | 3 | 3 | 3 | 1 |
| CO 4 | 2 | 1 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 1 |
| Weighted Average | 2.75 | 1.75 | 3.0 | 2.5 | 3.0 | 2.5 | 1.25 | 2.25 | 3.0 | 3.0 | 3.0 | 1.0 |

**SEC : Journalism And Mass Communication Syllabus for B.A**

**(Basic and Honors)**

**Semester VI**

| Course Code:23INTJOU01 | Course Title: Internship |
|---|---|
| Course Credits: 02 | Hours per Week: 02 |
| Total Contact Hours: 90 Hours | Formative Assessment Marks: 100 Marks C1=50 C2=50 |

**Note: This course will run as per the guidelines defined by the BoS, Journalism And Mass Communication ,University of Mysore, Mysuru and the same is approved by BoS, Journalism And Mass Communication, SBRR Mahajana First Grade College, Mysuru.**

**Course Outcomes (COs):**

**CO 1:** Functioning of media houses and produces the desired media content.

**CO 2:** Relate with the need of media houses.

**Course Articulation Matrix -23INTJOU01**

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 3 | 1 | 1 | 1 | 2 | 2 | 1 | 3 | 3 | 3 | 1 | 2 |
| CO 2 | 2 | 2 | 1 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 2 |
| Weighted Average | 2.5 | 1.5 | 1 | 2 | 2 | 2.5 | 1.5 | 2.5 | 3 | 3 | 1.5 | 2 |

# Scheme of Valuation for Internship

C1 and C2 are internal assessments to be conducted during 8th and 16th weeks respectively for the semester. The student will be evaluated on the basis of presentation skills and project development. The student has to compulsorily submit the project report for evaluation during C2. The report has to be certified by the Head of the Department and the Mentor/Supervisor.

**The student is evaluated for 100marks in C1 and C2 as per the following scheme:**

Project Progress Presentation (**C1**): 50 marks

Project Development and Report (**C2**): 50 marks

| Assessment Criteria | Marks |
|---|---|
| Project Presentation Skills | 50 |
| Project Development Skills and  Report | 50 |
| **Total** | **100** |

# Continuous Formative Evaluation/Internal Assessment (DSC)

Total marks for each course shall be based on continuous assessments and semester end examinations. The pattern is 40:60 for IA and Semester End Theory Examinations respectively and 50:50 for IA and Semester End Practical Examinations respectively.

|  | THEORY | PRACTICAL |
|---|---|---|
| **Total Marks** | 100 Marks | 50 Marks |
| **Continuous Assessment – 1 (C1)** | 20 Marks | 10 Marks |
| **Continuous Assessment – 2 (C2)** | 20 Marks | 15 Marks |
| **Semester End Examination (C3)** | 60 Marks | 25 Marks |

**Evaluation Process of IA Marks shall be as follows:**

a) The first component (C1) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, project work etc. This assessment and score process should be completed after completing 50% of syllabus of the course and within 45 working days of semester program.

b) The second component (C2) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, internship/industrial practicum/project work, quiz etc. This assessment and score process should be based on completion of remaining 50% of syllabus of the course of the semester.

c) During the 17th – 19th week of the semester, a semester end examination shall be conducted by the college for each course. This forms the third and final component of assessment (C3) and the maximum marks for the final component will be 60%.

d) In case of a student who has failed to attend the C1 or C2 on a scheduled date, it shall be deemed that the student has dropped the test. However, in case of a student who could not take the test on scheduled date due to genuine reasons, such a candidate may appeal to the Principal. The Principal in consultation with the concerned teacher shall decide about the genuineness of the case and decide to conduct special test to such candidate on the date fixed by the concerned teacher, but before commencement of the concerned semester end examinations.

e) For assignments, tests, case study analysis etc., of C1 and C2, the students should bring their own answer scripts (A4 size), graph sheets etc., required for such tests/assignments and these be sealed/signed by the concerned department at the time of conducting tests/assignment/project work etc.

f) The outline for continuous assessment activities for Component-I (C1) and Component-II (C2) of a course shall be as under:

|  | C1 Marks | C2 Marks | Total Marks |
|---|---|---|---|
| **Session Test** | 20 | - | 20 |
| **Seminar/Presentation/Assignment/Activity/Case Study/Field Work/Project Work/Quiz etc.** | - | 20 | 20 |
| **Total** | 20 | 20 | 40 |

- For practical course of full credits, seminar shall not be compulsory. In its place, marks shall be awarded for Practical Record Maintenance(the marks is 25 (10 + 15) and 25. Evaluated for a total of 50 Marks).

- Conduct of Test, Seminar, Case study/Assignment etc., can be either in C1 or in C2 component as decided by the college and concerned department/teacher.

- The teachers concerned shall conduct test/seminar/case study etc., The students should be informed about the modalities well in advance. The evaluated courses assignments during component I (C1) and component II (C2) of assessment are immediately provided to the candidates after obtaining acknowledgement in the register by the concerned teacher(s) and maintained by the Department. Before commencement of the semester end examination, the evaluated test, assignment etc., of C1 and C2 shall be obtained back to maintain them till the announcement of the results of the examination of the concerned semester.

g) The marks of the internal assessment shall be published on the notice board of the department/college for information of the students.

h) The internal assessment marks shall be communicated to the CoE at least 10 days before the commencement of the semester end examinations and the CoE shall have access to the records of such periodical assessments.

i) There shall be no minimum in respect of internal assessment marks.

j) Internal assessment marks may be recorded separately. A candidate who has failed or rejected the result shall retain the internal assessment marks

# Scheme of Valuation for Practical Examinations

C1 and C2 are internal tests to be conducted during 8th and 16th weeks respectively of the semester. C3 is the semester-end examination conducted for 3 hours. The student will be evaluated on the basis of manual work, programme and its execution. The student has to compulsorily submit the practical record for evaluation during C2. For C3, the record has to be certified by the Head of the Department.

• The student is evaluated for 25 marks in C1 and C2 as per the following scheme:

**C1 Component:** 10 Marks : This will be based on a practical test. This should

be completed by the 8th week of the semester.

**C2 Component** : 15 Marks : This will be based on practical test / assignment for 10 marks and 5 marks for practical record. This should be completed by the 16th week of the semester.

• The student is evaluated for 25 marks in **C3** as per the following scheme:

| Assessment Criteria | Marks |
|---------------------|-------|
| Practical Record | 15 |
| Viva | 10 |
| **Total** | **25** |

# Scheme of Valuation for Practical Examinations

C1 and C2 are internal tests to be conducted during 8th and 16th weeks respectively of the semester. C3 is the semester-end examination conducted for 3 hours. The student will be evaluated on the basis of manual work, programme and its execution. The student has to compulsorily submit the practical record for evaluation during C2. For C3, the record has to be certified by the Head of the Department.

• The student is evaluated for 25 marks in C1 and C2 as per the following scheme:

**C1 Component:** 10 Marks : This will be based on a practical test. This should

be completed by the 8th week of the semester.

**C2 Component** : 15 Marks : This will be based on practical test / assignment for 10 marks  and 5 marks for practical record. This should be completed by the 16th   week of the semester.

• The student is evaluated for 25 marks in **C3** as per the following scheme:

| Assessment Criteria | Marks |
|---------------------|-------|
| Practical Record | 15 |
| Viva | 10 |
| **Total** | **25** |

# DSC- Theory Question Paper Pattern -V and VI Semester

**Max. Marks:** 60 Marks                                        **Exam Duration:** 2½ Hours

**Instructions: Paper Setting**
- The Question Paper is divided into 3 parts: Part - A , Part – B and Part -C
- **Part – A** : Should consist of 1**0 Questions**.
        **10 Questions** to be answered.
- **Part – B** : Should consist of **4 Main** Questions (1 from Each Unit).
        **6 Sub Question** will be given, out of which **4 Questions** to be answer
- **Part – C**  Should consist of **4Main** Questions (1 from Each Unit).
        **3 Sub Question** will be given, out of which **3 Questions** to be answer

## Part A

**Answer all questions. Each Question carries 1 Marks.**             **1×10 =10**

I .
1.
    a.
    b.
    c
    d
    e
    f
    g
    h
    i
    j

## Part B

**Answer any Four questions. Each Question carries 5 Marks.**    **4×5=20**

II.
    2.
    3.
    4
    5
    6
    7

## Part C

**Answer any three questions. Each Question carries 10 Marks.**    **3×10 =30**

III.

    8.
    9.
    10.
    11
    12
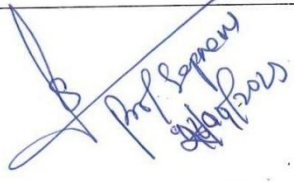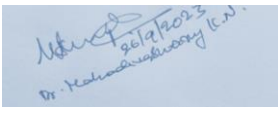
Mahajana Education Society (R)
**Education to Excel**

# SBRR Mahajana First Grade College (Autonomous)

Jayalakshmipuram, Mysuru – 570 012 Karnataka, INDIA
Affiliated to University of Mysore, Re-Accredited by NAAC with 'A' Grade,
College with Potential for Excellence

## Department of Journalism & Mass Communication

Board of Studies Meeting (NEP) held on 26th September 2023, Tuesday

| Sl.No. | Name | Designation | Signature |
|---|---|---|---|
| 1 | **Swathy H J** HoD & Assistant Professor Dept. of Journalism and Mass Communication SBRR Mahajana First Grade College (Autonomous) Jayalakshmipuram, Mysuru Email: swathy0704@gmail.com **Mobile: 9483394998** | **Chairperson** | |
| 2 | **Swarna** Assistant Professor Dept. of Journalism and Mass Communication SBRR Mahajana First Grade College (Autonomous) Jayalakshmipuram, Mysuru **Email:** swarnamahesh2468@gmail.com **Mobile: 9731093401** | **Member** | |
| 3 | **Dr. Sapna M.S** **Chairman & Professor** Dept. of Journalism and Mass Communication Manasagangothri, Mysore **Email:** splashsapna@gmail.com **Mobile: 9845485234** | **University Nominee** | |
| 4 | **Mr. Mahadevaswamy KN** HOD & Assistant Professor Dept. of Journalism Sahyadri Arts College Kuvempu University, BH Road, Shivamogga – 577303 **Email:** knmswamy@gmail.com **Mobile : +91 9483796169** | **Member (Other University)** | |

SBRR Mahajana First Grade College, Jayalakshmipuram,

| | | | |
|---|---|---|---|
| 5 | Dr. Shailesh Raj Urs G.B.<br>Assistant Professor<br>Dept. of Journalism and<br>Mass Communication,<br>Karnataka State Open<br>University, Mysore<br>Email:<br>shaileshrajurs@gmail.c<br>om<br>Mobile : 9448672473 | Member<br>(Other<br>University) | |
| 6 | Dr. Mahendra C. K<br>Editor-in-Chief<br>Prathinidhi' Kannada Daily<br>News paper,<br>Kuvempunagar, Mysore<br>Email: cvgudi@gmail.com<br>Mobile: 9886076957 | Member<br>(Media Industry) | |
| 7 | Ms. Sindhu Nagaraj<br>Sub-Editor, 'The Hindu'<br>No.859 & 860, Kasturi Buildings<br>Anna Salai, Mount Road<br>Chennai - 600002<br>Email: Sindhu0411@gmail.com<br>Mobile: 9916595072 | Member<br>(Alumnai) | AB |

Chairperson
BOS/BOE in
Journalism & Mass Communication
SBRR Mahajana First Grade College
(Autonomous)

SBRR Mahajana First Grade College, Jayalakshmipuram,
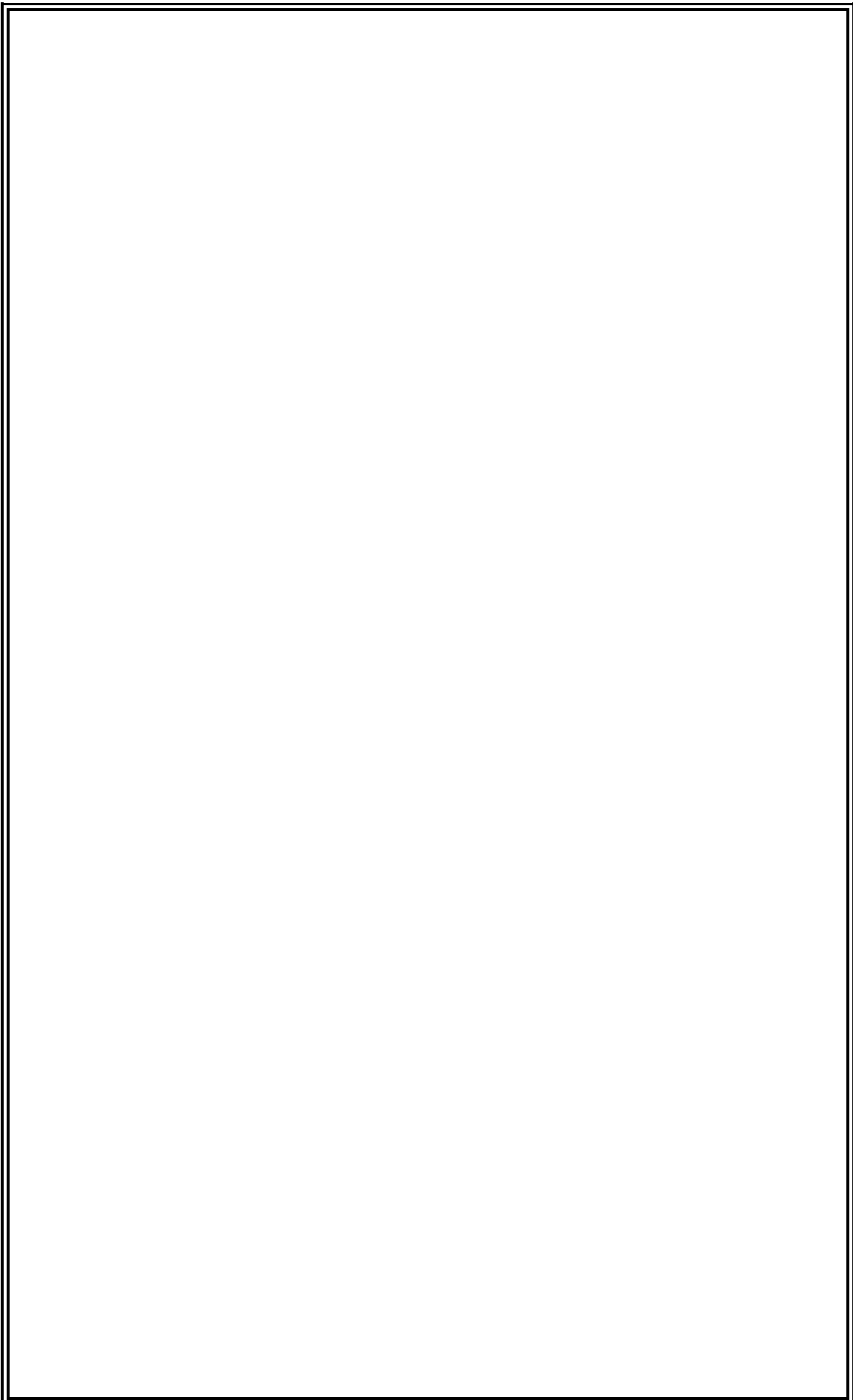
# DEPARTMENT OF MATHEMATICS

## Motto

*Accuracy and Perfection*

## Vision

*To Create a Mindset to apply Analytical Skills*

## Mission

*Empower with Logic Enhance with Skills*

# Program Outcomes (POs) for Bachelor of Science

**PO 1** : **Domain Knowledge -** Acquire and apply knowledge of science in relevant areas.

**PO 2** : **Problem Analysis –** Recognize real-world problems and user's requirements to propose solutions for the same using basic principles of science.

**PO 3** : **Design and Development of Solutions –** Developing solutions and inferences for complex problems using critical and analytical thinking.

**PO 4** : **Investigation & Research** – Ability to formulate hypothesis, augment research questions and identify & refer relevant sources for examining or inspecting technical issues as per their level of understanding and knowledge.

**PO 5** : **Use of Modern Techniques/Tools** – Use digital resources, various software/platforms and appropriate techniques to interpret concepts of science.

**PO 6** : **Impact of Science on Society** – To prepare competent human resource and to develop scientific attitude at local and global levels for social benefit.

**PO 7** : **Environment and Sustainability** – Apply the knowledge gained for conserving environment and to handle environmental issues with sustainable solutions.

**PO 8** : **Moral and Ethical Values** – Imbibe moral values and professional ethics to maintain the integrality in a professional scenario while being aware of the cultural diversities.

**PO 9** : **Individual and Team Work with Time Management** – Work productively in a team or as an individual while exhibiting time management skills.

**PO 10** : **Communication** – Develop the caliber to convey various concepts of science effectively.

**PO 11** : **Project Management and Finance** – Set up enterprises/companies and build entrepreneurship, project management and finance planning skills.

**PO 12** : **Life-long Learning** – Engage in the art of self-directed learning.

# List of BoS Members

| Sl. No. | Category | Name & Designation | Address for Communication | e-Mail & Mobile No. |
|---|---|---|---|---|
| 1 | Chairperson | Dr. Sumathi M P<br><br>Assistant Professor & HoD | Department of Mathematics<br><br>SBRR Mahajana First Grade College (A), Jayalakshmipuram, Mysuru - 12 | sumathimp.fgc@mahajana.edu.in<br><br>9880810618 |
| 2 | Member | Sri. Niranjan L<br><br>Assistant Professor | Department of Mathematics<br><br>SBRR Mahajana First Grade College (A), Jayalakshmipuram, Mysuru - 12 | niranjankavi.np@gmail.com<br><br>9108257072 |
| 3 | Two Experts from Other University | Dr Sudha T G<br><br>Associate Professor | Department of Mathematics<br><br>Nrupathunga University (Govt. Science CollegeAutonomous) Nrupathunga Road, Bengaluru-560001 | tgsudha65@gmail.com<br><br>9003310571 |
| 4 | | Dr. Jagadeesh R<br><br>Assistant Professor | Department of Mathematics<br><br>Government First Grade college Ramanagar | jagadeeshr1978@gmail.com<br><br>9448006546 |
| 5 | Nominee by the Vice Chancellor | Dr. R Rangarajan<br><br>Professor | DoS in Mathematics<br><br>Manasagangotri, University of Mysore, Mysuru – 570006 | ranga@maths.uni-mysore.ac.in<br><br>9611109079 |
| 6 | Alumnus | Harshavardhana C N<br><br>Assistant Professor | Department of Mathematics<br><br>Govt First Grade college for Women, Holenarasipura | cnhmaths@gmail.com<br><br>8971876885 |

# Course Structure (NEP 2020)

## Discipline Specific Courses (DSC) and Skill Enhancement Course (SEC)

## III Year

| Course Type, Code and Name | | Hours/ Week | | Credits | Maximum Marks | | | Exam Duration | Total Marks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | IA | | Exam | | |
| | | L | T/P | L:T:P | C1 | C2 | C3 | | |
| **MATHEMATICS – V Semester** | | | | | | | | | |
| **DSC(5)** | Real Analysis-II and Complex Analysis **232539** | 4 | 0 | **4:0:2** (6credits) | 20 | 20 | 60 | **2 ½ Hours** | **150** |
| **DSC(5)-Lab** | Theory based Practical's on Real Analysis-II and Complex Analysis **232539** | 0 | 4 | | 10 | 15 | 25 | 3 Hours | |
| **DSC(6)** | Advanced algebra and Discrete Mathematics **232540** | 4 | 0 | **4:0:2** (6credits) | 20 | 20 | 60 | **2 ½ Hours** | **150** |
| **DSC(6)-Lab** | Theory based Practical's on Advanced algebra and Discrete Mathematics **232540** | 0 | 4 | | 10 | 15 | 25 | 3 Hours | |
| **SEC(1) Theory & Practical** | Programming with Python **23EMPMAT01** | 2 | 0 | **2:0:1** | 10 | 10 | 30 | **1 ½ Hours** | **100** |
| | | 0 | 2 | | 10 | 15 | 25 | 3 Hours | |

| MATHEMATICS – VI Semester | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **DSC(7)** | Linear Algebra **232639** | 4 | 0 | | | 20 | 20 | 60 | **2 ½ Hours** | |
| **DSC(7)-Lab** | Theory based Practical's on Linear Algebra **232639** | 0 | 4 | **4:0:2** (6credits) | 10 | 15 | 25 | 3 Hours | **150** |
| **DSC(8)** | Numerical Analysis **232640** | 4 | 0 | | 20 | 20 | 60 | **2 ½ Hours** | |
| **DSC(8)-Lab** | Theory based Practical's on Numerical Analysis **232640** | 0 | 4 | **4:0:2** (6credits) | 10 | 15 | 25 | 3 Hours | **150** |
| **SEC(2)** | Internship (Industries /Institutions /project) **23INTMAT01** | 0 | 4 | **0:0:2** | 10 | 15 | 25 | 3 Hours | **50** |

**DSC(5) Mathematics Syllabus for B.Sc. Mathematics**

**(Basic and Honors)**

**Semester: V**

| Course Code: 232539 | Course Title: DSC(5) : Real Analysis-II and Complex Analysis DSC(5) : Lab :Theory based Practical's on Real Analysis-II and Complex Analysis |
|---|---|
| **Course Credits:** 06 (4:0:2) | **Hours of Teaching/Week:** 04 (Theory) + 04 (Practical) |
| **Total Contact Hours:** 60 Hours (Theory) 60 Hours (Practical) | **Formative Assessment Marks:** 40 (Theory) 25 (Practical) |
| **Exam Duration:** 2 ½ Hours (Theory) 3 Hours (Practical) | **Semester End Examination Marks:** 60 (Theory) 25 (Practical) |

**Course Outcomes (COs):**

**CO1 :** Computing upper and lower Riemann sums and Criterion for integrability of functions and Mean Value Theorems.

**CO2 :** Evaluate the properties of analytic functions and harmonic functions.

**CO3 :** Identifying and evaluating integral theorems and its applications.

**CO4 :** Analyze and apply various methods of transformations.

**Course Content**

| Content | Hours |
|---|---|
| **UNIT – 1** | |
| **Riemann Integration :** Definition & examples for partition of an interval, Refinement and Common refinement of a partition. Lower and Upper Riemann (Darboux) sums - definition, properties & problems. Riemann Integral-Lower and Upper integrals (definition & problems), Darboux's theorem and Criterion for Integrability, Integrability of sum, difference, product, quotient and modulus of integrable functions. **Integral as a limit of sum (Riemann sum)** -Problems. **Some integrable functions** -Integrability of continuous functions, monotonic functions, bounded function with finite number of discontinuity. Fundamental theorem of Calculus- related problems, change of variables, integration by parts, first and second mean value theorems of integral calculus. | **15** |
| **UNIT – 2** | |
| **Complex number** - Cartesian and Polar form (Definitions, properties and problems) – Geometrical representation of complex plane (z-plane); Euler's formula, $e^{i\theta} = cos\theta + i\, sin\theta$. Separate the real and imaginary parts of some standard functions ($,e^z, sinz, cosz, logz\ etc$). Dot and vector product of $z_1$ and $z_2$. Equation of a straight line and circle in a complex form and Represent graphically (locus of a point). **Functions of a complex variable** - Limit of a function, Continuity and differentiability, Analytic functions, Singular points (definitions and related problems); Cauchy-Riemann equations - Cartesian and Polar forms – Proof & Problems, Necessary and sufficient condition for a function to be analytic (Statement only); Harmonic functions-Definition and problems; Properties of analytic functions - Various properties with proofs; Construction of analytic functions: i) Milne Thomson Method (Only problems) ii) Using the concept of harmonic function. | **15** |
| **UNIT – 3** | |
| **Complex integration**: Complex integration - Definition, Line integral, properties and problems. Cauchy's Integral theorem – proof using Green's theorem - direct consequences. Cauchy's Integral formula with proof- Cauchy's generalized formula for the derivatives with proof and applications for evaluation of simple line integrals. Cauchy's inequality – Proof, Livouville's theorem – Proof. | **15** |

| **UNIT – 4** | |
|---|---|
| **Transformations** : Definition,  Jacobian of a transformation –Identity transformation – Reflection – Translation – Rotation  and Magnification - Inversion - Inverse points - Linear transformation – Definitions - Bilinear transformations - Cross-ratio of four points – Cross –ratio preserving property – Preservation of the family of straight lines and circles – Conformal mappings – Discussion of the transformations $w = z^2, w = sinz , w = cosz, w = e^z, w = \frac{z+\bar{z}}{2}$ etc | **15** |

**Books for References:**

1. Ajit Kumr and S. Kumaresan - A Basic Course in Real Analysis, Taylor and Francis Group.

2. Bruce P. Palka , Introduction to the Theory, of Function of a Complex Variable, Springer

3. L.V.Ahlfors, Complex Analysis, 3$^{rd}$ Edition, Mc Graw Hill Education

4. Richard R Goldberg, Methods of Real Analysis, Oxford and IBH Publishing

5. R.V.Churchil & J.W.Brown, Complex Variables and Applications, 5$^{th}$ ed, Mc Graw Hill Companies.

6. Shanthinarayan, Theory of Functions of a Complex Variable, S.Chand Publishers.

7.  Serge Lang, Complex Analysis, Springer

8. S.C.Malik and Savita Arora, Mathematical Analysis, 5$^{th}$ h ed. New Delhi, India: New Age international(P) Ltd., 2017.

9. S.C.Malik, Principles of Real Analysis, New Age International(India) Pvt. Ltd., 4$^{th}$ Edition, 2018.

10. S.Ponnuswamy, Foundations of Complex Analysis, 2$^{nd}$ Edition, Alpha Science International Limited.

**Mathematics Weblinks:**

1. http://scienceworld.wolfram.com/biography/topics/Mathematicians.html
2. http://teachers.sduhsd.k12.ca.us/abrown/index2.html
3. http://www.maths.tcd.ie/pub/HistMath/People/RBallHist.html
4. http://www.geometry.net/math.html
5. http://www-history.mcs.st-andrews.ac.uk/history/Indexes/Full_Alph.html
6. http://mathforum.org
7. http://www.cut-the-knot.org
8. http://nrich.maths.org
9. http://archives.math.utk.edu/
10. http://www-groups.dcs.st-and.ac.uk/~history/
11. http://www.maa.org/
12. http://e-math.ams.org/
13. Website on Books in Mathematics

**Practical/Lab Work to be performed in Mathematics Lab (FOSS) Suggested Software's**:

Maxima/Scilab /Python/R.

Introduction to the software and commands related to the topic.

1. Program to check whether a given set of real numbers attains supremum or infimum.

2. Program to find upper and lower Riemann sums with respect to given partition.

3. Program to test Riemann Integrability.

4. Program to evaluate Riemann integral as a limit of sum.

5. Program on verification of Cauchy – Riemann equations(Cartesian form) or test for analyticity.

6. Program on verification of Cauchy – Riemann equations(Polar form) or test for analyticity.

7. Program to check whether a function is harmonic or not.

8. Program to construct analytic functions (through Milne – Thomson method).

9. Program to find cross ration of points and related aspects .

10. Program to find fixed points of bilinear transformations.

11. Program to verify De-Moivre's theorem.

**Note:** Student has to execute a minimum of 8 programs in each part to complete the Lab course.

| Course Articulation Matrix - 232539 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
| CO 1 | 3 | 3 | - | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 3 |
| CO 2 | 3 | 2 | 1 | - | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 3 |
| CO 3 | 3 | 3 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 3 |
| CO 4 | 3 | 3 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 3 |
| Weighted Average | 3 | 2.75 | 1 | 1 | 1 | 1.75 | 1 | 1 | 2 | 1 | 1 | 3 |

## DSC(6) Mathematics Syllabus for B.Sc. Mathematics

## (Basic and Honors)

**Semester V**

| | |
|---|---|
| **Course Code:** 232540 | **Course Title:**<br>DSC(6) : Advanced algebra and Discrete Mathematics<br>DSC(6) Lab : Theory based Practical's on Advanced algebra and Discrete Mathematics |
| **Course Credits:** 06 (4:0:2) | **Hours of Teaching/Week:**<br>04 (Theory) + 04 (Practical) |
| **Total Contact Hours:**<br>60 Hours (Theory)<br>60 Hours (Practical) | **Formative Assessment Marks:**<br>40 (Theory)<br>25 (Practical) |
| **Exam Duration:**<br>2 ½ Hours (Theory)<br>3 Hours (Practical) | **Semester End Examination Marks:**<br>60 (Theory)<br>25 (Practical) |

**Course Outcomes (COs):**

**CO 1:** Identify and analyze different algebraic structure such as rings , fields integral domain and so on.

**CO 2:** Explore the relation between polynomial rings and homomorphism. Compute GCD of polynomials, irreducibility of polynomials and so on.

**CO 3 :** Analyze vectors and scalars with the operators Gradient, Divergence and Curl.

**CO 4 :** Compute various types of graph with its properties.

**Course Content**

| Content | Hours |
|---|---|
| **UNIT – 1** | |
| **Rings and Fields:** Rings - definition and properties of rings - integral domains – Fields –theorems and problems, Sub rings - Criterion for sub rings- theorems and problems on sub rings, Ideals - Algebra of Ideals - theorems – Principal ideals – examples and standard properties following the definition, Divisibility in an integral domain - theorems and problems, Units and Associates - theorems and problems. Quotient rings - examples and theorems -The field of quotients – theorems and problems. | **15** |
| **UNIT – 2** | |
| **Polynomial rings and Homomorphism:** Homomorphism - Definitions and example, Kernel of a homomorphism - examples and related theorems. Isomorphism of a ring - examples and related theorems. Automorphism - problems. Fundamental Theorem of Homomorphism of Rings, Prime and Maximal ideals in a commutative ring - definition and examples. Polynomials over rings and fields (some standard properties). Division algorithm (proof and problems), Greatest common divisor - Euclidian algorithm (problems); reducible and irreducible polynomials over fields (definition and problems): Eisenstein's criteria for reducibility - problems; Rational roots of a polynomial - Test – problems. | **15** |
| **UNIT – 3** | |
| **Vector algebra:** Vectors – Scalars – Vector Field –Scalar field (definition and problems); - Vector differentiation - The vector differential operator Gradient - Divergence - Curl – Standard derivations - vector integration , Green's theorem in plane (definition and problems). | **15** |
| **UNIT – 4** | |
| **Basics of Graph theory:** Basic definitions, Isomorphism, Subgraphs, Operations on Graphs, Walks, Paths, circuits. Connected and disconnected graphs, Euler graphs, Hamiltonian graph ,some applications. Trees basic properties, Distance, Eccentricity, center, Spanning trees, Minimal Spanning tree. | **15** |
| | |

**Books for References:**

1. C.L. Liu (200),Elements of Discrete Mathematics, Tata McGraw-Hill.

2. Frank Harary(1969), Graph Theory, Addison – Wesley Pub.Company.

3. Hari Kishan and Shiv Raj Pundir (2015), Discrete Mathematics, Pragathi Prakashan, 10th ed.

4. I N Herstein (1990), Topics in Algebra, 2nd Edition, Wiley Eastern Ltd., NewDelhi.

5. Joseph A, Gallian (2021), Contemporary Abstract Algebra, 10th ed., Taylor and Francis Group.

6. Kenneth H. Rossen, Discrete Mathematics and its Applications, Mc-Graw Hill, 8th ed.,2021.

7. Michael Artin (2015), Algebra, 2nd ed., Pearson.

8. Murray R Spiegel – Theory and problems of vector calculus.

9. N. Deo (1990), Graph Theory: Prentice, Hall of India Pvt. Ltd. NewDelhi.

10. Shanthinarayan and J N Kapur – A text book of Vector calculus.

11. Vijay K Khanna and S K Bhambri (1998), A Course in Abstract Algebra, Vikas Publications.

12. W D Wallis (2017), A Beginner's Guide to Discrete Mathematics for Computer Scicnce, Wiley Publishers.

**Practical/Lab Work to be performed in Mathematics Lab (FOSS) Suggested Software's**:

Maxima/Scilab /Python/R.
Introduction to the software and commands related to the topic.

1. (i) To Verify the given Ring is Commutative or not.

    (ii) To check the Presence of the Unity element in the Ring.

2. (i) To Verify the given Ring is a Field / Integral Domain or not.

    (ii)     To Verify given set is a Subring of a Ring or not.

3. To Verify given function is a homomorphism or not.

4. (i) To verify the given polynomial is reducible or irreducible.

    (ii)     To find the zeros of the given polynomial.

5. To find the G.C.D of any two polynomials.

6. (i) To find the Units of the given ring.

    (ii)     To verify the given elements are Associates or not.

7. Maxima program to obtain some standard graphs.

8. Create a graph of your choice and Obtain random graph..

9.  Obtain Induced subgraph and minimum spanning tree.

10. To check the given graphs are isomorphic or not.

11. Obtain degree of each vertex, distance between vertices and eccentricity of vertices and radius and diameter of the graph.

12. Operation on graphs: Product of graphs.

13. Maximum/Minimum degree vertices of the graph G and a vertex of maximum/minimum degree.

## Course Articulation Matrix - 232540

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|-------|------|------|------|------|------|------|------|------|------|-------|-------|-------|
| CO 1 | 3 | 3 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 |
| CO 2 | 3 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 |
| CO 3 | 3 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 |
| CO 4 | 3 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 |
| Weighted Average | 3 | 2.5 | 1 | 1.75 | 1 | 1.75 | 1 | 1 | 2 | 1 | 1 | 2 |

## SEC(1) - Mathematics Syllabus for B.Sc. Mathematics

## (Basic and Honors)

**Semester V**

| Course Code: 23EMPMAT01 | Course Title: SEC(1): Programming with Python (Theory and Practical) |
|---|---|
| Course Credits: 03 | Hours of Teaching/Week: 04 (Theory) |
| Total Contact Hours: 30 Hours (Theory) 30 Hours (Practical) | Formative Assessment Marks: 20 (Theory) 25 (Practical) |
| Exam Duration: 1 ½ Hours (Theory) 3 Hours (Practical) | Semester End Examination Marks: 30 (Theory) 25 (Practical) |

**Course Outcomes (COs):**

**CO 1:** Examine and Develop solution for polynomial equations, linear equation and problems based on Ages.

**CO 2:** Evaluate the problems on Area, Volume and Surface area for some conic sections.

**CO 3:** Analysis of Direction test, Relation test and seating puzzles using various techniques.

| Course Content | |
|---|---|
| **Content** | Hours |
| **UNIT – 1** | |
| **Introduction, Basics and Program flow:** Python character set, Tokens, variables and assignments, print statement, comments, Python data structure and data types, string operation in Python, simple input and output, range function, iteration/ looping statements, string and list manipulation, tuples, dictionaries, sorting techniques. | **15** |
| **UNIT – 2** | |
| **Functions, libraries and File handling:** Understanding and creating your own functions, Function parameters, flow of execution in a function call, passing parameters, returning values from functions, scope of a function, importing modules in a python, using standard library functions and modules, creating a python library, data files, operating and closing files, working with text files, standard, input, output and error streams, working with binary and CSV files. | **15** |
| **UNIT – 3** | |
| **Practicasl Implementation of Python.**<br><br>1. Write python programs using the concept of control structures.<br><br>2. Implement python programs using functions and strings.<br><br>3. Implement methods to create and manipulate lists, tuples and dictionaries.<br><br>4. Apply the concept of file handling and reg Ex using packages.<br><br>5. Illustrate the working of scraping websites with CSV. | **30** |

### Reference Books:

1. Automate the Boring Stuff with Python - AISweigart,William Pollock,2015.

2. Basic Python programming for Beginners - Varada rajkumar,  Marapalli Krishna, Jayprakash, Blue rose Publishers, 2022.

3. Learning Python - MarkLutz, O' Reilly Media, Paperback, $2^{nd}$ edition, 2020.

4. Programming and problem solving through Python- Sathish jain and Shashisingh, BPB Publications, 2020.

5. Python Cook Book – David Beazely and Brain K. Jones, 2022.

6. Python – John Shovic and Alan Simpson, Paperback, 2020.

## Course Articulation Matrix - 23EMPMAT01

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 2 | 3 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| CO 2 | 2 | 3 | 1 | 2 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 3 |
| CO 3 | 2 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 |
| Weighted Average | 2 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2.33 |

## DSC(7) Mathematics Syllabus for B.Sc. Mathematics

## (Basic and Honors)

**Semester: VI**

| Course Code: 232639 | Course Title: DSC(7) : Linear Algebra DSC(7) Lab :Theory based Practical's on Linear Algebra |
|---|---|
| **Course Credits:** 06 (4:0:2) | **Hours of Teaching/Week:** 04 (Theory) + 04 (Practical) |
| **Total Contact Hours:** 60 Hours (Theory) 60 Hours (Practical) | **Formative Assessment Marks:** 40 (Theory) 25 (Practical) |
| **Exam Duration:** 2 ½ Hours (Theory) 3 Hours (Practical) | **Semester End Examination Marks:** 60 (Theory) 25 (Practical) |

**Course Outcomes (COs):**

**CO1 :** Analyzing and applying the concepts of Vector spaces , subspaces , basis, dimension and their properties.

**CO2 :** Applying the concept of Eigen values and Eigen vectors, minimal polynomials, linear transformations etc.

**CO3 :** Determine properties of inner product spaces and orthogonality in inner product space and vector space.

**CO4 :** Realize importance of adjoint of a linear transformation and its canonical form.

**Course Content**

| Content | Hours |
|---|---|
| **UNIT – 1** | |
| **Vector spaces:** Vector spaces - Definition, examples and properties; Subspaces - Examples, criterion for a subspace and some properties; Linear Combination – Linear span, Linear dependence and Linear independence. Basic properties of linear dependence and independence, techniques of determining linear dependence and independence in various vector spaces and related problems; Basis and dimension – Co-ordinates, ordered basis, some basic properties of basis and dimension and subspace spanned by given set of vectors; Quotient space- theorems and examples. | **15** |
| **UNIT – 2** | |
| **Linear Transformations:** Linear transformation - Definition, examples, equivalent criteria, some basic properties and matrix representation, change of basis and effect on associated matrix, similar matrices; Rank-Nullity theorem –Null space , Range space, proof of rank nullity theorem and related problems. | **15** |
| **UNIT – 3** | |
| **Isomorphism, Eigen values and Diagonalization:** Homomorphism, Isomorphism and automorphism - Examples, order of automorphism and Fundamental theorem of homomorphism; Eigen values and Eigen vectors -Computation of Eigen values, algebraic multiplicity, some basic properties of eigen values, determination of eigen vectors and eigen space and geometric multiplicity. Diagonalizability of linear transfomation- Meaning, condition based on algebraic and geometric multiplicity (mentioning) and related problems (Only verification of diagonalizability). | **15** |
| **UNIT – 4** | |
| **Invertible Transformation and Inner Product spaces:** Invertible trasnsformaion - some basic properties of invertible , singular and non singular transformations and conditions of existence of inverses; Minimal polynomial of a transformation, Relation between characteristic and minimal polynomials and related problems.<br><br>Inner product and normed linear spaces - Definitions, examples, Cauchy – Schwartz inequality (with proof) and related problems; Gram - Schmidt orthogonalization - Orthogonal vectors, orthogonal basis, Gram - Schmidt orthogonalization process: both proof and problems. | **15** |
| | |

**Books for References:**

1. F. M. Stewart, Introduction to linear Algebra, Dover Publications.

2. Gilbert. Strang (2015), Linear Algebra and its applications, (2$^{nd}$ Edition), Elsevier.

3. I. N. Herstein, Topics in Algebra, 2$^{nd}$ Edition, Wiley.

4. Kenneth Hoffman & Ray Kunze (2015), Linear Algebra, ( 2$^{nd}$ Edition) , Prentice Hall India Leaning Private Limited.

5. Serge Lang(2005), Introduction to Linear Algebra (2$^{nd}$ Edition), Springer lndia.

6. S. Kumaresan, Linear Algebra, Prentice Hall India Learning Private Limited.

7. Stephen H. Friedberg, Arnold J. Insel & Lawrence E.Spence (2003), Linear Algebra (4$^{th}$ Edition), Printice - Hall of India Pvt. Ltd.

8. T. K. Manicavasagam Pillai and K S Narayanan, Modern Algebra Volume2.

9. Vivek Sahai & Vikas Bist (2013), Linear Algebra (2$^{nd}$ Edition) Narosa Publishing.

**Mathematics Weblinks:**

1. http://scienceworld.wolfram.com/biography/topics/Mathematicians.html
2. http://teachers.sduhsd.k12.ca.us/abrown/index2.html
3. http://www.maths.tcd.ie/pub/HistMath/People/RBallHist.html
4. http://www.geometry.net/math.html
5. http://www-history.mcs.st-andrews.ac.uk/history/Indexes/Full_Alph.html
6. http://mathforum.org
7. http://www.cut-the-knot.org
8. http://nrich.maths.org
9. http://archives.math.utk.edu/
10. http://www-groups.dcs.st-and.ac.uk/~history/
11. http://www.maa.org/
12. http://e-math.ams.org/
13. Website on Books in Mathematics

**Practical/Lab Work to be performed in Mathematics Lab (FOSS) Suggested Software's**:

Maxima/Scilab /Python/R.

Introduction to the software and commands related to the topic.

1. Program on linear combination of vectors.

2. Program to verify linear dependence and independence.

3. Program to find basis and dimension of the subspaces.

4. Program to verify the function is linear transformation or not.

5. Program to find the matrix of linear transformation.

6. Program to find the Eigen values and Eigen vectors of a given linear transformation.

7. Program on Rank – nullity theorem.

8. Program to verify if the given linear transformation is singular / non-singular.

9. Program to find the minimal polynomial of given transformation.

10. Program to find the algebraic multiplicity of the Eigen values of the given linear transformation.

11. Program on diagonalization.

**Note:** Student has to execute a minimum of 8 programs in each part to complete the Lab course.

## Course Articulation Matrix – 232639

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| CO 2 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| CO 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| CO 4 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| Weighted Average | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |

## DSC(8) Mathematics Syllabus for B.Sc. Mathematics

## (Basic and Honors)

**Semester: VI**

| | |
|---|---|
| **Course Code: 232640** | **Course Title:** <br> DSC(8) : Numerical Analysis <br> DSC(8) Lab :Theory based Practical's on Numerical Analysis |
| **Course Credits:** 06 (4:0:2) | **Hours of Teaching/Week:** <br> 04 (Theory) + 04 (Practical) |
| **Total Contact Hours:** <br> 60 Hours (Theory) <br> 60 Hours (Practical) | **Formative Assessment Marks:** <br> 40 (Theory) <br> 25 (Practical) |
| **Exam Duration:** <br> 2 ½ Hours (Theory) <br> 3 Hours (Practical) | **Semester End Examination Marks:** <br> 60 (Theory) <br> 25 (Practical) |

**Course Outcomes (COs):**

**CO1:** Evaluate various operators arising in numerical analysis such as difference operators, shift operators and so on.

**CO2:** Various techniques of numerical analysis such as in finding roots , integrals and derivatives.

**CO3:** Apply the rules of calculus and other areas of mathematics in justifying the techniques of numerical analysis.

**CO4:** Applicability of techniques of numerical analysis in solving real life problems modified to improve the accuracy.

| Course Content | |
|---|---|
| **Content** | Hours |
| **UNIT – 1** | |
| Algebraic and Transcendental Equations : Errors – Significant digits, absolute, relative, percentage errors, rounding off and truncation errors (meanings and related problems), general error formula (derivation of formula and problems based on it), error in series approximation: Taylor series approximations (problems only), Solutions to algebraic and transcendental equations – Bisection method, Regular - Falsi method, iterative method Newton - Raphson method and secant method ( Plain discussion of the rational behind techniques and problems on their applications). | 15 |
| **UNIT – 2** | |
| **System of Linear Algebraic Equations :** Direct Methods - Gauss elimination method, Gauss - Jordan elimination method and Tringularization method; Iterative methods – Jacobi method, Gauss – Jacobi method, Gauss- Seidal method, Successive – Over Relaxation (SOR) method. | 15 |
| **UNIT – 3** | |
| **Polynomial Interpolations** : Finite differences , Forward, backward and central differences and shift operators; definitions , properties and problems; Polynomial interpolation – Newton – Gregory forward and backward interpolation formulas, Gauss's Forward and backward interpolation formulas, Lagrange interpolation polynomial , Newton's divided differences and Newton's general interpolation formula (Discussion on setting up the polynomials, differences between them and problems on their applications). | 15 |
| **UNIT – 4** | |
| **Numerical Differentiation and Integration :** Formula for derivatives ( till second order) based on Newton – Gregory forward and backward interpolations (Derivations and problems based on them). Numerical Integration - General quadrature formula, Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 rule and Weddell's rule (derivations for only general quadrature formula, trapezoidal rule and Simpson's 1/3$^{rd}$ rule and problems on the applications of all formulas). | 15 |
| | |

**Books for References:**

1. E. Isaacson and H.B.Keller, Analysis of Numerical methods, Dover Publications.

2. S.S. Sastry, Introductory methods of Numerical Analysis, 5$^{th}$ Edition, PHI Learning Private Limited.

3. E Kreyszig, Advanced Engineering Mathematics, Wiley India Pvt. Limited.

4. B.S. Grewal, Numerical Methods for Scientists and Engineers, Khanna Publishers.

5. M.K. Jain, S.R.K. Iyengar and R.K.Jain, Numerical Methods for Scientific and Engineering computation, 4$^{th}$ Edition, New Age International

6. H.C.Saxena, Finite Difference and Numerical Analysis, S.Chand Publishers

7. B.D. Gupta, Numerical Analysis, Konark Publishers Pvt. Ltd.

**Practical/Lab Work to be performed in Mathematics Lab (FOSS) Suggested Software's**:

Maxima/Scilab /Python/R.

Introduction to the software and commands related to the topic.

1. Program to find root of an equation using Bisection and Regular – Falsi methods.

2. Program to find root of an equation using Newton – Raphson and Secant methods.

3. Program to solve system of algebraic equations using Gauss – Elimination method.

4. Program to solve system of algebraic equation using Gauss – Jordan method.

5. Program to solve system of algebraic equation using Gauss – Jacobi method.

6. Program to solve system of algebraic equation using Gauss – Seidel method.

7. Program to solve system of algebraic equation using SOR method.

8. Program to evaluate integral using Simpson's 1/3 and 3/8 rules.

9. Program to evaluate integral using Trapezoidal and Weddle rules.

10. Program to find the sums of powers of successive natural numbers using Newton – Gregory technique.

11. Program to find differentiation at specified point using Newton – Gregory interpolation method.

12. Program to find the missing values of table using Lagrange method.

# Course Articulation Matrix – 232640

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 2 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 |
| CO 2 | 2 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 |
| CO 3 | 3 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 |
| CO 4 | 3 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 |
| Weighted Average | 2.5 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 |

# SEC(2) - Internship

**Semester: VI**

| | |
|---|---|
| **Course Code: 23INTMAT01** | **Course Title:** SEC(2) - Internship |
| **Course Credits:** 02 | **Hours of Teaching/Week:** |
| **Total Contact Hours:** 90 Hours Internship | **Formative Assessment Marks:** 25 Marks |
| **Exam Duration:** 3 Hours (Presentation) | **Semester End Examination Marks:** 25 Marks |

**Note: This course will run as per the guidelines defined by the Bos Mathematics, University of Mysore, Mysuru and the same is approved by BoS, Mathematics SBRR Mahajana First Grade College, Mysuru.**

**Course Outcomes (COs):**

**CO1:** Integrate Theory and Practice of the area selected for Internship to Explore Career Opportunities prior to Graduation.

**CO2:** Develop Communication, Interpersonal, Work Habits, Attitude and other Critical Skills required for a job.

## Course Articulation Matrix – 23INTMAT01

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 3 | 3 | 3 | 3 | 3 | - | - | 1 | 3 | 3 | 2 | 2 |
| **CO 2** | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | 2 | 2 |
| **Weighted Average** | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | 2 | 2 |

# Continuous Formative Evaluation/Internal Assessment (DSC)

Total marks for each course shall be based on continuous assessments and semester end examinations. The pattern is 40:60 for IA and Semester End Theory Examinations respectively and 50:50 for IA and Semester End Practical Examinations respectively.

|  | THEORY | PRACTICAL |
|---|---|---|
| **Total Marks** | 100 Marks | 50 Marks |
| **Continuous Assessment – 1 (C1)** | 20 Marks | 10 Marks |
| **Continuous Assessment – 2 (C2)** | 20 Marks | 15 Marks |
| **Semester End Examination (C3)** | 60 Marks | 25 Marks |

**Evaluation Process of IA Marks shall be as follows:**

a) The first component (C1) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, project work etc. This assessment and score process should be completed after completing 50% of syllabus of the course and within 45 working days of semester program.

b) The second component (C2) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, internship/industrial practicum/project work, quiz etc. This assessment and score process should be based on completion of remaining 50% of syllabus of the course of the semester.

c) During the 17th – 19th week of the semester, a semester end examination shall be conducted by the college for each course. This forms the third and final component of assessment (C3) and the maximum marks for the final component will be 60%.

d) In case of a student who has failed to attend the C1 or C2 on a scheduled date, it shall be deemed that the student has dropped the test. However, in case of a student who could not take the test on scheduled date due to genuine reasons, such a candidate may appeal to the Principal. The Principal in consultation with the concerned teacher shall decide about the genuineness of the case and decide to conduct special test to such candidate on the date fixed by the concerned teacher, but before commencement of the concerned semester end examinations.

e) For assignments, tests, case study analysis etc., of C1 and C2, the students should bring their own answer scripts (A4 size), graph sheets etc., required for such tests/assignments and these be sealed/signed by the concerned department at the time of conducting tests/assignment/project work etc.

f) The outline for continuous assessment activities for Component-I (C1) and Component-II (C2) of a course shall be as under:

| | C1 Marks | C2 Marks | Total Marks |
|---|---|---|---|
| **Session Test** | 20 | - | 20 |
| **Seminar/Presentation/Assignment/Activity/Case Study/Field Work/Project Work/Quiz etc.** | - | 20 | 20 |
| **Total** | 20 | 20 | 40 |

- For practical course of full credits, seminar shall not be compulsory. In its place, marks shall be awarded for Practical Record Maintenance(the marks is 25 (10 + 15) and 25. Evaluated for a total of 50 Marks).

- Conduct of Test, Seminar, Case study/Assignment etc., can be either in C1 or in C2 component as decided by the college and concerned department/teacher.

- The teachers concerned shall conduct test/seminar/case study etc., The students should be informed about the modalities well in advance. The evaluated courses assignments during component I (C1) and component II (C2) of assessment are immediately provided to the candidates after obtaining acknowledgement in the register by the concerned teacher(s) and maintained by the Department. Before commencement of the semester end examination, the evaluated test, assignment etc., of C1 and C2 shall be obtained back to maintain them till the announcement of the results of the examination of the concerned semester.

g) The marks of the internal assessment shall be published on the notice board of the department/college for information of the students.

h) The internal assessment marks shall be communicated to the CoE at least 10 days before the commencement of the semester end examinations and the CoE shall have access to the records of such periodical assessments.

i) There shall be no minimum in respect of internal assessment marks.

j) Internal assessment marks may be recorded separately. A candidate who has failed or rejected the result shall retain the internal assessment marks.

# Scheme of Valuation for Practical Examinations

C1 and C2 are internal tests to be conducted during 8th and 16th weeks respectively of the semester. C3 is the semester-end examination conducted for 3 hours. The student will be evaluated on the basis of manual work, programme and its execution. The student has to compulsorily submit the practical record for evaluation during C2. For C3, the record has to be certified by the Head of the Department.

• The student is evaluated for 25 marks in C1 and C2 as per the following scheme:

**C1 Component:** 10 Marks : This will be based on a practical test. This should

be completed by the 8th week of the semester.

**C2 Component** : 15 Marks : This will be based on practical test / assignment for 10 marks and 5 marks for practical record. This should be completed by the 16th week of the semester.

• The student is evaluated for 25 marks in **C3** as per the following scheme:

| Assessment Criteria | Marks |
|---|---|
| For each Experiment | |
| Manual work – 04 Marks<br>Program writing – 04 Marks<br>Execution – 02 Marks | $10 \times 2 = 20$ |
| Viva | 05 |
| **Total** | **25** |

# Continuous Formative Evaluation/Internal Assessment (SEC)

Total marks for each course shall be based on continuous assessments and semester end examinations. The pattern is 20:30 for IA and Semester End Theory Examinations respectively and 25:25 for IA and Semester End Practical Examinations respectively.

|  | THEORY | PRACTICAL |
|---|---|---|
| **Total Marks** | 50 Marks | 50 Marks |
| **Continuous Assessment – 1 (C1)** | 10 Marks | 10 Marks |
| **Continuous Assessment – 2 (C2)** | 10Marks | 15 Marks |
| **Semester End Examination (C3)** | 30 Marks | 25 Marks |

**Evaluation Process of IA Marks shall be as follows:**

a) The first component (C1) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, project work etc. This assessment and score process should be completed after completing 50% of syllabus of the course and within 45 working days of semester program.

b) The second component (C2) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, internship/industrial practicum/project work, quiz etc. This assessment and score process should be based on completion of remaining 50% of syllabus of the course of the semester.

c) During the 17th – 19th week of the semester, a semester end examination shall be conducted by the college for each course. This forms the third and final component of assessment (C3) and the maximum marks for the final component will be 60%.

d) In case of a student who has failed to attend the C1 or C2 on a scheduled date, it shall be deemed that the student has dropped the test. However, in case of a student who could not take the test on scheduled date due to genuine reasons, such a candidate may appeal to the Principal. The Principal in consultation with the concerned teacher shall decide about the genuineness of the case and decide to conduct special test to such candidate on the date fixed by the concerned teacher, but before commencement of the concerned semester end examinations.

e) For assignments, tests, case study analysis etc., of C1 and C2, the students should bring their own answer scripts (A4 size), graph sheets etc., required for such tests/assignments and these be sealed/signed by the concerned department at the time of conducting tests/assignment/project work etc.

f) The outline for continuous assessment activities for Component-I (C1) and Component-II (C2) of a course shall be as under:

|  | C1 Marks | C2 Marks | Total Marks |
|---|---|---|---|
| **Session Test** | 10 | - | 10 |
| **Seminar/Presentation/Assignment/Activity/Case Study/Field Work/Project Work/Quiz etc.** | - | 10 | 10 |
| **Total** | 10 | 10 | 20 |

- For practical course of full credits, seminar shall not be compulsory. In its place, marks shall be awarded for Practical Record Maintenance(the marks is 25 (10 + 15) and 25. Evaluated for a total of 50 Marks).

- Conduct of Test, Seminar, Case study/Assignment etc., can be either in C1 or in C2 component as decided by the college and concerned department/teacher.

- The teachers concerned shall conduct test/seminar/case study etc., The students should be informed about the modalities well in advance. The evaluated courses assignments during component I (C1) and component II (C2) of assessment are immediately provided to the candidates after obtaining acknowledgement in the register by the concerned teacher(s) and maintained by the Department. Before commencement of the semester end examination, the evaluated test, assignment etc., of C1 and C2 shall be obtained back to maintain them till the announcement of the results of the examination of the concerned semester.

g) The marks of the internal assessment shall be published on the notice board of the department/college for information of the students.

h) The internal assessment marks shall be communicated to the CoE at least 10 days before the commencement of the semester end examinations and the CoE shall have access to the records of such periodical assessments.

i) There shall be no minimum in respect of internal assessment marks.

j) Internal assessment marks may be recorded separately. A candidate who has failed or rejected the result shall retain the internal assessment marks.

## Scheme of Valuation for Practical Examinations (SEC)

C1 and C2 are internal tests to be conducted during 8th and 16th weeks respectively of the semester. C3 is the semester-end examination conducted for 3 hours. The student will be evaluated on the basis of manual work, programme and its execution. The student has to compulsorily submit the practical record for evaluation during C2. For C3, the record has to be certified by the Head of the Department.

• The student is evaluated for 25 marks in C1 and C2 as per the following scheme:

**C1 Component:** 10 Marks : This will be based on a practical test. This should

be completed by the 8th week of the semester.

**C2 Component** : 15 Marks : This will be based on practical test / assignment for 10 marks and 5 marks for practical record. This should be completed by the 16th week of the semester.

• The student is evaluated for 25 marks in **C3** as per the following scheme:

| Assessment Criteria | Marks |
|---|---|
| For each Experiment | |
| Manual work – 04 Marks<br>Program writing – 04 Marks<br>Execution – 02 Marks | $10 \times 2 = 20$ |
| Viva | 05 |
| **Total** | **25** |

# Scheme of Valuation for Internship

C1 and C2 are internal assessments to be conducted during 8th and 16th weeks respectively of the semester. C3 is the semester-end examination conducted for 3 hours. The student will be evaluated on the basis of presentation skills and project development. The student has to compulsorily submit the project report for evaluation during C2. For C3, the report has to be certified by the Head of the Department and the Mentor/Supervisor.

• **The student is evaluated for 25 marks in C1 and C2 as per the following scheme:**

Project Progress Presentation (**C1**): 10 marks

Project Progress Presentation (**C2**): 10 marks + Report: 05 marks = 15 marks

• **The student is evaluated for 25 marks in C3 as per the following scheme:**

| Assessment Criteria | Marks |
|---|---|
| Project Presentation Skills | 05 |
| Project Development Skills | 10 |
| Viva Voce | 10 |
| **Total** | **25** |

## DSC Theory Question Paper Pattern

**Max. Marks:** 60 Marks                    **Exam Duration:** 2 ½ Hours

**Instructions: Paper Setting**
- The Question Paper is divided into 2 parts: Part - A and Part – B.
- **Part – A** : Should consist of **08 Questions** ( 2 Questions from each Unit).
        **6 Questions** to be answered.
- **Part – B** : Should consist of **4 Main** Questions (1 from Each Unit).
        **5 Sub Question** will be given, out of which **3 Questions** to be answered.

### Part A

**Answer any six questions. Each Question carries 2 Marks.          6×2 =12**

    I.      a.
            b.
            .
            .
            h

### Part B

**Answer any three questions. Each Question carries 4 Marks.  3×4 =12**

    II.     a.
            b.
            c.
            d.
            e.

**Answer any three questions. Each Question carries 4 Marks.   3×4 =12**

    III     a.
            b.
            c.
            d.
            e.

**Answer any three questions. Each Question carries 4 Marks.   3×4 =12**

    IV      a.
            b.
            c.
            d.
            e.

**Answer any three questions. Each Question carries 4 Marks.   3×4 =12**

    V       a.
            b.
            c.
            d.
            e.

# SEC Theory Question Paper Pattern

**Max. Marks:** 30 Marks                    **Exam Duration:** 1 ½  Hours

**Instructions: Paper Setting**
- The Question Paper Consist of **2 Main** Questions (1 from Each Unit).
  **5 Sub Question** will be given, out of which **3 Questions** to be answer

**Answer any three questions. Each Question carries 5 Marks.  3×5 =15**

    I.    a.
           b.
           c.
           d.
           e.

**Answer any three questions. Each Question carries 5 Marks.    3×5 =15**

    II    a.
           b.
           c.
           d.
           e.

B.Sc (Mathematics) NEP Syllabus 2023 - 2024

## Board of Studies

| Sl. No. | Name and address | Designation | Signature |
|---|---|---|---|
| 1 | Dr. Sumathi M P<br>HoD, Dept of Mathematics<br>SBRR Mahajana First Grade College,<br>Mysuru  Mob. 9880810618<br>sumathimp.fgc@mahajana.edu.in | Chairperson | Sumathi.MP |
| 2 | Prof. R Rangarajan<br>Professor , DOS in Mathematics<br>Manasagangothri, Mysuru<br>Mob. 9611109079<br>ranga@maths.uni-mysore.ac.in | Member | R.Rangarajan |
| 3 | Dr Sudha T G<br>Associate Professor, Dept of Mathematics<br>Nrupathunga University<br>(Govt. Science College Autonomous)<br>Nrupathunga Road,Bengaluru-560001<br>Mob. 9535056766<br>tgsudha65@gmail.com | Member | Sudha.T.g.<br>7/9/23 |
| 4 | Dr. Jagadeesh R<br>Assistant Professor, Dept of Mathematics<br>Government First Grade college<br>Ramanagar<br>Mob.9448268140<br>jagadeeshr1978@gmail.com | Member | Jagadeesh R<br>7/9/23 |
| 5 | Niranjan L<br>Assistant Professor<br>SBRR Mahajana First Grade<br>Mysuru, Mob: 9108257072<br>niranjankavi.np@gmail.com | Member | 7/9/23 |
| 6 | Harshavardhana C N<br>Assistant Professor<br>Govt First Grade college for Women,<br>Holenarasipura.<br>Mob. 8971876885<br>cnhmaths@gmail.com | Member | 07/09/23 |

Sumathi. M.A
Chairperson
BOS/BOE in Mathematics
SBRR Mahajana First Grade College
(Autonomous)
Jayalakshmipuram, Mysuru-

SBRR Mahajana First Grade College (Autonomous), Jayalakshmipuram , Mysuru

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# BOARD OF STUDIES (BoS)


# DEPARTMENT OF MICROBIOLOGY


**UG** ☑

**PG** ☐


# NEP Syllabi for V and VI Semester

# B.Sc. Microbiology

# 2023-24

# DEPARTMENT OF MICROBIOLOGY

*Motto*

*Impart benefit to the society*

*Vision*

*To provide innovative research expertise*

*Mission*

*To expand the knowledge of scientific field research*

# Program Outcomes (POs) for Bachelor of Science

**PO 1: Domain Knowledge -** Acquire and apply knowledge of science in relevant areas.

**PO 2: Problem Analysis -** Recognize real-world problems and user's requirements to propose solutions for the same using basic principles of science.

**PO 3: Design and Development of Solutions -**Developing solutions and inferences for complex problems using critical and analytical thinking.

**PO 4: Investigation & Research** - Ability to formulate hypothesis, augment research questions and identify & refer relevant sources for examining or inspecting technical issues as per their level of understanding and knowledge.

**PO5: Use of Modern Techniques/Tools** – Use digital resources, various software/platforms and appropriate techniques to interpret concepts of science.

**PO6: Impact of Science on Society** – To prepare competent human resource and to develop scientific attitude at local and global levels for social benefit.

**PO7: Environment and Sustainability** – Apply the knowledge gained for conserving environment and to handle environmental issues with sustainable solutions.

**PO8: Moral and Ethical Values** – Imbibe moral values and professional ethics to maintain the integrality in a professional scenario while being aware of the cultural diversities.

**PO9: Individual and Team Work with Time Management** – Work productively in a team or as an individual while exhibiting time management skills.

**PO 10: Communication** – Develop the caliber to convey various concepts of science effectively.

**PO 11: Project Management and Finance** – Set up enterprises/companies and build entrepreneurship, project management and finance planning skills.

**PO 12: Life-long Learning** – Engage in the art of self-directed learning.

# List of BoS Members

| Sl No | Category | Name and Designation | Address for Communication | e-Mail & Mobile No. |
|---|---|---|---|---|
| 1. | Chairperson | Ms. Spandana N<br><br>Assistant Professor & HoD | Department of Microbiology, SBRR Mahajana First Grade College, Autonomous Jaylakshmipuram, Mysuru-12 | spandanan.fgc@mahajana.edu.in<br>9449680239 |
| 2. | Nominee by the Vice Chancellor | Dr. Sreenivasa M Y<br><br>Professor | DoS in Microbiology, Manasagangothri University of Mysore, Mysuru. | sreenivasamy@gmail.com<br>9449054480 |
| 3. | Two Experts from Other University | Dr. Jamuna Bai<br><br>Assistant Professor | Department of Microbiology, School of Life Sciences, JSS Academy of Higher Education & Research, Mysuru - 570004 | jamunabhounsle@gmail.com<br>9480278098 |
| 4. | | Dr. Sindhu R<br><br>Assistant Professor | | sindhur@jssuni.edu.in<br>9986297935 |
| 5. | One Person from Industry | Dr. Sushrutha<br><br>Assistant Manager | Zeus Biotech Limited, Metagalli, Mysuru -570016 | sushruthazeus@gmail.com<br>8971703690 |
| 6. | Alumnus | Dr. Chaithra Narayan<br><br>Founder | Codagu Agritech-Eco Plot no.24/3 and 24/4, KIADB, Industrial area, kudlur PB#58, Kushalnagar-571234 | codagu.agritech.giu@gmail.com<br>9886299801 |

# Course Structure (NEP 2020)

## III Year B.Sc. Microbiology
## Discipline Specific Courses (DSC), Employability Skills (EMP), Internship (INT).

**L:** Lecture; **T:** Tutorial; **P:** Practical

| Course Code, Type and Title | | Hours /week | | Number of Credits | Max Marks | | | Exam Duration | Total Marks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | IA | | Exam | | |
| | | L | T/P | (L:T:P) | C1 | C2 | C3 | | |
| **V SEMESTER** | | | | | | | | | |
| 232579 | DSC (5) Microbial Genetics | 4 | 0 | 4 : 0 : 2 (6credits) | 20 | 20 | 60 | 2½ Hours | 100 |
| | DSC (5) LAB Microbial Genetics | 0 | 4 | | 10 | 15 | 25 | 3 Hours | 50 |
| 232580 | DSC (6) Food Microbiology | 4 | 0 | 4 : 0 : 2 (6 credits) | 20 | 20 | 60 | 2½ Hours | 100 |
| | DSC (6) LAB Food Microbiology | 0 | 4 | | 10 | 15 | 25 | 3 Hours | 50 |
| 23EMP MIB01 | SEC (1) Microbial and Biochemical Techniques | 2 | 0 | 2 : 0 : 1 (3credits) | 10 | 10 | 30 | 1½ Hours | 50 |
| | SEC (1) LAB Microbial and Biochemical Techniques | 0 | 2 | | 10 | 15 | 25 | 3 Hours | 50 |
| **VI SEMESTER** | | | | | | | | | |
| 232679 | DSC (7) Immunology and Medical Microbiology | 4 | 0 | 4 : 0 : 2 (6credits) | 20 | 20 | 60 | 2½ Hours | 100 |
| | DSC (7) LAB Immunology and Medical Microbiology | 0 | 4 | | 10 | 15 | 25 | 3 Hours | 50 |

| Microbiology – VI Semester | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 232680 | DSC (8) Industrial Microbiology | 4 | 0 | 4 : 0 : 2 (6credits) | 20 | 20 | 60 | 2½ Hours | 100 |
| | DSC (8) LAB Industrial Microbiology | 0 | 4 | | 10 | 15 | 25 | 3 Hours | 50 |
| 23INTM IB01 | SEC (2) INT Internship | 2 | 0 | 2 : 0 : 0 (2credits) | 50 | 50 | -- | -- | 100 |

# DSC (5) Syllabus for B.Sc. Microbiology

## Semester-V

| | |
|---|---|
| **Course Code: 232579** | **Course Title**:<br><br>Microbial Genetics(Theory)<br>Microbial Genetics (Practical) |
| **Course Credits (L:T:P) :** 06 (4:0:2) | **Hours of Teaching/Week:** 04 (Theory) + 04 (Practical) |
| **Total Contact Hours:**<br>60 Hours(Theory)<br>60 Hours (Practical) | **Formative Assessment Marks:**<br>40 (Theory)<br>25 (Practical) |
| **Exam Duration:** 2½ Hours(Theory)<br>3 Hours (Practical) | **Semester End Examination Marks:**<br>60 (Theory)<br>25 (Practical) |

### COURSE OUTCOMES (COs):

**CO 1:** Appreciate the experimental evidences to prove DNA as genetic material and differentiate various method of recombination in bacteria.

**CO 2**: Comprehend the concepts involved in replication, transcription, and translation in bacteria.

**CO 3:** Acquire information on regulatory mechanisms and gene expression in bacteria.

**CO 4:** Differentiating gene interaction in viruses and fungi.

| Course Content | 60Hrs |
|---|---|
| **UNIT -1 : DNA as genetic material and Bacterial Genetics** | |
| **DNA as a genetic material**: Griffith experiment of Transformation, Avery, MacLeod and McCarty experiment, Hershey and Chase experiment to prove DNA carries the genetic information. Structure and organization of chromosomes in prokaryotes. Plasmid- types, Transposons in Prokaryotes.<br>**Bacterial Genetics**: Mechanism of genetic exchange in bacteria: Bacterial transformation- Principle and Types of transformation mechanisms found in prokaryotes. Bacterial Conjugation: U-tube experiment, properties of the F plasmid, F$^+$ x F$^-$ conjugation, F′ x F$^-$ conjugation, Hfr x F$^-$conjugation, Transduction: Generalized and specialized transduction. | 15 |

| UNIT – 2: Genetic Material and Replication and Transcription of DNA | |
|---|---|
| **Genetic Material**: Chemical basis of heredity, Watson and Crick model of DNA, DNA types, RNA-types, structure, importance. Modern conceptof gene- cistron, muton, recon.<br><br>**DNA Replication:** Replicon, Enzymes and proteins involved in DNA replication; DNA polymerases, DNA ligase, primase, telomerase. General mechanism of replication. Models of DNA replication including rolling circle, Ө (theta) mode of replication.<br><br>**Transcription**: Structure of bacterial RNA polymerase, Promoter concept, Recognition of promoters and DNA melting, Transcription bubble, Stages of transcription- initiation elongation and termination. | **15** |

| UNIT - 3: Gene expression and Regulation | |
|---|---|
| **Gene expression**: Genetic code- features, Wobble hypothesis. Translational machinery, Charging of t RNA, aminoacyl t RNA synthetases, Mechanisms of initiation, elongation and termination of polypeptides in prokaryotes. Post translational modifications of proteins.Protein maturation and secretion- protein splicing, molecular chaperones.<br><br>**Gene regulation**: Regulatory mechanisms in bacteria. Operon concept, polycistronic mRNA. *lac* operon - negative inducible, structure of *lac* repressor, mechanism of binding of repressor to operator. Catabolite repression of *lac* operon. Regulation by lac repressor and CAP. | **15** |

| UNIT - 4: Genetics of Viruses and Fungi and Mutation | |
|---|---|
| **Genetics of Viruses:** Genetic recombination in phages, Heterozygosity inphages. Temperate phage and prophage, (Non-genetic interaction of viral gene products- Complementation, Phenotypic mixing).<br><br>**Genetics of Fungi**: Life cycle of *Neurospora*, Tetrad analysis, unordered tetrad analysis in yeast, ordered tetrad analysis in *Neurospora*.<br><br>**Mutation:** Nature and types, Mutagenic agents: physical and chemical mutagens, damage and repair of DNA: Photoreactivation and SOS repair, Ames test. | **15** |

**References:**

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16. Sambrook JF, Russell DW (2001). Molecular Cloning: a Laboratory Manual. 3rd edition. Cold Spring Harbor, N.Y. Cold Spring Harbor Laboratory Press

**Weblinks:**

1. https://bio.libretexts.org/Bookshelves/Introductory_and_General_Biology/Introductory_Biology_(CK-12)/04%3A_Molecular_Biology
2. https://www.sanger.ac.uk/
3. https://www.nature.com/scitable/definition/mutation-8/
4. https://microbenotes.com/the-wobble-hypothesis/
5. https://www.britannica.com/science/transcription-genetics
6. http://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/botany/07._genetics/05._tetrad_analysis/et/5903_et_tetrad_analysis_et.pdf

# DSC (5): Practical: Microbial Genetics

**(4Hrs/week) 2 Credits**

1. Micropipeting: Moving very small volumes very accurately.
2. Isolation of DNA from microbial source.
3. Determination of purity and quantity of DNA.
4. Visualization of genomic DNA by agarose gel electrophoresis.
5. Estimation of DNA by Diphenylamine method.
6. Estimation of RNA by orcinol method.
7. Isolation of Coliphages from sewage.
8. Preparation of Master and Replica plates.
9. Isolation of antibiotic resistant mutant by gradient plate method.
10. Study of effect of Physical mutagen (UV) on bacterial cells.
11. Study survival curve of bacteria after exposure to ultraviolet (UV) light.
12. Effect of Chemical mutagen on the growth of microorganism (Ames test)
13. Preparation of competent cells for bacterial transformation.
14. Demonstration of bacterial conjugation by plate mating method.
15. Study of Photographs - Griffith's experiment, conjugation, transduction, plasmid DNA, T4 phage, ordered tetrad analysis in *Neurospora*, Watson and Crick model of DNA, t RNA, semi-conservative replication of DNA, bacterial RNA polymerase, transcription, translation and lac operon through schematic representations.

## COURSE ARTICULATION MATRIX – 232579

| CO / PO | PO 1 | PO 2 | PO 3 | PO4 | PO 5 | PO 6 | PO7 | PO 8 | PO 9 | PO10 | PO11 | PO12 |
|---------|------|------|------|-----|------|------|-----|------|------|------|------|------|
| CO 1 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | - | 3 | 2 | 2 |
| CO 2 | 2 | 1 | 2 | 2 | 2 | 3 | 1 | 2 | - | 3 | 2 | 2 |
| CO 3 | 2 | - | 2 | 2 | 3 | 2 | 1 | 1 | 1 | 3 | 1 | 2 |
| CO 4 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 1 | 1 |
| Weighted Average | 2 | 1 | 1.75 | 2 | 2.25 | 2.25 | 1.5 | 1.5 | 1 | 3 | 1.5 | 1.75 |

# DSC (6) Syllabus for B.Sc. Microbiology

| Course Code: **232580** | Course Title: |
|---|---|
| | Food Microbiology (Theory) |
| | Food Microbiology (Practical) |
| **Course Credits (L:T:P):** 06 (4:0:2) | **Hours of Teaching/Week:** 04 (Theory) + 04(Practical) |
| **Total Contact Hours:** | **Formative Assessment Marks:** |
| 60 Hours(Theory) | 40 (Theory) |
| 60 Hours(Practical) | 25(Practical) |
| **Exam Duration:** 2½ Hours (Theory) | **Semester End Examination Marks:** |
| 3 Hours (Practical) | 60 (Theory) |
| | 25 (Practical) |

## COURSE OUTCOMES (COS):

**CO 1:** Appreciate the roles of microbes in food crops production and acquire information on disease of food crops.

**CO 2:** Considerate the association of microbes in food and the quality testing of food and water.

**CO 3:** Comprehend the methods of spoilage of food, the diseases associated with it and acquire broader facts on preservation and food safety protocols.

**CO 4:** Acquire information about properties of milk, methods of preservation of milk and capture facts on types of fermented food and dairy products and its significance.

| Course Content | 60Hrs |
|---|---|
| **UNIT 1: Production of food crops and their diseases** | |
| **Role of microbes in food crops production:** Biofertilizers: Definition, Mass production, mode of applications, advantages and limitations of *Rhizobium, Azotobacter, Azospirillum,* Cyanobacterial fertilizers. Role of *Frankia* and VAM in soil fertility. Biopesticides: Definition, types- bacterial (*Bacillus thuringiensis*) viral(*Baculovirus*) and fungal (*Beauveria bassiana*)-mode of action, factors influencing, target pests. Microbial herbicides.<br><br>**Diseases of food crops**: Study of symptoms, etiology, epidemiology and management of diseases caused by fungi (Tikka disease of groundnut, blast disease of paddy), bacteria (Citrus canker, Bacterial blight of rice), viruses (Papaya Ring Spot, Bunchy top of banana) and viroid (Potato spindle tuber disease). | 15 |

## UNIT – 2: Microbial quality of air and water for food processing and disposal of wastewater

| | |
|---|---|
| **Bioaerosols in food**: Air borne microbes and their impact on food. Bioaerosol sampling: Vertical cylinder spore trap, Hirst spore trap, Rotorod sampler, Andersensampler, Impingers and filtration. Control of bioaerosols- UV light, HEPA filters, desiccation, Incineration. | **15** |
| **Water quality in food safety**: Water sample collection, methods to detect potability of water samples: presumptive/MPN tests, confirmed and completed tests for faecal coliforms, SPC, IMViC reactions, membrane filter technique. Water borne pathogens, Control of water borne pathogens- Precipitation, filtration, chemical disinfection, UV light. | |
| **Disposal of wastewater in food industries**: Sources of waste water, Physical, Chemical and Microbiological characteristics of wastewater. Wastewater treatment- primary (screening, coagulation and sedimentation), secondary (trickling filter, activated sludge process, oxidation pond) tertiary (reverse osmosis, ion exchange). Methods of solid waste disposal (composting). BOD and COD. | |

## UNIT - 3:  Food spoilage, Infection and Preservation

| | |
|---|---|
| **Microbes and Food:** Introduction, Scope of Food Microbiology, Food as a substrate for microorganisms- Intrinsic and extrinsic parameters affecting the growth of microbes. Spoilage**:** Sources of food contamination, Principles of food spoilage, Spoilage of meat, Spoilage of fruits and vegetables. Spoilage of canned food. Food borne infection and intoxication**-** Salmonellosis*,* Botulism and Aflatoxicosis. | **15** |
| **Food Preservation:** Principles of food Preservation. Methods of - Physical (temperature, drying, irradiation), chemical (Class I – Salt, Sugar) and (Class II- Propionates, Benzoates, Sorbates, Sulfites, Nitrite and Nitrates). Bio preservation (Antimicrobials). Canning. Food Packaging-Types of packaging materials, properties and benefits. Food sanitation and Control, HACCP,  and FSSAI in brief. | |

## UNIT - 4: Microbiology of milk and fermented food products

| | |
|---|---|
| **Dairy Microbiology:** Composition of milk. Sources of contamination of milk. Biochemical changes of milk- souring, gassy fermentation, proteolysis, lipolysis, and ropiness. Microbiological analysis of milk- Rapid platform tests (COB, Phosphatase test, DMC), SPC and Reduction tests. Preservation of milk and milk products- Pasteurization, dehydration, sterilization. Starter culture- types and role. | **15** |
| **Fermented foods:** Fermented milk (Cheese- types and production of Cheddar, Tofu, Yoghurt, and Acidophilus milk), Vegetable (pickles) Meat (sausage) and fish (fish sauce). Beverages-beer, Microbes as food- SCP- *Spirulina*. Prebiotics, Probiotics and its characteristics. | |

**References:**

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15. Thomas J., Matthews, Karl; Kniel, Kalmia E (2017), FoodMicrobiology: An Introduction,American Society for (ASM).

**Web links:**

1. https://bio.libretexts.org/Bookshelves/Microbiology/Book%3A_Microbiology_(Boundless)/17%3A_Industrial_Microbiology
2. https://www.britannica.com/science/microbiology/Food-microbiology
3. https://biologyreader.com/food-preservation-techniques.html
4. https://www.healthline.com/nutrition/8-fermented-foods
5. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8724949/

# DSC (6): Practical Food Microbiology

**(4Hrs/week) 2 Credits**

1. Standard analysis of water samples and Determination of MPN.
2. Biochemical differentiation of Enterobacteriaceae isolates by IMViC reactions.
3. Determination of bacteriological quality of water by H2S paper strip test.
4. Measurement of Biochemical Oxygen Demand (BOD) of food processing wastewater.
5. Estimation of total solids of wastewater from food processing unit.
6. Microscopic examination of water samples for biological indicator microorganisms.
7. Isolation of bacteria and fungi from Food Utensil.
8. Isolation of bacteria and fungi from Spoiled Vegetables.
9. Isolation and Identification of *Aspergillus* on groundnut by blotters method.
10. Turbidity index for the detection of efficiency of sterilization of milk.
11. Methylene blue Reductase Test (MBRT) to determine the quality of Milk.
12. Quantitative examination of bacteria in raw and pasteurized milk by SPC method.
13. Culturing of *Spirulina* sp. as single cell protein.
14. Display of Photographs of disease food crops: Citrus canker, Bacterial blight of Rice, Tikka disease of groundnut, Blast disease of Paddy, Papaya Ring Spot disease and Potato spindle tuber disease, Biofertilizers
15. Display of photographs of Air samplers, water purification process and waste water treatment.

    **Note: Visit to agriculture research station, water/sewage treatment plant & food industry**

## COURSE ARTICULATION MATRIX – 232580

| CO \ PO | PO 1 | PO2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---------|------|-----|------|------|------|------|------|------|------|-------|-------|-------|
| CO 1 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 2 |
| CO 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 1 | 2 | 3 | 3 | 2 |
| CO 3 | 2 | 3 | 3 | 2 | 2 | 3 | 2 | 1 | - | 2 | 1 | 1 |
| CO 4 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 1 | 1 | 3 | 3 | 2 |
| Weighted Average | 2.75 | 2.75 | 2.75 | 2.25 | 2.25 | 3 | 2.5 | 1.5 | 1.67 | 2.75 | 2.5 | 1.75 |

## Semester V

## SEC: Microbial and Biochemical Techniques

| | |
|---|---|
| **Course Code: 23EMPMIB01** | **Course Title:** Microbial and Biochemical Techniques (Theory) Microbial and Biochemical Techniques (Practical) |
| **Course Credits (L:T:P):** 03 (2:0:1) | **Hours of Teaching/Week:** 02 (Theory) 02(Practical) |
| **Total Contact Hours:** 30Hours(Theory) 30Hours(Practical) | **Formative Assessment Marks:** 20 (Theory) 25(Practical) |
| **Exam Duration:** 1½ Hours (Theory) 3 Hours (Practical) | **Semester End Examination Marks:** 30 (Theory) 25(Practical) |

### COURSE OUTCOMES (COS):

**CO 1:** Demonstrate skills in microbiological and analytical techniques and comprehend the principles which underlie sterilization of culture media, glassware and plastic ware to be used for microbiological work.

**CO 2:** Considerate the principles of a number of analytical instruments which the students have to use during the study and also later as microbiologists for performing various laboratory manipulations and handle several separation techniques which may be required to be handled later as microbiologists.

| Course Content | 30Hours |
|---|---|
| **UNIT – 1 Microbial Techniques** | |
| **Methods and practices of cleaning and management of lab**: Learning and Practice of Integrated Clean-In-Place (CIP) and Sterilize-In-Place (SIP) as per Industry standards, Standard Operating Procedure (SOP)for various equipment in the QC Lab. Sterility check, Bio-burden and Logbook maintenance. **Handling and calibration of lab equipment**- Weighing balance, Micropipette Autoclave, Hot air Oven, Incubator, Centrifuge, Water bath, Colony Counter, and Stability chamber, Preparation of Normality, Molarity, and buffer solutions. **Types of culture media and their maintenance:** Preparation of various culture media.Cultivation of Bacteria, Fungi, Actinomycetes and Algae. Isolation and preservation of pure culture. Morphological and biochemical characterization of bacteria. | **15** |

| UNIT – 2 Biochemical Techniques | |
|---|---|
| **Centrifugation:** Principles of Centrifugation and Ultracentrifugation techniques and its applications. **Chromatography:** Principle and techniques with applications (Partition, adsorption, ion exchange, exclusion and affinity chromatography).Electrophoretic technique (agarose and polyacrylamide gel) its components, working and applications. **Spectrophotoscopy and Radiobiology:** Principle, mechanism and application of instruments used in Spectrophotometric techniques (UV and visible). Radiobiological techniques – characters of radioisotopes, autoradiography, Radioisotope dilution technique and pulse chase experiments. Basic principles & Law of absorption and radiation and its application. | **15** |

**References**
1. Michael Lufaso (2016). "Laboratory Skills for Science and Medicine:An Introduction".CRC Press.
2. Colin A. Ramsden (2014). "Analytical Molecular Biology". Oxford University Press.
3. John M. Walker and Ralph Rapley (2014). "Molecular Biomethods Handbook".HumanaPress.
4. Wilson and Walke, (2000). Principles and Techniques in Practical Biochemistry. 5th Edition
5. Murphy, D. B. (2001). Fundamental of Light Microscopy &Electron Imaging.1st Edition.Wiley-Liss.
6. Murphy, D. B. (2001). Fundamental of Light Microscopy &Electron Imaging.1st Edition. Wiley-Liss.
7. Pranav Kumar, (2016). Fundamentals and Techniques of Biophysicsand Molecular Biology
8. Aurora Blair. Laboratory Techniques & Experiments in Biology.Intelliz Press
9. Plummer, D. T. (1987). An Introduction to Practical Biochemistry. McGraw Hill Publication
10. Prescott, M. J., Harley, J. P. and Klein, D. A. (2002). Microbiology. 5th Edition WCB Mc Graw Hill, New York,
11. Black J. G. (2002). Microbiology- Principles andExplorations. John Wiley & Sons Inc.New York,
12. Maheshwari, D. K. (2010). Practical Microbiology. S Chandpublications

**Web links:**
1. **https://www.intechopen.com/chapters/37593https://techsafety.com/**
2. **https://pharmastate.academy/sop-responsibilities-of-quality-control-dept/**
3. **https://microbenotes.com/centrifugation-principle-types-and-applications/**
4. **https://www.astro.org/Affiliate/ARRO/Resident-Resources/Educational-Resources/Webinars/Radiation-Biology-and-Physics**

# SEC: Practical: Microbial and Biochemical Techniques

## (2Hrs/week) 1 Credit

1. Usage and maintenance of basic equipment of microbiology lab: Principles, calibrations, and SOPs of balances, pH meter, Autoclaves, Laminar flows, Biosafety cabinets, Microscopes, Homogenizers and Magnetic stirrers.
2. Cultivation of microorganisms: (i) Bacterial cultivation: (a) Streak-plate method (*E.coli, Staphylococcus aureus*) Streaking with inoculation loop. Streaking with toothpick. (b) Pour-plate method (*E.coli*).
3. Maintenance of microorganisms (slant culture, stab culture, glycerol stocks)

   (ii) Fungal cultivation (a) Yeast (*Saccharomyces cervisiae*) Molds (*Penicillium notatum, Aspergillus niger*)

4. Estimation of CFU count by serial dilution- spread plate method/pour plate method.
5. Study of colony characteristics on nutrient agar
6. Biochemical characterization of bacteria:
   a) Sugar utilization test (minimal medium + sugar)
   b) Sugar fermentation test (peptone water method, Ammonium salt sugar method
   c) IMViC reactions
   d) Enzyme detection – Amylase, Gelatinase, lipase, caseinase, Catalase, and Oxidase
   e) Oxidative-fermentative test, arginine hydrolysis, ornithine, lysine decarboxylase, nitrate, nitrite reduction
7. Separation of mixtures by paper / thin layer chromatography.
8. Demonstration of column packing in any form of column chromatography.
9. Separation of protein mixtures by any form of chromatography.
10. Separation of protein mixtures by Polyacrylamide Gel Electrophoresis (PAGE).
11. Determination of absorption max for an unknown sample and calculation of extinction coefficient.

## COURSE ARTICULATION MATRIX – 23EMPMIB01

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 3 | - | 2 | 1 | 1 | 1 | - | 1 | 2 | 2 | 3 | 3 |
| **CO 2** | 3 | 1 | 2 | 2 | 3 | 2 | 1 | 1 | 2 | 2 | 3 | 3 |
| **Weighted Average** | 3 | 1 | 2 | 1.5 | 2 | 1.5 | 1 | 1 | 2 | 2 | 3 | 3 |

# DSC (7) Syllabus for B.Sc. Microbiology

## VI SEMSTER

| Course Code: 232679 | Course Title:<br>Immunology and Medical Microbiology (Theory)<br>Immunology and Medical Microbiology (Practical) |
|---|---|
| Course Credits (L:T:P) : 06 (4:0:2) | Hours of Teaching/Week: 04 (Theory) + 04 (Practical) |
| Total Contact Hours:<br>60 Hours (Theory)<br>60 Hours (Practical) | Formative Assessment Marks: 40 (Theory)<br>25 (Practical) |
| Exam Duration: 2½ Hours(Theory)<br>3 Hours (Practical) | Semester End Examination Marks:<br>60 (Theory)<br>25 (Practical) |

## COURSE OUTCOMES (COS):

**CO 1:** Gain preliminary information about various immune mechanisms and articulate the concepts of antigen, antibodies and its classes.

**CO 2**: Familiarize with immunological techniques and sero-diagnosis of infectious diseases**.**

**CO 3:** Emphasize the pathogenic bacterial infections, pathogenesis, symptoms, and diagnosis and treatment process.

**CO 4:** Emphasize the pathogenic viral, fungal infections, its pathogenesis, symptoms, diagnosis and treatment process also comprehend the concepts of antimicrobial agents and antibiotic resistance.

| Course Content | 60 Hours |
|---|---|
| **UNIT – 1 : Introduction to Immune system** | |
| **Immune system:** Historical perspective of immunology. Immunity-Definition and types. Cells and organs of immune system: B and T Lymphocytes, Natural killer (NK) cells, Granulocytes (Neutrophils, Eosinophils and Basophils), Monocytes and macrophages, Dendritic cells and Mast cells. Primary lymphoid organs-Bone marrow and Thymus. Secondary lymphoid organs- Spleen and Lymph nodes. Lymphoid tissues- MALT and GALT.<br>**Antigen and Antibody:** Antigen- Definition, properties and types. Immunogenicity and antigenicity, epitopes, haptens. Degree of foreignness, molecular weight, degradability. Adjuvants and their importance. Antibody: Definition, Basic structure of antibody, Structure and functions of different types of antibodies (IgG, IgA, IgM, IgD and IgE). Antigenic Determinants on immunoglobulin: Isotype, allotype and idiotype. | 15 |

| UNIT – 2: Antigen-Antibody interactions and Hypersensitive reactions | |
|---|---|
| **Antigen-antibody reactions:** Definition, salient features, antibody affinity and avidity, cross reaction. Agglutination reactions: Hemagglutination-blood grouping. Immunoprecipitation: Radial (Mancini) and double (Ouchterlony) immunodiffusion, and Immunoelectrophoresis. Complement mediated opsonization, complement fixation test. Immunotechniques: Enzyme linked immune-sorbent assay (ELISA): Direct, indirect, sandwich and competitive ELISA, Radioimmunoassay (RIA) and Immunofluorescence.<br><br>**Hypersensitive reactions:** Classification, antibody mediated hypersensitivity; Type I (IgE), Type II (IgG and IgM-ADCC), Type III (Antigen-antibody complex), and Cell mediatedhypersensitivity Type IV (DTH). (Autoimmune diseases – Myasthenia gravis, Diabetes mellitus.Immunoprophylaxis-Vaccines-Types-Killed, Live attenuated and Toxoid with an example each.National Immunization Schedule. | 15 |

| UNIT - 3: Host-Pathogen interaction and Medical Bacteriology | |
|---|---|
| **Host Pathogen interaction:** Normal microflora of Human skin, respiratory tract, gastrointestinal tract, urogenital tract and their importance. Host pathogen interaction: Definitions - Infection, Invasion, Pathogen, Pathogenicity, Virulence, Attenuation, Exaltation, Toxigenicity,Carriers and their types. Infection-types of infection, modes of transmission of infection, portal of entry of pathogen. Sample collection, transport and storage.<br>**Medical Bacteriology:** Cultural characteristics, biochemical characteristics, pathogenesis Symptoms, mode of transmission, prophylaxis and control of the following- respiratory diseases caused by *Streptococcus pyogenes*, *Mycobacterium tuberculosis.* Gastrointestinal Diseases caused by: *Salmonella typhi*, *Vibrio cholerae*, UTI-*E coli*, Others: *Treponema pallidum.* | 15 |

| UNIT - 4: Medical Virology, Parasitology and Mycology and Chemotherapy | |
|---|---|
| **Medical Virology Parasitology and Mycology**: Pathogenesis, Clinical Symptoms, Laboratory diagnosis, mode of transmission, prophylaxis and control of Dengue, AIDS, and Corona. Malaria, Amoebic dysentery. Fungal infections: Cutaneous mycoses- Tinea pedis (Athlete's foot), Systemic mycoses- Histoplasmosis and Opportunistic mycoses- Candidiasis.<br>**Antimicrobial agents**: General characteristics and mode of action Antibacterial agents: Inhibitor of nucleic acid synthesis (Sulfonamides);Inhibitor of cell wall synthesis (Penicillin); Inhibitor of cell membrane function (Daptomycin); Inhibitor of Protein synthesis (Chloramphenicol);Inhibitor of metabolism (Isoniazid), Mechanism of action of antifungal agents: Amphotericin B, Griseofulvin; Antiviral agents: Acyclovir, Azidothymidine, Antibiotic resistance, MDR, MRSA. | 15 |

**References:**

1. Ananthanarayan R and Paniker C.K.J (2009) Textbook of Microbiology, 8th Edition, University Press, Publication.
2. Brooks G.F., Carroll K.C., Butel J.S., Morse S.A. and Mietzner, T.A. (2013)n Jawetz, Melnick and Adelberg's Medical Microbiology. 26th edition. McGraw Hill Publication
3. Goering R., Dockrell H., Zuckerman M. and Wakelin D. (2007)Mims' Medical Microbiology. 4thedition. Elsevier
4. Willey JM, Sherwood LM, and Woolverton CJ. (2013) Prescott, Harley and Klein'sMicrobiology.9th edition. McGraw Hill Higher Education
5. Madigan MT, Martinko JM, Dunlap PV and Clark DP. (2014). Brock Biology of Microorganisms.14thedition. PearsonInternational Edition
6. Delves P, Martin S, Burton D, and Roitt IM. (2006). Roitt's Essential Immunology.11th edition Wiley- Blackwell Scientific Publication, Oxford.
7. Golds by RA, Kindt TJ, Osborne BA. (2007). Kuby's Immunology. 6th edition W.H.Freeman and Company, New York.
8. Murphy K, Travers. P, Walport M. (2008). Janeway's Immunobiology.7th edition Garland Science, Publishers, New York.
9. Peakman. M. and Vergani D. (2009).Basic and Clinical Immunology, 2nd edition Churchill, Livingstone Publishers,Edinburg.

**Web links:**

1. https://www.ncbi.nlm.nih.gov/books/NBK279395/
2. https://www.medicalnewstoday.com/articles/320101#immunity
3. http://www.antimicrobe.org/b242.asp
4. https://main.mohfw.gov.in/sites/default/files/245453521061489663873.pdf
5. http://www.textbookofbacteriology.net/normalflora_3.html
6. https://www.ncbi.nlm.nih.gov/books/NBK459452/
7. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7120529/
8. https://www.ncbi.nlm.nih.gov/books/NBK11774/

# DSC (7): Practical: Immunology and Medical Microbiology

**(4Hrs/week) 2 Credits**

1. Identification of Human blood groups and Rh factor.
2. Perform Total Leukocyte Count of the given blood sample.
3. Demonstration: separate serum from the blood sample.
4. Perform immunodiffusion by Ouchterlony method.
5. Demonstration of Single Radial Immunodiffusion.
6. Widal test / HCG test.
7. VDRL test
8. Study of bacterial flora of skin by swab method.
9. Study of bacterial flora of oral cavity by swab method.
10. Perform antibiotic sensitivity by Kirby-Bauer method.
11. Identify bacteria ( *E. coli, Bacillu*s) using laboratory strains on the basis of cultural, morphological and biochemical characteristics: IMViC, TSI, nitrate reduction, urease production and catalase tests
12. Study of various stages of malarial parasites.
13. Study of composition and use of important differential media for identification of pathogenic bacteria: EMB Agar, MacConkey agar, Mannitol salt agar, Deoxycholate citrate agar, TCBS agar.
14. Display of photographs of human pathogens: Mycobacterium tuberculosis, *Treponema pallidum, Vibrio cholerae, Salmonella typhi,* AIDS, Dengue, Corona, Histoplasmosis, Candidiasis and Athlete's foot.

**Note: Visit to Pharmaceutical and Pathology Laboratory**

COURSE ARTICULATION MATRIX – **232679**

| CO/PO | PO 1 | PO2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | - | - | 2 | 1 | 2 |
| CO 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 1 |
| CO 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 2 |
| CO 4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 2 |
| Weighted Average | 2.75 | 2.25 | 2.5 | 2.5 | 2.5 | 2.5 | 1.75 | 2 | 2 | 2.75 | 2.5 | 1.75 |

# DSC (8) Syllabus for B.Sc. Microbiology

| Course Code: 232680 | Course Title: |
|---|---|
| | Industrial Microbiology (Theory) |
| | Industrial Microbiology (Practical) |
| **Course Credits (L:T:P) :**06 (4:0:2) | **Hours of Teaching/Week:** 04 (Theory) + 04 (Practical) |
| **Total Contact Hours:** 60 Hours (Theory) 60 Hours (Practical) | **Formative Assessment Marks:**40 (Theory) 25 (Practical) |
| **Exam Duration:** 2½ Hours(Theory) 3 Hours (Practical) | **Semester End Examination Marks:** 60 (Theory) 25 (Practical) |

## COURSE OUTCOMES (COS):

**CO1**: Considerate the overview of scope and importance of industrially important microbes and compare different types of fermentation processes and equipment's.

**CO2:** Acquire broader facts of purification of value-added products.

**CO3**: Comprehend facts on the concepts and terminology in genetic engineering.

**CO4:** Competent about principles involved in manipulating genes and DNA and emphasize with various techniques used in genetic engineering.

| Course Content | 60Hours |
|---|---|
| **UNIT - 1 Introduction to Industrial Microbiology** | |
| **Introduction to Industrial Microbiology:** Scope and concepts. Microorganisms of industrial importance: Selection criteria, Strain improvement and Preservation. Fermentor: Design and components of a bioreactor, Control of air, temperature and pH monitoring probes, Specialized bioreactors: Airlift bioreactors, fluidized bed reactor, and packed bed reactors. Sterilization of fermentor. Aseptic inoculation and sampling methods. **Fermentation media and process**: Natural and synthetic media. Production medium and Inoculum medium. Raw materials (Molasses and its types, corn steep liquor, sulphite waste liquor and whey).Buffers, Precursors, Inhibitors and Antifoam agents. Sterilization of media, Types of fermentation process: Submerged fermentation, Solid state fermentation (Koji), Batch fermentation and continuous fermentation. | 15 |

| UNIT - 2 : Downstream processing, General production strategies of microbial products and Enzyme immobilization | |
|---|---|
| **Downstream processing**- Definition, Stages in downstream processing. Methods of downstream processing: Precipitation, filtration, centrifugation, distillation, cell disruption, solvent recovery, drying and crystallization.<br><br>**Microbial production of industrial products**: Industrial production and uses of Ethyl alcohol, wine, Penicillin, Citric acid, Amylase. Oyster mushroom and its nutritional value.<br><br>**Enzyme immobilization**: Immobilized enzymes, Methods of Enzyme immobilization: Reversible immobilization- Adsorption, Irreversible immobilization- covalent coupling, entrapment, and copolymerization. Applications ofenzyme immobilization, Advantages and disadvantages of immobilized enzymes. Large scale application of immobilized enzyme – Glucose isomerase. | **15** |

| UNIT – 3 Genetic Engineering tools used in Strain improvement of microbes of industrial importance | |
|---|---|
| **Introduction to genetic engineering**: Definition, milestones in genetic engineering. Tools in genetic engineering: Restriction enzymes- Types, Mode of action, nomenclature, applications. DNA modifying enzymes and their applications: DNA polymerases, Methylases, Terminal deoxynucleotidyl transferases, Kinases, Phosphatase and DNA ligases.<br><br>**Cloning Vectors and Cloning host**: Cloning Vectors- Definition and Properties. Characteristics ofcloning vectors. Plasmid vectors: pBR and pUC series. Bacteriophage lambda, Cosmids, BACs, YACs. Use of linkers and adaptors. Expression vectors: *Baculovirus* based vectors, mammalian SV40-based expression vectors. Cloning host- Cloning in *Escherichia coli* and *Saccharomyces cerevisiae*. | **15** |

| UNIT – 4 Genetic engineering techniques in industrial production of recombinantproducts | |
|---|---|
| **Techniques in genetic engineering:** Isolation of DNA, restriction digestion and ligation of DNA,Agarose gel electrophoresis, Blotting techniques, DNA sequencing- Maxam-Gilbert method of DNA sequencing, Sanger's method. PCR techniques – RT PCR, q PCR, Multiplex PCR and applications. DNA transfer methods: Physical - Microinjection, Biolistic, Electric- Electroporation,Chemical -Calcium phosphate mediated DNA transfer. Identification and selection of recombinants: DNA hybridization, blue white selection, colony and plaque hybridization.<br><br>**Industrial production of recombinant products**: Products of human therapeutic interest - insulin, hGH, Bt - Cotton, Gene therapy, recombinant vaccines. Biological, ethical and social issues of gene cloning and IPR. Gene Library: Construction and application of cDNA and genomic libraries. Application of recombinant microorganisms in basic research, industry, medicine, agriculture, and environment. | **15** |

**References:**

1. Arindam Kuila and Vinay Sharma (2018) Principles and Applications of Fermentation Technology,Wiley.
2. Casida L E.J.R. (2016) Industrial Microbiology, 2$^{nd}$ edition, New Age International Publisher.
3. Crueger W&A Crueger (2017). Cruegers Biotechnology: A Text Book of Industrial Microbiology.Edited by K.R. Aneja. Panima Publishing Corporation.
4. Michael, J.W., Neil L. Morgan (2013) Industrial Microbiology: an Introduction. Blackwell science
5. Nduka Okafor, Benedict Okeke (2017). Modern Industrial Microbiology and Biotechnology.2$^{nd}$Edition :CRC Press Publishers
6. Stan bury P.F., W. Whitaker & S.J. Hall (2016). Principles of Fermentation Technology. 3$^{rd}$edition.Elsevier publication
7. Alexander N. Glazer, Hiroshi Nikaido (2014), Microbial Biotechnology: Fundamental of applied Microbiology, 2$^{nd}$ Edition, Cambridge University Press
8. Brown TA. (2010). Gene Cloning and DNA Analysis. 6th edition. Blackwell Publishing, Oxford, U.K.
9. Clark DP and Pazdernik NJ. (2009). Biotechnology: Applying the Genetic Revolution. ElsevierAcademic Press, USA
10. Krebs J, Goldstein E, Kilpatrick S (2013). Lewin's Essential Genes, 3rd Ed., Jones and Bartlett Learning
11. Primrose SB and Twyman RM. (2006). Principles of Gene Manipulation and Genomics, 7$^{th}$ edition. Blackwell Publishing, Oxford, U.K.
12. Sam brooks J and Russell D. (2001). Molecular Cloning-A Laboratory Manual. 3rd edition. Cold SpringHarbor Laboratory Press
13. Sam brooks J and Russell DW. (2001). Molecular Cloning: A Laboratory Manual. 4thEdition, Cold SpringHarbor Laboratory press.
14. Watson JD, Baker TA, Bell SP et al. (2008) Molecular Biology of the Gene, 6th Ed.,Benjamin Cummings Wiley


**Web links:**

1. https://www.nature.com/subjects/industrial-microbiology
2. https://www.ncbi.nlm.nih.gov/books/NBK26837/
3. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3787205/
4. https://www.genome.gov/genetics-glossary/Recombinant-DNA-Technology
5. https://www.nature.com/scitable/definition/recombinant-dna-technology-dna-cloning-gene-cloning
6. https://www.ncbi.nlm.nih.gov/books/NBK26837/
7. https://microbialcellfactories.biomedcentral.com/articles

# DSC (8): Practical: Industrial Microbiology

### (4Hrs/week) 2 credits

1. Preparation of natural and synthetic media used in industry.
2. Production of amylase by solid substrate fermentation.
3. Preservation of industrial important microbes with glycerol/soil.
4. Preparation of wine from grapes.
5. Preparation of alcohol using jaggery/molasses.
6. Estimation of citric acid produced from *Aspergillus niger* by titrimetricMethod.
7. Estimation of % alcohol in a given sample by specific gravity bottle method
8. Cultivation and processing of edible Mushroom.
9. Preparation of buffers-TE, TAE and Lysis buffer.
10. Isolation of plasmid DNA from *Escherichia coli.*
11. Digestion of DNA with restriction enzymes.
12. Demonstration of amplification of DNA by PCR.
13. Demonstration of Southern blotting.
14. Demonstration of cloning of DNA inserts and Blue white screening ofrecombinants.
15. Study of specialized bioreactors, Microbial production of industrial products, Cloning vectors, Techniques in genetic engineering and recombinantproducts as per theory.
   **Note: Visit to distilleries and molecular biology laboratory.**

## COURSE ARTICULATION MATRIX – **232680**

| CO/PO | PO 1 | PO 2 | PO3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO10 | PO11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 3 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 3 | 1 | 3 | 1 |
| CO 2 | 3 | 2 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 3 | 3 | 2 |
| CO 3 | 3 | 1 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO 4 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 |
| Weighted Average | 3 | 1.75 | 2 | 2 | 2.75 | 2.5 | 2 | 2.5 | 3 | 2.25 | 3 | 1.75 |

# SEC (2): Internship

# B.Sc. Microbiology

**Semester VI**

| | |
|---|---|
| **Course Code: 23INTMIB01** | **Course Title:** SEC(2) - Internship |
| **Course Credits:** 02 | **Hours of Teaching/Week:** |
| **Total Contact Hours:** | **90** |
| **Formative Assessment Marks** | **C1 -50** |
| | **C2-50** |
| | **Total -100 marks** |

**Note: This course will run as per the guidelines defined by the BoS Microbiology, University of Mysore, Mysuru and the same is approved by BoS, Microbiology, SBRR Mahajana First Grade College, Mysuru.**

**Course Outcomes (COs):**

**CO1:** Integrate Theory and Practice of the area selected for Internship to Explore Career    Opportunities prior to Graduation.

**CO2:** Develop Communication, Interpersonal, Work Habits, Attitude and other Critical Skills required for a job.

## COURSE ARTICULATION MATRIX – 23INTMIB01

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 3 | 3 | 3 | 3 | 3 | - | 1 | 1 | 3 | 3 | 2 | 2 |
| **CO 2** | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | 2 | 2 |
| **Weighted Average** | **3** | **3** | **3** | **3** | **3** | **2** | **1** | **1** | **3** | **3** | **2** | **2** |

## Continuous Formative Evaluation/Internal Assessment (DSC)

Total marks for each course shall be based on continuous assessments and semester end examinations. The pattern is 40:60 for IA and Semester End Theory Examinations respectively and 50:50 for IA and Semester End PracticalExaminations respectively.

|  | THEORY | PRACTICAL |
|---|---|---|
| **Total Marks** | 100 Marks | 50 Marks |
| **Continuous Assessment – 1 (C1)** | 20 Marks | 10 Marks |
| **Continuous Assessment – 2 (C2)** | 20 Marks | 15 Marks |
| **Semester End Examination (C3)** | 60 Marks | 25 Marks |

## Evaluation Process of IA Marks shall be as follows:

a) The first component (C1) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, project work etc. This assessment and score process should be completed after completing 50% of syllabus of the course and within 45 working days ofsemester program.

b) The second component (C2) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, internship/industrial practicum/project work, quiz etc. This assessment and score process should be based on completion of remaining 50% of syllabus of the course of the semester.

c) During the 17th – 19th week of the semester, a semester end examinationshall be conducted by the college for each course. This forms the third and final component of assessment (C3) and the maximum marks for the final component will be 60%.

d) In case of a student who has failed to attend the C1 or C2 on a scheduled date, it shall be deemed that the student has dropped the test. However, in case of a student who could not take the test on scheduled date due to genuine reasons, such a candidate may appeal to the Program Coordinator/Principal. The Program Coordinator/Principal in consultation with the concerned teacher shall decide about the genuineness of the case and decide to conduct special test to such candidate on the date fixed by the concerned teacher, but before commencement of the concerned semester end examinations.

e) For assignments, tests, case study analysis etc., of C1 and C2, the students should bring their own answer scripts (A4 size), graph sheets etc., required for such tests/assignments and these be sealed/signed by the concerned department at the time of conducting tests/assignment/project work etc.

f) The outline for continuous assessment activities for Component-I (C1) and Component-II (C2) of a course shall be as under:

| | C1 Marks | C2 Marks | Total Marks |
|---|---|---|---|
| **Session Test** | 20 | - | 20 |
| **Seminar/Presentation/Assignment/Activity/CaseStudy/Field Work/Project Work/Quiz etc.** | | 20 | 20 |
| **Total** | 20 | 20 | 40 |

For practical course of full credits, seminar shall not be compulsory. In its place, marks shall be awarded for Practical Record Maintenance (the ratio is 25 (10 + 15):25).

Conduct of Test, Seminar, Case study/Assignment etc., can be either in C1 or in C2 component as decided by the college and concerned department/teacher.

The teachers concerned shall conduct test/seminar/case study etc., the students should be informed about the modalities well in advance. The evaluated courses assignments during component I (C1) and component II (C2) of assessment are immediately provided to the candidates after obtaining acknowledgement in the register by the concerned teacher(s) and maintained by the Department. Before commencement of the semester end examination, the evaluated test, assignment etc., of C1 and C2 shall be obtained back to maintain them till the announcement of the results of the examination of the concerned semester.

g) The marks of the internal assessment shall be published on the notice board of the department/college for information of the students.

h) The internal assessment marks shall be communicated to the CoE at least 10 days before the commencement of the examinations and the CoE shall have access to the records of such periodical assessments.

i) There shall be no minimum in respect of internal assessment marks.

j) Internal assessment marks may be recorded separately. A candidate, who has failed or rejected the result, shall retain the internal assessment marks.

## Scheme of Valuation for Practical Examinations (DSC)

C1 and C2 are internal tests to be conducted during 8th and 16th weeks respectively of the semester. C3 is the semester-end examination conducted for 3 hours. The student will be evaluated on the basis of procedure development and its execution. The student has to compulsorily submit the practical record for evaluation during C2. For C3, the record has to be certified by the Head of the Department.

- The student is evaluated for 25 marks in C1 and C2 as per the following scheme:

Part-A (C1): 10 marks

Part-B (C2): 10 marks + Record: 05 marks = 15 marks

- The student is evaluated for 25 marks in C3 as per the following scheme:

| Part A | Major question | 08 |
|---|---|---|
| Part B | Minor question | 04 |
| Identify and comment (Any four photographs: Decided by the External Examiner) | | 08 |
| Viva Voce | | 05 |
| **TOTAL** | | **25** |

## Continuous Formative Evaluation/Internal Assessment (SEC)

Total marks for each course shall be based on continuous assessments and semester end examinations. The pattern is 20:30 for IA and Semester End Theory Examinations respectively and 25:25 for IA and Semester End Practical Examinations respectively.

|  | THEORY | PRACTICAL |
|---|---|---|
| **Total Marks** | 50 Marks | 50 Marks |
| **Continuous Assessment – 1  (C1)** | 10 Marks | 10 Marks |
| **Continuous Assessment – 2  (C2)** | 10 Marks | 15 Marks |
| **Semester End Examination  (C3)** | 30 Marks | 25 Marks |

## Evaluation Process of IA Marks shall be as follows:

a) The first component (C1) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, project work etc. This assessment and score process should be completed after completing 50% of syllabus of the course and within 45 working days of semester program.

b) The second component (C2) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, internship/industrial practicum/project work, quiz etc. This assessment and score process should be based on completion of remaining 50% of syllabus of the course of the semester.

c) During the 17th – 19th week of the semester, a semester end examination shall be conducted by the college for each course. This forms the third and final component of assessment (C3) and the maximum marks for the final component will be 60%.

d) In case of a student who has failed to attend the C1 or C2 on a scheduled date, it shall be deemed that the  student has dropped the test. However, in case of a student who could not take the test on scheduled date due to genuine reasons, such a candidate may appeal to the Program Coordinator/Principal. The Program Coordinator/Principal in consultation with the concerned teacher shall decide about the genuineness of the case and decide to conduct special test to such candidate on the date fixed by the concerned teacher, but before commencement of the concerned semester end examinations.

e) For assignments, tests, case study analysis etc., of C1 and C2, the students should bring their own answer scripts (A4 size), graph sheets etc., required for such tests/assignments and these be sealed/signed by the concerned department at the time of conducting tests/assignment/project work etc.

f) The outline for continuous assessment activities for Component-I (C1) and Component-II (C2) of a course shall be as under:

| | C1 Marks | C2 Marks | Total Marks |
|---|---|---|---|
| **Session Test** | 10 | - | 10 |
| **Seminar/Presentation/Assignment/Activity/CaseStudy/Field Work/Project Work/Quiz etc.** | - | 10 | 10 |
| **Total** | 10 | 10 | 20 |

- For practical course of full credits, seminar shall not be compulsory. In its place, marks shall be awarded for Practical Record Maintenance (the marks is 25 (10 + 15) and 25. Evaluated for a total 50 marks).

- Conduct of Test, Seminar, Case study/Assignment etc., can be either in C1 or in C2 component as decided by the college and concerned department/teacher.

- The teachers concerned shall conduct test/seminar/case study etc., the students should be informed about the modalities well in advance. The evaluated courses assignments during component I (C1) and component II (C2) of assessment are immediately provided to the candidates after obtaining acknowledgement in the register by the concerned teacher(s) and maintained by the Department. Before commencement of the semester end examination, the evaluated test, assignment etc., of C1 and C2 shall be obtained back to maintain them till the announcement of the results of the examination of the concerned semester.

g) The marks of the internal assessment shall be published on the notice board of the department/college for information of the students.

h) The internal assessment marks shall be communicated to the CoE at least 10 days before the commencement of the semester end examinations and the CoE shall have access to the records of such periodical assessments.

i) There shall be no minimum in respect of internal assessment marks.

j) Internal assessment marks may be recorded separately. A candidate, who has failed or rejected the result, shall retain the internal assessment marks.

## Scheme of Valuation for Practical Examinations - SEC

C1 and C2 are internal tests to be conducted during 8th and 16th weeks respectively of the semester. C3 is the semester-end examination conducted for 3 hours. The student will be evaluated on the basis of procedure development and its execution. The student has to compulsorily submit the practical record for evaluation during C2. For C3, the record has to be certified by the Head of the Department.

- The student is evaluated for 25 marks in C1 and C2 as per the following scheme:

Part-A (C1): 10 marks

Part-B (C2): 10 marks + Record: 05 marks = 15 marks

- The student is evaluated for 25 marks in C3 as per the following scheme:

| Part A | Major question | 08 |
|---|---|---|
| Part B | Minor question | 04 |
| Identify and comment (Any four photographs: Decided by the External Examiner) | | 08 |
| Viva Voce | | 05 |
| **TOTAL** | | **25** |

# DSC V AND VI SEM -THEORY QUESTION PAPER PATERN

## BSC MICROBIOLOGY

**DURATION: 2½ Hours**                                    **MAXIMUM: 60 Marks**

**Instructions: All questions are compulsory.**
                    **Draw neat labeled diagrams wherever necessary.**


I.      **Define any FIVE of the following**                    **5X2=10 Marks**

        1.        **(a)**              **(b)**

                  **(c)**              **(d)**

                  **(e)**               **(f)**

                  **(g)**


II.     **Write short notes on any FIVE of the following**          **5X6=30 Marks**



                  **(2)**              **(3)**

                  **(4)**              **(5)**

                  **(6)**              **(7)**

                  **(8)**

III.    **Explain any TWO of the following**                    **2X10=20 Marks**



                   **(9)**

                  **(10)**

                  **(11)**

                  **(12)**

# DSC V AND VI SEM PRACTICAL EXAMINATION PATTERN

## Practical Examination – B.Sc. MICROBIOLOGY- C3

**Duration: 3 hours**                                              **Max. Marks: 25**

Q1. Major question                                                    08 Marks

Q2. Minor question                                                    04 Marks

Q3. Identify and Comment                                        4X2= 08 Marks

Q4. Viva- voce                                                           05 Marks

## BSC MICROBIOLOGY

**DURATION: 1½ Hours**                                     **MAXIMUM: 30 Marks**

**Instructions: All questions are compulsory.**
**Draw neat labeled diagrams wherever necessary**

I.    **Define any FIVE of the following**                          **5X2=10 Marks**

   1.        **(a)**        **(b)**

             **(c)**        **(d)**

             **(e)**        **(f)**

             **(g)**

II.   **Explain any TWO of the following**                          **2X10=20 Marks**

             **(2)**

             **(3)**

             **(4)**

             **(5)**

# SEC (1) V SEM - PRACTICAL QUESTION PAPER PATERN

## Practical Examination – B.Sc. MICROBIOLOGY- C3

**Duration: 3 hours**                                      **Max. Marks: 25**

Q1. Major question                                          08 Marks

Q2. Minor question                                          04 Marks

Q3. Identify and Comment                              4X2= 08 Marks

Q4. Viva- voce                                                  05 Marks

# B.Sc. Microbiology Semester VI

## Scheme of Valuation for Internship

C1 and C2 are internal assessments to be conducted during $8^{th}$ and $16^{th}$ weeks respectively of the semester. The student will be evaluated on the basis of presentation skills and project development. The student Internship may be full-time/part-time (full-time during semester holidays and part-time in the academic session). The students shall avail their discipline specific internship or project in any laboratory, companies or Research Institutes.

The student has to compulsorily submit the project report for evaluation during C2. The report has to be certified by the Head of the department and the Mentor/Supervisor.

- **The student is evaluated for 100 marks in C1 and C2 as per the following scheme:**

| Assessment Criteria | Marks |
|---|---|
| **C1**: Project Progress Presentation and Skills | 50 |
| **C2**: Project Development Skills and Report | 50 |
| **Total** | 100 |

### DSC -5: <u>MICROBIAL GENETICS</u>

**Duration: 3 hours**                                                **Max. Marks: 25**

Q 1.  Perform the Experiment **A** giving Principle and procedure,
Record the result ……………………………………………  **08 Marks**

The following experiments is given for Question number 1
- Study of effect of Physical mutagens on bacterial cells
- Preparation of Master and Replica plates
- Study survival curve of bacteria after exposure to Ultraviolet light (UV))

**Assessment:**

(Demonstration - 4 marks, Principle - 1mark, Procedure – 2marks, Result – 1mark)

Q 2. Write the Protocol for the Experiment **B** giving principle and
procedure…………………...........................……………  **04 Marks**

The following experiments is given for Question number 2

- Preparation of competent cells for bacterial transformations.
- Isolation of DNA from microbial source.
- Isolation of Coliphages from sewage.

**Assessment:**   (Principle – 2 marks, Procedure - 2Marks)

Q 3.  Write the critical notes on **C, D, E** and **F.**         **4X 2 = 08 Marks**

(Study of Griffith's experiment, conjugation, transduction, plasmid DNA,
T4 phage, ordered tetrad analysis in *Neurospora*, Watson and Crick model
of DNA, t RNA, semi-conservative replication ofDNA, bacterial RNA
polymerase, transcription, translation and lac operon through schematic
representations, results of the experiments).

Q 4.  Viva-Voce                                               **05 Marks**

**Practical Examination – Scheme of Valuation (2023-24)**

**Practical DSC-6: FOOD MICROBIOLOGY**

**Duration: 3 hours**                                      **Max. Marks: 25**

Q 1.  Perform the Experiment **A** giving Principle and procedure,

Record the result ………………………………………………  **08 Marks**

The following experiments is given for Question number 1

- Standard analysis of water samples and Determination of MPN
- Biochemical differentiation of Enterobacteriaceae isolates by IMViC reactions
- Isolation of bacteria and fungi Spoiled Vegetables/Food Utensil
- Quantitative Examination of Bacteria in Raw and Pasteurized milk by SPC method.
- Methylene Blue Reductase test to determine the quality of milk.
- Determination of bacteriological quality of water by H2S paper strip test.

**Assessment:**

(Demonstration - 4 marks, Principle - 1mark, Procedure – 2marks, Result – 1mark)

Q 2. Write the Protocol for the Experiment **B** giving principle and procedure……………………......................……………  **04 Marks**

The following experiments is given for Question number 2

- Estimation of total solids of waste water from food processing unit.
- Microscopic examination of water samples for biological indicator microorganisms
- Isolation and Identification of *Aspergillus* on groundnut by blotters method
- Turbidity index for the detection of efficiency of sterilization of milk.

**Assessment:**   (Principle – 2 marks, Procedure - 2Marks)

Q 3.  Write the critical notes on **C, D, E** and **F.**          **4X 2= 08 Marks**

(Display of Photographs of disease food crops: Citrus canker, Bacterial blight of Rice, Tikka disease of groundnut, Blast disease of Paddy, Papaya Ring Spot disease and Potato spindle tuber disease.

Display of photographs of Air samplers, Water purification process and Waste Water treatment, results of experiments).

Q 4.  Viva-voce                                              **05 Marks**

**B.Sc. Microbiology SEMESTER V**

**Practical Examination – Scheme of Valuation (2023-24)**

**Practical SEC (1): MICROBIAL AND BIOCHEMICAL TECHNIQUES**

**Duration: 3 hours**                                          **Max. Marks: 25**

Q 1.  Perform the Experiment **A** giving Principle and procedure,

Record the result ……………………………………………   **08 Marks**

 The following experiments is given for Question number 1

- Estimation of CFU count by serial dilution- spread plate method/pour plate method.
- IMViC reactions
- Enzyme detection – Amylase, Gelatinase, lipase, caseinase, Catalase, and Oxidase test.

**Assessment:**

 (Demonstration - 4 marks, Principle - 1mark, Procedure – 2marks, Result – 1mark)

Q 2.  Write the Protocol for the Experiment **B** giving principle and procedure…………………...........................……………   **04 Marks**

The following experiments is given for Question number 2

- Separation of mixtures by paper / thin layer chromatography.
- Cultivation of microorganisms: (i) Bacterial cultivation: (a) Streak-plate method (*E.coli, Staphylococcus aureus*) Streaking with inoculation loop. Streaking with toothpick.  (b) Pour-plate method (*E.coli*).
- Study of colony characteristics on nutrient agar

**Assessment:**   (Principle – 2 marks, Procedure - 2Marks)

Q 3.  Write the critical notes on **C, D, E** and **F.**          **4X 2 = 08 Marks**
(Oxidative-fermentative test, arginine hydrolysis, ornithine, lysine decarboxylase, nitrate, nitrite reduction, results of the experiments).

Q 4.   Viva-voce                                          **05 Marks**

# B.Sc. Microbiology SEMESTER VI

## Practical Examination – Scheme of Valuation (2023-24)

### DSC -7: IMMUNOLOGY AND MEDICAL MICROBIOLOGY

**Duration: 3 hours**                                       **Max. Marks: 25**

Q 1.  Perform the Experiment **A** giving Principle and procedure,

Record the result …………………………………………… **08 Marks**

The following experiments is given for Question number 1

- Identification of Human blood groups and Rh factor
- Perform Immunodiffusion by Ouchterlony method
- Study of bacterial flora of skin by swab method
- Perform Antibiotic Sensitivity by Kirby Bauer method.

**Assessment:**

(Demonstration - 4 marks, Principle - 1mark, Procedure – 2marks, Result – 1mark)

Q 2. Write the Protocol for the Experiment **B** giving principle and procedure……………………................................…………… **04 Marks**

The following experiments is given for Question number 2
- Demonstration of Single Radial Immunodiffusion
- WIDAL test
- VDRL test
  **Assessment:**   (Principle – 2 marks, Procedure - 2Marks)

Q 3.  Write the critical notes on **C, D, E** and **F.**          **4X 2 = 08 Marks**

(Display of photographs of human pathogens: Mycobacterium tuberculosis, *Treponema pallidum, Vibrio cholerae, Salmonella typhi,* AIDS, Dengue, Corona, Histoplasmosis, Candidiasis and Athlete's foot.

Study of composition and use of important differential media for identification of pathogenic bacteria: EMB Agar, MacConkey agar, Mannitol salt agar, Deoxycholate citrate agar, TCBS agar results of the experiments).

Q 4.   Viva-voce                                               **05 Marks**

**Practical Examination – Scheme of Valuation (2023-24)**

**Practical DSC-8: INDUSTRIAL MICROBIOLOGY**

**Duration: 3 hours**                                                **Max. Marks: 25**

Q 1. Perform the Experiment **A** giving Principle and procedure,

Record the result ……………………………………………    **08 Marks**

The following experiments is given for Question number 1

- Estimation of % alcohol in a given sample by specific gravity bottle method
- Estimation of Citric acid produced from *Aspergillus niger* by titrimetric method.

**Assessment:**

(Demonstration - 4 marks, Principle - 1mark, Procedure – 2marks, Result – 1mark)

Q 2. Write the Protocol for the Experiment **B** giving principle and procedure…………………..........................……………    **04 Marks**

The following experiments is given for Question number 2

- Preparation of Wine from grapes.
- Preparation of buffers – TE, TAE and Lysis buffer.
- Preparation of alcohol using Jaggery or molasses.
- Demonstration of Southern blotting.
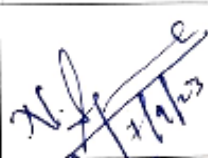
**Assessment:** (Principle – 2 marks, Procedure - 2Marks)

Q 3. Write the critical notes on **C, D, E** and **F.**      **4X 2 = 08 Marks**
(Study of specialized bioreactors, Microbial production of industrial products, Cloning vectors, Techniques in genetic engineering and recombinant products as per theory, results of the experiments).

Q 4. Viva-voce                                        **05 Marks**

## BOARD OF STUDIES

| Sl. No | Name and address | Designation | Signature |
|---|---|---|---|
| 1 | Ms. Spandana N<br>HOD, Department of Microbiology<br>SBRR Mahajana First Grade College,(A) Mysuru<br>9449680239<br>spandanan.fgc@mahajana.edu.in | Chairperson | |
| 2 | Dr. Sreenivasa M Y<br>Professor<br>DOS in Microbiology,<br>UOM, Manasagangotri, Mysuru<br>9449054480<br>sreenivasamy@gmail.com | Member | |
| 3 | Dr. Jamuna Bai A<br>Assistant Professor<br>Department of Microbiology, Faculty of Life Sciences, JSS – Academy of Higher Education and Research, Mysore<br>9480278098<br>jamunabhounsle@gmail.com | Member | A. Jamuna B<br>7/9/23 |
| 4 | Dr. Sindhu R<br>Assistant Professor<br>Department of Microbiology, Faculty of Life Sciences, JSS – Academy of Higher Education and Research, Mysore<br>9986297935<br>sindhur@jssuni.edu.in | Member | Sindhu R |
| 5 | Dr. Chaitra Narayan<br>Founder, Codagu Agritech-Eco,<br>Plot no. 24/3 and 24/4, KIADB, Industrial area, kudlur PB #58, Kushalnagar -571234<br>9886299801<br>codagu.agritech.giu@gmail.com | Member | MEMBER-NOT PRESENT |
| 6 | Smt. Sushrutha<br>Zeus Biotech Limited, Metagalli, Mysuru<br>8971703690<br>sushruthazeus@gmail.com | Member | MEMBER NOT PRESENT |

# DEPARTMENT OF PHYSICS

## Motto

Physics for Progress

## Vision

Science and Technology for Better Future

## Mission

*Imparting Physics education with a professional approach to make citizens that are scientifically tempered to invent and discover*

# Program Outcomes (POs) for Bachelor of Science

**PO 1: Domain Knowledge -** Acquire and apply knowledge of science in relevant areas.

**PO 2: Problem Analysis –** Recognize real-world problems and user's requirements to propose solutions for the same using basic principles of science.

**PO 3: Design and Development of Solutions –** Developing solutions and inferences for complex problems using critical and analytical thinking.

**PO 4: Investigation & Research** – Ability to formulate a hypothesis, augment research questions and identify & refer relevant sources for examining or inspecting technical issues as per their level of understanding and knowledge.

**PO 5: Use of Modern Techniques/Tools** – Use digital resources, various software/ platforms and appropriate techniques to interpret concepts of science.

**PO 6: Impact of Science on Society** – To prepare competent human resources and to develop scientific attitudes at local and global levels for social benefit.

**PO 7: Environment and Sustainability** – Apply the knowledge gained for conserving environment and to handle environmental issues with sustainable solutions.

**PO 8: Moral and Ethical Values** – Imbibe moral values and professional ethics to maintain integrality in a professional scenario while being aware of cultural diversities.

**PO 9: Individual and Team Work with Time Management** – Work productively in a team or as an individual while exhibiting time management skills.

**PO 10: Communication** – Develop the caliber to convey various concepts of science effectively.

**PO 11: Project Management and Finance** – Set up enterprises/companies and build entrepreneurship, project management and finance planning skills.

**PO 12: Life-long Learning** – Engage in the art of self-directed learning.

# List of BoS Members

| Sl.No | Category | Name & Designation | Address for Communication | Email & Mobile No. |
|---|---|---|---|---|
| 1 | Chairperson | Dr. Poornima S<br><br>Assistant Professor | Department of Physics SBRR Mahajana First Grade College (A), Jayalakshmipuram, Mysuru - 12 | psmks2@gmail.com<br><br>9844815838 |
| 2 | Nominee by the Vice Chancellor | Dr. Chandrashekar. M.S<br><br>Professor | DOS in Physics, Manasagangothri, Mysuru. | msc@physics.uni-mysore.ac.in mschandrashekara @gmail.com 9448600121 |
| 3 | Two Experts from Other University | Dr. Chethan Prathap K.N<br><br>Assistant Professor | Department of Physics<br><br>University College of Science Tumkur University, Tumkur. | cpforphysics@gmail. com<br><br>9686245523 |
| 4 | | Smt. Thejavathi N R<br><br>Assistant Professor | Department of Physics Govt. College (Autonomous) Mandya. | thejavathi@gmail.com<br><br>9481037230 |
| 5 | Member | Gayathri V<br><br>Assistant Professor | Department of Physics SBRR Mahajana First Grade College (A), Jayalakshmipuram, Mysuru - 12 | gayatrivasu94@gmail .com<br><br>9980859170 |
| 6 | Alumnus | Smt. M. Sushma Assistant Professor | Department of Physics Yuvaraja's College, Mysuru. | sushmamraju77@gmail .com<br><br>9986163654 |

# Course Structure (NEP 2020)

## Discipline Specific Courses (DSC)
## III Year

| Course type, code and Title | | Hours/week | | Credits | Maximum Marks | | | Maximum Marks | Total Marks |
|---|---|---|---|---|---|---|---|---|---|
| | | L | T/P | L:T:P | C1 | C2 | C3 | | |
| **Physics- V Sem** | | | | | | | | | |
| DSC(5) 232529 | Classical Mechanics-I and Quantum Mechanics-I | 4 | 0 | 4:0:2 6 credits | 20 | 20 | 60 | $2\frac{1}{2}$ hours | 150 |
| | DSC(5)-Lab | 0 | 4 | | 10 | 15 | 25 | 3 hours | |
| DSC(6) 232530 | Elements of Atomic, Molecular and Laser Physics | 4 | 0 | 4:0:2 6 credits | 20 | 20 | 60 | $2\frac{1}{2}$ hours | 150 |
| | DSC(6)-Lab | 0 | 4 | | 10 | 15 | 25 | 3 hours | |
| **Physics- VI Sem** | | | | | | | | | |
| DSC(7) 232629 | Elements of Condensed Matter and Nuclear Physics | 4 | 0 | 4:0:2 6 credits | 20 | 20 | 60 | $2\frac{1}{2}$ hours | 150 |
| | DSC(7)-Lab | 0 | 4 | | 10 | 15 | 25 | 3 hours | |
| DSC(8) 232630 | Electronic Instrumentation & Sensors | 4 | 0 | 4:0:2 6 credits | 20 | 20 | 60 | $2\frac{1}{2}$ hours | 150 |
| | DSC(8)-Lab | 0 | 4 | | 10 | 15 | 25 | 3 hours | |
| INT | Internship 23INTPHY01 | 2 | 0 | 2:0:0 2 credits | 50 | 50 | ---- | ---- | 100 |

# DSC(5) Syllabus for B.Sc. Physics (Basic and Honors)

## Semester V

| Course Code: 232529 | Course Title:<br>DSC(5)- Classical Mechanics-I and<br>Quantum Mechanics-I (Theory)<br>DSC(5)-Lab |
|---|---|
| Course Credits: 06 (4:0:2) | Hours of Teaching/Week:<br>04 (Theory) + 04 (Practical) |
| Total Contact Hours:<br>60 Hours (Theory)<br>60 Hours (Practical) | Formative Assessment Marks:<br>40 (Theory)<br>25 (Practical) |
| Exam Duration:<br>$2\frac{1}{2}$ Hours (Theory)<br>3 Hours (Practical) | Semester-End Examination Marks:<br>60 (Theory)<br>25 (Practical) |

| Course Outcomes (COs) | |
|---|---|
| CO1 | Comprehension of Newton's laws of motion, conservation momentum and energy. And to gain knowledge on constrains, degrees of freedom and harmonic oscillator. |
| CO2 | To gain knowledge on Hamiltonian mechanics. |
| CO3 | Identify the failure of classical physics at the microscopic level. Explain the minimum uncertainty of measuring both observables on any quantum state. |
| CO4 | Analyze the time-dependent and time-independent Schrödinger equation for simple potentials like for instance one-dimensional potential well and Harmonic oscillator. |

**Course Content**

| Content | Hrs |
|---|---|
| **Unit-1** | |
| **Introduction to Newtonian Mechanics**: Frames of references, Newton's laws of motion, inertial and non-inertial frames. Mechanics of a particle, Conservation of linear momentum, Angular momentum and torque, conservation of angular momentum, work done by a force, conservative force and conservative energy. <br><br> **Lagrangian formulation**: Constraints, Holonomic constraints, non-holonomic constraints, Scleronomic and Rheonomic constraints. Generalized coordinates, degrees of freedom, Principle of virtual work, D'Alembert's principle, Lagrange equations. Newton's equation of motion from Lagrange equations, simple pendulum, Atwood's machine and linear harmonic oscillator. | 12 Hrs |
| **Activity** | 3 Hrs |
| **Unit-2** | |
| **Variational principle:** Hamilton's principle, Deduction of Hamilton's principle, Lagrange's equation of motion from Hamilton's principle, Hamilton's principle for non-holonomic systems. <br><br> **Hamiltonian Mechanics**: The Hamiltonian of a system, Hamilton's equations of motion, Hamilton's equations from variational principle, Integrals of Hamilton's equations, energy integrals, Canonical Transformations, Poison Brackets, fundamental properties and equations of motion in Poison Brackets. | 12 Hrs |
| **Activity** | 3 Hrs |
| **Unit-3** | |
| **Introduction to Quantum Mechanics** <br> Brief discussion on failure of classical physics to explain black body radiation, Photoelectric effect, Compton effect, stability of atoms and spectra of atoms. <br> Compton scattering: Expression for Compton shift (With derivation). <br> Matter waves: de Broglie hypothesis of matter waves, Electron microscope, Wave description of particles by wave packets, Group and Phase velocities and relation between them, Experimental evidence for matter waves: Davisson- Germer experiment, G.P Thomson's experiment and its significance. <br> Heisenberg uncertainty principle: Elementary proof of Heisenberg's relation between momentum and position, energy and time, angular momentum and angular position, illustration of uncertainty principle by Gamma ray microscope thought experiment. Consequences of the | 12 Hrs |

| | |
|---|---|
| uncertainty relations: Diffraction of electrons at a single slit, why electron cannot exist in nucleus?<br>Two-slit experiment with photons and electrons. Linear superposition principle as a consequence. | |
| **Activity** | 3 Hrs |

## Unit-4

| | |
|---|---|
| **Foundation of Quantum Mechanics**<br>Probabilistic interpretation of the wave function - normalization and orthogonality of wave functions, Admissibility conditions on a wave function, Schrödinger equation: equation of motion of matter waves - Schrodinger wave equation for a free particle in one and three-dimension, time-dependent and time-independent wave equations, Probability current density, equation of continuity and its physical significance, Postulates of Quantum mechanics: States as normalized wavefunctions. Dynamical variables as linear Hermitian operators (position, momentum, angular momentum, and energy as examples). Expectation values of operators and their time evolution. Ehrenfest theorem (no derivation), Commutator brackets- Simultaneous Eigen functions, Commutator bracket using position, momentum and angular momentum operators.<br>Particle in a one-dimensional infinite potential well (derivation), degeneracy in three-dimensional case, particle in a finite potential well (qualitative), Transmission across a potential barrier, the tunnel effect (qualitative), scanning tunnelling microscope, One-dimensional simple harmonic oscillator (qualitative) - concept of zero - point energy. | 12 Hrs |
| **Activity** | 3 Hrs |

| **References** | |
|---|---|
| 1. | Classical Mechanics, H.Goldstein, C.P. Poole, J.L. Safko, 3rd Edn. 2002, Pearson Education. |
| 2. | Classical Mechanics: An introduction, Dieter Strauch, 2009, Springer |
| 3. | Classical Mechanics, G. Aruldhas, 2008, Prentice-Hall of India Private limited, New Delhi. |
| 4. | Classical Mechanics, Takwale and Puranik-1989, Tata Mcgraw Hill, new Delhi |
| 5. | Concepts of Modern Physics, Arthur Beiser, McGraw-Hill, 2009. |
| 6. | Physics for Scientists and Engineers with Modern Physics, Serway and Jewett, 9th edition, Cengage Learning, 2014. |
| 7. | Quantum Physics, Berkeley Physics Course Vol. 4. E.H. Wichman, Tata McGraw-Hill Co., 2008. |
| 8. | Six Ideas that Shaped Physics: Particle Behave like Waves, Thomas A. Moore, McGraw Hill, 2003. |
| 9. | P M Mathews and K Venkatesan, A Textbook of Quantum Mechanics, Tata McGraw Hill publication, ISBN: 9780070146174. |

| 10. | Ajoy Ghatak, S. Lokanathan, Quantum Mechanics: Theory and Applications, Springer Publication,ISBN 978-1-4020-2130-5. |
|-----|---|
| 11. | Modern Physics; R.Murugeshan & K.Sivaprasath; S. Chand Publishing. |
| 12. | G Aruldhas, Quantum Mechanics, Phi Learning Private Ltd., ISBN: 97881203363. |
| 13. | Gupta, Kumar & Sharma, Quantum Mechanics, Jai Prakash Nath Publications. |
| 14. | Physics for Degree Students B.Sc., Third Year, C.L.Arora and P.S.Hemne, 1st edition, S.Chand & Company Pvt. Ltd., 2014. |

## Web links

1. https://byjusexamprep.com/newtonian-mechanics-i
2. https://brilliant.org/wiki/lagrangian-formulation-of-mechanics/
3. https://profoundphysics.com/hamiltonian-mechanics-for-dummies/
4. https://www.insidescience.org/second-quantum-revolution?gclid=EAIaIQobChMIyILpt5iJgQMVFJlmAh1h3Au2EAAYAiAAEgK2YfD_BwE.
5. https://www.cambridge.org/core/elements/abs/foundations-of-quantum-mechanics/7D2F34BA2F54B51FBB33D557B2058D8E

**Activities**

1
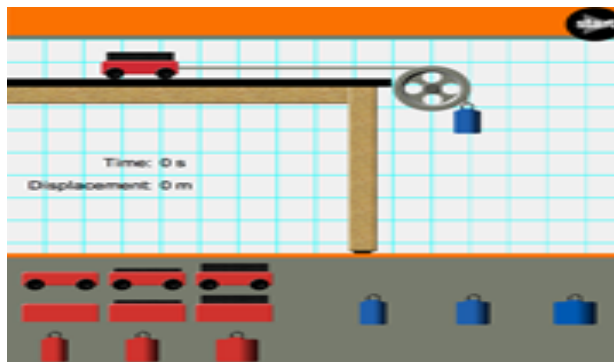


Atwood's Machine
Everyone is fascinated by pulleys. In this Interactive, learners will attach two objects together by a string and stretch the string over a pulley. Both an Atwood's machine and a modified Atwood's machine can be created and studies. Change the amount of mass on either object, introduce friction forces, and measure distance and time in order to calculate the acceleration.

Newton's Laws of Motion
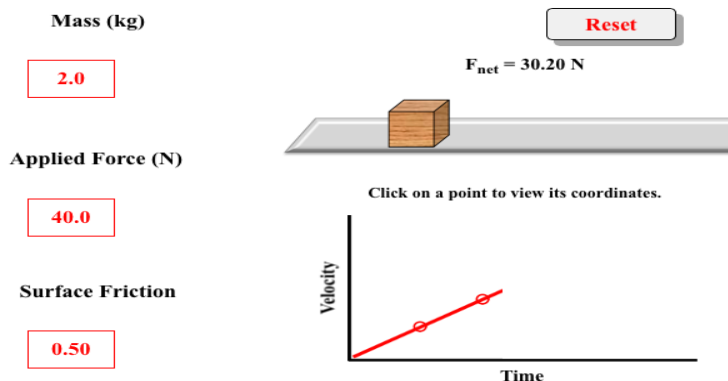


Force
When forces are unbalanced, objects accelerate. But what factors affect the amount of acceleration? This Interactive allows learners to investigate a variety of factors that affect the acceleration of a box pushed across a surface, The amount of applied force, the mass, and the friction can be altered. A plot of velocity as a function of time can be used to determine the acceleration.

In the Balloon Car Lesson Plan, students build and explore balloon-powered cars. This lesson focuses mostly on energy, but it also demonstrates Newton's laws of motion. Guidance is provided for talking specifically about the third law of motion. *Question*: how does the air escaping the balloon relate to Newton's third law of motion? Does the car continue to coast after the balloon is deflated? Why or why not?

Most of the activities and lessons below *focus* on one or two of the laws of motion. The Build a Balloon Car activity specifically **talks about all three of Newton's laws of motion** students can observe when building and experimenting with a simple balloon-powered car. This is an accessible hands-on activity that uses recycled materials and balloons for a fun combined engineering design project and physics experiment. The activity can be used with a wide range of grade levels to introduce and demonstrate the laws of motion. See the "Digging Deeper" section for a straightforward discussion of how each law of motion can be identified in the balloon car activity. (For a related lesson plan, see Balloon Car Lesson Plan, which is NGSS-aligned for middle school and focuses on the third law of motion.)

In the Push Harder — Newton's Second Law , students build their own cars using craft materials and get hands-on exploring Newton's second law of motion and the equation "force equals mass times acceleration" (F=ma). Options for gathering real-time data include using a mobile phone and a sensor app or using a meter stick and a stopwatch. *Questions*: What is the relationship between force, mass, and acceleration? As force increases, what happens to acceleration?

In the <u>Skydive Into Forces</u> , students make parachutes and then investigate how they work to slow down a falling object. As students investigate the forces that are involved, educators can introduce Newton's second law of motion and how different forces change the resulting speed of a falling object. *Questions*: What forces help slow down the speed of a falling object? How does a parachute help slow the fall?



| 2 | Both standard cameras (DSLRs, phone cameras) and our scientific cameras work on the principle of photoelectric effect to produce an image from light, involving the use of **photodetectors**and**sensor pixels. Prepare a report on the working of digital camera.** |
|---|---|
| 3 | Demonstration of Heisenberg uncertainty principle in the context of diffraction at a single slit:<br>The uncertainty in the momentum $\Delta p_x$ correspond to the angular spread of principal maxima $\Theta$.<br>Then, $\Delta p_x = \sin\theta . p$ where $p$ is the momentum of the incident photon.<br>     Conduct the diffraction at a slit experiment virtually using the following link<br>*https://www.walter-fendt.de/html5/phen/singleslit_en.htm*<br><br>**1.** Measure the angular spread ($\Theta$) for different slit widths ($\Delta x$) for given wavelength of the incident photon.<br>**2.** Determine the momentum of the incident photon using<br>$$p = \frac{h}{\lambda}$$<br>**3.** Create a line of best fit through the points in the plot $\frac{1}{\Delta p_x}$ against $\Delta x$ and find its slope. How this exercise is related to Heisenberg Uncertainty principle.<br>Make a report of the observations. |
| 4 | Virtual lab to demonstrate Photoelectric effect using *Value@Amritha*:Conduct the virtual experiment using the following link |

| | |
|---|---|
| | <br><br>1.   Determine the minimum frequency required to have Photoelectric effect for an EM radiation, when incident on a zinc metal surface.<br>2.   Determine the target material if the threshold frequency of EM radiation is $5.5 \times 10^{15}$ Hz in a particular photoelectric experimental set up.<br>3.   Determine the maximum kinetic energy of photo-electrons emitted from a Zinc metal surface, if the incident frequency is $3 \times 10^{15}$ Hz.<br>**4.**   What should be the stopping potential for photoelectrons if the target Material used is Platinum and incident frequency is $2 \times 10^{15}$ Hz? Make a report of the calculations. |
| 5 | Visualization of wave packets using Physlet@Quantum Physics:<br>The concept of group velocity and phase velocity of a wave packet can be studied using thislink https://www.compadre.org/PQP/quantum-need/section5_9.cfm<br>Students can take up the exercises using the link which is as followshttps://www.compadre.org/PQP/quantum-need/prob5_11.cfm<br>Six different classical wave packets are shown in the animations. Which of the wave packets have a phase velocity that is: greater than / less than / equal to the group velocity? Make a report of the observations. |
| 6 | Superposition of eigen states in an infinite one - dimensional potential well using QuVis (Quantum Mechanics Visualization Project):<br>Construct different possible states by considering the first three eigen states and study the variation of probability density with position. Take the challenges after understanding the simulation and submit the report. The link is as follows https://www.standrews.ac.uk/physics/quvis/simulations_html5/sims/SuperpositionStates/SuperpositionStates.html |
| 7 | Determination of expectation values of position, momentum for a particle in a an infinite one - dimensional potential well using Physlet@Quantum Physics:<br>The link to the visualization tool for the calculation is as follows<br><br>https://www.compadre.org/PQP/quantum-theory/prob10_3.cfm<br>A particle is in a one-dimensional box of length $L = 1$. The states shown are normalized. The results of the integrals that give $<x>$ and $<x^2>$ and $<p>$ and $<p^2>$. You may vary $n$ from 1 to 10.<br>a) What do you notice about the values of $<x>$ and $<x^2>$ as you vary $n$?<br>b) What do you think $<x^2>$ should become in the limit of $n \rightarrow \infty$? Why?<br>c) What do you notice about the values of $<p>$ and $<p^2>$ as you vary $n$?<br>Make a report of the calculations. |
| 8 | Determination of expectation values for a particle in a one-dimensional harmonic oscillator using Physlet@Quantum Physics:<br>The link to the visualization tool for the calculation is as follows<br>https://www.compadre.org/PQP/quantum-theory/prob12_2.cfm<br>A particle is in a one-dimensional harmonic oscillator potential ($\hbar = 2m = 1$; $\omega = k = 2$). The states shown are normalized. Shown are $\psi$ and the results of the |

|   | integrals that give $\langle x \rangle$ and $\langle x^2 \rangle$ and $\langle p \rangle$ and $\langle p^2 \rangle$. Vary $n$ from 1 to 10. |
|---|---|
|   | a) What do you notice about how $\langle x \rangle$ and $\langle x^2 \rangle$ and $\langle p \rangle$ and $\langle p^2 \rangle$ change? <br> b) Calculate $\Delta x \cdot \Delta p$ for $n = 0$. What do you notice considering $\hbar = 1$? <br> c) What is $E_n$? How does this agree with or disagree with the standard case for the harmonic oscillator? <br> d) How much average kinetic and potential energies are in an arbitrary energy state? Make a report of the calculations. |
| 9 | Calculate uncertainties of position and momentum for a particle in a boxusing Physlet@ Quantum Physics: <br> The link to the visualization tool for the calculation is as follows <br> https://www.compadre.org/PQP/quantum-theory/prob6_3.cfm <br> A particle is in a one-dimensional box of length $L = 1$. The states shown are normalized. The results of the integrals that give $\langle x \rangle$ and $\langle x^2 \rangle$, and $\langle p \rangle$ and $\langle p^2 \rangle$. You may vary $n$ from 1 to 10. <br><br> a. For $n = 1$, what are $\Delta x$ and $\Delta p$? <br> b. For $n = 10$, what are $\Delta x$ and $\Delta p$? |
| 10 | Write expressions for the three wave functions using Physlet@Quantum Physics: <br> The link to the visualization tool for the calculation is as follows <br> https://www.compadre.org/PQP/quantum-theory/prob8_1.cfm <br><br> These animations show the real (blue) and imaginary (pink) parts of three time-dependent energy eigen functions. Assume $x$ is measured in cm and time is measured in seconds. <br><br> a. Write an expression for each of the three time-dependent energy Eigen functions in the form: $e^{i(kx - wt)}$. <br> b. What is the mass of the particle? <br> c. What would the mass of the particle be if time was being shown in ms? <br> Make a report of the calculations. |
| 11 | If you store a file on your computer today, you probably store it on a solid-state drive (SSD), Make a detailed report on the role of quantum tunnelling in these devices. |

## DSC(5) lab
## List of Experiments  Credit : L:T:P
0:0:2

**(Minimum EIGHT experiments must be completed)**

| Sl.No | Experiments |
|---|---|
| 1. | To determine 'g', the acceleration due to gravity, at a given place, from the $L - T^2$ graph, for a simple pendulum. |
| 2. | Studying the effect of mass of the bob on the time period of the simple pendulum. |
| 3. | Studying the effect of amplitude of oscillation on the time period of the simple pendulum. |
| 4. | Determine the acceleration of gravity is to using a Fly Wheel. |
| 5. | Verification of the Principle of Conservation of Linear Momentum. |
| 6. | To study the spectral characteristics of a photo-voltaic cell (Solar cell). |
| 7. | To study the characteristics of solar cell. |
| 8. | To find the value of e/m for an electron by Thomson's method using bar magnets. |
| 9. | Determination of quantum efficiency of Photodiode. |
| 10. | Determination of electron charge 'e' by Millikan's Oil drop experiment. |

| | References |
|---|---|
| 1. | B.Sc Practical Physics by C.L Arora. |
| 2. | B.Sc Practical Physics by Harnam Singh and P.S Hemne. |
| 3. | Practical Physics by G.S Squires. |
| 4. | Scilab Manual for CC-XI: Quantum Mechanics &Applications (32221501) by Dr Neetu Agrawal, Daulat Ram College of Delhi. |
| 5. | Scilab Textbook Companion for Quantum Mechanics by M. C. Jain. |
| 6. | Computational Quantum Mechanics using Scilab, BIT Mesra. |
| 7. | Advanced Practical Physics for Students by Worsnop B L and Flint H T. |

| Course Articulation Matrix- course code-232529 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course outcomes | Program outcomes | | | | | | | | | | | |
| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
| CO1 | 3 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 |
| CO2 | 3 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 1 | ___ | 1 |
| CO3 | 3 | 3 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | ___ | 1 |
| CO4 | 3 | 3 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 |
| Weighted average | 3 | 2.5 | 1 | 1.25 | 2 | 2 | 2 | 1 | 2 | 1.5 | 1 | 1.25 |

# DSC(6) Syllabus for B.Sc. Physics (Basic and Honors)

**Semester V**

| Course Code: 232530 | Course Title:<br>DSC(6)- Elements of Atomic, Molecular and Laser Physics (Theory)<br>DSC(6)-Lab |
|---|---|
| **Course Credits:** 06 (4:0:2) | **Hours of Teaching/Week:**<br>04 (Theory) + 04 (Practical) |
| **Total Contact Hours:**<br>60 Hours (Theory)<br>60 Hours (Practical) | **Formative Assessment Marks:**<br>40 (Theory)<br>25 (Practical) |
| **Exam Duration:**<br>$2\frac{1}{2}$ Hours (Theory)<br>3 Hours (Practical) | **Semester-End Examination Marks:**<br>60 (Theory)<br>25 (Practical) |

| | Course Outcomes (COs) |
|---|---|
| **CO1** | Gain knowledge on various atomic models and implementing it for experimental methods. |
| **CO2** | Interpretation of atomic spectra of elements using vector atom model. |
| **CO3** | Implementing molecular spectra of compounds using basics of molecular physics. |
| **CO4** | Gaining knowledge on laser systems and their applications in various fields. |

**Course Content**

| Content | Hrs |
|---|---|
| **Unit-1- Basic Atomic models** | |
| Thomson's atomic model; Rutherford atomic model – Model, Theory of alpha particle scattering, Rutherford scattering formula; Bohr atomic model – postulates, Derivation of expression for radius, total energy of electron; Origin of the spectral lines; Spectral series of hydrogen atom; Effect of nuclear motion on atomic spectra - derivation; Ritz combination principle; Correspondence principle; Critical potentials – critical potential, excitation potential and ionisation potential; Atomic excitation and its types, Franck-Hertz experiment; Sommerfeld's atomic model – model, Derivation of condition for allowed elliptical orbits. | 12 Hrs |
| **Activity**<br>  1. Students to estimate radii of orbits and energies of electron in case of hydrogen atom in different orbits and plot the graph of radii / energy versus principal quantum number 'n'. Analyze the nature of the graph and draw the inferences.<br>  **2.** Students to search critical, excitation and ionisation potentials of different elements and plot the graph of critical /excitation / ionisation potentials versus atomic number/mass number/neutron number of element. Analyze the nature of the graph and draw the inferences. | 3 Hrs |
| **Unit-2- Vector atomic model and optical spectra** | |
| Vector atom model – model fundamentals, spatial quantisation, spinning electron; Quantum numbers associated with vector atomic model; Coupling schemes – L-S and j-j schemes; Pauli's exclusion principle; Magnetic dipole moment due to orbital motion of electron – derivation; Magnetic dipole moment due to spin motion of electron; Lande g-factor and its calculation for different states; Stern-Gerlach experiment – Experimental arrangement and Principle; Fine structure of spectral lines with examples; Spin-orbit coupling/Spin-Orbit Interaction – qualitative; Optical spectra – spectral terms, spectral notations, selection rules, intensity rules; Fine structure of the sodium D-line; Zeeman effect: Types, Experimental study and classical theory of normal Zeeman effect, Zeeman shift expression (no derivation), examples; Stark effect: Experimental study, Types and examples. | 12 Hrs |
| **Activity** | 3 Hrs |

| | |
|---|---|
| 1. Students to couple a p-state and s-state electron via L-S and j-j coupling schemes for a system with two electrons and construct vector diagrams for each resultant. Analyze the coupling results and draw the inferences. <br><br> **2.** Students to estimate magnetic dipole moment due to orbital motion of electron for different states $^2P_{1/2}$, $^2P_{3/2}$, $^2P_{5/2}$, $^2P_{7/2}$, $^2P_{9/2}$ and $^2P_{11/2}$ and plot the graph of dipole moment versus total orbital angular momentum "J". Analyze the nature of the graph and draw the inferences. | |

### Unit-3- Molecular Physics

| | |
|---|---|
| Types of molecules based on their moment of inertia; Types of molecular motions and energies; Born-Oppenheimer approximation; Origin of molecular spectra; Nature of molecular spectra; Theory of rigid rotator – energy levels and spectrum, Qualitative discussion on Non-rigid rotator and centrifugal distortion; Theory of vibrating molecule as a simple harmonic oscillator – energy levels and spectrum; Electronic spectra of molecules – fluorescence and phosphorescence; Raman effect – Stoke's and anti-Stoke's lines, characteristics of Raman spectra, classical and quantum approaches, Experimental study of Raman effect; Applications of Raman effect. | 12 Hrs |
| **Activity** <br> 1. Students to estimate energy of rigid diatomic molecules CO, HCl and plot the graph of rotational energy versus rotational quantum number 'J'. Analyse the nature of the graph and draw the inferences. Also students study the effect of isotopes on rotational energies. <br> **2.** Students to estimate energy of harmonic vibrating molecules CO, HCl and plot the graph of vibrational energy versus vibrational quantum number 'v'. Analyse the nature of the graph and draw the inferences. | 3 Hrs |

### Unit-4 -Laser Physics

| | |
|---|---|
| Ordinary light versus laser light; Characteristics of laser light; Interaction of radiation with matter - Induced absorption, spontaneous emission and stimulated emission with mention of rate equations; Einstein's A and B coefficients – Derivation of relation between Einstein's coefficients and radiation energy density; Possibility of amplification of light; Population inversion; Methods of pumping; Metastable states; Requisites of laser – energy source, active medium and laser cavity; Difference between Three level and four level lasers with examples; Types of lasers with examples; Construction and Working principle of Ruby Laser and He-Ne Laser; Application of lasers (qualitative) in science & research, isotope separation, communication, fusion, medicine, industry, war and space. | 12 Hrs |
| **Activity** | 3 |

| | Hrs |
|---|---|
| 1. Students to search different lasers used in medical field (ex: eye surgery, endoscopy, dentistry etc.), list their parameters and analyse the need of these parameters for specific application, and draw the inferences. Students also make the presentation of the study. **2.** Students to search different lasers used in defense field (ex: range finding, laser weapon, etc.), list their parameters and analyse the need of these parameters for specific application, and draw the inferences. Students also make the presentation of the study. | |

| **References** |
|---|
| 1. Modern Physics, R. Murugeshan, Kiruthiga Sivaprakash, Revised Edition, 2009, S. Chand & Company Ltd. |
| 2. Atomic & Molecular spectra: Laser, Raj Kumar, Revised Edition, 2008, Kedar Nath Ram Nath Publishers, Meerut. |
| 3. Atomic Physics, S.N. Ghoshal, Revised Edition, 2013, S. Chand & Company Ltd. |
| 4. Concepts of Atomic Physics, S.P. Kuila, First Edition, 2018, New Central Book Agency (P) Ltd. |
| 5. Concepts of Modern Physics, Arthur Beiser, Seventh Edition, 2015, Shobhit Mahajan, S. Rai Choudhury, 2002, McGraw-Hill. |
| 6. Fundamentals of Molecular Spectroscopy, C.N. Banwell and E.M. McCash, Fourth Edition, 2008, Tata McGraw-Hill Publishers. |
| 7. Elements of Spectroscopy – Atomic, Molecular and Laser Physics, Gupta, Kumar and Sharma, 2016, Pragati Publications. |

## Web links

1. https://byjus.com/jee/atomic-structure/
2. https://chem.libretexts.org/Courses/Furman_University/CHM101%3A_Chemistry_and_Global_Awareness_(Gordon)/03%3A_Atoms_and_the_Periodic_Table/3.01%3A_Basic_Atomic_Theory
3. https://handwiki.org/wiki/Physics:Vector_model_of_the_atom
4. https://www.tandfonline.com/toc/tmph20/current
5. https://byjus.com/physics/laser/

# DSC(6) lab
## List of Experiments          Credit : L:T:P
### 0:0:2

**(Minimum EIGHT experiments must be completed)**

| Sl.No | Experiments |
|-------|-------------|
| 1 | To determine Planck's constant using Photocell. |
| 2 | To determine Planck's constant using LED. |
| 3 | To determine wavelength of spectral lines of mercury source using spectrometer. |
| 4 | To determine the value of Rydberg's constant using diffraction grating and hydrogen discharge tube. |
| 5 | To determine the wavelength of H-alpha emission line of Hydrogen atom. |
| 6 | To determine wavelength of He-Ne laser using plane diffraction grating. |
| 7 | To determine the ionization potential of Xenon. |
| 8 | To determine the wavelength of laser using diffraction by single slit/double slits. |
| 9 | To determine the diameter of the given wire by LASER diffraction. |
| 10 | To determine angular spread of He-Ne laser using plane diffraction grating. |

| References | |
|---|---|
| 1 | Practical Physics, D.C. Tayal, First Millennium  Edition, 2000, Himalaya Publishing House. |
| 2 | B.Sc. Practical Physics, C.L. Arora, Revised Edition,  2007, S. Chand & Comp.Ltd. |
| 3 | An Advanced Course in Practical Physics, D. Chatopadhyaya, P.C. Rakshith, B. Saha, Revised Edition, 2002, New Central Book Agency Pvt. Ltd. |
| 4 | Physics through experiments, B. Saraf, 2013, Vikas Publications. |

| Course Articulation Matrix- course code-232530 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Course outcomes** | **Program outcomes** | | | | | | | | | | | |
| | **PO 1** | **PO 2** | **PO 3** | **PO 4** | **PO 5** | **PO 6** | **PO 7** | **PO 8** | **PO 9** | **PO 10** | **PO 11** | **PO 12** |
| **CO1** | 3 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 2 |
| **CO2** | 3 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 2 |
| **CO3** | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 |
| **CO4** | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 1 | 2 | 2 | 2 | 2 |
| **Weighted average** | 3 | 2 | 1.5 | 1.25 | 2 | 2.25 | 2 | 1 | 2 | 1.5 | 2 | 2 |

## DSC(7) Syllabus for B.Sc. Physics (Basic and Honors)

**Semester VI**

| Course Code: 232629 | Course Title: DSC(7)- Elements of Condensed Matter & Nuclear Physics (Theory) DSC(7)-Lab |
|---|---|
| Course Credits: 06 (4:0:2) | Hours of Teaching/Week: 04 (Theory) + 04 (Practical) |
| Total Contact Hours: 60 Hours (Theory) 60 Hours (Practical) | Formative Assessment Marks: 40 (Theory) 25 (Practical) |
| Exam Duration: $2\frac{1}{2}$ Hours (Theory) 3 Hours (Practical) | Semester-End Examination Marks: 60 (Theory) 25 (Practical) |

| | Course Outcomes (COs) |
|---|---|
| CO1 | Acquiring the knowledge on Crystal systems , X-rays and free electron theory of metals |
| CO2 | Comprehending the knowledge of magnetism, dielectrics and superconductivity. |
| CO3 | Analyzing the processes of alpha, beta and gamma decays based on well-established theories. |
| CO4 | Gaining knowledge about the basic aspects of interaction of gamma radiation with matter by photoelectric effect, Compton scattering and pair production and to differentiate nuclear radiation detectors such as ionization chamber, Geiger-Mueller counter etc. |

**Course Content**

| Content | Hrs |
|---|---|
| **Unit-1** | |
| **Crystal systems and X-rays:** Crystal structure**:** Space Lattice, Lattice translational vectors, Basis of crystal structure, Types of unit cells, primitive, non-primitive cells.. Seven crystal system, Coordination numbers, Miller Indices, Expression for inter planner spacing. **X Rays**: Production and properties of X rays, Coolidge tube, Continuous and characteristic X-ray spectra; Moseley's law. **X-Ray diffraction**, Scattering of X-rays, Bragg's law. <br> **Crystal diffraction:** Bragg's X-ray spectrometer- powder diffraction method, Intensity vs $2\theta$ plot (qualitative). <br> **Free electron theory of metals:** Classical free electron model (Drude-Lorentz model), expression for electrical and thermal conductivity, Weidman-Franz law, Failure of classical free electron theory; Quantum free electron theory, Fermi level and Fermi energy, Fermi-Dirac distribution function (expression for probability distribution F(E), statement only); Fermi Dirac distribution at T=0 and E<$E_f$, at T$\neq$ 0 and E>$E_f$, F(E) vs E plot at T = 0 and T$\neq$ 0. Density of states for free electrons (statement only, no derivation). Qualitative discussion of lattice vibration and concept of Phonons.; Specific heats of solids: Classical theory, Einstein's and Debye's theory of specific heats. Hall Effect in metals. | 12 Hrs |
| **Activity** | 3 Hrs |
| **Unit-2** | |
| **Magnetic Properties of Matter** <br> Review of basic formulae: Magnetic intensity, magnetic induction, permeability, magnetic susceptibility, magnetization (M), Classification of Dia, Para, and ferro magnetic materials; Langevin Classical Theory of dia – and Paramagnetism. Curie's law, Ferromagnetism and Ferromagnetic Domains (qualitative). Discussion of B-H Curve. Hysteresis and Energy Loss, Hard and Soft magnetic materials <br> **Dielectrics**: Static dielectric constant, polarizability (electronic, ionic and orientation), calculation of Lorentz field (derivation), Clausius-Mosotti equation (derivation), dielectric loss. Piezo electric effect, cause, examples and applications. <br> **Superconductivity:** Definition, Experimental results – Zero resistivity and Critical temperature– The critical magnetic field – Meissner effect, Type I and type II superconductors. | 12 Hrs |
| **Activity** | 3 Hrs |

| Unit-3 | |
|---|---|
| **General Properties of Nuclei**: Constituents of nucleus and their intrinsic properties, quantitative facts about mass, radii, charge density (matter density), binding energy, main features of binding energy versus mass number curve, angular momentum, parity, magnetic moment, electric moments | 12 Hrs |
| **Radioactivity decay:** Radioactivity: definition of radioactivity, half-life, mean life,radioactivity equilibrium (a) Alpha decay: basics of α-decay processes, theory of α emission (brief), Gamow factor, Geiger-Nuttall law. (b) β-decay: energy kinematics for β-decay, positron emission, electron capture, neutrino hypothesis. (c) Gamma decay: Gamma rays' emission & kinematics, internal conversion (Definition). | |
| **Activity** | 3 Hrs |
| **Unit-4** | |
| **Interaction of Nuclear Radiation with matter**: Gamma ray interaction through matter, photoelectric effect, Compton scattering, pair production, Energy loss due to ionization (quantitative description of Bethe Block formula), energy loss of electrons, introduction of Cerenkov radiation | 12 Hrs |
| **Detector for Nuclear Radiations**: Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter. Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT). Semiconductor Detectors (Si and Ge) for charge particle and photon detection (concept of charge carrier and mobility) qualitative only, Accelerators: Cyclotrons and Synchrotrons. | |
| **Activity** | 3Hrs |

| References | |
|---|---|
| 1 | Solid State Physics-R. K. Puri and V.K. Babber., S.Chand publications,1$^{st}$ Edition(2004). |
| 2 | Fundamentals of Solid State Physics-B.S.Saxena,P.N. Saxena,Pragati prakashan Meerut(2017). |
| 3 | Introductory nuclear Physics by Kenneth S. Krane (Wiley India Pvt. Ltd., 2008). |
| 4 | Nuclear Physics, Irving Kaplan, Narosa Publishing House |
| 5 | Introductiontosolid StatePhysics,*CharlesKittel*, VIIedition, (**1996**) |
| 6 | Solid State Physics-**A JDekker**, MacMillanIndia Ltd, (**2000**) |
| 7 | Essentialof crystallography,**MA Wahab**, Narosa Publications (**2009)** |
| 8 | Solid State Physics-**SO Pillai**-New Age Int. Publishers(**2001**). |
| 9 | Concepts of nuclear physics by Bernard L. Cohen. (Tata McGraw Hill, 1998). |
| 10 | Introduction to the physics of nuclei & particles, R.A. Dunlap. (Thomson Asia, 2004). |

| 11 | Introduction to High Energy Physics, D.H. Perkins, Cambridge Univ. Press |
|---|---|
| 12 | Basic ideas and concepts in Nuclear Physics - An Introductory Approach by K. Heyde (Institute of Physics (IOP) Publishing, 2004). |
| 13 | Radiation detection and measurement, G.F. Knoll (John Wiley & Sons, 2000). |

## Web links

1. https://en.wikipedia.org/wiki/X-ray_crystallography
2. https://semesters.in/free-electron-theory/
3. https://www.vedantu.com/physics/magnetic-properties-of-matter
4. https://byjus.com/physics/radioactive-decay/
5. https://chem.libretexts.org/Bookshelves/General_Chemistry/Book%3A_General_Chemistry%3A_Principles_Patterns_and_Applications_(Averill)/24%3A_Nuclear_Chemistry/24.04%3A_The_Interaction_of_Nuclear_Radiation_with_Matter#:~:text=1%20Radiation%20Damage%20When%20high,such%20as%20ductility%20or%20color.

| | Suggested Activities |
|---|---|
| **1** | Students to construct seven crystal systems with bamboo sticks and rubber bands. Use foam ball as atoms and study the BCC and FCC systems. |
| **2** | Students to search the characteristic X ray wavelength of different atoms/elements and plot characteristic wavelength vs atomic number and analyse the result and draw the inference. |
| **3** | Magnetic field lines are invisible. Students to trace the magnetic field lines using bar magnet and needle compass. https://nationalmaglab.org/magnet-academy/try-this-at-home/drawing-magnetic-field-lines/ |
| **4** | Using vegetable oil and iron fillings students to make ferrofluids and see how it behaves in the presence of magnetic field. https://nationalmaglab.org/magnet-academy/try-this-at-home/making-ferrofluids/ |
| **5** | Study the decay scheme of selected alpha, beta & gamma radioactive sources with the help of standard nuclear data book. |
| **6** | Calculate binding energy of some selected light, medium and heavy nuclei. Plot the graph of binding energy versus mass number A |
| **7** | Study the decay scheme of standard alpha, beta and gamma sources using nuclear data book. |
| **8** | Make the list of alpha emitters from Uranium series and Thorium series. |

| | |
|---|---|
| | Search the kinetic energy of alpha particle emitted by these alpha emitters. Collect the required data such as half life or decay constant. Verify Geiger-Nuttal in each series. |
| **9** | Study the Z dependence of photoelectric effect cross section. |
| **10** | Study the Z dependence of common cross section for selected gamma energies and selected elements through theoretical calculation. |
| **11** | List the materials and their properties which are used for photocathode of PMT. |
| **12** | Study any two types of PMT and their advantages and disadvantages. |

# DSC(7) lab
## List of Experiments
### Credit : L:T:P 0:0:2

**(Minimum EIGHT experiments must be completed)**

| Sl.No | Experiments |
|-------|-------------|
| 1 | Energy gap of semiconductor by using meter bridge board. |
| 2 | Temperature coefficient of resistance of a Thermistor |
| 3 | Analysis of X-ray diffraction spectra and calculation of lattice parameter. |
| 4 | Determination of Dielectric Constant of solid |
| 5 | B-H Curve Using CRO. |
| 6 | Study of inverse square law of gamma rays using GM tube. |
| 7 | Study the characteristics of Geiger-Mùller Tube. Determine the threshold voltage, plateau region and operating voltage. |
| 8 | Study the absorption of beta particles in aluminium foils using GM counter. Determine mass attenuation coefficient of Aluminium foils. |
| 9 | Study the attenuation of gamma rays in lead foils using Cs-137 source and G M counter. Calculate mass attenuation coefficient of Lead for Gamma. |
| 10 | Determine the end point energy of Tl-204 source by studying the absorption of beta particles in aluminium foils. |

| References | |
|------------|---|
| 1 | IGNOU: Practical PhysicsManual |
| 2 | Saraf : ExperimentinPhysics, VikasPublications |
| 3 | S.P. Singh : Advanced Practical Physics |
| 4 | Melissons : ExperimentsinModern Physics |
| 5 | Misra and Misra, PhysicsLab.Manual, South Asianpublishers, (**2000**) |
| 6 | Gupta and Kumar, Practical physics, Pragatiprakashan, (**1976**) |

| Course Articulation Matrix- course code-232629 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Course outcomes** | Program outcomes | | | | | | | | | | | |
| | **PO 1** | **PO 2** | **PO 3** | **PO 4** | **PO 5** | **PO 6** | **PO 7** | **PO 8** | **PO 9** | **PO 10** | **PO 11** | **PO 12** |
| **CO1** | 3 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 2 |
| **CO2** | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 |
| **CO3** | 3 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 |
| **CO4** | 3 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 |
| **Weighted average** | 3 | 2 | 1.25 | 1 | 2 | 2 | 2 | 1 | 1.75 | 1.5 | 1 | 2 |

# DSC(8) Syllabus for B.Sc. Physics (Basic and Honors)

## Semester VI

| | |
|---|---|
| **Course Code:** 232630 | **Course Title:** DSC(8)- Electronic Instrumentation and Sensors (Theory) DSC(8)-Lab |
| **Course Credits:** 06 (4:0:2) | **Hours of Teaching/Week:** 04 (Theory) + 04 (Practical) |
| **Total Contact Hours:** 60 Hours (Theory) 60 Hours (Practical) | **Formative Assessment Marks:** 40 (Theory) 25 (Practical) |
| **Exam Duration:** $2\frac{1}{2}$ Hours (Theory) 3 Hours (Practical) | **Semester-End Examination Marks:** 60 (Theory) 25 (Practical) |

| | Course Outcomes (COs) |
|---|---|
| **CO1** | Identifying the different types of tests and measuring instruments used in practice and understand their basic working principles. |
| **CO2** | Comprehending and giving a mathematical treatment of the working of rectifiers, filter, data converters and different types of transducers. |
| **CO3** | Implementation and understanding the data conversion and to analyze its output display. |
| **CO4** | Gaining the knowledge about the different types of transducers and sensors. |

**Course Content**

| Content | Hrs |
|---|---|
| **Unit-1** | |
| **Power supply**<br>AC power and its characteristics, Single phase and three phase, Need for DC power supply and its characteristics, line voltage and frequency, Rectifier bridge, Filters: Capacitor and inductor filters, L-section and $\pi$-section filters, ripple factor, electronic voltage regulators, stabilization factor, voltage regulation using ICs.<br><br>**Basic electrical measuring instruments**<br>Cathode ray oscilloscope- Block diagram, basic principle, electron beam, CRT features, signal display. Basic elements of digital storage oscilloscopes. Basic DC voltmeter for measuring potential difference, Extending Voltmeter range, AC voltmeter using rectifiers. Basic DC ammeter, requirement of a shunt, Extending of ammeter ranges.<br><br>**Topics for self-study:**<br><br>Average value and RMS value of current, Ripple factor, Average AC input power and DC output power, efficiency of a DC power supply. Multirange voltmeter and ammeter. | 12 Hrs |
| **Activity**<br><br>Design and wire your own DC regulated power supply. Power output: 5 V, 10 V, ± 5 V.<br>Components required: A step down transformer, semiconductor diodes (BY126/127), Inductor, Capacitor, Zener diode or 3-pin voltage regulator or IC. Measure the ripple factor and efficiency at each stage. Tabulate the result.<br><br>1. Extend the range of measurement of voltage of a voltmeter (analog or digital) using external component and circuitry. Design your own circuit and report.<br>2. Measure the characteristics of the signal waveform using a CRO and function generator. Tabulate the frequency and time period. Learn the function of Trigger input in an CRO.<br>3. Learn to use a Storage Oscilloscope for measuring the characteristics of a repetitive input signal. Convince yourself how signal averaging using Storage CRO improves S/N ratio. | 3Hrs |

| Unit-2 | |
|---|---|
| **Wave form generators and Filters**<br>Basic principle of standard AF signal generator:  Fixed frequency and variable frequency, AF sine and square wave generator, basic Wein-bridge network and oscillator configuration, Triangular and saw tooth wave generators, circuitry and waveforms.<br><br>Passive and active filters. Fundamental theorem of filters, Proof of the theorem by considering a symmetrical T-network. Types of filters, Circuitry and Cut-off frequency and frequency response of Passive (RC) and Active (op-amp based) filters:  Low pass, high pass and band pass. | 12 Hrs |
| **Activity**<br>    1.  Measure the amplitude and frequency of the different waveforms and tabulate the results.<br>        Required instruments: A 10 MHz oscilloscope, Function generators (sine wave and square wave).<br>    2.  Explore where signal filtering network is used in real life. Visit a nearby telephone exchange and discuss with the Engineers and technicians. Prepare a report.<br>    3.  Explore op-amp which works from a single supply biasing voltage (+15V). Construct an inverting/non-inverting amplifier powered by a single supply voltage instead of dual or bipolar supply voltage.<br>    4.  Op-amp is a linear (analog) IC. Can it be used to function as logic gates? Explore, construct and implement AND, OR NAND and NOR gate functions using op-amps.<br>Verify the truth table. Hint: LM3900 op-amp may be used. The status of the output may be checked by LED. | 3 Hrs |
| Unit-3 | |
| **Data Conversion and display**<br>Digital to Analog (D/A) and Analog to Digital (A/D) converters – A/D converter with pre-amplification and filtering. D/A converter - Variable resistor network, Ladder type (R-2R) D/A converter, Op-amp based D/A converter.<br>Digital display systems and Indicators- Classification of displays, Light Emitting Diodes (LED) and Liquid Crystal Display (LCD) – Structure and working.<br>Data Transmission systems – Advantages and disadvantages of digital transmission over analog transmission, Pulse amplitude modulation (PAM), Pulse time modulation (PTM) and Pulse width modulation (PWM)- General principles. Principle of Phase Sensitive Detection (PSD).<br><br>Topic for self-study: Lock-in amplifier and its application, phase locked loop. | 12 Hrs |

| | |
|---|---|
| **Activity** | 3 |
| 1. Explore where modulation and demodulation technique is employed in real life. Visit a Radio broadcasting station. (Aakashavani or Private). Prepare a report on different AM and FM stations. | Hrs |
| 2. Explore and find out the difference between a standard op-amp and an instrumentation op-amp. Compare the two and prepare a report. | |

## Unit-4

| | |
|---|---|
| **Transducers and sensors** | 12 |
| Definition and types of transducers. Basic characteristics of an electrical transducer, factors governing the selection of a transducer, Resistive transducer-potentiometer, Strain gauge and types (general description), Resistance thermometer-platinum resistance thermometer. Thermistor. Inductive Transducer-general principles, Linear Variable Differential Transducer (LDVT)- principle and construction, Capacitive Transducer, Piezo-electric transducer, Photoelectric transducer, Photovoltaic cell, photo diode and phototransistor – principle and working. | Hrs |

| | |
|---|---|
| **Activity** | 3 |
| 1. Construct your own thermocouple for the measurement of temperature with copper and constantan wires. Use the thermocouple and a Digital multimeter (DMM). Record the emf (voltage induced) by maintaining one of the junctions at a constant temperature (say at $0^{o}$ C, melting ice) and another junction at variable temperature bath. Tabulate the voltages induced and temperatures read out using standard chart (Chart can be downloaded from the internet). | Hrs |
| 2. Observe a solar water heater. Some solar water heaters are fitted with an anode rod (alloy of aluminium). Study why it is required. Describe the principle behind solar water heater. | |

| | References |
|---|---|
| 1 | Physics for Degree students (Third Year) – C.L. Arora and P.S. Hemne, S, Chand and Co. Pvt. Ltd. 2014 (For Unit-1, Power supplies) |
| 2 | Electronic Instrumentation, 3$^{rd}$ Edition, H.S. Kalsi, McGraw Hill Education India Pvt. Ltd. 2011 (For rest of the syllabus) |
| 3 | Instrumentation – Devices and Systems (2$^{nd}$ Edition)– C.S. Rangan, G.R. Sarma, V.S.V. Mani, Tata McGraw Hill Education Pvt. Ltd. (Especially for circuitry and analysis of signal generators and filters) |

## Web links

1. https://mechanicaljungle.com/types-of-measuring-instruments/
2. https://www.tutorialspoint.com/linear_integrated_circuits_applications/linear_integrated_circuits_applications_waveform_generators.htm
3. https://www.talend.com/resources/what-is-data-conversion/
4. https://byjus.com/physics/difference-between-transducer-and-sensor/#:~:text=A%20transducer%20is%20a%20device,it%20into%20a%20measurable%20output.
5. https://www.electronics-tutorials.ws/io/io_1.html

## DSC(8) lab
### List of Experiments          Credit : L:T:P
                                           0:0:2

**(Minimum EIGHT experiments must be completed)**

| Sl.No | Experiments |
|-------|-------------|
| 1 | Bridge rectifier with and without filter. |
| 2 | Phase measurement in LCR circuit using CRO. |
| 3 | Study of Zener diode as a voltage regulator. |
| 4 | RC low pass and high pass filters. |
| 5 | Study of Wien bridge oscillator. |
| 6 | Calibration of a low range voltmeter using a potentiometer. |
| 7 | Calibration of an ammeter using a potentiometer. |
| 8 | Study the frequency response of a first order op-amp low pass filter. |
| 9 | Study the characteristics of a LDR. |
| 10 | Study the amplitude modulation using a transistor. |

| References |
|------------|
| 1 | Advanced Practical Physics for students, B. L. Flint and H.T. Worsnop, 1971, Asia Publishing House. |
| 2 | B.Sc. Practical Physics, C.L. Arora (Revised Edition), S. Chand and Co. Ltd. 2007. |
| 3 | Practical Physics, D.C. Tayal, First Millennium Edition, Himalaya Publishing House, 2000. |

| Course Articulation Matrix- course code-232630 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Course outcomes** | Program outcomes | | | | | | | | | | | |
| | **PO 1** | **PO 2** | **PO 3** | **PO 4** | **PO 5** | **PO 6** | **PO 7** | **PO 8** | **PO 9** | **PO 10** | **PO 11** | **PO 12** |
| **CO1** | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 |
| **CO2** | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 |
| **CO3** | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 |
| **CO4** | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 |
| **Weighted average** | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 |

# Continuous Formative Evaluation/ Internal Assessment

Total marks for each course shall be based on continuous assessments and semester-end examinations. The pattern of 40:60 for IA and Semester End theory examinations respectively and 50:50 for IA and Semester End practical examinations respectively.

|  | Theory | Practical |
|---|---|---|
| Total Marks for each Course | 100 marks | 50 marks |
| Continuous assessment-1 (C1) | 20 marks | 10 marks |
| Continuous assessment-2 (C2) | 20 marks | 15 marks |
| Semester End Examination (C3) | 60 marks | 25 marks |

**The evaluation process of IA marks shall be as follows:**

a) The first component (C1) of the assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, fieldwork, project work, etc. This assessment and score process should be completed after completing 50% of the syllabus of the course/s and within 45 working days of the semester program

b) The second component (C2) of the assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, internship / industrial practicum/project work, etc. This assessment and score process should be based on the completion of the remaining 50 percent of the syllabus of the courses of the semester.

c) During the $17^{th}$ – $19^{th}$ week of the semester, a semester-end examination shall be conducted by the University for each Course. This forms the third and final component of the assessment (C3) and the maximum marks for the final component will be 60%.

d) In case of a student who has failed to attend the C1 or C2 on a scheduled date, it shall be deemed that the student has dropped the test. However, in case of a student who could not take the test on the scheduled date due to genuine reasons, such a candidate may appeal to the Principal. The Principal in consultation with the concerned teacher shall decide about the genuineness of the case and decide to conduct a special test for such candidate on the date fixed by the concerned teacher but before the commencement of the concerned semester-end examinations.

e) For assignments, tests, case study analysis, etc., of C1 and C2, the students should bring their own answer scripts (A4 size), graph sheets, etc., required for such tests/assignments and these be stamped by the concerned department using their department seal at the time of conducting tests/assignment/work, etc.

f) The outline for continuous assessment activities for Component-I (C1) and Component-II (C2) of a course shall be as under.

|  | C1 marks | C2 marks | Total Marks |
|---|---|---|---|
| Session Test | 20 | --- | 20 |
| Seminars/Presentations/Activity/ Case study /Assignment / Fieldwork / Project work etc. | --- | 20 | 20 |
| Total | 20 | 20 | 40 |

- For the practical course of full credits, the Seminar shall not be compulsory. In its place, marks shall be awarded for Practical Record Maintenance. (the ratio is 25 (10 + 15) and 25. Evaluated for a total of 50 Marks).
- Conduct of Test , Seminar, Case study / Assignment, etc. can be either in C1 or in t h e  C2  component at the convenience of the concerned departmet/teacher.
- The teachers concerned shall conduct test / seminar / case study, etc. The students should be informed about the modalities well in advance. The evaluated course assignments during component I (C1) and component II (C2) of the assessment are immediately provided to the candidates after obtaining acknowledgment in the register by the concerned teachers(s) and maintained by the Department. Before the commencement of the semester-end examination, the  evaluated test, assignment, etc. of C1 and C2 shall be obtained back to maintain them  till the announcement of the results of the examination of the concerned semester.
- g) The marks of the internal assessment shall be published on the notice board of the department/college for information of the students.
- h) The Internal assessment marks shall be communicated to the CoE at  least  10  days before the commencement of the examinations and the  CoE shall have access to the records of such periodical assessments.
- i) There shall be no minimum in respect of internal assessment marks.
- j) Internal assessment marks may be recorded separately. A candidate who has failed or rejected the result shall retain the internal assessment marks.

# Scheme of Valuation for Practical Examinations

C1 and C2 are internal tests to be conducted during the $8^{th}$ and $16^{th}$ weeks respectively of the semester. C3 is the semester-end examination conducted for 3 hours. The student will be evaluated based on skill, comprehension and recording of the results. The student has to compulsorily submit the practical record for evaluation during C1 and C2. For C3, the record has to be certified by the Head of the Department.

• The student is evaluated for 25 marks in C1 and C2 as per the following scheme:

Experiment: 10 for C1 (10 marks)

Experiment: 10, Record: 05 for C2 (15 marks)

• The student is evaluated for 25 marks in C3 as per the following scheme:

Experiment: 20, Viva: 05 for C3 (25 marks)

The experimental portion of the evaluation (C3) is carried out as per the following scheme:

| | |
|---|---|
| formula with proper units and explanation | 03 |
| Setting up the apparatus/circuit connections | 03 |
| Taking readings and tabulating | 07 |
| Calculations and Graph | 07 |
| Viva | 05 |
| Total | 25 |

# Internship

**Semester: VI**

| Course Code: 23INTPHY01 | Course Title: Internship |
|---|---|
| Course Credits: 02 | Hours of Teaching/Week: |
| Total Contact Hours:<br>90 Hours Internship | Formative Assessment Marks:<br>100 Marks(C1+C2= 50 + 50) |

**Note: This course will run as per the guidelines defined by the BoS Physics, University of Mysore, Mysuru and the same is approved by BoS, Physics SBRR Mahajana First Grade College ( Autonomous), Mysuru.**

**Course Outcomes (COs):**

**CO1:** Integrate Theory and Practice of the area selected for Internship to Explore Career Opportunities prior to Graduation and to create interest towards research.

**CO2:** Develop Communication, Interpersonal, Work Habits, Attitude and other Critical Skills required for a job.

## Course Articulation Matrix – 23INTPHY01

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 3 | 3 | 3 | 3 | 3 | - | - | 1 | 3 | 3 | 2 | 2 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | 2 | 2 |
| Weighted Average | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | 2 | 2 |

# Scheme of Valuation for Internship

C1 and C2 are internal assessments to be conducted during $8^{th}$ and $16^{th}$ weeks respectively for the semester. The student will be evaluated on the basis of presentation skills and project development. The student has to compulsorily submit the project report for evaluation during C2. The report has to be certified by the Head of the Department and the Mentor/Supervisor.

• **The student is evaluated for 100 marks as per the following scheme:**

Project Progress Presentation (**C1**): 50 marks

Project Development and Report (**C2**): 50 marks

| Assessment Criteria | Marks |
|---|---|
| Project Presentation Skills | 50 |
| Project Development Skills and  Report | 50 |
| **Total** | **100** |

## DSC THEORY QUESTION PAPER PATTERN FOR V AND VI SEMESTER

Max Marks: 60                                      Exam duration: $2\frac{1}{2}$ hours

### Part-A

I.    One question from each unit is to be given with an internal choice.
Each question carries 10 marks

$4 \times 10 = 40$

1                                              (a)
OR
(a)


2                                              (a)
OR
(a)


3                                              (a)
OR
(a)


4                                              (a)
OR
(a)

### Part-B

II.    One numerical problem must be given for each unit. Any three to be answered.

$3 \times 4 = 12$

5

6

7

8

### Part-C

III  One question must be given from each unit. Any four to be answered.     $2 \times 4 = 08$

9  (a)
(b)
(c)
(d)
(e)
(f)

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## DEPARTMENT OF PSYCHOLOGY

## BOARD OF STUDIES (BoS)

**UG**    ✓

**PG**    ☐

## NEP Syllabi for V and VI Semester - B.A Psychology

## Autonomous 2023-24

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# DEPARTMENT OFPSYCHOLOGY

**Motto:** Enriching scientific thought & Promoting Pro-Social Behavior.

**Vision:** Thriving towards a scientifically driven environment for the development of Psychological literacy.

**Mission:** Enabling the 'Learner' to develop the Research attitude and explore new dimensions in Behavioral Sciences.

| Programme Outcomes (PO's) - "Bachelors of Arts" | |
|---|---|
| PO1 | **Domain Knowledge:** Inculation of fundamental concepts, principles, methods and the application of the same in the realm of concerned domain. |
| PO2 | **Problem Analysis:** This programme enhances the ability to define, identify and analyze appropriate means towards amicable solutions in the given area of Knowledge. |
| PO3 | **Design & Development of Solutions:** Structuring theoretical knowledge and developing customized designs in terms of – Intervention strategies, Profiling, Reviews, Archives, Marketing strategies, Info-graphics and Approaches for arriving at relevant and desirable solutions. |
| PO4 | **Research & Investigation**: Knowledge and application of "Research Methods" to investigate domain specific problems and derive scientific conclusions through testing of Hypotheses and relevant findings empirically. |
| PO5 | **Usage of Modern Tools and Techniques:** Mastery in the academic enclave through skilled handling administering, assessing, validating and interpreting complex phenomena using advanced tools and techniques to create simple and sustainable solutions. |
| PO6 | **Social Sciences & Society –** Promotes domain specific literacy to illuminate the significance of each discipline and its applicability for the well-being of Society. |
| PO7 | **Environment and Sustainability:** Contemplate and Introspect prevailing environmental challenges and consequences. Further, channelize initiatives towards sustainability. |
| PO8 | **Moral and Ethical Values:** Application of Professional Ethics, Humanitarian Values, Accountability and Social Responsibilities in emerging society towards attainment of harmony and co-existence. |
| PO9 | **Individual and Teamwork:** Imbibe the qualities of Teamwork and function effectively as an emerging leader in the diversified and multidisciplinary areas. |
| PO10 | **Communication:** Demonstrates Competency in comprehending and conceptualizing discipline specific concepts and ideas and communicates effectively through fluid communication within the professional and social setup. |
| PO11 | **Economics and Project Management:** Understand the Economic Concept in the context of specific discipline and apply the same through initiating Planning, and Executing the Project Dynamics effectively towards successful Project Management. |
| PO12 | **Lifelong Learning**: Identify and address their own educational needs in a changing world in ways sufficient to upgrade one's skills and competencies through constant self-evaluation and eternal learning. |

# OBJECTIVES:Psychology

1.) Promote higher learning and research orientation among students, through effective establishment of the interface between the field of Psychology and its empirical nature.

2.) Establish Introspective approach through – Educational tours, Internship Programmes, Minor Projects ect; to gear-up the Learner to explore the dynamics of Applied Psychology.

3.) Kindle "Self – Enhancingand Innovative" skills among students throughbroader insights into the realm of Psychology.

4.) Inspire Students to foresee various promising Career prospects available in the field of Mental Health Sciences through the pursuit of Psychology.

5.) Endowa sense of 'Professional Integrity' in the learner through realizing the significance of Psychology in facilitating Mental Health services.

# List Of BOS Members in Psychology

| Sl.No. | Category | Name | Designation | Address for Communication | E-mail and Mobile No. |
|---|---|---|---|---|---|
| 1. | **HoD** | **Smt. Sujata. M** | **Asst. Professor &HoD** | **Dept. of Psychology SBRR Mahajana First Grade College, Mysore** | **Sujatam.fgc@mahajana.edu.in** **9886191174** |
| 2. | **Two Experts from Outside the parent University** | **1.) Mr. Rithwik Kashyap** | **Asst. Professor** | **Dept. of Clinical Psychology JSS Medical College JSS University (Deemed) Mysore.** | **rithvikkashyap@gmail.com** **9611314087** |
| | | **2.) Dr Archana Bhatt K** | **Associate Professor & HoD** | **UG & PG Dept. of Psychology Kateel Ashok Pai Memorial College – Shivamogga, Kuvempu University.** | **archana.kallahalla@gmail.com** **9538298660** |
| 3. | **Nominee by the Vice Chancellor** | **Dr. Mridula Singh** | **Associate Professor** | **Dept. of Psychology Maharajas College, Mysore.** | **mridulasingh15@gmail.com** **9448312327** |
| 4. | **One Person from Industry /Corporate Sector /Allied** | **Dr. Lancy D'Souza** | **Professor &HoD,** | **Dept. of Psychology, Maharaja's College Mysore** | **lancyd@gmail.com** |
| 6. | **Alumnus** | **Siyana Salim** | **P G Student M.Sc Clinical Psychology** | **Dept. of Clinical Psychology St. Agnes College Mangalore** | **ishasalim31@gmail.com** **9071693910** |

# Course Structure (NEP2020)

## Discipline Specific Courses(DSC)

| CourseType& Code | Hours/Week | | T/P | Credits L:T:P | MaximumMarks IA | | Exam | ExamDuration | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | L | T/P | L:T:P | C1 | C2 | C3 | | Marks |
| **PSYCHOLOGY- VSem** | | | | | | | | | |
| DSC( 5  ) - 231565 DSC (5 ) -Lab | Health Psychology | 4 | 0 | 4:0:2 | 20 | 20 | 60 | 2:30 Hours | 150 |
| | Psychology Practicum - I | 0 | 4 | | 10 | 15 | 25 | 3Hours | |
| DSC( 6 ) - 231566 DSC ( 6 ) -Lab | Social Psychology | 4 | 0 | 4:0:2 | 20 | 20 | 60 | 2: 30 Hours | 150 |
| | Psychology Practicum - II (Research Project) | 0 | 4 | | 10 | 15 | 25 | 3Hours | |
| **PSYCHOLOGY–VI Sem** | | | | | | | | | |
| DSC(7) - 231665 DSC(7) - Lab | Abnormal Psychology | 4 | 0 | 4:0:2 | 20 | 20 | 60 | 2:30 Hours | 150 |
| | Psychology Practicum - I | 0 | 4 | | 10 | 15 | 25 | 3Hours | |
| DSC(8) - 231666 DSC(8) - Lab | Organizational Psychology | 4 | 0 | 4:0:2 | 20 | 20 | 60 | 2: 30 Hours | 150 |
| | Psychology Practicum - II | 0 | 4 | | 10 | 15 | 25 | 3Hours | |
| SEC 23INTPSY01 | Internship Programme (Optional) | 0 | 4 | 0:0:2 | 10 | 15 | 25 | 3 Hours | 50 |

## DSC (3)SyllabusforB.APSYCHOLOGY(BasicandHonors)

| | |
|---|---|
| **CourseCode:231565** | **CourseTitle:**<br>DSC(5) Health Psychology (Theory)<br>DSC(5) Lab -Psychology (Practical) |
| **CourseCredits:**06 (4:0:2) | **HoursofTeaching/Week:** 04(Theory)+08(Practical I & II) |
| **TotalContactHours:**<br>60Hours(Theory)<br>60Hours(Practical) | **FormativeAssessmentMarks:** 40(Theory)<br> 25(Practical) |
| **Exam Duration:**2:30Hours(Theory)<br> 3Hours(Practical) | **SemesterEndExaminationMarks:**60(Theory)<br> 25(Practical) |

### CourseOutcomes(COs):

| |
|---|
| **CO1 – Elucidate the Concept of Health & Wellbeing and analyze the nature, significance, and subject matter of Health Psychology.** |
| **CO 2 – Determine and deconstruct the Health Enhancing and Compromising Behaviors.** |
| **CO3 – Demonstrate the nature of Stress, comprehend its impact on the overall Health and introspect the coping strategies.** |
| **CO 4 – Identify and describe the nature of Pain, Correlates of Pain and Illness and reflect upon the Management of Pain & Illness.** |

### CourseContent

| Content | Hours |
|---|---|
| **UNIT – 1INTRODUCTION TO HEALTH PSYCHOLOGY AND HEALTH BEHAVIOUR** | |
| **a) Health**: Meaning and definition (WHO); Components of health: social, emotional, cognitive and physical aspects**.** Quality of life & Wellbeing.<br><br>**b)Health Psychology**: Introduction & Significance of health psychology; Mind-Body relationship; Models of health -Biomedical and Bio psychosocial model.<br><br>**c) Health Behaviours:** Factors influencing Poor health behaviours, Strategies to Optimize Health Behaviours. | **15 Hrs** |
| **UNIT – 2HEALTH  ENHANCING AND COMPROMISING BEHAVIOUR** | |
| **a)Theories of Health behaviors:**  Health belief model and its implications.<br><br>**b) Health compromising behaviors**: Lifestyle Issues, Abuse of Social Media,Substance abuse, & Unhealthy Dietary Practices, and Sleep Issues. | **15 Hrs** |

| | |
|---|---|
| **c) Health enhancing behaviours:** PhysicalExercise, Balanced Diet, Sleep hygiene & Balancing Mental Health.<br><br>**d) Adherence:** Meaning and factors influencing adherence. | |
| **UNIT – 3**   STRESS AND HEALTH | |
| **a) Stress:** Definition, Nature and sources of stress; Selyes' Model, GAS Model and Diathesis Model of Stress.<br><br>**b) Effects of stress on Health:** Stress and immune system, Role of stress in CVD, Mental Health, & Diabetes.<br><br>**c) Stress & Coping -**   Meaning & Coping Styles<br><br>**d) Stress Management** – Lifestyle Modification,  Yoga & Meditation, Relaxation therapy, Mindfulness Practices, Expressive Therapies -music, art and dance. | **15 Hrs** |
| **Chapter IV** UNDERSTANDING OF PAIN, CHRONIC AND TERMINAL ILLNESS | |
| **a) Psychology of Pain-** Meaning & Types; Issues related to Chronic Pain, individual differences and Cognitive Behavioural Perspective of Pain.<br><br>**b) Psychological aspects of chronic and terminal Illness** - Emotional responses to illness- Diagnosis & Treatment; Coping with illness – Emotional, Interpersonal & Psychological; Death Anxiety.<br><br>**c) Palliative Care** – Meaning &Methods ; Role of Family & Support groups. | **15 Hrs** |

**References:**

**Books for Reference**

1.) Taylor, S.E. (2010). Health psychology. 6th Ed, New Delhi: Tata McGraw Hill
2.) Marks. D .F .,Murry.M., Evans.B and Estacio.E.V (2011), Health psychology: Theory, research and practice (3rd edi), New Delhi: Sage publication India Pvt Ltd.
3.) Brannon.L& Feist. J (2007) Introduction to Health Psychology New Delhi: Thomson Learning Inc.
4.) DiMatteo, M.R. & Martin, L.R.(2002). Health psychology. New Delhi: Pearson.

**5.)** Ogden.J (2000) Health Psychology,  2nd edition Philadelphia, Open University press.

**Online e-sources**

**1.) Health Psychology Promotes Wellness**

**https://www.apa.org/education-career/guide/subfields/health**

**2.) BPCG-173 Psychology for Health and Wellbeing**
https://egyankosh.ac.in/handle/123456789/73140

**3.) Introduction to Health Psychology**
https://egyankosh.ac.in/handle/123456789/73143

**4.) Models of Health and Illness**
https://egyankosh.ac.in/bitstream/123456789/73144/1/Unit-2.pdf

**5.) Article on History of Health Psychology – Truth to be Told**https://scottbarrykaufman.com/wp-content/uploads/2015/01/Froh-2004.pdf

## CourseArticulationMatrix –221565

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|-------|------|------|------|------|------|------|------|------|------|-------|-------|-------|
| CO1 | 3 | 2 | 1 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | - | 3 |
| CO2 | 3 | 3 | 1 | 1 | 3 | 2 | | - | - | 2 | 1 | 1 |
| CO3 | 3 | 3 | 1 | 1 | 3 | 2 | - | - | - | 2 | - | 1 |
| CO4 | 3 | 3 | 1 | 1 | 3 | 3 | - | 1 | - | 2 | 1 | 1 |
| Weighted Average | 3 | 2.7 | 1 | 1.5 | 3 | 2.5 | 0.5 | 0.5 | 0.25 | 2.25 | 0.5 | 1.5 |

## DSC (3)SyllabusforB.APSYCHOLOGY(BasicandHonors)

| | |
|---|---|
| **CourseCode:231566** | **CourseTitle:**<br>DSC(6) Social Psychology (Theory)<br>DSC(6) Lab -Psychology (Research Project) |
| **CourseCredits:**06 (4:0:2) | **HoursofTeaching/Week:** 04(Theory)+08(Practical I & II) |
| **TotalContactHours:**<br>60Hours(Theory)<br>60Hours(Practical) | **FormativeAssessmentMarks:** 40(Theory)<br>25(Practical) |
| **Exam Duration:**2:30Hours(Theory)<br>3Hours(Practical) | **SemesterEndExaminationMarks:**60(Theory)<br>25(Practical) |

### CourseOutcomes(COs):

| |
|---|
| **CO1 – Enumerate the nature and scope of Social Psychology and illustrate its significant impact on Individual Behaviour.** |
| **CO2 – Concretely analyze the dynamics involved in Social Processes and illuminate their interaction with the Social World.** |
| **CO3 – Comprehensively understand and determine the essence of Interpersonal Relationships on Individual Behaviour.** |
| **CO4 – Demonstrate and conceptualize the nature of Social Issues and deduce the complexities that centre the Social Behaviours.** |

### CourseContent

| Content | Hours |
|---|---|
| **UNIT – 1      Fundamentals of Social Psychology** | |
| **a) Social Psychology:** Definition, Nature and Scope of social psychology.<br><br>**b) Social perception:** Meaning, Non-verbal communication; impression formation and management.<br><br>**c) SocialCognition:** Meaning,schemas, heuristics, and Stereotypes - Meaning & Types, Glass ceiling andDiscrimination.<br><br>d) **Perceiving Ourselves:** Self-concept, Self-Esteem, & Self-Presentation. | **15 Hrs** |
| **UNIT – 2Understanding And Evaluating the SocialWorld** | |
| **a) Attribution:**Meaning, Theories of attribution- Fritz-Heider's theory, Jones and Davis theory, Kelly's theory; Attributional Bias. | |

| | |
|---|---|
| **b)Attitudes:**Definition, attitude-behaviour link; Attitude - Formation and change. <br><br> **c)Prejudice:** Meaning, Causes, and techniques to reduce Prejudice. | **15 Hrs** |
| **UNIT – 3**         **Social Relations, Interaction and Influences** | |
| **a) Interdependent Relationship**: Family, Friendship and Attachment style, Relationship problems, Effects of relationship failure. <br><br> **b) Group Dynamics:** Meaning & Characteristics, **Group Processes -** Social facilitation, Social loafing, Group Think, Group Polarization, De-individuation, Co-operation, Conflict and techniques to resolve conflicts. <br><br> **c) Pro-Social Behaviour**- Meaning, situational factors influencing pro-social behaviour. <br><br> d) **Social Media** - Impact of social media on Interpersonal Relations. | **15 Hrs** |
| **Unit – 4**         **Issues in Social Behaviours** | |
| **a) Aggression-**Meaning, Theories - Social learning perspectives & Drive theory, Determinants of Aggression, Anger Management Strategies. <br><br> **b)Violence** – Meaning, Nature and types of violence – Interpersonal Violence. Collective violence towards social change. <br><br> **c)Anti-Social behaviour**- Meaning & Types, Psychosocial factors influencing Anti-Social Behaviours. <br><br>  d) **Applying social psychology to Social Systems** - Work & Family. | **15 Hrs** |
| **References:** <br> **Books for Reference** <br> **1.)** Baron, R.A., Byrne, D. &Bhardwaj, G. (2010).Social Psychology (12th Ed.). New Delhi: Pearson. <br> **2.)** Baron Robert and Byrne Donn (2004) Social Psychology, 10th Edition Pearson Education, Inc <br> **3.)** Misra, G. (2009).Psychology in India, Vol. 4: Theoretical and Methodological Developments (ICSSR Survey of Advances in Research).New Delhi: Pearson <br> **4.)** Myers David -Social Psychology (2006) -8th Edition, Tata McGraw Hill. <br> **5.)** Taylor, S.E., Peplau, L.A. & Sears, D.O. (2006).Social Psychology (12th Ed.).New Delhi: Pearson <br> **Online e-sources** <br><br>      **1.)** **Introduction to Social Psychology** <br>        **https://opentext.wsu.edu/social-psychology/chapter/chapter-1/** <br>      **2.)** **Social Psychology** <br>        **https://niilmuniversity.in/coursepack/humanities/Social_Psychology.pdf** <br>      **3.)** **Introduction to Social Psychology** | |

4.) **History and principles of social psychology**
**opentextbc.ca/socialpsychology/chapter/defining-social-psychology-history-and-principles/**

## CourseArticulationMatrix –221565

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|-------|------|------|------|------|------|------|------|------|------|-------|-------|-------|
| **CO1** | 3 | 2 | 1 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | 1 | 3 |
| **CO2** | 3 | 3 | 2 | 2 | 3 | 2 | | - | - | 2 | 1 | 1 |
| **CO3** | 3 | 3 | 1 | 1 | 3 | 2 | - | - | - | 2 | 1 | 1 |
| **CO4** | 3 | 3 | 2 | 2 | 3 | 3 | - | 1 | - | 2 | 1 | 1 |
| **Weighted Average** | 3 | 2.7 | 1.5 | 2 | 3 | 2.5 | 0.5 | 0.5 | 0.25 | 2.25 | 1 | 1.5 |

**Health Psychology& Social Psychology (Practical)PSY C12-P**

**Practicum I - Experimentation**

**Practicum II – Research Project / Project Work**

**Practicum-I Experimentation (Minimum 06 Practical to be conducted)**

1. Psychological Well-Being (Ryff C.D. et.al.2010)
2. Quality of Life Scale
3. Students Stress Rating Scale (Dr. Zaki Akhtar)
4. Type A and Type B - ABBPS (Upinder Dhar and Manish Jain)
5. Resilience Scale (Wagnild. G. M. and Young H.M )
6. Gratitude questionnaire (McCullough M.E, Emmons R.A, Tsang J 2002)
7. Mental Health Inventory
8. Optimum Health Scale (Pravin Kumar and Lovellen Bala)
9. Self-Concept Scale

**STATISTICS:** One way ANOVA - Independent or Uncorrelated Score

**Practicum II – Research Project / Project Work**

**Course duration: 14 weeks with 4 hours of lab/field work per week amounting to 2 credits (60 Hrs)**

This segment of theof **V Sem syllabus nurtures Research inclination** in students. The Student is expected to choose a specific topic from the given list of Topics approved by the HoD; within the realm of Psychology. The student is expected to conduct an empirical research study involving - Research Objectives & Questions; Formulation of Hypothesis, Review of literature; Developing a Research Design; Sampling, Selection of Tools; Data Collection, Statistical Analysis of data and Drawing conclusions. Towards the completion of research the student has to compile the Research Document and submit 2 copies of the same along with a CD uploaded with files of work done and the pile of datasheets collected from sample; documented report, under the supervision of the Subject teacher and the HoD. Further, the report will be evaluated and approved by the Head of the Department of Psychology provided it meets the expected standards of scientific work and this is mandatory to be eligible for the Practical Examination failing which the candidate shall be not allowed to Write the Practical Examination in the concerned Paper of Research Project.

# DSC (3)SyllabusforB.APSYCHOLOGY(BasicandHonors)

| | |
|---|---|
| **CourseCode:231665** | **CourseTitle:**<br>DSC(7) Abnormal Psychology (Theory)<br>DSC(7) Lab -Psychology (Practical) |
| **CourseCredits:**06 (4:0:2) | **HoursofTeaching/Week:** 04(Theory)+08(Practical I & II) |
| **TotalContactHours:**<br>60Hours(Theory)<br>60Hours(Practical) | **FormativeAssessmentMarks:** 40(Theory)<br>25(Practical) |
| **Exam Duration:**2:30Hours(Theory)<br>3Hours(Practical) | **SemesterEndExaminationMarks:**60(Theory)<br>25(Practical) |

## CourseOutcomes(COs):

| |
|---|
| **CO 1 –  Elucidate and analyze the construct of Normality & Abnormality to dispel myths regarding abnormality.** |
| **CO 2 – Describe  and familiarize the  criteria of Abnormality and the Classification Systems of  psychological disorders.** |
| **CO 3 –  Demonstrate the nature, Symptomology and etiology of various Psychological Disorders.** |
| **CO 4 – Conceptualize the essence of Personality Disorders in relevance Abnormality.** |

## CourseContent

| Content | Hours |
|---|---|
| **Unit 1UNDERSTANDING ABNORMALITY** | |
| **Introduction:**Meaning anddefinitions of abnormality, Criteria of abnormality; Models of abnormality - Psychodynamic, Behaviouristic, Cognitive, and Humanistic models. Classificatory Systems –DSM- 5(TR) and ICD-10. | 15 Hrs |

| Unit 2 | ANXIETY BASED DISORDERS | |
|---|---|---|
| Diagnostic criteria/ Clinical features, Causes& treatment: <br>    a) **Anxiety based disorders**: Meaning; Types - Phobic disorders; Obsessive Compulsive Disorders(OCD); Generalized Anxiety Disorder(GAD); <br>    b) **Somatoform disorders**- Somatoform Pain Disorder, Hypochondriasis (Illness Anxiety) ; conversion disorders. <br>    c) **Dissociative disorder** - Amnesia, fugue; Identity disorder | | **15 Hrs** |

| Unit 3 | SCHIZOPHRENIA AND MOOD DISORDERS | |
|---|---|---|
| Diagnostic criteria/ Clinical features, Causes& treatment: <br><br> **a) Schizophrenia**: Meaning & Subtypes - Paranoid, Catatonia and Disorganized. <br><br> **b**) Persistent **Delusional disorder: Meaning & Types – Grandiose, Persecutory and Infidelity** <br><br> **c) Mood Disorders – Meaning & Subtypes - Depression, Mania and Bipolar Affective Disorders – I & II, Cyclothymia** | | **15 Hrs** |

| Unit 4 | PERSONALITY DISORDERS | |
|---|---|---|
| Diagnostic criteria/ Clinical features, Causes& treatment: <br>    a) Cluster A (paranoid, schizoid, antisocial), <br>    b) Cluster B (histrionic, narcissistic, antisocial and borderline) & <br>   Cluster C (avoidant and dependent personality disorder). | | **15 Hrs** |

**References:**
**Books for Reference**
Carson R.C, Butcher JN and Mineka Susan (2005*)., Abnormal Psychology and modern life* (10th edn) New York: Harper-Collins
1.) Kaplan H, Sadock BJ, Grebb JA (1994) *Synopsis of Psychiatry* (7th edn). New Delhi: BL Waverly Pvt. Ltd.
2.) Sarason .I.G &Sarason R.B (2005) *Abnormal PsychologyThe Problems of Maladaptive Behaviour* 11th edition New Delhi Pearson Pub.
3.) Gerald C.Davison& John M.Neale, *Abnormal Psychology,* 2000, John Wiley & Sons, New York.S
4.) Alloy,Riskind,Manos, *Abnormal psychology-current perspectives-ninth edition*-.
5.) Neale, Davidson,Hagga, *Exploring Abnormal psychology-sixth edition*- -Wiley and sons.
6.) David Sue, Sue and Sue.-third edition *Understanding abnormal behaviour*- Hougthon Miff

**Online e-sources**

   **1.) Abnormal Psychology**

**courses.lumenlearning.com/abnormalpsychology/**

**2.) Understanding Abnormal Psychology**

www.verywellmind.com/what-is-abnormal-psychology-2794775

**3.) Abnormal Psychology – Discovering Psychology Series**

www.opentext.wsu.edu/abnormal-psych/wp-content/uploads/sites/41/2018/05/Abnormal-Psychology-2nd-Edition.pdf

**4.) Psychological Disorders**

www.spsrohini.com/sites/default/files/12 - Psychology - Psychological Disorders-Notes and Video link.pdf

**5.) Articles on Abnormal Psychology**

www.researchgate.net/publication/340536864_Abnormal_Psychology

## CourseArticulationMatrix –231665

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|-------|------|------|------|------|------|------|------|------|------|-------|-------|-------|
| CO1 | 3 | 2 | 1 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | - | 3 |
| CO2 | 3 | 3 | 1 | 1 | 3 | 2 | | - | - | 2 | 1 | 1 |
| CO3 | 3 | 3 | 1 | 1 | 3 | 2 | - | - | - | 2 | 1 | 1 |
| CO4 | 3 | 3 | 1 | 1 | 3 | 3 | - | 1 | - | 2 | - | 1 |
| Weighted Average | 3 | 2.7 | 1 | 1.5 | 3 | 2.5 | 0.5 | 0.5 | 0.25 | 2.25 | 0.5 | 1.5 |

## DSC (3)SyllabusforB.APSYCHOLOGY(BasicandHonors)

| | |
|---|---|
| **CourseCode:231666** | **CourseTitle:**<br>DSC(8) Organizational Psychology (Theory)<br>DSC(8) Lab -Psychology (Internship) |
| **CourseCredits:**06 (4:0:2) | **HoursofTeaching/Week:** 04(Theory)+08(Practical I & II) |
| **TotalContactHours:**<br>60Hours(Theory)<br>60Hours(Practical) | **FormativeAssessmentMarks:** 40(Theory)<br>25(Practical) |
| **Exam Duration:**2:30Hours(Theory)<br>3Hours(Practical) | **SemesterEndExaminationMarks:**60(Theory)<br>25(Practical) |

### CourseOutcomes(COs):

| |
|---|
| **CO 1 –** Articulate and conceptualize the fundamentals of Organizational Psychology and infer the basic concepts comprehensively. |
| **CO 2 –** Concretely relate and synthesize the basics of Individual differences and Job Stress. |
| **CO 3 –** Define, Integrate, and determine the nature and nexus of Organizational Perception and Learning. |
| **CO 4 –** Analyze and contrast the inherent characteristics of Organizational Structure and Culture. |

### CourseContent

| Content | Hours |
|---|---|
| **Unit 1INTRODUCTION TO ORGANIZATIONAL PSYCHOLOGY** | |
| a) Nature, Importance and fundamental assumptions. Relevance of OB - Globalization, Technology and people's Changing Expectations.<br>b) Organizational Justice: Nature and Strategies.<br>c) Ethical Behaviour in Organizations: Nature, Meaning. Corporate ethics. & Corporate Social Responsibility -CSR. | 15 Hrs |

| Unit 2 | INDIVIDUAL DIFFERECES & JOB STRESS | |
|---|---|---|
| a) **PERSONALITY:** Nature and Measurement. Big Five dimension. Work related aspects of Personality- Achievement motivation.<br><br>b) **ABILITIES AND SKILLS**: Intelligence, physical abilities, and social skills.<br><br>c) **JOB STRESS:** Meaning &Nature, Sources of Job Stress, Burnout, Work-Leisure Balance. | | **15 Hrs** |

| Unit 3 | ORGANIZATIONAL PERCEPTION AND LEARNING | |
|---|---|---|
| a) **Social Perception and Social Identity**: Attribution Process. Perceptual Biases: Systematic Errors, Stereotyping. Perceiving others: Organizational Applications- Performance appraisal.<br><br>b) **Learning:** principles of learning; Operational Conditioning- Learning through Rewards and Punishments. Training-varieties of training, Organizational behaviour Management. | | **15 Hrs** |

| Unit 4 | ORGANIZATIONAL CULTUREAND STRUCTURE | |
|---|---|---|
| a.) **Organizational Structure:** Meaning;**Basic Dimensions**- Hierarchy of authority, span of control, division of labour, line v/s staff positions, decentralization;**Departmentalization**- functional, product and matrix organizations.<br><br>b) **Organizational Culture**: Meaning and definition, characteristics of organizational culture.<br><br>c) **Creating, and Transmitting and changing organizational culture**: Creation & Transformation of Work Culture – Tools, composition of workforce, mergers and acquisitions, and Digital Marketing. | | **15 Hrs** |

**References:**
**Books for Reference**

1. Carson R.C, Butcher JN and Mineka Susan (2005*)., Abnormal Psychology and modern
2. life* (10th edn) New York: Harper-Collins
3. Kaplan H, Sadock BJ, Grebb JA (1994) *Synopsis of Psychiatry* (7th edn). New
4. Delhi: BL Waverly Pvt. Ltd.
5. Sarason .I.G &Sarason R.B (2005) *Abnormal PsychologyThe Problems of Maladaptive
6. Behaviour* 11<sup>th</sup> edition New Delhi Pearson Pub.
7. Gerald C.Davison& John M.Neale, *Abnormal Psychology,* 2000, John Wiley & Sons,
8. New York.S
9. Alloy,Riskind,Manos, *Abnormal psychology-current perspectives-ninth edition*-.
10. Neale, Davidson,Hagga, *Exploring Abnormal psychology-sixth edition*-
11. Wiley and sons.

**Online e-sources**

1. **Abnormal Psychology**
2. **courses.lumenlearning.com/abnormalpsychology/**
3. **Understanding Abnormal Psychology**
4. **www.verywellmind.com/what-is-abnormal-psychology-2794775**
5. **Abnormal Psychology – Discovering Psychology Series**
6. **www.opentext.wsu.edu/abnormal-psych/wp-content/uploads/sites/41/2018/05/Abnormal-Psychology-2nd-Edition.pdf**
7. **Psychological Disorders**
8. **www.spsrohini.com/sites/default/files/12 - Psychology - Psychological Disorders-Notes and Video link.pdf**
9. **Articles on Abnormal Psychology**
10. **www.researchgate.net/publication/340536864_Abnormal_Psychology**

## CourseArticulationMatrix –231666

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|-------|------|------|------|------|------|------|------|------|------|-------|-------|-------|
| CO1 | 3 | 2 | 1 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | - | 3 |
| CO2 | 3 | 3 | 1 | 1 | 3 | 2 | | - | - | 2 | - | 1 |
| CO3 | 3 | 3 | 1 | 1 | 3 | 2 | - | - | - | 2 | 1 | 1 |
| CO4 | 3 | 3 | 1 | 1 | 3 | 3 | - | 1 | - | 2 | 1 | 1 |
| Weighted Average | 3 | 2.7 | 1 | 1.5 | 3 | 2.5 | 0.5 | 0.5 | 0.25 | 2.25 | 0.5 | 1.5 |

**Abnormal Psychology(Practicals)**

**Practicum I  - Experimentation**

### (Minimum 06 Practical to be conducted)

1. Multiphasic Questionnaire (H.N.Murthy)
2. Bell's Adjustment Inventory
3. Yale Brown Obsessive Compulsive Scale
4. Cohen'S Perceived Stress Scale
5. Defence Mechanism Inventory (N R Mrinal &Uam Singhal)

6. Behavioural Deviance Scale (N. S. Chauhan and Saroj Aurora)

7. Alcohol and Drug Attitude Scale (Sunil Saini & Sandeep Singh)

8. Beck Depression Scale

9. Narcissistic Personality Inventory(e-source)

**STATISTICS:** Mann – Whitney U test & Kruskal – Wallis H (One-Way)

**Organizational Psychology (Practicals)**

**Practicum II – Experimentation**

**(Minimum 06 Practical to be conducted)**

1.) Job Satisfaction  (Dr. Amar Singh &Dr. T. R. Sharma)

2.) Interpersonal Skills Inventory (IPSI) (Dr. Luba Jakubowska, Dr. Pooja Sharma and Shivngi Nigam)

3.) Leadership Behaviour Scale (Asha Hinger)

4.) Organizational Commitment Scale (Anukool M. Hyde ad Vishu Roy)

5.) Employee Engagement Scale (Santhosh Dhar and Upindar Dhar)

6.) Workplace Exploitation Scale (Ramandeep Kaur and Meena Jhamat)

7.) Work - Life Balance Scale (Hayman -2005)

8.) Organizational Conflict Scale (Santhosh Dhar and Upindar Dhar)

**SEC (23INTPSY01) - Internship Program (Hospital Based Internship) – Optional**

**Course duration: 14 weeks with 2 hours of lab/field work per week amounting to 2 credits (60 Hrs)**

This segment is an optional  feature for the Students; an opportunity to score of 2 Credits in the Practical component of VI Sem syllabus, this feature is left to the students discreation. This segment is concerned with enabling the student experience application of Psychology in real life setups. The student is expected to pursue internship of 60 Hrs in a Hospital / NGO / Special Education Centers. During this period the student is expected to get acquainted with the practical implications of Psychology in various realms such as Clinical Setups / Special Schools / NGO's; to explore the scope of Psychology in Mental Health Services, understand how it caters to the Children with Special needs or realize the significance of Psychology  facilitating the lifestyle changes or the Social Welfare causes endorsed by NGO's and help people in coping with challenges of life / crisis  enhancing the true potential in people. The student has to conduct Case studies in anyone of the prescribed Professional setups. And, after the

completion of Internship programme the student must submit a documented report of his/her experiences including the case studies under the supervision of the Subject teacher. Further, the report will be evaluated and approved by the Head of the Department of Psychology provided it meets the expected standards of scientific work. this is mandatory to be eligible for the Practical Examination failing which the candidate shall be not allowed to Write the Practical Examination in the concerned Paper of Internship Programme.

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# ContinuousFormativeEvaluation/InternalAssessment(DSC)

Totalmarksforeachcourseshallbebasedoncontinuousassessmentsandsemesterendexaminations.Thepatternis40:60forIAandSemesterEndTheoryExaminationsrespectivelyand50:50forIAandSemesterEndPractical Examinations respectively.

|  | THEORY | PRACTICAL |
|---|---|---|
| **TotalMarks** | 100Marks | 50Marks |
| **ContinuousAssessment –1(C1)** | 20Marks | 10Marks |
| **ContinuousAssessment –2(C2)** | 20Marks | 15Marks |
| **SemesterEndExamination(C3)** | 60Marks | 25Marks |

### Evaluation ProcessofIAMarksshallbeasfollows:

a) Thefirstcomponent(C1)ofassessmentisfor20%marks.Thisshallbebasedontest,assignment,seminar,case study, field work, project work etc. This assessment and score process should be completed aftercompleting50%of syllabus ofthe course and within 45 working days ofsemester program.

b) The second component (C2) of assessment is for 20% marks. This shall be based on test, assignment,seminar,casestudy,fieldwork,internship/industrialpracticum/projectwork, quizetc.Thisassessmentandscoreprocess should be based oncompletion ofremaining 50%of syllabusofthe course of thesemester.

c) Duringthe17th– 19thweekofthesemester,asemesterendexaminationshallbeconductedbythecollege foreachcourse.Thisformsthethirdandfinalcomponentofassessment(C3)andthemaximum marksforthefinal component will be60%.

d) In case of a student who has failed to attend the C1 or C2 on a scheduled date, it shall be deemed that thestudent has dropped the test. However, in case of a student who could not take the test on scheduled datedue to genuine reasons, such a candidate may appeal to the Program Coordinator/Principal. The Program Coordinator/Principal in consultation with the concerned teacher shall decide about

the genuineness of the case and decide to conduct special test to such candidate on the date fixed by the concerned teacher, butbefore commencement ofthe concerned semester end examinations.

e) For assignments, tests, case study analysis etc., of C1 and C2, the students should bring their own answerscripts (A4 size), graph sheets etc., required for such tests/assignments and these be sealed/signed by theconcerneddepartment atthe timeofconducting tests/assignment/project work etc.

f) Theoutlineforcontinuousassessment activitiesforComponent-I(C1)andComponent-II(C2)of acourseshall beas under:

| | C1Marks | C2Marks | TotalMarks |
|---|---|---|---|
| SessionTest | 20 | - | 20 |
| Seminar/Presentation/Assignment/ Activity/Case Study/FieldWork/ProjectWork/Quizetc. | - | 20 | 20 |
| Total | 20 | 20 | 40 |

- For practical course of full credits, seminar shall not be compulsory. In its place, marks shall be awardedforPracticalRecord Maintenance, themarksare 25(10 +15)and25.Evaluatedfor atotal of50Marks.
- ConductofTest,Seminar,Casestudy/Assignmentetc.,canbeeitherinC1orinC2componen tasdecidedbythe collegeandconcerneddepartment/teacher.
- The teachers concerned shall conduct test/seminar/case study/Assignment etc., the students should be informed aboutthemodalitieswellinadvance.Theevaluatedcoursesassignmentsduringcomponent I(C1)andcomponentII(C2)ofassessmentareimmediatelyprovidedtothecandidatesaftero btainingacknowledgement in the register by the concerned teacher(s) and maintained by the Department. Beforecommencementofthesemesterendexamination,theevaluatedtest,assignmentetc., ofC1andC2shallbeobtained back to maintain them till the announcement of the results of the examination of the concernedsemester.

g) The marks of the internal assessment shall be published on the notice board of the department/college forinformation of thestudents.

h) The internal assessment marks shall be communicated to the CoE (Controller of

Examination) atleast 10days before the commencement of the semester end examinations and the CoE shall have access tothe records of such periodicalassessments.

i)  There shall be no minimum in respect of internal assessment marks.

j)  Internal assessment marks may be recorded separately. A candidate, who has failed or rejected the result,shallretain the internalassessment marks.

# PRACTICAL COMPONENT

## Scheme of Valuation for V & VI Sem
## Practical Component I &II  - Practical Experimentation

C1 and C2 (Practical) are internal tests to be conducted during 8th and 16th weeks of the semester respectively. C3 (Practical Examination) is conducted during the end of the semester for the duration of 3 hours. The students are assessed and evaluated by the External and Internal Examiners - on various skills associated with Psychology Practical – Administration, Procedure, Instructions, Analysis and Interpretation of results of the Subjects performance in the Experiment conducted. The Practical Component is valuated for 50 Marks (during each of the Semesters respectively).

The C1(Test) and C2 (Assignment – Case Study) components are - IA assessment. During the C1 and C2 elements the student is evaluated for 20 marks (collectively) as per the following scheme:

a.) C1 –  Test on Experiments - 10 marks (On first Half of the Practical Portions)

b.) C2 –  Test on Experiments / Assignment/Case Study/Statistics - 15 marks (On the second Half of Practical Syllabus + Record/Report)

Though the C1 and C2 components are evaluated for 20 marks each for the ease of calculation, however the total marks scored by the student are then normalized to 10 under each component, (C1 and C2 Collectively – 20 + 5 Marks for Practical Record).

Record - 5 Marks; the Practical record has to be evaluated on 5 marks (IA) and then certified by the Head of the Department.

- The student is evaluated for 25 marks during C3 Examination as per the following scheme:

| Heading | Marks |
|---|---|
| Experiment | 5 |
| Conduction | 5 |
| Group Discussion | 5 |
| Viva Voce | 5 |
| Statistics | 5 |
| **TOTAL** | **25** |

**General Pattern on Psychology PRACTICAL Question Paper**
**(NEP-2020)**
**TermEndExaminationforDiscipline SpecificPaper**

**Scheme of Valuation for V & VI Sem: Practical Experimentation**
**(Practicum I or Practicum II – Only for Experiments)**

| Total marks = 50 | | |
|---|---|---|
| **Internal assessment =25** | | |
| Content | | Marks |
| Test C1 | | 10 |
| C2 Test/Assignment (Case Study/Reports/Seminar Presentations; Statistics etc)  + Practical Record | 10 05 | Total 15 |
| **Total IA** | | **25** |
| **Practical examination =25** | | |
| Content | | Marks |
| Writing Plan and procedure (any one) | | 05 |
| Conduction / administration (any one) | | 05 |
| Discussion of results (any one) | | 05 |
| Statistics | | 05 |
| Viva voce | | 05 |
| **Total Practical Examination** | | **25** |

**Practical Exam Duration & Ordinance**

- **The Exam duration for I.A Practicals (Test C1 component) is for 1 Hr and C3 the main Practical Examination is for 3 Hrs.**

- **The student is expected to reach the Examination venue 30 minutes before the schedule.**
- **If the student is delayed beyond 30 min of the given schedule of Practical Examination; then he/she is not entitled or allowed to write the Practical examination for that Semester and will be considered as absent.**

 *** **Practical Record** - 5 Marks; Record submission is compulsory prior to the scheduled Examination date failing which the student is considered as not eligible to take up the Practical Examination. The student has to compulsorily submit the written Practical Record during C3 - Final Practical Examination. While, the student is considered as eligible for the C3 component of Psychology Practical Examination, only if the Practical record has been submitted by the student to be evaluated on 5 marks (IA) and then certified  by  the  Head of  the  Department. In case of an incomplete record the Department has every authority to either consider or penalize the student by deducting the marks for their negligence and lack of involvement.

## PRACTICAL COMPONENT –II
## Scheme of Valuation for V & VI Sem
## VSem - Research Project (Compulsory)

### Research Project – 50 Marks Total

The C1 ( Synopsis) and C2 ( Documented Report on the Concerned Research Topic ) components are - IA assessment.
- C1 - 10 marks (Synopsis)
- C2 - 15 marks (Documented Report on the Research Topic Chosen)

Qualifying C1 & C2 components is compulsory for the student. And also, submission of the Research Document prior to the Commencement Date of Semester End Practical/Project Examination is compulsory, failing which the student shall not be eligible to take up the Semester End Practical Examination.

| Research Project  - Total marks = 50 | |
|---|---|
| **Internal assessment =25** | |
| Content | Marks |
| C1- Synopsis of the Research | 10 |
| C2 – Documented Research Report | 15 |
| **Total IA** | **25** |
| **Semester End Research Project Based examination =25** | |
| Content | Marks |
| Research Presentation (Using PPT) | 10 |
| Viva Voce / Pannel Discussion/ Interaction – Research Based | 15 |
| **Total Sem-End Research Examination** | **25** |

## VI Sem -SEC - InternshipProgramme(Optional)
## Internship Programme – 50 Marks Total

The C1 (Case Study Presentation - 1) and C2 (Documented Report on the Concerned Internship Programme) components are - IA assessment.

- C1 - 10 marks ( Case Study Presentation - 1)
- C2 - 15 marks (Documented Report of the Whole Internship Programme)

Qualifying C1 & C2 components is compulsory for the student. And also, submission of the Documented Report of the Internship prior to the Commencement Date of Semester End Practical/Internship Programme based Examination is compulsory, failing which the student shall not be eligible to take up the Semester End Practical Examination.

| SEC- Internship Report - Total marks = 50 | |
|---|---|
| **Internal assessment =25** | |
| Content | Marks |
| C1- Case Study Presentation (Any One) | 10 |
| C2 - Documented Report on the Whole Internship Programme | 15 |
| **Total IA** | **25** |
| **Semester End Research Project Based examination =25** | |
| Content | Marks |
| Presentation of Internship Report (Using PPT) | 10 |
| Viva Voce / Pannel Discussion/ Interaction – Internship Based | 15 |
| **Total Sem-End Research Examination** | **25** |

## Practical Exam Duration & Ordinance

- The Exam duration for I.A Practicals (Test C1 component) is for 1 Hr and C3 the main Practical Examination is for 3 Hrs.

- The student is expected to reach the Examination venue 30 minutes before the schedule.

- If the student is delayed beyond 30 min of the given schedule of Practical Examination; then he/she is not entitled or allowed to write the Practical examination for that Semester and will be considered as absent.

# DSC- QuestionPaperPattern (For V & VI Semesters)

**PSYCHOLOGY B.A PROGRAMME**

**B.A PSYCHOLOGY – DSC**

**Time: 2:30 Hours**                                     **Max. Marks: 60**

## Part-A

**I. Answer any five of the following questions.**              **5x2=10**

  1.).……………………………………………………………….
  2.).……………………………………………………………….
  3.).……………………………………………………………….
  4.).……………………………………………………………….
  5.).……………………………………………………………….
  6.).……………………………………………………………….
  7.).……………………………………………………………….

## Part-B

**II. Answer any Four of the following questions.**            **4x5=20**

  8.).………………………………………………………..
  9.).………………………………………………………..
 10.).………………………………………………………
 11.).……………………………………………………….
 12.).………………………………………………………
 13.).………………………………………………………
 14.).………………………………………………………

## Part-C

**III. Answer any Four of the following questions.**           **3x10=30**

 15.).………………………………………………………
 16.).………………………………………………………
 17.).………………………………………………………
 18.).………………………………………………………
 19.).………………………………………………………
 20.).………………………………………………………

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# BOARD OF STUDIES (BoS)

# DEPARTMENT OF SOCIOLOGY

| | |
|---|---|
| **UG** | ✓ |
| **PG** | |

# NEP Syllabi for V&VI Semester BA SOCIOLOGY2023-24

# Department of Sociology

## Motto:
Globalizing through the development
of    Intellectual Culture

## Vision:
Building Sociological Imagination

## Mission:
Sociological Programmes provide students with a broad and actionable education, applicable to a variety of career paths that includes research, writing and critical thinking skills.

# Program Outcomes (POs) for Bachelor of Arts

**PO 1: Domain Knowledge:** Inculcation of fundamental concepts, principles, methods and the application of the same in the realm of the concerned domain.

**PO 2: Problem Analysis:** This programme enhances the ability to define, identify and analyze appropriate means towards amicable solutions in the given area of Knowledge.

**PO 3:Design& Development of Solutions:** Structuring theoretical knowledge and developing customized designs in terms of – Intervention strategies, Profiling, Reviews, Archives, Marketing strategies, Infographics and Approaches for arriving at relevant and desirable solutions.

**PO 4:Research& Investigation**: Knowledge and application of "Research Methods" to investigate domain-specific problems and derive scientific conclusions through the testing of Hypotheses and relevant findings empirically.

**PO5:Usage of Modern Tools and Techniques:** Mastery in the academic enclave through skilled handling administering, assessing, validating and interpreting complex phenomena using advanced tools and techniques to create simple and sustainable solutions.

**PO6: Social Sciences & Society –** Promotes domain-specific literacy to illuminate the significance of each discipline and its applicability to the well-being of Society.

**PO7**: **Environment and Sustainability:** Contemplate and Introspect prevailing environmental challenges and consequences. Further, channel the initiatives towards sustainability.

**PO8:Moral and Ethical Values:** Application of Professional Ethics, Humanitarian Values, Accountability and Social Responsibilities in emerging society towards the attainment of harmony and co-existence.

**PO9**: **Individual and Teamwork:** Imbibe the qualities of Teamwork and function effectively as an emerging leader in diversified and multidisciplinary areas.

**PO 10**: **Communication:** Demonstrates Competency in comprehending and conceptualizing discipline-specific concepts and ideas and communicates effectively through fluid communication within the professional and social setup.

**PO 11**: **Economics and Project Management:** Understand the Economic Concept in the context of a specific discipline and apply the same through initiating Planning, and Executing the Project Dynamics effectively towards successful Project Management.

**PO 12: Lifelong Learning**: Identify and address their own educational needs in a changing world in ways sufficient to upgrade one's skills and competencies through constant self-evaluation and eternal learning.

# List of BoS Members

| Sl no | Category | Name & Designation | Address for Communication | e-Mail & Mobile No. |
|---|---|---|---|---|
| 1 | Chairperson | Radha MS Asst. Professor | Dept of Sociology SBRRMahajana FGC, Mysuru | radhamfgc@gmail.com |
| 2 | Vice Chancellor Nominee | DrYashoda Chairperson | Dept of Sociology  University ofMysore, Myruru | yashodamahesh678@gmail.com |
| 3 | Alumni | DrSowmya Kumar Associate Professor | DoS in Sociology Government First Grade College, KR Nagar | sociologychest@gmail.com |
| 4 | Other University | Prof. Rangappa Asst. Professor | HoD, Dept. of Sociology. Field Marshall Cariappa College, Kodagu. | |

# Objectives: Sociology

1. To provide knowledge about social entrepreneurship.

2. To help them to start their own social enterprise or non-profit startup as well asact innovative inthe alreadyworkingorganization.

3. To provide basic knowledge about social organization among tribals.

4. General introduction to statistical techniques for analyzing social science data.

5. Learn techniques for summarizing data, examining relationships among variables, generalizing from samples to populations, and testing statistical hypotheses.

6. To introduce major sociological theoretical approaches.

7. Understand the concept of health, illness and social conditions.

8. Understand the role of medical doctors, paramedics, pharmaceutical industry and social institutions in maintaining and promoting health.

9. Enhance Sociological knowledge about the Local and Regional context of Karnataka.

10. Learn about the unique cultures in Karnataka.

# Year-wise Programme Structure
## Discipline Specific Courses (DSC)

| Course, Type, Code & Title | | Hours/ Week | | Credits | Maximum Marks | | | Exam Duration | Total Marks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | IA | | EXAM | | |
| | | L | T/P | L:T:P | C1 | C2 | C3 | | |
| **Sociology VSemester** | | | | | | | | | |
| DSC (9) 231551 | Social Entrepreneurship | 4 | 0 | 4:0:0 | 20 | 20 | 60 | $2\frac{1}{2}$Hrs | 100 |
| DSC (10) 231552 | Society and Tribes | 4 | 0 | 4:0:0 | 20 | 20 | 60 | $2\frac{1}{2}$Hrs | 100 |
| DSC (11) 231553 | Statistics for Sociological Research | 4 | 0 | 4:0:0 | 20 | 20 | 60 | $2\frac{1}{2}$Hrs | 100 |
| | | | | | | | | | |
| **Sociology VI Semester** | | | | | | | | | |
| DSC (12) 231651 | Sociological Perspectives | 4 | 0 | 4:0:0 | 20 | 20 | 60 | $2\frac{1}{2}$Hrs | 100 |
| DSC (13) 231652 | Sociology of Health | 4 | 0 | 4:0:0 | 20 | 20 | 60 | $2\frac{1}{2}$Hrs | 100 |
| DSC (14) 231653 | Society in Karnataka | 4 | 0 | 4:0:0 | 20 | 20 | 60 | $2\frac{1}{2}$Hrs | 100 |
| 23INTS OC01 | Internship | 2 | 0 | 2:0:0 | 50 | 50 | - | - | 100 |

## DSC (9) Syllabus for BA. Sociology (Basic Honors)

| | |
|---|---|
| **Course Code: 231551** | **Course Title: Social Entrepreneurship** |
| **Course Credits: 04 (4:0:0)** | **Hours of Teaching/Week: 04** |
| **Total Contact Hours: 60 Hrs** | **Formative Assessment Marks: 40** |
| **Exam Duration: $2\frac{1}{2}$Hrs** | **Semester-End Examination Marks:60** |

**Course Outcomes (COs)**

**CO1**: Recognise the scope and need for social entrepreneurship.

**CO2**: Illustrate the plan and implement socially innovative ideas.

**CO3**: Equipped to start their own social enterprise or non-profit organization.

**CO4:**Critically analyse the role of social entrepreneurship in combating the social issues.

## Course Content

| DSC 9: Social Entrepreneurship | 60 Hrs |
|---|---|
| **Unit-1: Fundamentals of Social Entrepreneurship** | **15 Hrs** |
| **Chapter 1:**Social Entrepreneurship: Meaning, Features and Relevance;SocialBusiness:Meaning; Difference between Social Entrepreneurship and Social Business; Relation between Social Change and Social Entrepreneurship. **Chapter 2:** Typology of Ventures: Social PurposeVentures, Social Consequence Entrepreneurship, Enterprising Non-profits, Hybrid Models of Social Entrepreneurship. **Chapter 3:**Identifying social business opportunities. | |
| **Unit-2:Establishment of Non-Profit Organisations** | **15 Hrs** |
| **Chapter-4:**Concept (includes GovernmentOrganisations), Objectives and establishment of Non-Profit organizations (NPOs) **Chapter-5:**Legal Procedure for establishment of NPOs:Societies Registration Act, Indian Companies Act, Charitable Endowments Act, Foreign Contribution (Regulation) Act (FCRA);Available Tax Reliefs. **Chapter-6:**Social Values of NPOs: Mission and Vision; MoA and Bye-Laws. | |
| | **15 Hrs** |

| | |
|---|---|
| **Unit-3: ManagementandFinancing** | |
| **Chapter 7:**Human Resource Management: Staffing Plan, Social Security of Workers:Provisions and Benefits of Gratuity Act;Rules and Regulations of EPF Scheme. **Chapter-8:**ProjectManagement:Definition of Concept;Identification of Project; Proposal Development: BasicFactors, Project Proposal Guide; Budget, Rationale for sending Project Proposal to the Donor; Proposal Writing; Do's and Don'ts of a Project Proposal **Chapter 9:**Financing:Sources of Finance:Government, Donors, International Agencies; Documents Used in Fund Raising; Due Diligence; Campaigns; Internal Income Generation. | |
| **Unit-4:CaseStudies** | **15 Hrs** |
| **Chapter 10:**Pratham,RUDSET,Vivekananda GirijanaKalyanaKendra,BRHills **Chapters 11 &12:**Students should study the functioning of a local NPO, present their ideas in a seminar and submit a report (For example working in the areas of Sanitation, Rural Development,and (WomenEmpowerment) | |

**Books for Reference**:

Ruef,Martin2007, Sociology of Entrepreneurship, Emerald Publishing Limited
Sawang, Sukanlaya 2020 Entrepreneurship Education: A Lifelong Learning Approach, Springer Sharma, Sangeetha 2016 Entrepreneurship Development, Eastern Economy Edition, Prentice-HallIndia, Delhi

Sunder,Pushpa 2013 Business and Community:

The Story of Corporate Social Responsibility in India, Sage

Swedberg, Richard (Ed) 2000, Entrepreneurship: The Social Science View, Oxford University Press, London

**Web links:**
https://www.hec.edu/en/faculty-research/centers/society-organizations-institute/think/so-institute-executivefactsheets/what-social-business

https://socialtrendspot.medium.com/what-is-the-difference-between-social-innovation-social-enterprise-social-entrepreneurship-fe3fce7bf925

http://eprints.lse.ac.uk/29032/1/cswp3.pdfDefining the non-profit

sectorhttps://prosper-strategies.com/seven-nonprofit-core-values-examples/

https://www.intechopen.com/chapters/55499

## Course Articulation Matrix- 231551

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO2 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 |
| CO3 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| C04 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Weighted Average | 1.25 | 1.5 | 2 | 1.5 | 1.75 | 1.75 | 2 | 2 | 2 | 1.75 | 2. | 2 |

**DSC(10) Syllabus for BA. Sociology (Basic Honors)**

| Course Code: 231552 | Course Title: DSC (10) Society and Tribes |
|---|---|
| Course Credits: 04 (4:0:0) | Hours of Teaching/Week: 04 |
| Total Contact Hours: 60 Hrs | Formative Assessment Marks: 40 |
| Exam Duration: $2\frac{1}{2}$Hrs | Semester-End Examination Marks: 60 |

Course Outcomes(COs)

**CO1:**Recognise the social organization among the tribals.

**CO2:** Examine the impact of social changes on tribal social life.

**CO3:** Equipped to handle micro research work and communicat eeffectively.

**CO4:** Recognise the reality of tribal settlements and their challenges.

Course Content:

| DSC 10:Society and Tribes | 60 Hrs |
|---|---|
| **Unit – 1: Concepts and Categories** | **15 Hrs** |
| **Chapter-1:** Tribes and Indigenous People; Scheduled Tribes, Primitive Tribes, De-Notified or ex-criminal Tribes in India; Geographical Distribution of Tribes in India <br><br> **Chapter-2:**Meaningof:Hadis, Rules of Marriage,Clan,Lineage,Consanguinity and Affinity; Male-Female relations. <br><br><br> **Chapter-3:** SocialSystem,LegalSystem,PoliticalSystem,EconomicSystem,Religion and Magic. | |
| **Unit – 2:Changes and Development Issues** | **15 Hrs** |
| **Chapter-4:**SocialMobility:Types, Tribes and Caste, Tribe-Caste-Peasant Continuum, Sanskritisation. | |
| **Chapter-5:**Tribalisation, Detribalisation, Retribalisation. | |
| **Chapter-6:** Tribal Development and Welfare: Approaches - Assimilationist and Isolationist; Problems of Exploitation,Land Alienation, Unemployment, Cultural Transformation, Scheduled Areas, Tribal Justice and Modern Law. | |
| **Unit – 3: Studying Tribes** | **15 Hrs** |

| | |
|---|---|
| **Chapter-7:**Tradition of Fieldwork:History and Significance; Ethics of Fieldwork; Etic and Emic Perspectives | |
| **Chapter-8:**Sources of Data:Primary and Secondary | |
| **Chapter-9:**Participatory Method, CaseStudies, SampleSurveys, Genealogies | |
| <div align="center">**Unit-4: FieldWork**</div> | **15 Hrs** |
| Students have to takeup field work in any nearby tribal settlement and present their findings in a Seminar and written report. | |

## Books for Reference:

Ahuja,R2001SocietyinIndia,RajatPublications,Jaipur

Bose, N K 1941, Hindu Mode of Tribal Absorption, Science and Culture, Vol

VIIElwin,Verier.1963.ANewDealforTribalIndia. Forde,GD1979,

Habitat,EconomyandSociety,MetuenandCoLondon

Furer-Haimerdorf, Christoph von Tribes of India: The Struggle for Survival,

University ofCaliforniaPress,Berkeley

Ghurye, G S 1963 The Scheduled Tribes, Popular Prakashan, BombayHasnain,

Nadeem 2011

## Course Articulation Matrix – 231552

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| CO2 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| CO3 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Weighted Average | 2 | 1.5 | 1.5 | 1.75 | 1 | 2 | 1.75 | 2 | 2 | 2 | 1.75 | 2 |

## DSC(11) Syllabus for BA. Sociology (Basic Honors)

| | |
|---|---|
| **Course Code: 231553** | **Course Title: Statistics in Sociological Research** |
| **Course Credits: 04(4:0:0)** | **Hours of Teaching/Week: 04** |
| **Total Contact Hours: 60 Hrs** | **Formative Assessment Marks: 40** |
| **Exam Duration: $2\frac{1}{2}$Hrs** | **Semester-End Examination Marks: 60** |

**Course Outcomes(COs)**
**CO1**: Examine the research methods.
**CO2**:Evaluate the appropriate statistical techniques.
**CO3**:Identify and examine relationships among variables.
**CO4**: Enrich the knowledge of statistical research methods.

### Course Content

| DSC 11:Statistics in Sociological Research | 60 Hrs |
|---|---|
| **Unit – 1 Sociological Research** | **15Hrs** |
| **Chapter1:**Meaning of Science, Social Science, Research, Research Design<br>**Chapter 2:**Steps for Conducting Research: Choosing Research Topic, Literature Review, Sources of Data (Primary,Secondary)<br>**Chapter3:**Meaningof Concept, Assumption, Hypothesis; Formulating a Hypothesis; Independent Variable, Dependent Variable; Drawing Conclusion. | |
| **Unit – 2 MethodsofSociologicalResearch** | **15Hrs** |
| **Chapter4:**Qualitative and Quantitative Methods: Meaning, Differences<br>**Chapter 5:**Survey Methods: Sampling, Questionnaire, Interview<br>**Chapter6:**Observation: Participant, Non-participant Observation. | |
| **Unit – 3 Social Statistics** | **15Hrs** |
| **Chapter 7:**What is Social Statistics? Need for Studying Social Statistics<br>**Chapter 8:**Definition of -Population, Sample, Count, Fractions, | |

| | |
|---|---|
| Constant,Variable; Types of Statistics: Descriptive Statistics, Inferential Statistics<br>**Chapter 9:**Meaning of Frequency Distribution; Construction of Frequency Tables; Diagrammatic and Graphical Representation of Grouped Data: Advantages; Types: PieCharts, Bar Charts, Histograms, FrequencyCurve. | |
| **Unit-4: Methods of Statistical Measurement** | **15  Hrs** |
| **Chapter-10:**Measures of Central Tendency: Merits, Demerits;ArithmeticMean:Merits,Demerits;Median and Mode-Merits, Demerits<br>**Chapter-11:-**Measures of Dispersion: Range,-Standard Deviation,Mean Deviation, Quartile Deviation<br>**Chapter-12:-**Correlation:-Pearson's Correlation,-Rank Correlation. | |

**Books for Reference:**

Agarwal,Y.P.(1995).StatisticalMethods:Concepts,ApplicationsandComputation,New Delhi:SterlingPublishers.

Altman, Micah, Jeff Gill and Michael McDonald (2003). Numerical Issues in StatisticalComputingfortheSocialScientist,NewYork:JohnWileyandSons.

**Course Articulation Matrix – 231553**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Weighted Average | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

## DSC(12) Syllabus for BA. Sociology (Basic Honors)

| Course Code: 231651 | Course Title: Sociological Perspectives |
|---|---|
| Course Credits: 04 (4:0:0) | Hours of Teaching/Week: 04 |
| Total Contact Hours: 60 Hrs | Formative Assessment Marks: 40 |
| Exam Duration:$2\frac{1}{2}$Hrs | Semester-End Examination Marks: 60 |

**Course Outcomes(COs)**

**CO1:**Analyse the significance of major Sociological theories
**CO2:**Critically examine the fundamental theoretical categories
**CO3**: Identify the different nuances of concepts and terms.
**CO4:**Recognise the need and importance of social interaction and reflective relations in society**.**

### Course Content

| DSC 12:SociologicalPerspectives | 60 Hrs |
|---|---|
| **Unit-1: Basics of Theory** | **15 Hrs** |
| **Chapter-1:**Theory:Meaning and Features, Meaning of Social Theory.Types of Theory:Macro,Meso,Micro<br>**Chapter-2:**Building Blocks: Concept, Assumption, Hypothesis, Model;Need for Theoretical Thinking<br>**Chapter-3:**Meaning of Induction, Deduction, Fact, Causal Relation, Correlation, Constant, Variable, Generalisation. | |
| **Unit-2: Structural-FunctionalPerspective** | **15 Hrs** |
| **Chapter-4:**Origin of Functionalism and Structuralism; Meaning of: SocialStructure,Social System, Function, Integration, Social Equilibrium, Social Order, Dysfunction<br>**Chapter-5:**Postulates of Functional Analysis<br>**Chapter-6:**Neo-functionalism | |
| **Unit-3:ConflictPerspective** | **15 Hrs** |
| **Chapter-7:**Origin of Conflict Perspective; Meaning of Conflict, Social Inequality, Power, Dominance, Authority, Class Struggle, | |

| | |
|---|---|
| Hegemony<br>**Chapter-8:**Process of Social Conflictand Social Change;<br>**Chapter-9:**Functions of Social Conflict. | |
| **Unit-4:SymbolicInteraction Perspective** | **15 Hrs** |
| **Chapter-10:**Origin of Symbolic Interaction Perspective;<br>Meaning of:Symbol,Interaction, Social Construction of Reality,<br>Interpretation, Reflexivity,Negotiation<br>**Chapter-11:**Importance of Meaning; Definition of Situation<br>**Chapter-12:**Dramaturgyand Everyday Life. | |

## Books for Reference:

Aron,Raymond(1991). MainCurrentsinSociologicalThought(Vol.1),

London:Penguin.Barnes H.E. ed. (1948). An Introduction to the History of Sociology,

Chicago: ChicagoUniversityPress.

Black, Max ed. (1961). The Social Theories of Talcott Parsons: A

CriticalExamination,Carbondale: Southern IllinoisUniversityPress.

## Course Articulation Matrix – 231651

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| **CO2** | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| **CO3** | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 2 |
| **CO4** | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 2 |
| **Weighted Average** | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 1.5 | 2 |

## DSC(13) Syllabus for BA. Sociology (Basic Honors)

| | |
|---|---|
| CourseCode:231652 | Course Title: Sociology of Health |
| CourseCredits:04(4:0:0) | Hours of Teaching/Week: 04 |
| Total Contact Hours:60 Hrs | Formative Assessment Marks: 40 |
| Exam Duration: $2\frac{1}{2}$Hrs | Semester-End Examination Marks: 60 |

## Course Outcomes(COs)

**CO1:**Analysethe concept of health, illness and social conditions

**CO2:**Analyse the relationship between social factors and health status

**CO3**:Examine the role of medical doctors, paramedics, pharmaceutical industry and social institutions in maintaining and promoting health.

**CO4:** Critically evaluate the role of hospitals, and pharma companies in providing health services.

## Course Content

| DSC-13:Sociology of Health | 60 Hrs |
|---|---|
| **Unit -1: Introduction** | **15 Hrs** |
| **Chapter-1:**Sociology of Health:Meaning,Nature and Need;Scope:Sociology in Medicine and Sociology of Medicine<br>**Chapter-2:**Emergence and Development of Sociology of Health in World and India<br>**Chapter-3:**Actors:Doctors-Nurses and Paramedical Staff-Patients and their Relationship. | |
| **Unit -2: Determinants of Health** | **15 Hrs** |
| **Chapter-4:**SocialDeterminants:Class, Caste, Power, Gender, Social Cohesion<br>**Chapter-5:**Cultural Determinants: Beliefs, Nutrition, Environment<br>**Chapter-6:**EconomicDeterminants:Poverty, Homelessness, Living Conditions, Neighbourhood | |

| | 15 Hrs |
|---|---|
| **Unit-3: ModelsofHealth** | |
| **Chapter-7:**Systems of Medicine (BiomedicineandAYUSH); Dominance of Bio-medical Model<br>**Chapter-8:**Sick Role and Experiencing Illness<br>**Chapter-9:**Hospital as Social Organisation. | |
| **Unit-4: Health Care Reform** | **15 Hrs** |
| **Chapter-10:** Medicalisation and Pharamceuticalisation of Health<br>**Chapters 11 &12:**Learning from the Field: Report on Health Services or Functioning of Health Organisations or Selected Health Programmes at State Level. | |

## Books for Reference:

Albert, Gary L. and R. Fitzpatrick (1994).Quality of Life in Health Care: Advances inMedicalSociology,Mumbai:JaiPress.

AnnandaleAllen(2001).TheSociologyofHealthandMedicine–ACriticalIntroduction,Cambridge:PolityPress.

Bloom,SamuelW.(1963).TheDoctorandHisPatient,NewYork:FreePress.Coe,RodneyM.(1970).SociologyofMedicine,NewYork: McGraw Hill

### Course Articulation Matrix – 231652

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| **CO2** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| **CO3** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| **CO4** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| **Weighted Average** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

## DSC(14) Syllabus for BA. Sociology (Basic Honors)

| | |
|---|---|
| **Course Code: 231653** | **Course Title:  Society in Karnataka** |
| **Course Credits: 04(4:0:0)** | **Hours of Teaching/Week: 04** |
| **Total Contact Hours: 60 Hrs** | **Formative Assessment Marks: 40** |
| **Exam Duration: $2\frac{1}{2}$Hrs** | **Semester-End Examination Marks: 60** |

## Course Outcomes(COs)

**CO1**: Acquaint and appreciate the cultural aspects of Karnataka.
**CO2:**Critique and examine the social changes occurring in Karnataka.
**CO3:**Identify the usefulness of sociological study in contemporary society.
**CO4:** Examine the changing social institutions and their impact on social life.

## Course Content

| DSC- 14 :SocietyinKarnataka | 60 Hrs |
|---|---|
| **Unit – 1: Features of Karnataka** | **15  Hrs** |
| **Chapter-1:**Overview of Karnataka's History:Antiquity of Land and Language Social Composition: Religion, Language, Caste, Tribe, Class as per latest Census/ Sample Surveys; HDI and Regional Disparities. **Chapter -2:** Geography and Politics: Spatial Features: Plains, Coastal and Malnad; Old Mysuru, Hyderabad Karnataka, Bombay Karnataka and present-day administrative division (Mysuru,Bengaluru, Kalyana Karnataka and Kittur Karnataka); Political Landscape since Independence **Chapter-3:**EconomicProfile:Developments in Agriculture, Industry and Service Sectors. | |
| **Unit-2: Social Organisation** | **15  Hrs** |
| **Chapter-4:**Religions, Languages, Castes, Tribes and Classes as per latest Census/Sample Survey **Chapter-5:**Education: Growth of STEM Courses,Status of Social Sciences. **Chapter-6:**HDI and Regional Disparities. | |
| | |

| Unit – 3  Social Movements of Karnataka | 15  Hrs |
|---|---|
| **Chapter-7:**Unification of Karnataka, Save Kannada and Gokak Movements.<br>**Chapter-8:**EnvironmentMovements:Chipko and Appiko, Sahyadri Mining Protest, Sea-bird Naval Base, Movement Against Social Forestry.<br>**Chapter-9:**Socio-Religious Movements:Veerashaiva, Non-Brahmin, Dalit Movements. | |
| **Unit-4:Studieson Karnataka Society** | **15  Hrs** |
| **Chapter-10:**Contributions of M N Srinivas, SParvathamma, HiremallurIshwaran<br>**Chapters -11 and 12:** Fieldwork report on Changing Social Institutions and their Impact on Social Life. | |

## Books for Reference:

GovernmentofKarnataka.HumanDevelopmentReports,PlanningandStatisticsDepartment,Bangalore.

Jai Prabhakar SC, Socio-Cultural DimensionsofDevelopmentinNorthKarnataka,CMDR MonographSeriesNo.–63.PanchamukhiPR.2001.North-South Divide:Karnataka'sDevelopmentScenario,CMDR.

## Course Articulation Matrix – 231653

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO3 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| **Weighted Average** | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

## VI SEMESTER BA INTERNSHIP

| | |
|---|---|
| Course Code: 23INTSOC01 | Course Title: Internship |
| Course Credits: 02 | Hours of Teaching/Week: |
| Total Contact Hours: <br><br> 90 Hours Internship | Formative Assessment Marks: <br><br> 100 Marks(C1=50+C2=50) |

**Note: This course will run as per the guidelines defined by the BoS Bachelor of Arts (Sociology), University of Mysore, Mysuru and the same is approved by BoS, Bachelor of Arts (Sociology)SBRRMahajana First Grade College, Mysuru.**

**Course Outcomes (COs):**

CO1: Ableto understand social phenomena.

CO2: Will engage in community development programs.

### Course Articulation Matrix – 23INTSOC01

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Weighted Average | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

### Scheme of Valuation for Internship

C1 and C2 are internal assessments to be conducted during the 8th and 16th weeks respectively for the semester. The student will be evaluated on the basis of presentation skills and project development. The student has to compulsorily submit the project report for evaluation during C2. The report has to be certified by the Head of the Department and the Mentor/Supervisor.

The student is evaluated for 100marks in C1 and C2 as per the following scheme:

➢ Project Progress Presentation (**C1**): 25 marks
➢ Project Development and Report (**C2**): 25marks

| Assessment Criteria | Marks |
|---|---|
| Project Presentation Skills | 25 |
| Project Development Skills and Report | 25 |
| **Total** | **50** |

**Note:Assessment needs to be done as per the regulation.**

# Continuous Formative Evaluation/Internal Assessment

Total marks for each course shall be based on continuous assessments and semester-end examinations. The pattern is 40:60 for IA and Semester End Theory Examinations respectively.

| THEORY | | |
|---|---|---|
| **Total Marks** | | **100** |
| **Continuous Assessment – 1 (C1)** | **20** | |
| **Continuous Assessment – 2 (C2)** | | **20** |
| **Semester End Examination (C3)** | **60** | |

## Evaluation Process of IA Marks shall be as follows:

a. The first component (C1) of the assessment is for 20% marks. This shall be based on tests, assignments, seminars, case studies, fieldwork, project work etc. This assessment and score process should be completed after completing 50% of the syllabus of the course and within 45 working days of the semester program.

b. The second component (C2) of the assessment is for 20% marks. This shall be based on the test, assignment, seminar, case study, fieldwork, internship/industrial practicum/project work, quiz etc. This assessment and score process should be based on the completion of the remaining 50% of the syllabus of the course of the semester.

c. During the 17th – 19th week of the semester, a semester-end examination shall be conducted by the college for each course. This forms the third and final component of the assessment (C3) and the maximum marks for the final component will be 60%.

d. In case of a student who has failed to attend the C1 or C2 on a scheduled date, it shall be deemed that the student has dropped the test. However, in case of a student who could not take the test on the scheduled date due to genuine reasons, such a candidate may appeal to the Program Coordinator/Principal. The Program Coordinator/Principal in consultation with the concerned teacher shall decide about the genuineness of the case and decide to conduct the special test for a such candidate on the date fixed by the concerned teacher but before the commencement of the concerned semester-end examinations.

e. For assignments, tests, case study analysis etc., of C1 and C2, the students should bring their answer scripts (A4 size), graph sheets etc., required for such tests/assignments and these be sealed/signed

   by the concerned department at the time of conducting tests/assignment/project work etc.

f. The outline for continuous assessment activities for Component-I (C1) and Component-II (C2) of a course shall be as under:

| | C1 Marks | C2 Marks | Total Marks |
|---|---|---|---|
| Session Test | 20 | 20 | |
| Seminar/Assignment/ Field Visits/Quiz etc. | 20 | 20 | |
| Total | 20 | 20 | 40 |

- Conduct of Tests, Seminars, Case studies/Assignments etc., can be either in the C1 or in the C2 component as decided by the college and concerned department/teacher.
- The teachers concerned shall conduct tests/seminars/case studies etc., The students should be informed about the modalities well in advance. The evaluated course assignments during component I (C1) and component II (C2) of the assessment are immediately provided to the candidates after obtaining acknowledgement in the register by the concerned teacher(s) and maintained by the Department. Before the commencement of the semester-end examination, the evaluated test, assignment etc., of C1 and C2 shall be obtained back to maintain them till the announcement of the results of the examination of the concerned semester.
- The marks of the internal assessment shall be published on the notice board of the department/college for information of the students.
- The internal assessment marks shall be communicated to the CoE at least 10 days before the commencement of the examinations and the CoE shall have access to the records of such periodical assessments.
- There shall be no minimum in respect of internal assessment marks.
- Internal assessment marks may be recorded separately. A candidate who has failed or rejected the result shall retain the internal assessment marks.

**Question Paper Pattern (DSC and OE)**
**B.A. Examination Month /Year**
**(Scheme NEP) Sociology**
**Title of the Paper**


**Time:2 Hrs 30 minsMax Marks:60**
**Part-A**
**I. Answer all Questions:**                    **5 X 2 = 10**
1.
2.
3.
4.
5.

**Part-B**
**II. Answer any Four Questions:**           **4 X 5 = 20**
6.
7.
8.
9.
10.
11.

**Part-C**
**III. Answer any Three Questions:**                    **3X 10 = 30**
12.
13.
14.
15.
16

SBRR MAHAJANA FIRST GRADE COLLEGE (Autonomous)
**POST GRADUATE WING**
(Accredited by NAAC with 'A' grade)

# Pooja Bhagavat Memorial Mahajana Education Centre.
**Affiliated to University of Mysore.**
K.R.S. Road Metagalli, Mysuru-570016
Ph:0821-4009600, 4009614, 4009622
Website: pgc.mahajana.edu.in

# MBA (Autonomous) Regulations w.e.f. 2022 – 2023

## DEPARTMENT OF STUDIES IN BUSINESS ADMINISTRATION

# New Courses added 2023-24

# II Semester

| Course Nature | Course Area | Semester | |
|---|---|---|---|
| Foundation | General Management | II | |
| Course code | Course Name | Credit/Distributions | |
| 23C207 | Business Analytics | (L-3: T-0:P-0) Credit - 03 | |
| | | C1+C2 | 30 Marks |
| | | C3 | 70 Marks |

**Course Objective**

- o Provide a basic knowledge of the application of business analytics to business disciplines
- o To study the role of Business Analyst and Data Science in business.
- o To understand the basic concept of data management and data mining techniques
- o To analyze the application of business analysis.
- o To examine optimization techniques for making business decisions

**Course Learning Outcome**

**CO1**: Understand the Scope and Importance of Business Analytics through the various approaches to Business Decision Making

**CO 2**: Analyze the application of business analysis in different domains

**CO 3:** Use measures of dispersion, compute and interpret the results of Correlation and Regression Analysis in business forecasting and decisions.

**CO 4**: Demonstrate the use of decision theory to handle uncertain business situations.

**CO 5**: Find optimal solutions by various data analytics techniques.

**Module 1: Foundations of Data Analytics**                          **Contact Hours: 06**

- **Historical Overview of Data Analytics**, Data Scientist vs. Data Engineer vs. Business Analyst, Career in Business Analytics,

- **Introduction to Data:** Sources of Data, Data Collection, Data Classification, Data Acquisition, Data Preparation and Data Management, Big Data Management, Data Science.

**Module 2: Application of Business Analytics**                          **Contact Hours: 04**

- **Applications for Data Science**: Data Scientists Roles and Responsibility.

- **Application of Business Analytics**: Retail Analytics, Marketing Analytics, Financial Analytics, Healthcare Analytics, Supply Chain Analytics (Only Theory)

**Module 3: Descriptive Statistics**                                    **Contact Hours: 10**

- **Measures of Central Tendency**: Applications and Problems on measures of central tendency

- **Measures of Dispersion**–Karl Pearson correlation, Spearman's Rank correlation, Simple and multiple regressions (Problems on Simple regression only), Time Series Analysis (Method of Least Squares)

**Module 4: Decision Theory**                                           **Contact Hours: 08**

- **Introduction**: Steps of the decision-making process, types of decision-making environments, Decision-making under uncertainty, Decision-making under Risk

- **Decision Tree**: Meaning & Concept, Numerical Problems on Decision Tree.

**Module 5: Optimization Techniques for Data Analytics**                **Contact Hours: 08**

- **Linear programming**: Graphical method

- **Transportation problem**: Various methods of finding the Initial basic feasible solution, NorthWest Corner Method, Least Cost Method & VAM Method,

- Assignment Model & Game Theory

**Reference Material**

- **James R Evans,** Business Analytics-Methods, Models and Decisions, Pearson Education,3rdEdition,2021, ISBN-13: 978-93-903-9458-6

- **Purba Haldy Rao**, Business Analytics-an application focus, PHI Learning, 2013, ISBN 978- 81-203-4819-6

- **U R Dinesh Kumar,** Business Analytics: The Science of Data - Driven Decision Making, Wiley,2017, ISBN 978-81-265-6877-2

| CO/PO ARTICULATION MATRIX | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
| CO1 | 3 | 3 | - | - | - | - | - | - | 3 | - | - | - |
| CO2 | - | 3 | - | - | - | - | - | - | - | 3 | - | - |
| CO3 | - | - | - | 2 | - | 2 | - | - | - | - | - | - |
| CO4 | - | - | - | 2 | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | 3 | - | - | - | - | - | - |
| W. A | 3 | 3 | - | 2 | - | 2.5 | - | - | 3 | 3 | - | - |

# IV Semester

| Course Nature | Course Area | Semester | |
|---|---|---|---|
| Hard Core | General Management | IV | |
| Course code | Course Name | Credit/Distributions | |
| 23C401 | Project Appraisal & Management | (L-3: T-0:P-0) Credit - 03 | |
| | | C1+C2 | 30 Marks |
| | | C3 | 70 Marks |

## COURSE OBJECTIVE

☐ To Introduce students to the concept of project concept and idea formulation;
☐ To equip the students with evaluation techniques.
☐ To enable and enhance the understanding of students on project management and appraisal.
☐ To enable students to decide project uncertainty conditions

## COURSE LEARNING OUTCOME

**CO1:** Identify different concepts, contemporary methods, and systems for project management and appraisal.

**CO2:** Understand specialized evaluation techniques to determine and evaluate project feasibility.

**CO3:** Apply, synthesize, and communicate the financial context of projects and compare alternative projects.

**CO4:** Critically analyses risk parameters to decide the selection of projects.

**CO5:** To acquire knowledge and competencies to successfully implement the project

## MODULE 1: Project Planning and Project Analysis　　　　　HOURS:12

☐ Planning & Analysis Overview: Phases of capital budgeting. Resource Allocation Framework: Key criteria for allocation of resource. Generation and screening of project ideas

☐ Market and demand analysis - Technical analysis – Environment analysis. (Environmental appraisal of projects: types and dimensions of a project – meaning and scope of the environment – Environment – Environmental resources values – environmental impact assessment and environmental impact statement).

## MODULE 2: Financial estimates and Project cash flows　　　　　HOURS: 10

☐ Financial Estimates and projections- Estimation of cost of project and means of financing – Estimates of sales and production – Cost of production – Working capital requirement and its financing – Estimates of working results – breakeven points – projected cash flow statement – projected balance sheet.

**MODULE 3:   Project Risk Analysis**                                   **HOURS: 08**

- ☐ Simple estimation of risk – sensitivity analysis – scenario analysis – Monte Carlo simulation – decision tree analysis, decision tree, and real option – option to abandon – option to continue and an option to extend – selection of project – risk analysis  in practice.

**MODULE 4:  Special decision situations**                              **HOURS: 08**

- ☐ Choice between mutually exclusive projects of unequal life – optimal timing decision –determination of economic life – inter-relationships between investment andfinancing aspects – inflation and capital budgeting

**MODULE 5: Project Implementation**                                     **HOURS: 10**

- ☐ Project planning    and    control management –Network    techniques    for project management – Development of project network – Time estimation – Determination of critical path – scheduling when resources are limited – PERT and CPM models

**REFERENCE MATERIAL**

- ☐ Prasanna Chandra; Projects-Planning, Analysis, Selection, Financing, Implementationand Review; Tata McGraw Hill;
- ☐ Narendra Singh – Project Management and Control – HPH,
- ☐ Nicholas – Project Management for Business and Technology: Principles and Practice Pearson / PHI Gray & Larson – Project Management: The Managerial Proc

| CO/PO ARTICULATION MATRIX | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
| CO1 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 1 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 1 | 3 | 2 |
| CO4 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 1 | 3 | 2 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 1 | 2 |
| W. A | 2.8 | 3 | 2.8 | 2.6 | 2.4 | 2.4 | 2.2 | 2.4 | 2.8 | 1.8 | 2.6 | 2.6 |

# IV Semester

| Course Nature | Course Area | Semester | |
|---|---|---|---|
| Elective | **Human Resource Management** | **IV** | |
| **Course code** | **Course Name** | **Credit/Distributions** | |
| **23C4H6** | **International Human Resource Management** | **(L-4: T-0:P-0) Credit - 04** | |
| | | **C1+C2** | **30 Marks** |
| | | **C3** | **70 Marks** |

## COURSE OBJECTIVE

☐ To understand how global HRM functions are different from generic HRM functions in the domestic arena and to understand various concepts and practices within the field of Global HRM

☐ To appreciate the implications of globalization on people management in multinational organizations

☐ To systematically define, categorize, and analyze issues and problems faced by MNCs in their people management activities

☐ To appraise the impact of global factors (cultural and contextual factors) in shaping HR practices namely hiring, training, compensating, performance appraisal, and management and employee/Labour relations management in MNCs

## COURSE LEARNING OUTCOME

**CO1**: Demonstrate how global HRM functions are different from generic HRM functions in the domestic arena and understand various concepts and practices within the field of global HRM

**CO2:** Identify the impact of global factors (cultural and contextual factors) in shaping HR practices.

**CO3:** Outline the implications of globalization on people management in multinational organizations

**CO4:** Examine the issues and problems faced by MNCs in their people Management activities.

**CO5:** Identify the impact of global factors in shaping compensation, performance Appraisal and management.

**Module 1: Introduction to International HRM**                    **Hours: 10**

- **Introduction -** Defining International HRM Models of International HRM, DifferenceBetween HRM & International HRM.
- **Strategic View of IHRM -** A Model of Variables Differentiating HRM & InternationalHRM, Strategic View of International HRM, Evolving Field of International
- HRM, Evolving Roles of HRM in MNCs, IHRM Trends & Challenges, ChangingContext of International HRM

**Module 2: The Cultural & Organizational Context of IHRM**                    **Hours: 10**

- **Cultural Context** – Introduction to Cross-Cultural Management System, Schein's Concept of Culture, Hofstede's Cross Cultural Management Study, The Globe Study, Cultural Dimensions of Globe Study, The Trompenaars and Hampden-Turner study, The Cultural dimensions by Hall and Hall
- **Organizational Context -** Standardization & Localization of HRM Practices, Factors Driving Standardization, Factors Driving Localization, The Path to Global Status and Control Mechanism

**Module 3: Sourcing Human Resource for Global Markets**                    **Hours: 08**

- **Staffing** – Approaches to Staffing, Transferring Staff for International Business Activities, The Role of Expatriate, Non-expatriate & Inpatriates.
- **Recruitment & Selection** – Recruitment & Selection of International Managers, Selection Criteria, Expatriate Selection Process in Practice, Expatriate Success & Failureand Dual Career Couples.

**Module 4: International Training, Development & Career**                    **Hours: 10**

- Global Training & Development - Trends in International Training & Development, Components of Effective Pre-departure Training Programme, The Effectiveness of Pre–departure Training and Developing Staff Through International Assignments.
- Global Career – Re-Entry & Career Issues, The Repatriation Process, Individual Reactions to Re-Entry, and, Designing a Repatriation Programme

**Module 5: International Performance Management & Compensation**                    **Hours:10**

- **Performance Management** – Multinational Performance Management, Expatriate and non-expatriate Performance Management, Performance, and Appraisal of International Employees.
- **Compensation** – Objective of International Compensation, Key Components of an International Compensation Programme for Expatriates, Approaches to International Compensation of Expatriates, and Complexity, Choices and Challenges in Global Pay

**Reference Material**

- **Dowling P. J.**, International human resources management, Cengage EMEA.
- **Harzing, A. W. and Pinnington, A.**, International human resource management, SagePublication, London.
- **Saini, D. S. and Sami A. K.,** Human resource management – Perspectives for the newera,Response Books (A Division of Sage), New Delhi.

| CO/PO ARTICULATION MATRIX | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
| CO1 | 3 | 2 | 3 | 1 | 1 | 2 | 2 | 3 | 2 | 3 | 3 | 2 |
| CO2 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 |
| CO3 | 3 | 2 | 3 | 3 | 3 | 1 | 2 | 1 | 2 | 3 | 2 | 2 |
| CO4 | 3 | 2 | 3 | 3 | 3 | 2 | 1 | 2 | 2 | 3 | 3 | 2 |
| CO5 | 3 | 2 | 3 | 3 | 3 | 1 | 1 | 3 | 2 | 3 | 3 | 2 |
| W. A | 3 | 2 | 3 | 2.6 | 2.6 | 1.6 | 1.6 | 2.2 | 2 | 3 | 2.8 | 2 |

# SBRR Mahajana First Grade College (Autonomous), PG Wing
# Pooja Bhagavat Memorial Mahajana Education Centre
KRS Road, Metagalli, Mysuru-570016.

## DEPARTMENT OF MCA
## 2023-2024

## MOTTO
Enter to Learn Depart to Serve

## VISION
Build a Strong Research and Teaching Environment that Responds Swiftly to the Challenges of the 21st Century.

## MISSION

1. To provide the highest quality education in Computer Science;
2. To perform research that advances the state-of-the-art in Computer Science;
3. To produce post graduates who are knowledgeable, articulate, principled, innovative, confident, and able to think critically;
4. To be engaged in local, State, and National issues to the benefit of both public and the private sector; and
5. To maintain a diverse college community.

## New Courses added 2023-24

**SC**                        **Research Methodology**                **3:1:0**

### OBJECTIVES:
- To give an overview of the research methodology and explain the technique ofdefining a research problem.
- To explain the functions of the literature review in research.
- To explain carrying out a literature search, its review, developing theoretical andconceptual frameworks and writing a review.
- To explain various research designs and their characteristics.

### OUTCOMES:
- Identify the suitable research methods and articulate the research steps in a properway.
- Explain the functions of the literature review in research, carrying out a literaturesearch.
- Explain various research designs, sampling designs, measurement and scalingtechniques.
- Perform the data collection from various sources segregate the primary and secondary.

### UNIT I:

Research Methodology: Introduction, Meaning of Research, Objectives of Research, Motivation in Research, Types of Research, Research Approaches, Significance of Research, Research Methods versus Methodology, Research and Scientific Method, Importance of Knowing How Research is Done, Research Process, Criteria of Good Research, and Problems Encountered by Researchers in India.

### UNIT II:

Defining the Research Problem: Research Problem, Selecting the Problem, Necessity of Defining the Problem, Technique Involved in Defining a Problem, An Illustration. Reviewing the literature: Place of the literature review in research, Bringing clarity and focus to your research problem, Improving research methodology, Broadening knowledgebase in research area, Enabling contextual findings, How to review the literature, searching the existing literature, reviewing the selected literature, Developing a theoretical framework, Developing a conceptual framework, Writing about the literature reviewed.

### UNIT III:

Research Design: Meaning of Research Design, Need for Research Design, Features of aGood Design, Important Concepts Relating to Research Design, Different Research Designs, Design of Sample Surveys: Introduction, Sample Design, Sampling and Non sampling Errors, Sample Survey versus Census Survey, Types of Sampling Designs.

**UNIT IV:**

Data Collection: Experimental and Surveys, Collection of Primary Data, Collection of Secondary Data, Selection of Appropriate Method for Data Collection, Case Study Method. Interpretation: Meaning of Interpretation, Technique of Interpretation, Precaution in Interpretation, Significance of report writing, Different steps in writing report, Layout of the research report.

**References:**
1. Research Methodology: Methods and Techniques, C.R. Kothari, Gaurav Garg New Age International 4th Edition, 2018.
2. Research Methodology a step-by- step guide for beginners. (For the topic Reviewing the literature under module 2)Ranjit Kumar SAGE Publications Ltd 3rd Edition, 2011 Study Material.
3. Research Methods: the concise knowledge base Trochim, Atomic Dog Publishing, 2005.
4. Conducting Research Literature Reviews: From the Internet to Paper Fink A SagePublications, 2009.

## Course articulation matrix:

| PO / CO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 |
| CO2 | - | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 |
| CO3 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| CO4 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| Weighted Average | 2 | 1.75 | 1.25 | 1 | 1 | 1.5 | 1.25 | 1 | 1.75 | 1 |

**1: Low, 2: Moderate, 3: High**

## SC                    NPTEL MOOC COURSE                    4 Credits

NPTEL Certification Courses (MOOC Courses) NPTEL (National Programme on Technology Enhanced Learning) is a joint initiative of the IITs and IISc. Through this initiative, online courses and certification in various topics are offered to the students and scholars to enrich their knowledge in various domains.

Students shall submit certificates showing the credit points (no. of week course) earned through SWAYAM MOOCs to the Head of the department.

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# Mahajana Education Society (R)

## Education to Excel

## SBRR Mahajana First Grade College (Autonomous)
## Post Graduate Wing

## Pooja Bhagavat Memorial Mahajana Education Center
## KRS Road, Metagalli, Mysuru

## SCHOOL OF LIFE SCIENCES
## M.Sc. BIOCHEMISTRY

## Choice Based Credit System (CBCS)

| M.Sc. Biochemistry I Semester | Membrane Biology Course Code: 23F108 | SC – Soft Core |
|---|---|---|
| Total Hours: 48 | Credits: 03 (LTP - 3:1:0) | Total Marks: 15+15+70 = 100 |

Learning Objectives: Students should study this paper to know –
   a. To study biological membrane structure and function.
   b. To study physiological process of biological membranes

| Module | Course contents | |
|---|---|---|
| 1 | **Physico-chemical properties of membranes:** Compositionsand supra molecular organization. Membrane lipid phases; bilayer phase, non-bilayer phase, phase transition and membrane potential. Models of membrane: Evolution in concept of membrane models, Gorter and Grendel's experiment. Bilayer structure; Danielle - Davson model of membrane, Singer and Nicholson's model and Newer models. **Membrane asymmetry:** Membrane lipids, proteins and carbohydrates and their lateral diffusion. Biogenesis of lipids and proteins, polarized cells, membrane domains; caveolae, rafts and protein turnover. Intracellular targeting of proteins. Biogenesis of sub cellular organelles. | 12h |
| 2 | **Methods of study of membrane structure:** Lipid transfer proteins, phospholipases, chemical methods, amino-phospholipid translocation, TNBS reagent, freeze fracture and freeze etching. Lipid vesicles; liposome preparations and application, function of sterols in membranes. FRET, FRAP, single particle tracking, EM of membranes, calorimetry, confocal microscopy of membrane dynamics. Cell fusion, shedding of membrane. | 12h |
| 3 | **Membrane transport:** Laws of diffusion across membranes; simple diffusion, facilitated diffusion and active transport. Glucose transporters, $Ca_{2+}$ ATPase, $Na+-K+$ATPase (Structure and mechanism of action). Endocytosis, receptor mediated endocytosis, exocytosis, ion channels; gated and non-gated, aquaporin channel.Bacterial phosphotransferase system. | 12h |
| 4 | **Nerve transmission:** Structure and types of Neuron. Acetylcholine receptor and neurotransmitters, mechanisms of nerve conduction, resting and action potential,ion channels, ionophores, patch clamp technique. Presynaptic and postsynaptic membranes. Nicotinic and muscarinic neurons. GABA, NMDA, structure and function. **Muscle contraction:** Mechanisms, role of calcium, calmodulin, and phospholamban. | 12h |

Learning Outcomes:
   a. Understand properties of biological membrane, and different models of membrane explaining the biological function.
   b. Understand membrane asymmetry and other properties using various methods.
   c. Understand the complex mechanism involved in transportation of biomolecules across membranes.
   d. Nerve transmission.

References:
   1. Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., and Walter, P. 2008. Molecular Biology of the Cell.(5th Ed.) New York: Garland Science.
   2. Cooper, G. M., and Hausman, R. E. 2013. The Cell: a Molecular Approach (6th Ed.). Washington: ASM.Sunderland.
   3. Lodish H., and Berk A. 2016. Molecular Cell Biology (8th Ed.). New York. W H Freeman.

| M.Sc. Biochemistry II Semester | Endocrinology Course Code: 23F207 | SC – Soft Core |
|---|---|---|
| **Total Hours: 48** | **Credits: 03(LTP - 3:0:0)** | **Total Marks: 15+15+70 = 100** |

| Module | Course contents | |
|---|---|---|
| 1 | **Cell:** Structure of a cell, mitosis, meiosis, cell cycle and its regulation, different phases of cell cycle. Apoptosis, cyclins and CDKs. Cell-cell and cell-ECM interaction and ECM structure and function.<br>**Endocrine System:** Endocrine organs in man. Location and inter relationship of endocrine glands in man; classification and chemistry of hormones, hormones of hypothalamus, pituitary, thyroid, parathyroid, pancreas, liver, adrenals, gonads and intestine. | 08h |
| 2 | **Functions and abnormalities:** Hypo and hyper production of hormones secreted by; pituitary, thyroid, pancreas, adrenals and gonads.<br>**Structure and control of hypothalamus function:** Hormones produced; GRH, somatostatin, TRH, CRH, GnRH.<br>**Pituitary gland:** Structure, hormones of anterior, posterior and median lobes. Pro-opiomelanocortin.<br>**Testes and ovaries:** Structure, hormones produced by testes and ovaries, menstrual cycle.<br>Regulation of hormone production and release: hypothalamus-pituitary-target organ axis and regulation by feedback mechanism. | 14h |
| 3 | **Mechanism of hormone action: Peptide hormones:** General mechanisms of cell signaling by hydrophilic factors, transmembrane receptors, transmembrane receptors, G protein coupled receptors, receptor tyrosine kinase, eicosanoid receptors.<br>**Second messengers:** IP3, DAG, cAMP, protein kinases. Nitric oxide signaling; generation and action.<br>**Growth factors:** Structure, mechanism of action and receptors of EGF, PDGF, NGF and IGF. insulin receptor. | 12h |
| 4 | **Mechanism of action of steroid hormones:** Conversion of cholesterol to steroid hormone. Steroid receptors, isolation and characterization of steroid receptors. Receptor down regulation, desensitization and up regulation.<br>Pineal gland, melotonin and circadian rhythm.<br>Chemistry and action of prostaglandins, prostacyclins and thromoxanes.<br>Newly discovered hormones<br>**Insect hormones:** Structure and function of moulting hormone, ecdysone, juvenile hormones, Pheromones. Application of insect hormones. | 14h |

**Learning Outcomes: After studying this paper the students will know –**
  a. Understand the detailed structure of a cell
  b. Involvement of various organelles in the synthesisof protein, amino acid and steroid hormones.
  c. Understand the various endocrine organs in relation to the regulation of various metabolic processes.
  d. Understand the hypo and hyperactivities of all the endocrine organs and their manifestation in various disorders.

**References:**
  a. Alberts. B., Johnson, A., Lewis, J., Raff, M., Roberts, K., and Walter, P. 2008. Molecular Biology of the Cell. (5th Ed.) New York: Garland Science.
  b. Cooper, G. M., and Hausman, R. E. 2013. The Cell: a Molecular Approach (6th Ed.). Washington: ASM, Sunderland.
  c. Lodish H., and Berk A. 2016. Molecular Cell Biology (8th Ed.). New York. W H Freeman.

| M.Sc. Biochemistry II Semester | Biology for non-biologists Course Code: 23F208 | Open Elective |
|---|---|---|
| **Total Hours: 48** | **Credits: 04 (LTP - 2:2:0)** | **Total Marks: 15+15+70 = 100** |

| Module | Course contents | |
|---|---|---|
| 1 | Introduction: History of Biology; Origin of Life-theories, The Scientific Study of Life; The Chemical Basis of Life ; The Molecules of Cells<br>A Tour of the Cell ; The Working Cell<br>Classification of Phyla, (microbes, plants and animals.)<br>Photosynthesis: Using Light to Make Food; How Cells Harvest Chemical Energy | 12h |
| 2 | The Cellular Basis of Reproduction and Inheritance<br>Patterns of Inheritance | 6h |
| 3 | Human Physiology: Basic structure and functioning, disorders of Nervous, renal, hepatic, muscle, blood, bone tissues. Reproduction, Hormones. Animal cell culture for research and therapy.<br>Plant physiology: Meristems, primary and secondary growth, types of tissues, reproduction, flowers, fruits, seeds, germination. Plant hormones, Plant tissue culture for crop improvement. | 18 h |
| 4 | Molecular Biology of the Gene. Importance of gene expression. DNA Technology and Genomics and Proteomics<br>Human diseases: Communicable, non-communicable. Familial and Sporadic disorders. | 12 |

**Learning outcomes**

1. Student would be able to work independently to use scientific methods during biology related investigations.

2. Use critical thinking and scientific problem-solving to make informed decisions in a real-worldcontext.

3. Understand cellular processes in a living being.

4. Human diseases.

**References:**
1) Renato A Dela Pena Jr. General Biology. 2016. JFS Publishing
2) Holley D. General Biology I: Molecules, Cells and Genes. 2017. Dog Ear Publishing
3) Dela Pena Jr et al., General Biology. JFS Publishing Services 2016

| M.Sc. Biochemistry III Semester | Research Methodology, Biostatistics and Bioinformatics | SC – Soft Core |
| --- | --- | --- |
| | Course Code: 23F306 | |
| **Total Hours: 60** | **Credits: 04 (LTP - 3:0:0)** | **Total Marks: 15+15+70 = 100** |

| Module | Course contents | |
| --- | --- | --- |
| 1 | **Research Methodology:** Definition –Characteristics, types. Identification of the problem, assessing the status of the problem, formulating the objectives, preparing the design (experimental or otherwise), actual investigation. Review of literature, Hypothesis, Data– Categorical, nominal & Ordinal. Methods of Collecting Data: Observation, field investigations, direct studies, questionnaires: Sources, methods-questionnaires, records, archives. Validation and standardization of the methods, modification and experimental design. Types of Report – Technical Reports and Thesis – Significance – Different steps in the preparation – Layout, structure and Language of typical reports - Illustrations and tables. Bibliography: Citations and references; Plagiarism – Citation and Acknowledgement (citation softwares) **Ethical Issues** – Ethical Committees, Types of experiments that require ethical clearance –GMO, animal ethics and human ethical guidelines, socio-environmental responsibilities. Commercialization – copy right – royalty – Intellectual Property rights (IPR) and patent law; Indian and International scenario, WIPO, – Reproduction of published material – Plagiarism – Citation and Acknowledgement – Reproducibility and accountability. Helsinki declaration. | 12h |
| 2 | **Introduction to Biostatistics:** Introduction: Population, sample, sampling techniques, random sample. Mean, median, mode, range, variance, coefficient of variation, frequency, standard deviation, standard error. **Statistical tests:** Probability: Rules of probability, binomial distribution, normal distribution, area under the curve, Z value, choosing sample size, hypothesis testing, Student's t test. One way ANOVA, correlation and regression. Goodness of fit, test of independence. Non parametric statistics, sign test, rank sum test, rank correlation. **Statistics softwares.** Representation of statistical data line graph, histogram, bar diagram, pie chart, scatter diagram. Collection of data: Relevance of sample size. | 24H |
| 3 | **Bioinformatics:** Biological databases: Introduction, classification of biological databases, retrieval of biological database systems. Molecular Modeling Database at NCBI, PDB, Molecular visualization software (RASMOL). Phylogenetics Clustal. Prediction of genes (Gene finder, ORF finder). Sequence comparison and database search: Introduction, different types of alignment. Iterative refinement methods, pattern matching in DNA and protein sequences, PAM matrices, BLAST, FAST and FASTA. nucleotide sequence analysis, single nucleotide polymorphism, primer designing. Emboss, prosite, prodom, protein expression profiling. Prediction of Secondary structure of proteins, softwares for secondary structure prediction, protein families and classification, (trans membrane regions). CATH and SCOP. Introduction to drug designing: In silico analysis, physico-chemical property | 24H |

| | | |
|---|---|---|
| | prediction, aqueous solubility, Lipinski's rule of five. | |
| 4 | **Docking methods:** Three dimensional descriptions of binding site environment and energy calculation, automatic docking method. Three dimensional database search approaches, protein-protein interactions, design of ligands, drug-receptor interactions, automated structure construction methods | 6h |

Learning Outcomes: After studying this paper the students will know,

1. Basics and ethics in research. Various streams of ethical responsibilities of a researchers at societal, environmental, legal andemotional ethics.

2. Importance of plagiarism.National and international guidelines about Intellectual property rights.Basics and ethics inresearch.Writing and analysis of research articles.

3. Knowledge of basic statistical methods to solve problems.

4. The importance of statistics in research and prepares them for a career in research. Understanding about the sequence analysis tools and also about the drug discovery.

References:

a. Bulakh P.M., Patki P.S. and Chodhary A.S. (2010). Research Methodology. Expert Trading Corporation Dahisar West, Mumbai.

b. Garg B.L., Karadia R., Agarwal F. and Agarwal U.K. (2002). An introduction to Research Methodology. RBSA Publishers.

c. Gupta S.P. (2008). Statistical Methods. (37th Edition). Sultan Chand and Sons. New Delhi.

d. Kothari C.R.(2008). Research Methodology: Methods and Techniques. (2nd Edition). New Age International Publishers, New Delhi.

e. Leon A. and Leon M. (2012). Internet for everyone (15th Edition). Vikas Publishing House.

f. Sinha S.C. and Dhiman A.K. (2002). Research Methodology. Ess Ess Publications.

g. Wadehra B.L. (2000). Law relating to patents, trade marks, copyright designs and geographical indications. Universal Law Publishing.

h. Amdekar, S.J. 2014. Statistical Methods for Agricultural and Biological Sciences. Narosa Publishing House.

i. Baxevanis, A.D. and Ouellette, F. B. E. 2004. Bioinformatic: A practical guide to the analysis of genes and proteins. John Wiley & Sons.

j. Chen, D. G., and Zhao, Y. 2018. New Frontiers of Biostatistics and Bioinformatics. Springer.

| M.Sc. Biochemistry III Semester | Human Physiology with clinical relevance. Course Code: 23F307 | SC –Soft Core |
|---|---|---|
| **Total Hours: 48** | **Credits: 04 (LTP - 3:1:0)** | **Total Marks: 15+15+70 = 100** |

| Learning Objectives: Students should study this paper to know – |
|---|
| a. To study different systems operating in living organisms. |

| Module | Course contents | |
|---|---|---|
| 1 | **Blood:** Composition, cells, plasma proteins and lipoproteins, preparation of plasma, serum, and different blood cells. Erythrocytes; shape and function. WBC; types, differential count and functions. Platelets and their function. Half-life of blood cells. Buffer systems, hemostasis, blood clotting, different pathways of blood clotting, mechanisms of initiation of clotting pathways, various enzyme complexes digestion of clot, anticoagulants, blood volume, blood pressure and its regulations. Plasma lipoproteins and their functions, HDL, LDL, VLDL, chylomicrons. | 12h |
| 2 | **Respiratory System:** Lungs, structure and functions, gas exchange, oxygen binding by hemoglobin, factors affecting oxygenation and acid-base balance. **Nervous system:** Structure of a neuron, nerve transmission, mechanism of neurotransmission, action potential, synapse, different types of neurotransmitters, stimulatory and inhibitory, central and peripheral nervous system, neuro-muscular junction. Parts of brain, brain-gut interaction, ion channels, types of ion-channels, secretion of neurotransmitters, CSF; composition and function. | 12h |
| 3 | **Excretory System:** Ultra structure of the nephron, glomerular filtration, filtration rate, mechanism of formation of urine, acid-base balance. Consequences of imbalance in acid-base balance, formation of kidney stones. Kidney function tests **Hepatobiliary System:** Anatomy of the liver, blood supply, cells; hepatocytes, endothelial cells and Kupffer cells, secretory and excretory functions and formation of bile. Role of liver in detoxification. | 12h |
| 4 | **Digestive System:** GI tract, digestion and absorption of carbohydrates, proteins and lipids. Mechanism of HCI production in the stomach. Gastrointestinal hormones and role of pancreas in digestion. **Muscle physiology:** Types of muscle, structure of skeletal muscle and smooth muscle, muscle proteins; actin, myosin, tropomyosine, troponins. Mechanisms of skeletal and smooth muscle contraction, sliding filament model. | 12h |

| Learning Outcomes: After studying this paper the students will know – |
|---|
| a. Biological processes involving membranes. |
| b. Importance of membranes in the biological system |
| c. Nutritional significance |
| d. Disorders related to nutrition and digestion. |

**References:**
   a. Berg J.M., Tymoczko J.L. and Stryer L. (2006). Biochemistry: international edition: WH Freeman & Company Limited.
   b. Devlin T.M. (2020). Textbook of biochemistry: with clinical correlations (8th Edition). New York: J. Wiley & Sons.
   c. Guyton and Hall. Human Physiology.

| M.Sc. Biochemistry III Semester | Internship<br><br>Course Code: 23F308 | SC –<br>SOFT Core |
|---|---|---|
| Total Hours: 128 | Credits: 04 (LTP - 0:0:4) | Total Marks: 15+15+70 = 100 |

## Objectives:

To gain industrial experience and enhance theoretical knowledge in practical application

To develop new skills and abilities

Explore career options

Build professional networks and connections

## Internship:

Each student shall enroll for an internship at an R & D laboratory and learn industrial skills in life sciences over a period of 1 month (non-class hours) and submit a report on the principles and applications of the scientific protocols. The student shall be evaluated for C1 and C2 by the internal faculty while for C3 the student shall be evaluated for their "Knowledge on the scientific protocols presented in the report" by two examiners (internal and external) during the end semester examination.

## Outcomes:
1. Evaluate career goals and aspirations
2. Enhance resume and job prospects
3. Develop problem solving and critical thinking skills
4. Gain insight into company culture and operations.

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# SCHOOL OF LIFE SCIENCES
# M.Sc. TECHNOLOGY

# Choice Based Credit System (CBCS)

# MOLECULAR CELL BIOLOGY (FCHC)

**4 credits**                                                          **48 Hours**

## Course Outcome: Students should study this paper to know

1. The structures and purposes of basic components of prokaryotic and eukaryotic cells,especially macromolecules, membranes, and organelles.
2. Cell cycle and cellular processes.
3. Concept of cancer biology and signal transduction.
4. Phytochemicals in cancer treatment and stems cells.

## Module- I: Organization of the cell                               **12 Hours**

Universal features of cells, Ultra-structure of prokaryotic and eukaryotic cells (Plants and animals), Structure of plant cell wall, Structure of cell membrane and models, functions of cell membrane, Intracellular organelles: Structure and functions of Ribosomes, Golgi apparatus; Mitochondria, Chloroplast, Lysosomes, Centrosome, Endoplasmic reticulum, Nucleus-Internal organization, Chromatin- structure and function, cellular cytoskeleton.

## Module – II: Cellular processes                                    **12 Hours**

Cell cycle and its regulation, Cell cycle check points, Molecular dynamics of cell division, interphase, Mitosis and meiosis, Cyclins and CDKs, Cell differentiation: Stem cells, Differentiation of stem cells into different cell types and organization into specialized tissues, apoptosis, necrosis & autophagy, Molecular mechanisms of membrane transport active, passive and facilitated, Receptor mediated endocytosis.

## Module – III: Cancer Biology                                       **12 Hours**

Introduction, Historical account, classification, Characteristics of cancer cells, hallmark features of cancer cells, Carcinogenesis, Exogenous and endogenous carcinogens, cancer initiation, promotion and progression, Cancer cell cycle, Virusesand cancer, Oncogenes, Tumor suppressor genes with examples, cancer therapy present and future, Role of p53 in cancer. Role of phytochemicals in cancer treatment, cancer stem cells.

## Module – IV Basics of Signal Transduction                         **12 Hours**

Extra-cellular matrix components, Cell junctions, Cell adhesion molecules, Hormones and their receptors, Cell surface receptors as reception of extra- cellular signals, Types of cell signaling growth factors- EGFR, VEGF, PDGF and their Signalling, Signalling through G-protein coupled receptors; Second messengers in signal transduction pathways: cAMP and calcium ions (Ca2+), Signalling through Receptor tyrosine kinases ,MAP kinase pathway,P13K -Akt pathway.

**References:**

1. Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., and Walter, P. 2008. MolecularBiology of the Cell. (5th Ed.) New York: Garland Science.
2. Cooper, G. M., and Hausman, R. E. 2013. The Cell: a Molecular Approach (6th Ed.).Washington: ASM, Sunderland.
3. Hardin, J., Bertoni, G., Kleinsmith, L. J., and Becker, W. M. 2012. Becker's World of theCell. Boston (8th Ed.). Benjamin Cummings.
4. Kleinsmith, L.J., and Kish, V. M. 1995. Principles of Cell and Molecular Biology (2ndEd.) Harper Collins College Publishers, New York, USA.
5. Lodish H., and Berk A. 2016. Molecular Cell Biology (8th Ed.). New York. W H Freeman.
6. E-books

- https://cdn.preterhuman.net/texts/science_and_technology/nature_a nd_biology/Cell and_ Molecular_Biology/Molecular%20Cell%20Biology%205th%20 ed%20- %20Lodish%20et%20al.pdf.
- http://standring.weebly.com/uploads/2/3/3/5/23356120/8_-_unit_30c.pdf.
- file:///C:/Users/Dr.%20Divya/Downloads/Cancer%20Biology%204 th%20ed%20- %20R.%20Ruddon%20(%20PDFDrive%20).pdf

7. Web links:

- https://www.slideshare.net/musselburghgrammar/cell- molecular-biology
- https://www.slideshare.net/TapeshwarYadav1/basics-of- molecular-biology-56429099
- https://slideplayer.com/slide/12568274/

## ARTICULATION MATRIX MAPPING OF COURSE OUTCOME (CO's) WITH PROGRAMME OUTCOME (PO I – PO XII)

| SEMESTER I | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Name : MOLECULAR CELL BIOLOGY (FCHC) | | | | | | | | | | | |
| PO \ CO | PO-1 | PO-II | PO-III | PO-IV | PO-V | PO-VI | PO-VII | PO-VIII | PO-IX | PO-X | PO-XI | PO-XII |
| CO1 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 3 |
| CO3 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 3 |
| CO4 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 3 |
| Weighted Average | 2 | 2 | 2 | 3 | 2 | 3 | 2.25 | 2.25 | 2.25 | 2.25 | 3 | 3 |

# TECHNIQUES IN BIOLOGY (FCHC)

**4 credits**                                                                 **48 Hours**

**Course Outcome: Students should study this paper to know**

1. This paper is designed to give a brief introduction to most of the techniques usedin the field of biological analyses.
2.  Nevertheless, the topics in this paper are to be taught compendiously.
3. The fundamental principles in cell homogenization.
4. Importance of bioanalytical techniques.

## Module I: Biological samples: Types and preparation          12hours

**Study Models:** *In vivo* and *in vitro* models; Microbial, Animal, Plants; choice of models;types ofstudies, auxotrophs. Routes of exposure of test chemicals in animals. Culture: microbes, animaland plant cells in laboratory.

**Cell fractionation techniques:** Tissue homogenization, Cell lysis techniques, extraction of cellcellularcontents. Protein purification techniques: salting in, salting out, dialysis and ultrafiltration.

**Centrifugation:** Svedberg's constant, sedimentation velocity and sedimentation equilibrium.

**Ultra centrifugation**: Differential and density gradient centrifugation, centrifugal elutriation, isolation of cell organelles (e.g. Mitochondria) from biological tissue samples.

## Module II: Spectroscopic analysis          12Hours

Principles and applications of colorimeter, spectrophotometer, fluorimeter, multiwell plate reader. Beer-Lambert's Law and its limitations. Extinction coefficient, chromogenic and fluorescent probes, their applications. Principle of flame photometry, and X-ray crystallography, IR, ESR, NMR& Raman's spectroscopy.

## Module III: Chromatographic and electrophoretic techniques: 12Hours

**Chromatography:**Principles, working and applications of paper chromatography (radial, ascending, descending and 2-D), Thin layer chromatography, Brief introduction, application of Adsorption, Ion exchange, Gel filtration, Affinity, Gas chromatography. Chromatofocusing, HPLC, UPLC and FPLC.

**Protein electrophoresis:** Polyacrylamide gel electrophoresis, SDS-PAGE, IEF & 2DEF.Visualizing proteins using CBB, silver stain, glycoproteins and lipoproteins staining, Brief introduction to Zymogram and reverse zymogram;

**Nucleic acid electrophoresis:** Agarose gel electrophoresis, Visualizing nucleic acids in using Ethidium bromide and UV. Fluorescence probes: SYBR green and Eeva green, Taq man, PFGE and capillary electrophoresis.

## Module IV: Radiochemistry and Mass spectroscopy          12Hours

**Isotopes:** Heavy isotopes and radio isotopes, half-life, decay constant, detection and quantification principle and working of GM counter and scintillation counter (solid/liquid).

**Mass spectroscopy** Principle and construction of mass spectrometer. m/e, tof,MALDI and

**Applications of radioactivity:** Radio isotopes in biology 3H, 14C, 32P, 131I,35S; Labeling of proteins and nucleic acids, autoradiography, pulse chase method, carbon dating.

### References:

1. Bryce, C. and Balasubramanian, D.2004. Concepts in Biotechnology: UniversitiesPress.
2. Crueger, W. and Crueger, A. 2017. Biotechnology:a textbook of microbiology.Medtech.
3 Marshall, A. G.1978. Biophysical chemistry: principles,techniques, andapplications: Wiley New York.
4. Micklos, D. A., andFreyer, G. A. 1990. DNA science; a first course in recombinant DNA technology: Cold Spring Harbor Laboratory Press.
5. Purohit, S., and Mathur, S.1999. Drugs in Biotechnology fundamentals and applications. Purohit SS.,Ed.,Maximum Publishers, India.
6. Slater,A.., Scott, N., and Fowler, M. 2003. Plant Biotechnology: The Genetic Manipulation of Plants. Oxford University Press, Oxford, New York.
7. Walker, M., and Rapley, R. 2009. Route maps in gene technology. John Wiley &Sons.
8. Wilson, K., and Walker, J. 2010. Principles and techniques of biochemistry andmolecular biology. Cambridge University Press.
9. **Weblink:**
- https://www.slideshare.net/mprasadnaidu/molecular- biology-tecniques.
- https://www.slideshare.net/MeenalAggarwal2/chromatog raphic-techniques.
- https://www.slideshare.net/JayashreeShanmugam14/cell- fractionation- 115544348.

### ARTICULATION MATRIX MAPPING OF COURSE OUTCOME (CO's)WITH PROGRAMME OUTCOME (PO I – PO XII)

| SEMESTER I | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Course Name : TECHNIQUES IN BIOLOGY (FCHC)** | | | | | | | | | | | |
| PO / CO | PO-I | PO-II | PO-III | PO-IV | PO-V | PO-VI | PO-VII | PO-VIII | PO-IX | PO-X | PO-XI | PO-XII |
| CO1 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 3 |
| CO3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 3 |
| Weighted Average | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 3 |

# HARDCORE: <u>MOLECULAR BIOLOGY(FCHC)</u>

**TotalCredit:04**                                    **Total Hours: 48hours**

*Course Outcome: After studying this paper the students will know –*
1.  To understand biological activities and metabolism at DNA and proteinlevel
2.  The course gives an in-depth insight into the molecular aspects of life - the central dogma.
3.  It explains molecular aspects of genes and its regulation- genome- gene expressions heredity- recombination- protein synthesis- molecular basis of diseases-mutationsgenetic analysisetc.

4.  The student will get an idea about the principles behind molecularbiology

**ModuleI:**                                                          **08Hours**
1.          **Genome organization:** Prokaryotic and eukaryotic genome organization, central dogma, structural organization of chromosome, structure and functions of DNA & RNA, Biochemical evidences for DNA as geneticmaterial.
2.          **DNA**: Chemistry of DNA, Forces stabilizing DNA structure, Physical Properties of Ds DNA (UV absorption spectra Denaturation and renaturation), chemical that react with DNA, Interaction with small ions, DNA binding motifs: Zinc finger, leucine zipper, helix-turn-helix others motifs, DNA binding and kinks.

**ModuleII:**                                                         **12Hours**
1.          **DNA topology:**Supercoiled form of DNA, Biology of supercoiled DNA, DNA topoisomerases, effect of supercoiling on structure of DNA and role of supercoiling in gene expression and DNAreplication.
2.          **DNA Replication:** Characteristics and functions of bacterial DNA polymerases I, Mechanism of prokaryotic DNA replication, models of replications in prokaryotes. Fidelity of replication,Eukaryotic DNA polymerases and mechanism of replication. Replication of viral DNA,                    DNA                    replication                    in telomericregions,Telomerases,mechanismsofactionoftopoisomeraseIandII ,Models of DNA replication, Inhibitors of replication.

**ModuleIII:**                                                        **14Hours**

**Transcription:** Characteristics and function of bacterial RNA polymerases Eukaryotic RNA polymerases, mechanism of transcription and regulation. transcription factors, Stringent response. Post transcriptional modifications of mRNA mechanism of splicing ,Processing of tRNA and rRNA. Inhibitors of transcription. Mechanism of action of ribozymes ,

1.          **Translation:** Structure and role of tRNA in protein synthesis, ribosome structure, basic feature of genetic code and its deciphering, translation (initiation, elongation and termination in detail in prokaryotes as well as eukaryotes), Post translational processing,Control of translation in eukaryotes (Antisense RNA, Heme andinterferon).

**ModuleIV:**                                                         **14Hours**

1.  **Regulation of Gene expression in prokaryotes and eukaryotes:** Positive and negative regulation. lac-, ara-, his- and trp- operon regulation; antitermination,global regulatory responses; Regulation of gene expression in eukaryotes: Transcriptional, translational and processing level control mechanisms.

2.  **Protein localization&Gene Silencing:** Export of secretory proteins- signal hypothesis, transport and targeting of proteins to mitochondria, chloroplast, peroxisomes, Gene Silencing: Definition, types, RNAi pathway, shRNA & CRISPR-CAS.

3.  **Non coding RNA:** coding and non coding RNA, types of ncRNA : Short ncRNA(mi RNA,Sn RNA,Pi RNA,t-RNA & its fragments,SnoRNA)long ncRNA ,functional significance of ncRNA

**REFERENCES:**

1.  Alberts, B., Bray, D., Lewis, J., Raf, M., Roberts, K., and Watson, J.D. 1994.Molecular Biology of the Cell (4th ed.). OxfordPress

2.  Cooper, G.M. 1997. The Cell: A molecular approach (5th ed.). ASM Press,USA

3.  Darnell, J., Lodish, H., and Baltimore, D. 1990. Molecular Cell Biology(3rd ed.). Scientific American Books Inc. pressNY.

4.  Elliott, W.H., and Elliott, D.C. 2006. Biochemistry and Molecular Biology (3rd Indian ed.). Pub. OxfordPress.

5.  Garrett, R.H., and Gresham, C.M . 1995. Molecular aspects of CellBiology(4t ed.).International edition, Saunders College Pubpress.

6.  Karp, G. 1996. Cell and Molecular Biology concepts and experiments(3rd ed). John Wiley and Sons Inc. press.NY.

7.  Lodish, H., Baltimore, D., Berk, A., Zipursky, B.L., Mastsydaira, P., and Darnell,J. 2004. Molecular Cell Biology (4th ed.).Scientific American Books Inc. press.NY.

8.  Mathews and Ahern, V.H. 2000. Biochemistry. (3rd ed.). Pub Pearson educationpress.

9.  Nelson, D.L., and Cox, M.M.2005. Lehninger- Principles of Biochemistry,4th edition Pub WH FreemanCo.

10. Old, R.W., and Primrose,S.B. 1993. Principles of gene manipulation .An introductionto genetic engineering Blackwell ScientificPublications.

1.  Weblinks:

i.  https://www.slideshare.net/ShobhaSurbhaiyya/gene-silencing-69645867.
ii. https://www.slideshare.net/lalvarezmex/dna-topology.

2.  Research article:

i.  Karakar, D and Ozpolat, B. 2021. The role of Lnc RNAsin Translation . Non coding RNA . 23:7-16.
ii. Anderson, P and Ivanov P . 2014. t RNA fragments in healthand disease ,FEBS letters 588:4297-4304.
iii. Mleczko, A.M ., Celichowski ,P., and Żywicka K.B, 2014. Ex- translational function of tRNAs and their fragments incancer,61(2): 211-216.
iv. Afonso A.P and Micro L .G. 2021. RNAs in the TFh regulation : Small molecules with big impact ,European Journal ofImmunology 51:292-295.

# HARDCORE: GENETIC ENGINEERING(FCHC)

**TotalCredit:04**                                          **Total Hours: 48hours**

*Course outcome: Students should study this paper to know –*
1. The basics of Geneticengineering.
2. Basic principles of gene cloning and geneproducts.
3. Applied aspects of Geneticengineering
4. Importance of Recombinant DNA Technology.

## Module-I                                         12hours

**Cloning and Expression vectors**: Plasmids, lambda vectors, M13 Pha ge, cosmids,phagemids, Artificial chromosome vectors-YACs, PACs and BACs, plant and animal viruses as vectors, Transposons, Expression vectors- prokaryotic (pRSET, pET), eukaryotic (pcDNA3, pCEP), Baculovirus and Pichia vector system, plant based vectors- Ti and Ri, binary and shuttle vectors,Gene cloning: genomic cloning,c-DNAcloning,

## Module-II                                         12hours

**Gene manipulation** Restriction enzymes, restriction mapping, cloning in plasmid, Phage and cosmid vectors, insertion of foreign DNA into host cells- transformation, electroporation, Transfection transient and stable, screening methods for transformants, downstream processing of recombinant proteins, affinity tags- His-tag, GST-tag, MBP-tag, Fc-tag. Construction and screening of genomic and cDNA libraries, chromosome walking, Chromosome Jumping, BAC libraries and assembly of BACs intocontigs.

## Module-III                                         14hours

**Gene analysis techniques**
Hybridization techniques- Southern, Northern, South-western, Far-western, Colony hybridization, fluorescence *in situ* hybridization, molecular probes- preparation, labelling, amplification, applications, Polymerase chain reaction- Principle, primer designing, Types- RT-PCR, Realtime PCR, colony PCR, Multiplex PCR, Hot-start PCR, asymmetric PCR, Sequencing methods- chemical sequencing of DNA (Maxam and Gilberts methods andSangers dideoxy method), automated DNA sequencing, sequencing by DE-MALDI-TOFMS,microarray.

ChIP and Chip-on-chip techniques Chromogenic *in situ* hybridization, qPCR, next generation sequencing .

**Module-IV**                                                                          **10hours**

**Gene therapy, transgenics and Genome editing**

*Ex vivo* and *in vivo* gene therapy, Vectors and other delivery systems for gene therapy, Invitro gene therapy, gene therapy of genetic diseases: eg.Neurologocal, metabolic disorders and cystic fibrosis, viruses for gene therapy- lentivirus, adenovirus. Gene targeting, knockout mice, genome editing by CRISPR-CAS

**REFERENCES:**

1.  Alexander, N., Glazer and Nikaido , H. 2007. Microbial Biotechnology Fundamentals of Applied Microbiology (2nd ed.) Cambridge UniversityPress.
2.  Brown, T.A. 2010. Gene Cloning and DNA Analysis-An Introduction (6[th]ed.). Blackwell SciencePress.
3.  Brown, T.A. 2011. Introduction to Genetics: A Molecular Approach (1st ed.).Blackwell SciencePress.
4.  Desmond, S. T., and Nicholl. 2002. An Introduction to Genetic Engineering (2[nd]ed.). Cambridge UniversityPress.
5.  Gupta P.K. 2008. Molecular Biology and Genetic Engineering (2nd ed.). Deep and Deep Publications.India.
6.  Gupta,V.K., MSchmoll., M. M, Tuohy.,M. Mazutti., M. A.2013 Applications of Microbial Engineering(4th ed.). CRCPress.
7.  Lodish, H., Berk, A., Chris, A., and Krieger .K K. 2007. Molecular Cell Biology (6th ed.) W.H. Freeman and Company, NewYork.
8.  Maheshwari, D.K., Dubey, R.C., and Kang, S.C. 2006. Biotechnological Applications of Microorganisms(3rd ed.). I.K. International Publishing House. NewDelhi.

9.  Rehm H.J., and Reed, G. 2008. Biotechnology: Genetic Fundamentals and Genetic Engineering(3rd ed.). Cambridge UniversityPress.
10. Setlow and Jane, K. 2004. Genetic Engineering: Principles and Methods (3[rd]ed.) Springer Publication.

| CO/PO | | | | | | | | | | | | |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO | PO1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 | PO 8 | PO 9 | PO10 | PO11 | PO12 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Weighted Average | 3 | 2.75 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

## SOFTCORE:MOLECULAR DIAGNOSTICS(FCSC)

**TotalCredit:03**                                       **Total Hours: 48hours**

*Course outcome: Students should study this paper to know*

1.   The course focuses on learning and understanding how the various molecular techniques that were studied can be developed and utilized indiagnosis.
2.   The course explains common analytical techniques and molecular techniques related to the development and use ofdiagnostics.
3.   Students learn about the clinical applications of molecular diagnostic in patients with infectiousdisease.
4.   The student will get an idea about the concept of molecular diagnosis and underpinning the successful application of gene therapy or biologic response modifiers as well theycan find their future focus in biotechnology companies developing and marketing Diagnostic kits.

**Module-I**                                                                              **08hrs**

**Introduction and History of diagnostics:**

**1.**        Introduction and History of diagnostics of diseases, mode of infection, types of infectious diseases, philosophy and general approach to clinical specimens. genetic basis of diseases, inherited diseases. Infection – mode of transmission in infections, factors predisposing to microbial pathogenicity, inborn errors ofmetabolism.

**2.**        Traditional disease diagnosis methods: Diagnosis of infectious diseases caused by bacteria, fungi, viruses, protozoa and Helminthes, Philosophy and general approach to clinical specimens, Sample collection- method of collection, transport and processing of samples, Interpretation of results, Normal microbial flora of the human body, Host - Parasiterelationships.

**Module-II**                                                                              **14hrs**

**Molecular techniques for diagnosis**

**1.**        Basics and Implication of Molecular techniques in Genome resolution, detection and analysis of pathogen causing disease : PCR,Real-time; Multiplex; FISH; RFLP; DGGE; SSCP; Nucleic acid sequencing: new generations of automated sequencers; Microarray chips; EST; SAGE; microarray data normalization & analysis; molecular markers: 16S rRNA typing; MALDITOF- MS; Metabolite profile for biomarker detection the tissues in various disorders by making using LCMS & NMR technologicalplatforms.

**2.**        Biochemical tests & Immunoassays: Detection and quantification of biochemicalparameters

Types:    RIA,ELISA,Chemiluminescent    IA,    FIA    and    specific    applications; Immunohistochemistry – principle and techniques. Different Levels of Biosafety, Containment.

**Module-III**                                                                              **12hrs**

**Major Metabolic & Genetic disorders:**

1.        Traditional methods for the diagnosis of metabolic errors(Diabetes Type 1 & Type 2, hyperthyrodis&Hypothyrodism). Disease due to genetic disorders(Sickle cell anemia& Cystic fibrosis).Identifying human disease genes., Methods available for the diagnosis of genetic diseases and metabolic disorders.Blood (formation, composition, function and

pathology of blood disorders (haemoglobinopathies,hemophilia), Muscle disorders (Duchene muscular dystrophy-DMD. Becker's muscular dystrophy-BMD, spinal muscular atrophy-SMA), Bonedisorders

2.      (Osteogenesis imperfecta, Rheumatoid arthritis), Skin disorder (Muir- Torre *syndrome*), Eye disorder (Retinitispigmentosa).

3.      Neonatal and Prenatal disease diagnostics. Gender identification using amelogenin gene locus. Amplification of Y chromosome specific Short Tandem Repeats (Y-STR). Analysis of mitochondrial DNA for maternal inheritance,Karyotyping& characteristics of Karyotyping.. Molecular diagnosis for early detection of cerebral palsy. Down syndromeetc.

## Module-IV                                      14hrs
### Cancer diagnosis:

1.      Molecular Oncology Tests, Analysis of the Expression of Multiple Genes and Cancer Prognosis, Analysis of Lymph Nodes to Detect Metastasis of Breast Cancer, Screening for Colorectal Cancer: Stool-Based DNA Screening, Leukemias and Lymphomas, DNA Methylation Tests and Cancer, Predicting Risk of DevelopingCancer.

2.      Personalized Medicine: Pharmacogenomics and Companion Diagnostics, Cytochrome P450 and Drug Metabolism, Targeted Cancer Therapies and Companion Diagnostics Tests, Testing for HER2/neu Overexpression in Breast Cancer, Testing for Epidermal Growth Factor Receptor (EGFR), UGT1A1 Genetic Variants, Pharmacogenetics and Response to Antiretroviral Therapy. Thiopurine Methyltransferase and Metabolism of ThiopurineDrugs

## REFERENCES:

1.   Bruns, D.E., Ashwood,E.R., and      Burtis.C.A.2007. Fundamentals of Molecular Diagnostics. (2nd ed.) Cambridge UniversityPress.

2.   Buckingham, L and Flaws, M.L. 2007. Molecular Diagnostics: Fundamentals, Methods & Clinical applications (3rd ed.). HumanaPress

3.   Carl, A., Burtis, Edward, R., Ashwood and David E. Bruns, D.E.2007. Textbook of Clinical Chemistry and Molecular Diagnosis (5nded.) .ElsevierPublisher.

4.   Coleman, W. B., and Tsongalis, G. J. 2006. Molecular diagnostics: for the clinical laboratorian. Springer Science & Business Media. (5rd ed.) .ElsevierPublisher

5.   Coleman, W.B.2006. Molecular Diagnostics for the Clinical Laboratorian (2nded.) HumanaPress

6.   Greenwood, D., Slack, R and Peutherer, J, 1997. Medical Microbiology (5thed). Sinauer Associates Incpress.

7.   Henry.2007.   Clinical Diagnosis And Management By Laboratory Methods(2nded). .Mcpherson publisher.

8.   Leonard, D. G., Bagg, A., Caliendo, A. M., Deerlin, V. M., and Kaul, K. L. 2007. Molecular pathology in clinical practice (2nd ed.). SpringerPublisher.

9.   McPherson, R. A.,      and     Pincus, M. R. 2017. Henry's Clinical Diagnosis and Management by Laboratory Methods(1st ed.). Elsevier Health Sciences Publishinghouse.

1.   **Weblinks:**

i.   https://www.slideshare.net/Dentist_abdurrahman/genetic-disorders-47095869

ii.   https://www.ihrp.uic.edu/files/4%20Screening%20and%20Diagnosis.ppt

2.   **Researcharticles:**

i.   Dermime, S. 2013. Cancer Diagnosis, Treatment and Therapy.M J CarcinogeneMutagene 14:1-3.

ii.   Egger, G.,*etal.*,   2004. Epigenetics in human disease and prospects for epigenetic therapy. Nature, 429:457-463.

| CO/PO | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO | PO1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 | PO 8 | PO 9 | PO10 | PO11 | PO12 |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Weighted Average | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

# FOOD AND ENVIRONMENTAL BIOTECHNOLOGY (SC)

**3 credits**                                     **48 Hours**

**Course Outcome: Students should study this paper to know**

1. The knowledge about fermentation and fermented products and nutrition.
2. The functional foods and genetically modified foods.
3. The detailed account of Environment and bioremediation of pollutants.
4. The knowledge of phytoremediation.

## Module-I
### 12 Hours

**Introduction to Food biotechnology:** Fermented foods, milk-based products, fermented vegetables, fermented meats, fish, beverages, vinegar, mould fermentation - tempeh, soy sauce, rice wine. Enzymatic processing of fruit juices; DNA-based methods for food authentication, comparative methods of toxicity testing in (novel) foods, application of generic technologies in food and nutritional sciences; anti-cancercomponents in foods.

## Module-II
### 12 Hours

**Functional foods and Biotechnology**: Biochemical processing in the improvement of functional foods with targeted health benefits and increased nutrient value; Pre- and Pro-biotics, single cell protein, single cell lipids. Manipulation of fruit ripening process. Food processing, principles and practices, food ingredients and processing aids from biotechnological processes, corn sweeteners, bacterial starter cultures, cold-adapted enzymes. Food spoilage, preservation, mycotoxins in food commodities. Genetically modified foods, designer foods, detection of GM foods, Nutraceuticals, Concept of food parks.

## Module-III
### 12 Hours

**Introduction to Environment**, Renewable and non-renewable resources, current status of biotechnology in environment protection. Waste water management: Bioreactors for waste-water

treatment, treatment of industrial effluents-dairy, distillery, paper and sugar industries. Membrane- based waste water treatment. Biotechnology & Environment, Biodiversity and its conservation, Microbial ecology.

**Module-IV**
**12 Hours**

**Bioremediation:** Concepts and principles, bioremediation using microbes, in situ and ex situ bioremediation, biosorption and bioaccumulation of heavy metals. Phytoremediation Xenobiotics: Degradation capabilities of microorganisms with reference to toxicology, pesticides, herbicides, polyaromatic hydrocarbons.

**References:**

1. Bagchi, D., Ghosh, D, K., Lau, F. C. 2010. Biotechnology in Functional Foods andNutraceuticals (1st Ed.).CRC Press.
2. Das, S. 2014. Microbial Biodegradation and Bioremediation (1st Ed.). Elsevier.
3. Johnson-Green, P. 2018.Introduction to Food Biotechnology(1stEd.).CRC Press.
4. Prasad, M. N. V., and Hasanuzzaman, M. 2020. Handbook of BioremediationPhysiological, Molecular and Biotechnological Interventions,(1st Ed .) Elsevier.
5. Sati, V. P. 2012.An Introduction to Environment, Rawat.
6. Weblink:
   - https://www.slideshare.net/HumairSindhi/applications-of-environmental- biotechnology- by-hameer-khan
   - https://www.slideshare.net/IMANELADRAA/food-biotechnology-91606605.

## PLANT BIOTECHNOLOGY (HC)

**4 credits**                                               **48 Hours**

**Course Outcome: Students should study this paper to know**

1. The goal of this course is to introduce biotechnology methods in plants.

2. Handling of classical and modern plant biotechnology processes.

3. Understanding breeding of healthy plants for improved characteristics andplants for biomolecule production.

4. Applications of Plant Biotechnology in pharmaceuticals, food industry and in agriculture.

**Module I**                                               **12 hours**

**Methods in Plant Tissue culture:** Concept of cellular Totipotency, Role of phytohormones in tissue culture techniques. Establishment of cultures- Nutritional requirements for in vitro cultures, Media preparation and sterilization. **Micropropagation:** Propagation from shoot apical meristem, node cultures, stages of micropropagation and applications. **Germplasm preservation**: Plant germplasm storage using different methods. **Haploid Production**: Methods of androgenic haploid cultures. **Protoplast Culture and Somatic Hybridization**: Protoplast isolation, purification and culture, protoplast fusion, somatic hybridization, applications of somatic hybrids.

**Module II**                                               **12hours**

**Plant transformation techniques**: Agrobacterium-plant interaction.Ti plasmid, T- DNA transfer, disarmed Ti plasmid. Agrobacterium-mediated gene delivery- binary and co-integrated vectors. **Direct gene transfer methods-** Particle bombardment, PEG-mediated, Electroporation. **Transgenic plants:** Herbicide resistance, pest resistance, plant disease resistance, improvement of nutritional quality. Biosafety regulations of transgenics.

**Module III**                                               **12hours**

**Secondary metabolite production**: Major secondary metabolic pathways- Phenyl propanoid pathways, Shikimate pathway; Induction of bioactive secondary metabolites by plant tissue culture; Value addition via biotransformation; hairy root cultures for production of pharmaceuticals. Bioreactor systems for mass cultivation of plant cells, Molecular pharming: edible vaccines.

**Module IV**                                               **12 Hours**

**Micro algal biotechnology: Cyanobacteria**, culture media, cultivation methods, Medicinal compounds from cyanobacteria. **Single-Cell Proteins (SCP):** Spirulina, Chlorella, Yeast as SCP; Production and process; Health benefits of SCP. **Agricultural products:** biofertilizers and Vermiculture **Biofuels:** production of Ethanol, Methane, and their applications. **Intellectual Property Rights (IPR):** IPRs and agricultural technology. Plant Breeder's Rights. Labeling of GM crops and foods.

# PLANT BIOTECHNOLOGY (HC)

**4 credits**                                                    **48 Hours**

## Course Outcome: Students should study this paper to know

1. The goal of this course is to introduce biotechnology methods in plants.
2. Handling of classical and modern plant biotechnology processes.
3. Understanding breeding of healthy plants for improved characteristics and plants for biomolecule production.
4. Applications of Plant Biotechnology in pharmaceuticals, food industry and in agriculture.

## Module I                                                    12 hours

**Methods in Plant Tissue culture:** Concept of cellular Totipotency, Role of phytohormones in tissue culture techniques. Establishment of cultures- Nutritional requirements for in vitro cultures, Media preparation and sterilization. **Micropropagation:** Propagation from shoot apical meristem, node cultures, stages of micropropagation and applications. **Germplasm preservation:** Plant germplasm storage using different methods. **Haploid Production:** Methods of androgenic haploid cultures. **Protoplast Culture and Somatic Hybridization:** Protoplast isolation, purification and culture, protoplast fusion, somatic hybridization, applications of somatic hybrids.

## Module II                                                    12 hours

**Plant transformation techniques:** Agrobacterium-plant interaction, Ti plasmid, T- DNA transfer, disarmed Ti plasmid. Agrobacterium-mediated gene delivery- binary and co-integrated vectors. **Direct gene transfer methods-** Particle bombardment, PEG-mediated, Electroporation. **Transgenic plants:** Herbicide resistance, pest resistance, plant disease resistance, improvement of nutritional quality. Biosafety regulations of transgenics.

## Module III                                                    12 hours

**Secondary metabolite production:** Major secondary metabolic pathways- Phenyl propanoid pathways, Shikimate pathway; Induction of bioactive secondary metabolites by plant tissue culture; Value addition via biotransformation; hairy root cultures for production of pharmaceuticals. Bioreactor systems for mass cultivation of plant cells, Molecular pharming: edible vaccines.

## Module IV                                                    12 Hours

**Micro algal biotechnology: Cyanobacteria,** culture media, cultivation methods, Medicinal compounds from cyanobacteria. **Single-Cell Proteins (SCP):** Spirulina, Chlorella, Yeast as SCP; Production and process; Health benefits of SCP. **Agricultural products:** biofertilizers and Vermiculture **Biofuels:** production of Ethanol, Methane, and their applications. **Intellectual Property Rights (IPR):** IPRs and agricultural technology. Plant Breeder's Rights. Labeling of GM crops and foods.

## References:

1. Abdin, M.Z., Kiran, U., Kamaluddin and Ali, A. 2017. Plant Biotechnology:Principles andApplications. Springer.

2. Buchanan , B. B., Gruissem, W and Jones, R. L. 2015. Biochemistry & MolecularBiologyof Plants. John Wiley& Sons.

3. Chawla, II. S. 2000. Introduction to PlantBiotechnology (3$^{rd}$ed.).CRC Press.https://www.perlego.com/book/1573809/introduction-to-plant- biotechnology- 3e-pdf.

4. Glick, B. R., Pasternak, J. J. and Patten, C.L. 2010. Molecular Biotechnology: Principlesand Applications of Recombinant DNA. ASM Press.

5. Kumar, K. D. 2017. Plant Tissue Culture. New Central Book Agancy (P) Ltd.

6. Razdan, M. K. 2003.Introduction to Plant Tissue Culture ($^{2nd}$ed.). Science Publishers.

7. Sangita, S., Prasad, B.D., and Kumar, P. 2017. Plant Biotechnology : Transgenics, StressManagement, and Biosafety Issues (2$^{nd}$ Vol.). Apple Academic Press.

8. Slater, A., Scott, N., and Flower, M. 2008. Plant Biotechnology: the genetic manipulationofplants (2$^{nd}$ed.). OxfordUniversity Press.

9. Umesha, S. 2013. Plant Biotechnology. TERI Press.

10. Weblink:

- https://www.slideshare.net/Wabworld/plant-biotechnology- 129050729

- https://www.austincc.edu/awheeler/Files/BIOL%201414%20Fall%20 2010/chapter%206.ppt.

## ARTICULATION MATRIX MAPPING OF COURSE OUTCOME (CO's)

### PROGRAM OUTCOME (PO=I –POXII)

| SEMESTER III | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Course Name : PLANT BIOTECHNOLOGY (HC)** | | | | | | | | | | | |
| PO<br><br>CO | PO-1 | PO-II | PO-III | PO-IV | PO-V | PO-VI | PO-VII | PO-VIII | PO-IX | PO-X | PO-XI | PO-XII |
| CO1 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| O2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| Weighted Average | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |

# ANIMAL BIOTECHNOLOGY (SC)

**4 credits**                                                                **48 Hours**

**Course Outcome: Students should study this paper to know**
1. Culturing of animal cells and steps in production of transgenic animals
2. Techniques in animal cell culture
3. Cloning of animals
4. Approaches for tissue engineering

**Module I:**                                                                **12 Hours**

**Culture of animal cells:** Advantages and limitations of tissue culture, aseptic handling, facilities required, media and cell lines, Different types of media, preparation & Storage etc., Primary culture: Isolation of mouse and chick embryos, human biopsies, methods for primary culture, nomenclature of cell lines, sub culture and propagation, immortalization of cell lines, cell line designation, selection of cell line and routine maintenance. Secondary cell culture.

**Cloning and Selection:** Cloning protocol, stimulation of plating efficiency, suspension cloning, isolation of clones, isolation of genetic variants, interaction with substrate, selective inhibitors.

**Module II:**                                                               **12 Hours**

**Cell separation and characterization:** Density based, antibody based, magnetic and fluorescence based cell sorting. Characterization of cells based in morphology, chromosome analysis, DNA content, RNA and protein, enzyme activity, antigenic markers, cytotoxicity assays, cell quantitation, cell culture contamination: monitoring and eradication, cryopreservation.

**Culturing of specialized cells:** Epithelial, mesenchymal, neuro ectodermal, hematopoietic gonad and tumor cells, Lympocyte preparation, culture of amniocytes, fish cells, confocal microscopy. Stem cell culture and its applications

**Organic and embryo culture:** Choice of models, organ culture, histotypic culture, filter-well inserts, neuronal aggregates whole embryo culture eggs, chick and mammalian embryos.

**Module III:**                                                              **12 Hours**

**Cell and Tissue engineering:** Growth factors for *in situ* tissue regeneration, biomaterials in tissue engineering, approaches for tissue engineering of skin, bone grafts, nerve grafts. Haemoglobin- based blood substitutes, bio artificial or biohybrid organs. Limitations and possibilities of tissue engineering, 3D bioprinting. *In vitro* **fertilization and Embryo transfer:** *In vitro* fertilization in Humans, Embryo transfer in Humans, Super ovulation and embryo transfer in farm animals e.g.: Cow

**Cloning of Animals:** Methods and uses. Introduction, nuclear transfer for cloning, cloning from- embryonic cells, adult and fetal cells. Cloning from short-term cultured cells: cloning of sheep, monkeys, mice, pets, goats and pigs. Cloning from long-term cultured cells: Cloning of cows from aged animals. Cloning efficiency, cloning for production of transgenic animals, gene targeting for cloned transgenic animals, cloning for conservation, human cloning: ethical issues and risks.

**Module IV:** **12 Hours**

**Transfection methods and transgenic animals:** Gene transfer, transfection of fertilized eggs or embryos, unfertilized eggs, cultured mammalian cells, targeted gene transfer. Transgenic animals and applications: mice and other animals, sheep, pigs, goats, cows and fish. The legal and socio- economic impact of biotechnology at national and international levels, public awareness. Biosafety regulations- guidelines for research in transgenic animals, public awareness of the processes of producing transgenic organisms.

**References:**

1. Ashish, S.V. andAnchal,S. 2013. Animal Biotechnology: Models in Discovery andTranslation.Academic Press.
2. Freshney, R.I. 2015. Culture of Animal Cells: A Manual of Basic Technique andSpecialized Applications. John Wiley& Sons.
3. Gordon, I. 2004. Reproductive Techniques in Farm Animals. Oxford: CABInternational.
4. Gorakh, M., Manishi, M., Birbal, S. andSanjeev, K. G.2019. Advances in AnimalBiotechnology. Springer.
5. Myrone, M. L.,Gordon, D., Michael, F. G., Margaret A. L.,Gary J. N.,James P.N. And Rino, R. New Generation Vaccines (4th Ed.). CRC Press.
6. Niemann, H., and Wrenzycki.C. 2018. Animal Biotechnology 1: Reproductive Biotechnologies. Springer.
7. Niemann. H , and Wrenzycki. C. 2018. Animal Biotechnology 2: Emerging BreedingTechnologies. Springer.
8. Portner, R. 2007. Animal Cell Biotechnology: Methods and Protocols. Humana Press.
9. Richard, T. 2004. Gene Transfer to Animal Cells. Taylor & Francis.
10. Srivastava. A.K., Singh, R. K., and Yadav, M.P. 2018. Animal Biotechnology.OxfordandIBH Publishing Press.
10. Weblink:

- https://www.slideshare.net/Pure-man/introduction-to-animal- biotechnology
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- https://slideplayer.com/slide/3514424/

# IMMUNOLOGY (FCHC)

**Total Credits: 04Total Hours:48hours**

*Course outcome: Students should study this paper to know –*

1.      Role of immune system in maintaininghealth
2.      Cellular and molecular basis of immuneresponses
3.      How immune responses are triggered andregulated
4.      Organs, tissues, cells and molecules of the immunesystem

**Module-I**                                                                   **14Hrs.**

a)      **Over view and Types ofimmunity:**
**Innate immunity:** anatomic barriers, physiologic barriers, phagocytic barriers, microbial antagonism, acute phase reactants, anti-microbial peptides, interferons, inflammation, Pattern Recognition Receptors (PRRs), Pathogen Associated Molecular Patterns (PAMPs) and Damage Associated Molecular Patterns (PAMPs). Complement system: components, pathways of activation and biologicalconsequences.

**Acquired immunity:** Active (Naturally acquired and artificially acquired), Passive (Naturally acquired and artificially acquired), Adoptive immunity, Humoral and Cell mediated immune response

b)      **Tissues of immune system:** Structural organization and functions of Lymphatic system, Primary lymphoid organs (Bone marrow, Thymus) Secondary lymphoid organs and tissues (Spleen, Lymph node, Tonsils, Adenoids, Peyer's patches, Lamina propria, Mucosa-associated lymphoid tissue, Gut-associated lymphoidtissue).
c)      **Cells of the immune system:** Hematopoiesis, Biology, Development and Functions of PMNLs, NK cells, Macrophages, T-Lymphocytes, B-Lymphocytes, Dendriticcells

**Module-II**                                                                  **12Hrs**

a)      **Antigens, and Antibodies:** Antigens, Immunogens and Haptens, Factors influencing immunogenicity, adjuvants, epitopes, Structure and functions of immunoglobulins, Synthesis of immunoglobulins, Genetic basis of immunoglobulindiversity.
b)      **MHC molecules:** Types, structure, diversity andfunctions
c)      **Antigen recognition:** Thymus dependent and independent Antigens, Clonal selection and immunological memory of B and T cells, Antigen processing and presentation (Endogenous pathway, Exogenous pathway, Cross presentation),Superantigens.
d)      **Monoclonal Antibodies:** Hybridoma technology and production of mAbs, types, and applications. Advantages and disadvantages of mAbs intherapy.

**Module-III**                                                 **12Hrs**

a)       **Immune System in Health and Disease:** Immunological Tolerance and Autoimmunity, Autoimmune Diseases (Organ specific autoimmune diseases-Graves' disease, Myasthenia Gravis, Systemic autoimmune diseases-Multiple Sclerosis, Rheumatoid Arthritis, Systemic Lupus Erythematosus), Immunosuppression, Hypersensitivity (Type I, II, III &IV).

b)       **Vaccines and Vaccination:** Principles of vaccination, Immune response to vaccines (Primary and Secondary response), Whole-Organism vaccines, Purified macromolecules as vaccines, Recombinant vaccines, DNA vaccines, Multivalent subunit vaccines and Edible vaccines, Vaccine safety, Reverse vaccinology. Overview of COVID-19 vaccines.

c)       **Primary & Secondary Immuno-DeficiencyDisorders:**

**Primary:** Wiscott-Aldrich syndrome, Severe combined immunodeficiency disease (SCID), DiGeorge syndrome. Ataxia-telangectasia, Leucocyte adhesion defects, Chronic granulomatous disease, X-linked agammaglobulinemia, Complement deficiencies. Gammopathies (Multiple myeloma).

**Secondary:** AIDS, Malnutrition, Drug regimen, Diabetes, Chronic infection.

**Module-IV**                                                 **10Hrs.**

a)       **Clinical Immunology: Transplantation of tissues and organs:** Nomenclature of transplantations, Transplantation reactions, HvG and GvH. Exception from rejections, Major and minor blood groups, Blood transfusion, tissue typing, Kidney and bone marrow transplantations. Immunosuppressive drugs. **Tumor immunology:** Neoplasms, tumor-associated antigens, immune response to tumor antigens, immunologic factors favoring tumor growth, immune surveillance,Tumor necrosis factor α and β.Metastatic processes, Immunodiagnosis, Antitumour drugs,Immunotherapy.

b)       **Immunological Techniques:.** *In vitro* antigen-antibody reactions, serotyping, agglutination, complement fixation, immunoprecipitation, Immunodiffusion, ELISA, RIA, IHC,Immunoelectrophoresis.

**REFERENCES:**

1.     Abbas A.K., Lichtman A.H. and Pillai S. (2014). Cellular and Molecular Immunology (10th Edition). Online Access: Elsevier HealthSciences.
2.     Abbas, AK., Andrew,H., Lichtman, H., Pillai, S. 2012.Basic Immunology: Functions and Disorders of the Immune System, ;Saunders
3.     Abul, K.A., Andrew, H. L. and Shiv, P. 2019. Basic Immunology: Functions and Disorders of the Immune System. ElsevierIndia.
4.     Ajoy, P. 2015. Textbook of Immunology: including Immunotechnology & Immunotherapy. Books & AlliedPress.
5.     Ashim, K. C. 2006. Immunology and Immunotechnology (1st ed.). Oxford UniversityPress.
6.     Berg J.M., Tymoczko J.L. and Stryer L. (2002). Biochemistry (5th Edition). International edition: WH Freeman & CompanyLimited
7.     Brostoff, J., Seaddin, J. K., Male, D. and Roitt, I. M. 2002. Clinical Immunology. London: Gower MedicalPub.
8.     Chapel,H.,           Haeney,M.,   Misbah,S., Snowden, N. 2014. Essentials of Clinical Immunology;Wiley-Blackwell
9.     Coico, R. and Sunshine, G. 2015. Immunology – A Short Course (7[th]ed.).Wiley.
10.   Delves P.J., Martin S.J., Burton D.R. and Roitt I.M. (2011) Roitt's essential immunology: John Wiley &Sons.
11.   Hawley,L., Clarke, B., Ziegler, RJ. 2013. Microbiology and Immunology;LWW

# NATURAL PRODUCTS & DRUG DISCOVERY (SC)

**3 credits**                                    **48 Hours**

**Course Outcome: Students should study this paper to know**
1. The prospects of Natural products in 21st Century.
2. The use of different natural sources for discovery of drug.
3. To perform molecular modelling.
4. Regulatory guidelines for preclinical studies

**Module I**                                    **12 Hours**

**Prospects of Natural Products research in the 21st Century**: Introduction, use of natural products in traditional medicines, Marine natural products, Use of herbal remedies and the potential of drug development from natural products and noveldrug templates: paclitaxel, podophyllotoxin, artimisinin etc. Recent development in the research on naturally occurring polyphenolic compounds: - Introduction, biosynthetic pathway, isolation and characterization, biological and pharmacological activities of different class of phytoconstituents - alkaloids, flavonoids, terpenoids, glycosides, steroids, saponins, (Antioxidant activity, cyto-toxic activity, anticancer and anti- microbial activity etc). aid design of clinical studies.

**Module II**                                    **12 Hours**

**Natural product drug discovery from different sources (marine, microbial, mineral etc):**Introduction, recent developments, applications. Extraction and Isolation techniques: Introduction, Principle and Applications of different extraction & isolation methods viz Soxhlet extraction, microwave extraction, supercritical fluid extraction, solid phase extraction,Column chromatography, Flash chromatography.

**Module III:**                                    **12 Hours**

**Target identification and molecular modelling**: Identification of target or drug leads associated with a particular disease by different techniques including combinations of molecular modeling, combinatorial libraries and high-throughputscreening (HTS); Use of bioinformatics and data processing in identification of lead compounds; Rational drug design, Modelling drug/receptor interactions with the emphasis on molecular mechanisms, molecular dynamics simulations and homology modelling; Conformational sampling, macromolecular folding, structural bioinformatics, receptor-based and ligand-based design and docking methods, in silico screening of libraries, semi-empirical and ab-initio methods, QSAR methods, molecular diversity, design of combinatorial libraries of drug-like molecules, macromolecular and chemical databases.

**Module IV:**                                    **12Hours**

**Lead optimization**: Identification of relevant groups on a molecule that interact with a receptor and are responsible for biological activity; Understanding structure activity relationship; Structure modification to increase potency and therapeutic index; Concept of quantitative drug design using Quantitative structure–activity relationship models (QSARmodels); Bioanalytical assay development in support of in vitro and in vivo studies (LC/MS/MS, GC/MS and ELISA). Preclinical development: Principles of drug absorption,

drug metabolism and distribution - intestinal absorption, metabolic stability, drug-drug interactions, plasma protein binding assays, metabolite profile studies, Principles of toxicology, Experimental design for preclinical and clinical PK/PD/TK studies, Selection of animal model; Regulatory guidelines for preclinical PK/PD/TK studies; Scope of GLP, SOP for conduct of clinical & non clinical testing, control on animal house, report preparation and documentation.Integration of nonclinical and preclinical data tool.

**References:**
1. Brahmachari, G. 2011. Bioactive Natural Products: Opportunities and ChallengesinMedicinal Chemistry. World Scientific Publishing Company.
2. Charis, G. 2019. Nutraceuticals And Natural Product Pharmaceuticals. AcademicPress.
3. Kratika, D., Swapnil, G., Naveen, C.,and Vivek, D. 2015. Drug Discovery andDevelopment in Medicinal Chemistry. NiraliPrakashan.
4. Kshirsagar, T. 2008. High-Throughput Lead Optimization in Drug Discovery.CRC Press.
5. Moll, J., and Carotta, S. 2019. Target Identification and Validation in Drug Discovery: Methods and Protocols. Springer.
6. Olga, G. and Francisca, V. 2012. Drug Discovery From Natural Products. RoyalSociety Of Chemistry.
7. Roessner U.,and Dias, D. A. 2013. Metabolomics Tools For Natural ProductDiscovery: Methods and protocols. Humana Press.
8. Subhash, C. M., Vivekananda, M., and Tetsuya, K. 2018. Natural Products and DrugDiscovery: An Integrated Approach. Elsevier.
9. Vincent, P. G. 1994.The Discovery of Natural Products withTherapeautic Potential.Elsevier.
10. Wade, R.C. and Salo-Ahen, O.M.H. 2019. Molecular Modelingin DrugDesign.MDPIPress.
11. Weblink:
- https://www.slideshare.net/rahulbs89/role-of-natural-product-in-drug- discovery
- http://ccc.chem.pitt.edu/wipf/courses/5119_05_files/lecture_files/lecture.ppt

## ARTICULATION MATRIX MAPPING OF COURSE OUTCOME (CO's)WITHPROGRAMME OUTCOME (PO I – PO XII)

| SEMESTER III | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Name : NATURAL PRODUCTS & DRUG DISCOVERY (SC) | | | | | | | | | | | |
| PO / CO | PO-1 | PO-II | PO-III | PO-IV | PO-V | PO-VI | PO-VII | PO-VIII | PO-IX | PO-X | PO-XI | PO-XII |
| CO1 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| Weighted Average | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |

# BIOSTATISTICS & BIOINFORMATICS (SC)

**3 credits**                                    **48 Hours**

**Course Outcome: Students should study this paper to know**

1. Knowledge of basic statistical methods to solve problems.
2. Students are taught to operate various statistical software packages.
3. The in-depth knowledge about the bioinformatics.
4. Understanding about the sequence analysis tools and also about the drug discovery.

## Module I:                              12Hours

**Biostatistics**-Statistical concepts: Data structure, sampling methods, descriptive statistics - data collection, tabulation Measures of central tendency: mean, median, mode Measures of dispersion: Range, interquartile range, mean deviation, standard deviation, standard error, coefficient of variation, confidence limits.

## Module II :                              12 Hours

**Types of distribution of data:** Normal, Binomial, Poisson. **Hypothesis testing**: Z-test, t- test, ANOVA, multiple comparisons – LSD and DMRT,chi- square test; Regression and correlation; Non-parametric significance tests; Experimental designs- CRBD, RCBD, LSD, factorial; data transformation- arcsine, log, square-root. Probability.

## Module III:                              12Hours

**Bioinformatics**- an overview, Definition and History, Applications of Bioinformatics. Introduction to Genomics: Genome mapping, Genome sequencing, human Genome project. Introduction to Proteomics: Tools and techniques in proteomics.Sequence formats. Homology and similarity, Introduction to Data mining, NCBI, EBI, DDBJ, Database search software:ENTREZ, SRS, Expasy.Protein Sequence Databases, UNIPROT, Structure Database: PDB.

**Sequence Analysis:** definition of sequence analysis, Introduction to Sequences, alignments and Dynamic Programming; Local alignment and Global alignment (algorithm and example), Pair wise Alignment, and significance of alignment, Tools of sequence alignment, Homology sequence search, Nucleotide Sequence Analysis, Protein Sequence Analysis, Parameters of Blast, BlastN, BlastP, Interpreting Blast Results.

## Module IV:                              12 Hours

**Multiple sequence analysis:** scoring pattern, exhaustive and heuristic algorithms; Parameters of CLUSTAL-W and CLUSTALX for multiple sequence alignment, interpretation; Phylogenetic analysis: methods and tools. RASMOL Display Styles- Wire Frame, Ball and Stick, Space Fill, Ribbons, Cartoons

**Drug discovery:** Introduction, drug discovery technologies, virtual high-throughput *in silico* screening, Target validation EMBOSS Introduction to emboss Software package and its key features, other latest commercial softwares.

**References:**

1. Amdekar, S.J. 2014.Statistical Methods for Agricultural and Biological Sciences.Narosa Publishing House.
2. Baxevamis, A.D. and Ouellette, F.B.E. 2004. Bioinformatic: A practical guide totheanalysis of genes and proteins. John Wiley& Sons.
3. Chen, D.G.,and Zhao, Y. 2018. New Frontiers of Biostatistics and Bioinformatics.Springer.
4. Emden, H.V. 2008. Statistics for Terrified Biologists. Blackwell Publishing Press.
5. Higgins, D. and Taylor, W. 2000. Bioinformatics – Sequence, Structure and DataBanks. Oxford University Press.
6. Hodgman, C., French, A. and Westhead, D. 2010. BIOS Instant Notes:Bioinformatics. Taylon& Francis.
7. MacKenzie, G., and Defen Peng, D. 2014. Statistical Modelling in Biostatistics andBioinformatics: Selected Papers. Springer.
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10. Srinivas, V.R. 2005. Bioinformatics: A modern approach. Prentice Hall India Learning Pvt. Ltd.
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- https://www.slideserve.com/minna/statistics-in-bioinformatics-powerpoint- ppt-presentation
- https://www.powershow.com/viewfl/58edf7-MzAxN/Biostatistics_and_Statistical_Bioinformatics_powerpoint_ppt_pre sentation.

## ARTICULATION MATRIX MAPPING OF COURSE OUTCOME (CO's) WITH PROGRAMME OUTCOME (PO I – PO XII)

| SEMESTER III | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Name : BIOSTATISTICS & BIOINFORMATICS (SC) | | | | | | | | | | | | |
| PO<br><br>CO | PO-1 | PO-II | PO-III | PO-IV | PO-V | PO-VI | PO-VII | PO-VIII | PO-IX | PO-X | PO-XI | PO-XII |
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Weighted Average | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

# MOLECULAR PLANT PATHOLOGY (SC)

**3 credits**                                        **48 Hours**

**Course Outcome: Students should study this paper to know**

1. The concepts of plant pathology
2. The host pathogen interaction.
3. *The genetics of plant diseases and resistance.*
4. Application of molecular biology to conventional disease control strategies

**Module I:**                                        **12 Hours**

The fundamentals of plant pathology: The concept of plant disease, the causal agents, the significance of plant diseases, the control of plant diseases. Fungal diseases: establishing infection, dispersal spores, finding a suitable host, spore attachment, germination process, penetration, germ-tube elongation, induction appressoria, cell-wall degrading enzymes. Basic concepts of necrotrophy and biotrophy, host barriers.

**Module II:**                                        **12 Hours**

Bacterial and viral diseases: communication between bacteria, plant penetration, attachment, cell wall degrading enzymes, toxins, hormones, extracellular polysaccharides, determinants of host specificity. Plant viruses: Structure and replication, infection, types of viruses, viroids.

**Module III:**                                        **12 Hours**

Genetics of plant diseases and resistance: Genes and diseases, Mechanism of variability, stages of variation in pathogens, Types of plant disease resistance to pathogens. Defense mechanism of plants, structural, chemical and biochemical defenses. MAP kinases, ion fluxes and calcium homeostasis, The oxidative burst, Nitric oxide, (p)ppGpp signaling.

**Module IV:**                                        **12 Hours**

Application of molecular biology to conventional disease control strategies: Breeding for disease resistance, the use of tissue culture in plant breeding, the use of chemicals for disease control, biological control-PGPR and PGPF. Transgenic approaches for crop protection- Bt cotton.

## References:

1. Haq, I. U., and Ijaz, S., 2020. Plant Disease Management Strategies for Sustainable Agriculture Through Traditional and Modern Approaches. Springer Nature Switzerland.
2. Dickinson, M. 2004. Molecular Plant Pathology. Garland Science.
3. Singh, U. S., and Singh, R. P. 2017. Molecular Methods in Plant Pathology. CRC Press.
4. Wani, S. H. 2019. Disease Resistance in Crop PlantsMolecular, Genetic and GenomicPerspectives. Springer.
5. Weblink:

- https://www.slideshare.net/jeevaraj9/molecular-mechanism-of- disease-diagnosis
- https://slideplayer.com/slide/10526875/

# PROJECT WORK (HC)

**8 credits**

## Course Outcome: Students should study this paper to know

1. Review research papers for find out gap in the literature.

2. Understand designing experiments based on the research problem.

3. Understand compiling and analyzing of data.

4. Able to write a comprehensive project report/review.

| SEMESTER IV | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Name : PROJECT WORK (HC) | | | | | | | | | | | |
| PO / CO | PO-1 | PO-II | PO-III | PO-IV | PO-V | PO-VI | PO-VII | PO-VIII | PO-IX | PO-X | PO-XI | PO-XII |
| CO1 | 2 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| Weighted Average | 2 | 2 | 2.75 | 2.25 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |