**Session: 2018-2019 (odd sem)**

**Class: BSc Medical Second year (III Sem)**

**Subject: Life and Diversity of Chordates I and Mammalian Physiology I**

**Teachers’s name: Dr Seema Kumari**

**Sec. A**

|  |  |
| --- | --- |
| **S. No** | **Topic** |
| Week 1 | Chordates: Principles of classification; Origin and Evolutionary tree; Role of amnion in evolution; Salient features of chordates; |
| Week 2 | Functional morphology of the types with examples emphasizing their biodiversity, economic importance and conservation measures where required. |
| Week 3 | General characters and classification of phyla upto orders with examples emphasizing their biodiversity, economic importance and conservation measures where required. |
| Week 4 | Protochordates: Systematic position, distribution, ecology, morphology and affinities Urochordata: Herdmania – type study Cephalochordata; Amphioxus – type study |
| Week 5 | General characters and classification of phyla upto orders with examples emphasizing their biodiversity, economic importance and conservation measures where required. |
| Week 6 | Cyclostomes: Classification and ecological significance Type study of Petromyzon |
| Week 7 | General characters and classification of all phyla upto orders with examples emphasizing their biodiversity, economic importance and conservation measures where required. |
| Week 8 | Pisces intd, Scales & Fins, Parental care in fishes, fish migration. Types study of Labeo |
| Week 9 | Introduction, Classification, Structure, function and general properties of carbohydrates |
| Week 10 | Introduction, Classification, Structure, function and general properties of lipids |
| Week 11 | Introduction, Classification, Structure, function and general properties of proteins; |
| Week 12 | Nomenclature, Classification and mechanisms of enzyme action. Transport through biomembranes (Active and Passive), buffers |
| Week 13 | Nutritional components; Carbohydrates, fats, lipids, Vitamins and Minerals. Types of nutrition & feeding, Digestion of dietary constituents, viz. lipids, proteins |
| Week 14 | Digestion of carbohydrates & nucleic acids; symbiotic digestion. Absorption of nutrients & assimilation; control of enzyme secretion. |
| Week 15 | Muscles Intd, Types of muscles, ultra-structure of skeletal muscle. Bio-chemical and physical events during muscle contraction; single muscle twitch, tetanus, muscle fatigue muscle, tone, oxygen debt, Cori’s cycle, |
| Week 16 | Single unit smooth muscles, their physical and functional properties. Bones: Structure and types, classification, bone growth and resorption, effect of ageing on skeletal system and bone disorders |

**Session: 2018-2019 (even sem)**

**Class: BSc Medical Second year (III Sem)**

**Subject: Life and Diversity of Chordates II and Mammalian Physiology II**

**Teachers’s name: Dr Seema Kumari**

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | Origin, Evolutionary tree. Parental Care in Amphibia |
| WEEK 2 | Type study of frog (Rana tigrina) continued |
| WEEK 3 | Type study of Lizard (Hemidactylus) |
| WEEK 4 | Origin, Evolutionary tree. Extinct reptiles; Poisonous and non-poisonous snakes; Poison apparatus in snakes. |
| WEEK 5 | Flight adaptation, Principles of aerodynamics in Bird flight, migration in birds. |
| WEEK 6 | Type study of Pigeon (Columba livia) |
| WEEK 7 | Classification, Adaptive radiations of mammals and dentition |
| WEEK 8 | type study of Rat |
| WEEK 9 | Origin, conduction and regulation of heart beat, cardiac cycle, electrocardiogram, cardiac output, fluid pressure and flow pressure in closed and open circulatory system; circulatory system; |
| WEEK 10 | Composition and functions of blood & lymph; Mechanism of coagulation of blood, coagulation factors, anticoagulants, hemopoiesis |
| WEEK 11 | Exchange of respiratory gases, transport of gases, lung air volumes, oxygen dissociation curve of hemoglobin, Bohr’s effect, Haburger’s phenomenon (Chloride shift), control / regulation of respiration. |
| WEEK 12 | Patterns of excretory products viz. Amonotelic, ureotlic uricotelic, ornithine cycle (Kreb’s– Henseleit cycle) for urea formation in liver |
| WEEK 13 | Urine formation, counter-current mechanism of urine concentration,osmoregulation, micturition. |
| WEEK 14 | Nature, origin and propagation of nerve impulse along with medullated & non-medullated nerve fibre, conduction of nerve impulse across synapse. |
| WEEK 15 | Structure and mechanism of hormone action; physiology of hypothalamus, pituitary, thyroid, parathyroid, adrenal, pancreas and gonads |

**Session: 2019-2020 (odd sem)**

**Class: BSc Medical Second year (III Sem)**

**Subject: Life and Diversity of Chordates I and Mammalian Physiology I**

**Teachers’s name: Dr Seema Kumari**

|  |  |
| --- | --- |
| **S. No** | **Topic** |
| Week 1 | Chordates: Principles of classification; Origin and Evolutionary tree; Role of amnion in evolution; Salient features of chordates; |
| Week 2 | Functional morphology of the types with examples emphasizing their biodiversity, economic importance and conservation measures where required. |
| Week 3 | General characters and classification of phyla upto orders with examples emphasizing their biodiversity, economic importance and conservation measures where required. |
| Week 4 | Protochordates: Systematic position, distribution, ecology, morphology and affinities Urochordata: Herdmania – type study Cephalochordata; Amphioxus – type study |
| Week 5 | General characters and classification of phyla upto orders with examples emphasizing their biodiversity, economic importance and conservation measures where required. |
| Week 6 | Cyclostomes: Classification and ecological significance Type study of Petromyzon |
| Week 7 | General characters and classification of all phyla upto orders with examples emphasizing their biodiversity, economic importance and conservation measures where required. |
| Week 8 | Pisces intd, Scales & Fins, Parental care in fishes, fish migration. Types study of Labeo |
| Week 9 | Introduction, Classification, Structure, function and general properties of carbohydrates |
| Week 10 | Introduction, Classification, Structure, function and general properties of lipids |
| Week 11 | Introduction, Classification, Structure, function and general properties of proteins; |
| Week 12 | Nomenclature, Classification and mechanisms of enzyme action. Transport through biomembranes (Active and Passive), buffers |
| Week 13 | Nutritional components; Carbohydrates, fats, lipids, Vitamins and Minerals. Types of nutrition & feeding, Digestion of dietary constituents, viz. lipids, proteins |
| Week 14 | Digestion of carbohydrates & nucleic acids; symbiotic digestion. Absorption of nutrients & assimilation; control of enzyme secretion. |
| Week 15 | Muscles Intd, Types of muscles, ultra-structure of skeletal muscle. Bio-chemical and physical events during muscle contraction; single muscle twitch, tetanus, muscle fatigue muscle, tone, oxygen debt, Cori’s cycle, |
| Week 16 | Single unit smooth muscles, their physical and functional properties. Bones: Structure and types, classification, bone growth and resorption, effect of ageing on skeletal system and bone disorders |

**Session: 2019-2020 (even- sem)**

**Teachers’s name: Dr Seema Kumari (Maternity leave)**

**Session: 2020-2021 (odd sem)**

**Class : BSc Medical First year (I Sem)**

**Subject: Animal Diversity and Cell Biology**

**Teachers’s name: Dr Seema Kumari**

**Sec. A**

|  |  |
| --- | --- |
| **S. No** | **Topic** |
| Week 1 | General characters and classification up to order level, Biodiversity and economic importance, Type study of Plasmodium, |
| Week 2 | Parasitic protozoans: Life history, mode of infection and pathogenicity of Entamoeba, Trypanosoma, Leishmania and Giardia |
| Week 3 | Phylum- Porifera introduction, General characters and classification up to order level, Biodiversity and economic importance Type study – Sycon, |
| Week 4 | Canal system in sponges, Spicules in sponges, General characters and classification up to order level |
| Week 5 | Type Study – Obelia, Biodiversity, economic importance |
| Week 6 | Corals and coral reefs, Polymorphism in Siphonophores |
| Week 7 | General characters and classification up to order level, Biodiversity, economic importance, Type study - Fasciola hepatica, Helminths parasites: |
| Week 8 | Brief account of life history, mode of infection and pathogenesity of Schistosoma, Ancylostoma, Trichinella, Wuchereria and Oxyuris |
| Week 9 | Ultrastructure of different cell organelles of animal cell, Plasma Membrane: Fluid mosaic model, various modes of transport across the membrane, mechanism of active and passive transport, endocytosis and exocytosis |
| Week 10 | Endoplasmic reticulum (ER): types, role of ER in protein synthesis and transportation in animal cell, Golgi complex: Structure, Associated enzymes and role of golgi-complex in animal cell |
| Week 11 | Ribosomes: Types, biogenesis and role in protein synthesis. 2 Lysosomes: Structure, enzyme and their role; polymorphism 3 Mitochondria: Mitochondrial DNA; as semiautonomous body, biogenesis, mitochondrial enzymes ( only names), role of mitochondria |
| Week 12 | Cytoskeleton: Microtubules, microfilaments, centriole and basal body, Cilia and Flagella |
| Week 13 | Ultrastructure and functions of Nucleus: Nuclear· membrane, nuclear lamina, nucleolus, fine structure of chromosomes, nucleosome concept and role of histones |
| Week 14 | Euchromatin and heterochromatin, lampbrush chromosomes and polytene chromosomes. |
| Week 15 | Mitosis and Meiosis (Cell reproduction), Brief account of causes of cancer |
| Week 16 | Cancer cont., An elementary idea of cellular basis of Immunity |

**Session: 2020-2021 (odd sem)**

**Class: BSc Medical Second year (III Sem)**

**Subject: Life and Diversity of Chordates I and Mammalian Physiology I**

**Teachers’s name: Dr Seema Kumari**

**Sec-B**

|  |  |
| --- | --- |
| **S. No** | **Topic** |
| Week 1 | Chordates: Principles of classification; Origin and Evolutionary tree; Role of amnion in evolution; Salient features of chordates; |
| Week 2 | Functional morphology of the types with examples emphasizing their biodiversity, economic importance and conservation measures where required. |
| Week 3 | General characters and classification of phyla upto orders with examples emphasizing their biodiversity, economic importance and conservation measures where required. |
| Week 4 | Protochordates: Systematic position, distribution, ecology, morphology and affinities Urochordata: Herdmania – type study Cephalochordata; Amphioxus – type study |
| Week 5 | General characters and classification of phyla upto orders with examples emphasizing their biodiversity, economic importance and conservation measures where required. |
| Week 6 | Cyclostomes: Classification and ecological significance Type study of Petromyzon |
| Week 7 | General characters and classification of all phyla upto orders with examples emphasizing their biodiversity, economic importance and conservation measures where required. |
| Week 8 | Pisces intd, Scales & Fins, Parental care in fishes, fish migration. Types study of Labeo |
| Week 9 | Introduction, Classification, Structure, function and general properties of carbohydrates |
| Week 10 | Introduction, Classification, Structure, function and general properties of lipids |
| Week 11 | Introduction, Classification, Structure, function and general properties of proteins; |
| Week 12 | Nomenclature, Classification and mechanisms of enzyme action. Transport through biomembranes (Active and Passive), buffers |
| Week 13 | Nutritional components; Carbohydrates, fats, lipids, Vitamins and Minerals. Types of nutrition & feeding, Digestion of dietary constituents, viz. lipids, proteins |
| Week 14 | Digestion of carbohydrates & nucleic acids; symbiotic digestion. Absorption of nutrients & assimilation; control of enzyme secretion. |
| Week 15 | Muscles Intd, Types of muscles, ultra-structure of skeletal muscle. Bio-chemical and physical events during muscle contraction; single muscle twitch, tetanus, muscle fatigue muscle, tone, oxygen debt, Cori’s cycle, |
| Week 16 | Single unit smooth muscles, their physical and functional properties. Bones: Structure and types, classification, bone growth and resorption, effect of ageing on skeletal system and bone disorders |

**Session: 2020-2021 (even sem)**

**Class: BSc Medical Second year (IV Sem)**

**Subject: Life and Diversity of Chordates II and Mammalian Physiology II**

**Teachers’s name: Dr Seema Kumari**

**Sec. B**

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | Origin, Evolutionary tree. Parental Care in Amphibia |
| WEEK 2 | Type study of frog (Rana tigrina) continued |
| WEEK 3 | Type study of Lizard (Hemidactylus) |
| WEEK 4 | Origin, Evolutionary tree. Extinct reptiles; Poisonous and non-poisonous snakes; Poison apparatus in snakes. |
| WEEK 5 | Flight adaptation, Principles of aerodynamics in Bird flight, migration in birds. |
| WEEK 6 | Type study of Pigeon (Columba livia) |
| WEEK 7 | Classification, Adaptive radiations of mammals and dentition |
| WEEK 8 | type study of Rat |
| WEEK 9 | Origin, conduction and regulation of heart beat, cardiac cycle, electrocardiogram, cardiac output, fluid pressure and flow pressure in closed and open circulatory system; circulatory system; |
| WEEK 10 | Composition and functions of blood & lymph; Mechanism of coagulation of blood, coagulation factors, anticoagulants, hemopoiesis |
| WEEK 11 | Exchange of respiratory gases, transport of gases, lung air volumes, oxygen dissociation curve of hemoglobin, Bohr’s effect, Haburger’s phenomenon (Chloride shift), control / regulation of respiration. |
| WEEK 12 | Patterns of excretory products viz. Amonotelic, ureotlic uricotelic, ornithine cycle (Kreb’s– Henseleit cycle) for urea formation in liver |
| WEEK 13 | Urine formation, counter-current mechanism of urine concentration,osmoregulation, micturition. |
| WEEK 14 | Nature, origin and propagation of nerve impulse along with medullated & non-medullated nerve fibre, conduction of nerve impulse across synapse. |
| WEEK 15 | Structure and mechanism of hormone action; physiology of hypothalamus, pituitary, thyroid, parathyroid, adrenal, pancreas and gonads |

**Lesson Plan (2018-2019)**

SESSION 2018-2019

CLASS B.Sc BIOTECHNOLOGY 1st YEAR

TEACHER DR POOJA YADAV

SUBJECT BIOCHEMISTRY and METABOLISM (Semester 1)

PAPER BT-104

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | Unit-1 Amino acids and Proteins |
| WEEK 2 | Contd. Unit-1- Amino acids and Proteins + Discussion of doubts, Revision and Test |
| WEEK 3 | Unit-1- Carbohydrates |
| WEEK 4 | Contd. Unit-1- Carbohydrates + Discussion of doubts, Revision and Test |
| WEEK 5 | Unit 4- Carbohydrate Metabolism |
| WEEK 6 | Contd. Carbohydrate Metabolism |
| WEEK 7 | Unit 4- Discussion of doubts, Revision and Test |
| WEEK 8 | Unit 2- Lipids |
| WEEK 9 | Contd. Unit 2- Lipids |
| WEEK 10 | Contd. Unit 2- Lipids+ Discussion of doubts, Revision and Test |
| WEEK 11 | Unit 2- Nucleic acids |
| WEEK 12 | Contd.- Unit2- Nucleic acids+ Discussion of doubts, Revision and Test |
| WEEK 13 | Unit 3- Enzymes |
| WEEK 14 | Contd. Unit 3- Enzymes |
| WEEK 15 | Contd. Unit 3- Enzymes + Discussion of doubts, Revision and Test |
| WEEK 16 | Full revision of the total syllabus through oral and written tests |

**Lesson Plan**

**SESSION 2018-2019**

**CLASS B.Sc. Medical 1st sem**

**TEACHER DR POOJA YADAV**

**SUBJECT Life and Diversity from Protozoa to Helminthes**

**and Cell Biology (Paper 1.1 & 1.2)**

|  |  |
| --- | --- |
| **S NO** | **TOPIC** |
| WEEK 1 | **Paper 1- Unit-1: Protozoa- General characters and classification up to order level, biodiversity and economic importance. Type study of Plasmodium** |
| WEEK 2 | **Unit-1: Contd. Protozoa- Parasitic protozoans- Entamoeba, Trypanosoma, Leishmania and Giardia** |
| WEEK 3 | **Unit 2:Porifera: General characters and classification up to order level, biodiversity and economic importance. Spicules in sponges** |
| WEEK 4 | **Unit 2:Contd. Porifera- Type study of Sycon and canal system in sponges.** |
| WEEK 5 | **Unit 3:** **Coelenterata:** **General characters and classification up to order level, biodiversity and economic importance. Corals and coral reefs and polymorphism in Siphonophores** |
| WEEK 6 | **Unit 3: Contd. Coelenterata- Type study of Obelia** |
| WEEK 7 | **Unit 4: Helminthes- General characters and classification up to order level, biodiversity and economic importance. Type study- Fasciola hepatica** |
| WEEK 8 | **Unit 4: Contd. Heliminthes- Heminthes parasites- life history, pathogenicity and mode of infection of Schistosoma, Ancyclostoma, trichinella, Wuchereria, Oxyuris** |
| WEEK 9 | **Paper 2, Unit 1: Ultrastructure of different cell organelle-Plasma membrane, ER** |
| WEEK 10 | **Contd. Unit 1: ER and Golgi complex** |
| WEEK 11 | **Unit 2: Ribosomes, Lysosomes and Mitochondria** |
| WEEK 12 | **Contd. Unit 2: Cytoskeleton and cilia and flagella**  **Unit3: Ultrastructure of Nucleus** |
| WEEK 13 | **Contd. Unit 3: Structure of chromosomes, nucleosomes, Giant chromosomes and euchromatin and heterochromatin** |
| WEEK 14 | **Unit 4: Mitosis and Meiosis** |
| WEEK 15 | **Unit 4: Brief account of cancer** |
| WEEK 16 | **Unit 4: Cellular basis of immunity** |

**Lesson Plan**

**SESSION 2018-2019**

**CLASS B.Sc. Biotechnology Sem. 3**

**TEACHER DR POOJA YADAV**

**SUBJECT Medical Microbiology (BT-301)**

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | **Unit-1:** Introduction to Microbiology, Normal microflora of human body, Nosocomial infections,  *Staphylococcus aureus, Streptococcus pyogenes* - Morphology, toxins and pathogenesis, symptoms and chemotherapy, Lab. Diagnosis, preventive measures |
| WEEK 2 | **Unit-1:** *Bacillus anthracis-* Morphology, toxins, disease- Anthrax, *Clostridium perfringens, Clostridium botulinum* and *Cl. tetani* - Morphology, toxins, pathogenesis, symptoms, Lab. Diagnosis, preventive measures |
| WEEK 3 | **Unit 1:***Corynebacterium diphtheria-* Morphology, toxins, pathogenesis, Disease- Diphtheria, Lab. Diagnosis, preventive measures and chemotherapy, *M. leprae-* Morphology, toxins, pathogenesis, symptoms, Lab. Diagnosis, preventive measures, chemotherapy |
| WEEK 4 | **Unit 1:***M. tuberculosis*- Morphology, toxins, pathogenesis, symptoms, Lab. Diagnosis, preventive measures, chemotherapy.  **Unit 4:** Gastrointestinal infections- Amoebiasis and Giardiasis |
| WEEK 5 | **Unit 4:** Blood borne infections- Leishmaniasis and Malaria, Fungal infections- Dermatophytoses and subcutaneous infections |
| WEEK 6 | **Unit 4: Contd.** subcutaneous infections, systemic and opportunistic fungal infections |
| WEEK 7 | **Unit 2:** *E. coli*- Morphology, toxins, Disease- Diarrhea, Pathogenesis, lab. Diagnosis, preventive measures, chemotherapy, *Neisseria meningitides* and *N.* *gonorrhoeae*- Morphology, pathogenesis, symptoms, lab. Diagnosis, preventive measures and chemotherapy, |
| WEEK 8 | **Unit 2:** *M. pneumonia, P. aeruginosa*, Rickettsiacea - Morphology, pathogenesis, symptoms, lab. Diagnosis, preventive measures and chemotherapy. |
| WEEK 9 | **Unit 2:** *Chlamydia, Yersinia* and *T. pallidum, Haemophilus influenzae* - Morphology, pathogenesis, symptoms, lab. Diagnosis, preventive measures and chemotherapy |
| ,WEEK 10 | **Unit 2:** *Salmonella typhi, S. dysenteriae* and *S. tetani-* Morphology, pathogenesis, symptoms, lab. Diagnosis, preventive measures and chemotherapy, *Bacillus abortus, Vibrio cholera -* Morphology, pathogenesis, symptoms, lab. Diagnosis, preventive measures and chemotherapy |
| WEEK 11 | **Unit 3:** Diseases caused by viruses- Pox virus, Reovirus and papova virus |
| WEEK 12 | **Unit 3:** Rabdovirus and Retrovirus (AIDS) |
| WEEK 13 | **Unit 3:** Hepatitis virus |
| WEEK 14 | **Unit 3:** Paramyxovirus and orthomyxovirus |
| WEEK 15 | **Unit 3:** Picornavirus |
| WEEK 16 | **Unit 3:** Herpesvirus |

**Lesson Plan**

**SESSION 2018-2019**

**CLASS B.Sc. Biotechnology Sem. 2nd**

**TEACHER DR POOJA YADAV**

**SUBJECT BIOTECHNOLOGY**

**Animal Diversity-I & Economic Zoology**

**Paper BT- 204**

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| --- | --- |
| S NO | TOPIC |
| WEEK 1 | **Unit-1:** Coelomates, Acoelomates, symmetries, Deuterostomes, protostomes. Protozoa- Locomotion and reproduction, evolution of sex. Pathogenic protozoans. |
| WEEK 2 | **Unit-1:** General features of life history of paramecium and Plasmodium |
| WEEK 3 | **Unit 1:** Porifera-General characters, outline of classification, skeleton and canal system |
| WEEK 4 | **Unit 2:** Coelenterata- General characters, outline of classification, polymorphism, various types of stinging cells, metagenesis, coral reefs and their formation |
| WEEK 5 | **Unit 2:** Platyhelminthes- General characters, outline of classification, pathogenic flatworms, parasitic adaptations and important larval forms |
| WEEK 6 | **Unit 2:** Aschelminthes- General characters, outline of classification, pathogenic roundworms and their vectors in relation to man and parasitic adaptations |
| WEEK 7 | Discussion and test of Unit 1 and Unit 2 |
| WEEK 8 | **Unit 3: Annelida-** General characters, outline of classification, coelom, metameric segmentation |
| WEEK 9 | **Unit 3: Annelida-** life history of earthworm and vermicomposting |
| WEEK 10 | **Unit 3: Arthropoda-** General characters, outline of classification, respiration in arthropods, metamorphosis in insects |
| WEEK 11 | **Unit 3: Arthropoda-** larval forms of crustaceans, insect vector of diseases |
| WEEK 12 | **Unit 3:** Social insects, apiculture and Sericulture |
| WEEK 13 | **Unit 4:** Mollusca-General characters, outline of classification, shell diversity, torsion in gastropods, life history of Pila |
| WEEK 14 | **Unit 4:** Echinodermata-General characters, outline of classification, life history of starfish, Larval forms of echinodermata |
| WEEK 15 | **Unit 4:** Contd. Larval forms of echinodermata,Hemichordata- phylogeny and affinities of Balanoglossus |
| WEEK 16 | Discussion and test of Unit 3 and Unit 4. |

**Lesson Plan**

**SESSION 2018-2019**

**CLASS B.Sc. Medical 2nd sem**

**TEACHER DR POOJA YADAV**

**SUBJECT Life and Diversity of Annelida to Hemichordata**

**and Genetics (Paper 2.1 & 2.2)**

|  |  |
| --- | --- |
| **S NO** | **TOPIC** |
| WEEK 1 | **Paper 1- Unit-1: Annelida- General characters and classification up to order level, biodiversity and economic importance. Metamerism in Annelida.** |
| WEEK 2 | **Unit-1: Contd. Annelida- Type study- Pheretima, Trochophore larva-affinities and evolutionary significance** |
| WEEK 3 | **Unit 2:Arthropoda: General characters and classification up to order level, biodiversity and economic importance of insects. Type study-Periplaneta** |
| WEEK 4 | **Unit 2:Contd. Arthropoda - Type study of Periplaneta**  **Unit 3: Mollusca- General characters and classification up to order level, biodiversity and economic importance** |
| WEEK 5 | **Unit 3:** **Mollusca:** **Type study- Pila, Torsion and detorsion in gastropoda, Respiration and foot** |
| WEEK 6 | **Unit 4: Echinodermata- General characters and classification up to order level, biodiversity and economic importance, Echinoderm larvae, Aristotle’s Lantern** |
| WEEK 7 | **Unit 4: Contd. Echinodermata- Aristotle’s Lantern and Type study- Asterias** |
| WEEK 8 | **Unit 4: Type study- Balanoglossus** |
| WEEK 9 | **Paper 2, Unit 1: Elements of Heredity and Variation and the varieties of gene interactions** |
| WEEK 10 | **Unit 1: Contd. varieties of gene interactions** |
| WEEK 11 | **Unit 1: Linkage and recombination**  **Unit 3: Multiple allelism** |
| WEEK 12 | **Unit 2: Sex determination and its mechanism, sex-linked inheritance, and sex-influenced inheritance**  **Unit3- Human genetics** |
| WEEK 13 | **Unit 3: Inborn errors of metabolism.**  **Unit4: Applied Genetics- Eugenics, euthenics and euphenics, Prenatal-diagnosis, DNA fingerprinting and genetic counselling** |
| WEEK 14 | **Unit 4: Nature and function of genetic material** |
| WEEK 15 | **Unit 3: Extra chromosomal and cytoplasmic inheritance** |
| WEEK 16 | **Unit 4: Transgenic animals** |

**Lesson Plan (2019-2020)**

**SESSION 2019-2020**

**CLASS B.Sc. Medical 1st sem**

**TEACHER DR POOJA YADAV**

**SUBJECT Life and Diversity from Protozoa to Helminthes**

**and Cell Biology (Paper 1.1 & 1.2)**

|  |  |
| --- | --- |
| **S NO** | **TOPIC** |
| WEEK 1 | **Paper 1- Unit-1: Protozoa- General characters and classification up to order level, biodiversity and economic importance. Type study of Plasmodium** |
| WEEK 2 | **Unit-1: Contd. Protozoa- Parasitic protozoans- Entamoeba, Trypanosoma, Leishmania and Giardia** |
| WEEK 3 | **Unit 2:Porifera: General characters and classification up to order level, biodiversity and economic importance. Spicules in sponges** |
| WEEK 4 | **Unit 2:Contd. Porifera- Type study of Sycon and canal system in sponges.** |
| WEEK 5 | **Unit 3:** **Coelenterata:** **General characters and classification up to order level, biodiversity and economic importance. Corals and coral reefs and polymorphism in Siphonophores** |
| WEEK 6 | **Unit 3: Contd. Coelenterata- Type study of Obelia** |
| WEEK 7 | **Unit 4: Helminthes- General characters and classification up to order level, biodiversity and economic importance. Type study- Fasciola hepatica** |
| WEEK 8 | **Unit 4: Contd. Heliminthes- Heminthes parasites- life history, pathogenicity and mode of infection of Schistosoma, Ancyclostoma, trichinella, Wuchereria, Oxyuris** |
| WEEK 9 | **Paper 2, Unit 1: Ultrastructure of different cell organelle-Plasma membrane, ER** |
| WEEK 10 | **Contd. Unit 1: ER and Golgi complex** |
| WEEK 11 | **Unit 2: Ribosomes, Lysosomes and Mitochondria** |
| WEEK 12 | **Contd. Unit 2: Cytoskeleton and cilia and flagella**  **Unit3: Ultrastructure of Nucleus** |
| WEEK 13 | **Contd. Unit 3: Structure of chromosomes, nucleosomes, Giant chromosomes and euchromatin and heterochromatin** |
| WEEK 14 | **Unit 4: Mitosis and Meiosis** |
| WEEK 15 | **Unit 4: Brief account of cancer** |
| WEEK 16 | **Unit 4: Cellular basis of immunity** |

**Lesson Plan**

**SESSION 2019-2020**

**CLASS B.Sc. Biotechnology Sem. 3**

**TEACHER DR POOJA YADAV**

**SUBJECT Medical Microbiology (BT-301)**

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | **Unit-1:** Introduction to Microbiology, Normal microflora of human body, Nosocomial infections,  *Staphylococcus aureus, Streptococcus pyogenes* - Morphology, toxins and pathogenesis, symptoms and chemotherapy, Lab. Diagnosis, preventive measures |
| WEEK 2 | **Unit-1:** *Bacillus anthracis-* Morphology, toxins, disease- Anthrax, *Clostridium perfringens, Clostridium botulinum* and *Cl. tetani* - Morphology, toxins, pathogenesis, symptoms, Lab. Diagnosis, preventive measures |
| WEEK 3 | **Unit 1:***Corynebacterium diphtheria-* Morphology, toxins, pathogenesis, Disease- Diphtheria, Lab. Diagnosis, preventive measures and chemotherapy, *M. leprae-* Morphology, toxins, pathogenesis, symptoms, Lab. Diagnosis, preventive measures, chemotherapy |
| WEEK 4 | **Unit 1:***M. tuberculosis*- Morphology, toxins, pathogenesis, symptoms, Lab. Diagnosis, preventive measures, chemotherapy.  **Unit 4:** Gastrointestinal infections- Amoebiasis and Giardiasis |
| WEEK 5 | **Unit 4:** Blood borne infections- Leishmaniasis and Malaria, Fungal infections- Dermatophytoses and subcutaneous infections |
| WEEK 6 | **Unit 4: Contd.** subcutaneous infections, systemic and opportunistic fungal infections |
| WEEK 7 | **Unit 2:** *E. coli*- Morphology, toxins, Disease- Diarrhea, Pathogenesis, lab. Diagnosis, preventive measures, chemotherapy, *Neisseria meningitides* and *N.* *gonorrhoeae*- Morphology, pathogenesis, symptoms, lab. Diagnosis, preventive measures and chemotherapy, |
| WEEK 8 | **Unit 2:** *M. pneumonia, P. aeruginosa*, Rickettsiacea - Morphology, pathogenesis, symptoms, lab. Diagnosis, preventive measures and chemotherapy. |
| WEEK 9 | **Unit 2:** *Chlamydia, Yersinia* and *T. pallidum, Haemophilus influenzae* - Morphology, pathogenesis, symptoms, lab. Diagnosis, preventive measures and chemotherapy |
| ,WEEK 10 | **Unit 2:** *Salmonella typhi, S. dysenteriae* and *S. tetani-* Morphology, pathogenesis, symptoms, lab. Diagnosis, preventive measures and chemotherapy, *Bacillus abortus, Vibrio cholera -* Morphology, pathogenesis, symptoms, lab. Diagnosis, preventive measures and chemotherapy |
| WEEK 11 | **Unit 3:** Diseases caused by viruses- Pox virus, Reovirus and papova virus |
| WEEK 12 | **Unit 3:** Rabdovirus and Retrovirus (AIDS) |
| WEEK 13 | **Unit 3:** Hepatitis virus |
| WEEK 14 | **Unit 3:** Paramyxovirus and orthomyxovirus |
| WEEK 15 | **Unit 3:** Picornavirus |
| WEEK 16 | **Unit 3:** Herpesvirus |

**Lesson Plan**

**SESSION 2019-2020**

**CLASS B.Sc. Medical 2nd sem**

**TEACHER DR POOJA YADAV**

**SUBJECT Life and Diversity of Annelida to Hemichordata**

**and Genetics (Paper 2.1 & 2.2)**

|  |  |
| --- | --- |
| **S NO** | **TOPIC** |
| WEEK 1 | **Paper 1- Unit-1: Annelida- General characters and classification up to order level, biodiversity and economic importance. Metamerism in Annelida.** |
| WEEK 2 | **Unit-1: Contd. Annelida- Type study- Pheretima, Trochophore larva-affinities and evolutionary significance** |
| WEEK 3 | **Unit 2:Arthropoda: General characters and classification up to order level, biodiversity and economic importance of insects. Type study-Periplaneta** |
| WEEK 4 | **Unit 2:Contd. Arthropoda - Type study of Periplaneta**  **Unit 3: Mollusca- General characters and classification up to order level, biodiversity and economic importance** |
| WEEK 5 | **Unit 3:** **Mollusca:** **Type study- Pila, Torsion and detorsion in gastropoda, Respiration and foot** |
| WEEK 6 | **Unit 4: Echinodermata- General characters and classification up to order level, biodiversity and economic importance, Echinoderm larvae, Aristotle’s Lantern** |
| WEEK 7 | **Unit 4: Contd. Echinodermata- Aristotle’s Lantern and Type study- Asterias** |
| WEEK 8 | **Unit 4: Type study- Balanoglossus** |
| WEEK 9 | **Paper 2, Unit 1: Elements of Heredity and Variation and the varieties of gene interactions** |
| WEEK 10 | **Unit 1: Contd. varieties of gene interactions** |
| WEEK 11 | **Unit 1: Linkage and recombination**  **Unit 3: Multiple allelism** |
| WEEK 12 | **Unit 2: Sex determination and its mechanism, sex-linked inheritance, and sex-influenced inheritance**  **Unit3- Human genetics** |
| WEEK 13 | **Unit 3: Inborn errors of metabolism.**  **Unit4: Applied Genetics- Eugenics, euthenics and euphenics, Prenatal-diagnosis, DNA fingerprinting and genetic counselling** |
| WEEK 14 | **Unit 4: Nature and function of genetic material** |
| WEEK 15 | **Unit 3: Extra chromosomal and cytoplasmic inheritance** |
| WEEK 16 | **Unit 4: Transgenic animals** |

**Lesson Plan (2019-2020)**

**SESSION 2019-2020**

**CLASS B.Sc. Biotechnology Sem. 4th**

**TEACHER DR POOJA YADAV**

**SUBJECT Animal Diversity-II**

**Paper BT- 401**

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | **Unit-1:** Proto-chordates: outline of classification, General features and important characters of Herdmania |
| WEEK 2 | **Unit-1:** General features and important characters of Branchiostoma |
| WEEK 3 | **Unit 1:** Origin of chordates, Pisces: migration in pisces |
| WEEK 4 | **Unit 1:** Amphibia: outline of classification, origin, parental care and pedogenesis |
| WEEK 5 | Discussion and test of Unit 1. |
| WEEK 6 | **Unit 2:** Reptiles- origin and classification |
| WEEK 7 | **Unit 2:** Aves- origin, classification, flight-adaptations, migration |
| WEEK 8 | **Unit 2:** Mammals- classification, origin and dentition |
| WEEK 9 | Discussion and test of Unit 2. |
| ,WEEK 10 | **Unit 3:** Comparative anatomy of Vertebrates-I: Integumentary and digestive system |
| WEEK 11 | **Unit 3:** Comparative anatomy of Vertebrates-I: Respiratory system  **Unit 4:** Comparative anatomy of Vertebrates-II: Brain |
| WEEK 12 | Discussion and test of Unit 3 |
| WEEK 13 | **Unit 4:** Comparative anatomy of Vertebrates-II: Heart and aortic arches |
| WEEK 14 | **Unit 4:** Comparative anatomy of Vertebrates-II: Kidney and urino-genital system |
| WEEK 15 | **Unit 4:** Comparative anatomy of Vertebrates-II: Eye, ear and autonomic nervous system in mammals |
| WEEK 16 | Discussion and test of Unit 4. |

**Lesson Plan (2020-2021)**

**SESSION 2020-2021**

**CLASS B.Sc. Biotechnology Sem. 3**

**TEACHER DR POOJA YADAV**

**SUBJECT Medical Microbiology (BT-301)**

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | **Unit-1:** Introduction to Microbiology, Normal microflora of human body, Nosocomial infections,  *Staphylococcus aureus, Streptococcus pyogenes* - Morphology, toxins and pathogenesis, symptoms and chemotherapy, Lab. Diagnosis, preventive measures |
| WEEK 2 | **Unit-1:** *Bacillus anthracis-* Morphology, toxins, disease- Anthrax, *Clostridium perfringens, Clostridium botulinum* and *Cl. tetani* - Morphology, toxins, pathogenesis, symptoms, Lab. Diagnosis, preventive measures |
| WEEK 3 | **Unit 1:***Corynebacterium diphtheria-* Morphology, toxins, pathogenesis, Disease- Diphtheria, Lab. Diagnosis, preventive measures and chemotherapy, *M. leprae-* Morphology, toxins, pathogenesis, symptoms, Lab. Diagnosis, preventive measures, chemotherapy |
| WEEK 4 | **Unit 1:***M. tuberculosis*- Morphology, toxins, pathogenesis, symptoms, Lab. Diagnosis, preventive measures, chemotherapy.  **Unit 4:** Gastrointestinal infections- Amoebiasis and Giardiasis |
| WEEK 5 | **Unit 4:** Blood borne infections- Leishmaniasis and Malaria, Fungal infections- Dermatophytoses and subcutaneous infections |
| WEEK 6 | **Unit 4: Contd.** subcutaneous infections, systemic and opportunistic fungal infections |
| WEEK 7 | **Unit 2:** *E. coli*- Morphology, toxins, Disease- Diarrhea, Pathogenesis, lab. Diagnosis, preventive measures, chemotherapy, *Neisseria meningitides* and *N.* *gonorrhoeae*- Morphology, pathogenesis, symptoms, lab. Diagnosis, preventive measures and chemotherapy, |
| WEEK 8 | **Unit 2:** *M. pneumonia, P. aeruginosa*, Rickettsiacea - Morphology, pathogenesis, symptoms, lab. Diagnosis, preventive measures and chemotherapy. |
| WEEK 9 | **Unit 2:** *Chlamydia, Yersinia* and *T. pallidum, Haemophilus influenzae* - Morphology, pathogenesis, symptoms, lab. Diagnosis, preventive measures and chemotherapy |
| ,WEEK 10 | **Unit 2:** *Salmonella typhi, S. dysenteriae* and *S. tetani-* Morphology, pathogenesis, symptoms, lab. Diagnosis, preventive measures and chemotherapy, *Bacillus abortus, Vibrio cholera -* Morphology, pathogenesis, symptoms, lab. Diagnosis, preventive measures and chemotherapy |
| WEEK 11 | **Unit 3:** Diseases caused by viruses- Pox virus, Reovirus and papova virus |
| WEEK 12 | **Unit 3:** Rabdovirus and Retrovirus (AIDS) |
| WEEK 13 | **Unit 3:** Hepatitis virus |
| WEEK 14 | **Unit 3:** Paramyxovirus and orthomyxovirus |
| WEEK 15 | **Unit 3:** Picornavirus |
| WEEK 16 | **Unit 3:** Herpesvirus |

**Session : 2020-2021**

**Class: BSc Biotech Final year (V Sem)**

**Subject: Immunology (BT 501)**

**Teachers’s name: Dr Pooja Yadav**

|  |  |
| --- | --- |
| S. No | Topic |
| Week 1 | Immune Response - An overview, components of mammalian immune system, molecular structure of Immunoglobulins or Antibodies |
| Week 2 | Humoral & Cellular immune responses, T-lymphocytes & immune response (cytotoxic T-cell, helper Tcell, suppressor T-cells), , |
| Week 3 | T-cell receptors, genome rearrangements during B-lymphocytedifferentiation |
| Week 4 | Antibody affinity, maturation class switching, assembly of T-cell receptor genes by somatic recombination. |
| Week 5 | Regulation of immunoglobulin gene expression – clonal selection theory, allotypes & idiotypes, |
| Week 6 | Allelic exclusion, immunologic memory |
| Week 7 | Heavy chain gene transcription, genetic basis of antibody diversity, |
| Week 8 | Hypothesis (germ line & somatic mutation), antibody diversity. |
| Week 9 | Major Histocompatibility complexes – class I & class II MHC antigens, |
| Week 10 | Antigen processing. avoidance of recognition. |
| Week 11 | Immunity to infection – immunity to different organisms, pathogen defense strategies |
| Week 12 | Auto- immune diseases, Immunodeficiency- AIDS |
| Week 13 | Vaccines & Vaccination – adjuvants, cytokines, DNA vaccines, recombinant vaccines, bacterial vaccines |
| Week 14 | Viral vaccines,Vaccines to other infectious agents |
| Week 15 | Passive & active immunization |
| Week 16 | Introduction to immunodiagnostics – RIA, ELISA. |

**Lesson Plan**

**SESSION 2020-2021**

**CLASS B.Sc. Medical 3rd sem**

**TEACHER DR POOJA YADAV**

**SUBJECT Life and Diversity of Chordates-I and**

**Mammalian Physiology (Paper 3.1 & 3.2)**

|  |  |
| --- | --- |
| **S NO** | **TOPIC** |
| WEEK 1 | **Paper 1- Unit-1: Chordates- Salient features, Classification, Origin and Evolutionary tree, biodiversity and economic importance and conservation measures.** |
| WEEK 2 | **Unit-2: Protochordates- General characters and classification, biodiversity and economic importance. Type study- Herdmania** |
| WEEK 3 | **Unit 2:Protochordates- Type study- Amphioxus** |
| WEEK 4 | **Unit 3:Cyclostomes - Type study of Petromyzon**  **Classification up to order level, biodiversity and economic importance.** |
| WEEK 5 | **Unit 4:** **Pisces:** **General characters and classification up to order level, biodiversity, economic importance and conservation measures.** |
| WEEK 6 | **Unit 4: Pisces: Type study of Labeo** |
| WEEK 7 | **Unit 4: Contd. Type study of Labeo, Scales and fins of pisces, parental care in fishes and fish migration.** |
| WEEK 8 | **Discussion and oral test** |
| WEEK 9 | **Paper 2, Unit 1: Carbohydrates- Introduction, classification, structure, function and general properties.** |
| WEEK 10 | **Unit 1: Lipids- Introduction, classification, structure, function and general properties.** |
| WEEK 11 | **Unit 2: Proteins- Introduction, classification, structure, function and general properties. Classification and mechanisms of enzyme action.** |
| WEEK 12 | **Unit 2: Transport through biomembranes and buffers** |
| WEEK 13 | **Unit 3: Nutrition** |
| WEEK 14 | **Unit 3: Contd. Nutrition** |
| WEEK 15 | **Unit 4: Muscles** |
| WEEK 16 | **Unit 4: Bones** |

**Lesson Plan**

**SESSION 2020-2021**

**CLASS B.Sc. Medical 6th sem**

**TEACHER DR POOJA YADAV**

**SUBJECT Entomology and Developmental Biology**

**(Paper 6.1 & 6.2)**

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| --- | --- |
| **S NO** | **TOPIC** |
| WEEK 1 | **Paper 2- Unit-1: Historical perspectives, aims and scope of developmental biology. Generalized structure of mammalian ovum and sperm, Spermatogenesis and Oogenesis** |
| WEEK 2 | **Unit-2: Fertilization, parthenogenesis. Different types of eggs and patterns of cleavage** |
| WEEK 3 | **Unit 2:Blastulation in invertebrates and vertebrates. Fate maps construction in frog and chick** |
| WEEK 4 | **Unit 3:Gastrulation and formation of three germinal layers in frog and chick** |
| WEEK 5 | **Unit 3:** **Elementary knowledge of primary organizers.**  **Unit 4: Extra embryonic membranes-structure and significance in birds and mammals.** |
| WEEK 6 | **Unit 4: Contd. Extra embryonic membranes-structure and significance in birds and mammals. Concept of regeneration** |
| WEEK 7 | **Unit 4: Concepts of competence, determination and differentiation.** |
| WEEK 8 | **Discussion and oral test.** |
| WEEK 9 | **Paper 1, Unit 1: Study of Sugarcane pests- Sugarcane leaf-hopper, whitefly, Sugarcane top borer, root borer, Gurdaspur borer.** |
| WEEK 10 | **Unit 1: Study of Cotton pests- Pink bollworm, Red cotton bug, Cotton grey weevil and Cotton Jassid** |
| WEEK 11 | **Unit 2: Study of Wheat pests- Wheat stem borer, Paddy pests- Gundhi bug, Rice grasshopper, Rice stem borer and Rice hispa.** |
| WEEK 12 | **Unit 3: Study of Vegetable pests- The Red pumpkin beetle, Dacus cucurbitas, vegetable mite, and the Hadda beetle** |
| WEEK 13 | **Unit 3: Study of Stored grains- Pulse beetle, Rice weevil, wheat weevil, Rust red flour beetles, Lesser Grain borer and Grain & Flour moth** |
| WEEK 14 | **Unit 4: Insect control** |
| WEEK 15 | **Unit 4: Chemical control** |
| WEEK 16 | **Discussion and oral test.** |

**Lesson Plan**

**SESSION 2020-2021**

**CLASS B.Sc. Biotechnology Sem. 2nd**

**TEACHER DR POOJA YADAV**

**SUBJECT BIOTECHNOLOGY**

**Animal Diversity-I & Economic Zoology**

**Paper BT- 204**

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | **Unit-1:** Coelomates, Acoelomates, symmetries, Deuterostomes, protostomes. Protozoa- Locomotion and reproduction, evolution of sex. Pathogenic protozoans. |
| WEEK 2 | **Unit-1:** General features of life history of paramecium and Plasmodium |
| WEEK 3 | **Unit 1:** Porifera-General characters, outline of classification, skeleton and canal system |
| WEEK 4 | **Unit 2:** Coelenterata- General characters, outline of classification, polymorphism, various types of stinging cells, metagenesis, coral reefs and their formation |
| WEEK 5 | **Unit 2:** Platyhelminthes- General characters, outline of classification, pathogenic flatworms, parasitic adaptations and important larval forms |
| WEEK 6 | **Unit 2:** Aschelminthes- General characters, outline of classification, pathogenic roundworms and their vectors in relation to man and parasitic adaptations |
| WEEK 7 | Discussion and test of Unit 1 and Unit 2 |
| WEEK 8 | **Unit 3: Annelida-** General characters, outline of classification, coelom, metameric segmentation |
| WEEK 9 | **Unit 3: Annelida-** life history of earthworm and vermicomposting |
| WEEK 10 | **Unit 3: Arthropoda-** General characters, outline of classification, respiration in arthropods, metamorphosis in insects |
| WEEK 11 | **Unit 3: Arthropoda-** larval forms of crustaceans, insect vector of diseases |
| WEEK 12 | **Unit 3:** Social insects, apiculture and Sericulture |
| WEEK 13 | **Unit 4:** Mollusca-General characters, outline of classification, shell diversity, torsion in gastropods, life history of Pila |
| WEEK 14 | **Unit 4:** Echinodermata-General characters, outline of classification, life history of starfish, Larval forms of echinodermata |
| WEEK 15 | **Unit 4:** Contd. Larval forms of echinodermata,Hemichordata- phylogeny and affinities of Balanoglossus |
| WEEK 16 | Discussion and test of Unit 3 and Unit 4. |

**Lesson Plan**

**SESSION 2020-2021**

**CLASS B.Sc. Biotechnology Sem. 6th**

**TEACHER DR POOJA YADAV**

**SUBJECT ANIMAL BIOTECHNOLOGY**

**Paper BT- 602**

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | **Unit-1:** Gene transfer methods in animals- microinjection, embryonic stem cell and gene transfer |
| WEEK 2 | **Unit-1:** Retrovirus and gene transfer |
| WEEK 3 | Discussion and test of Unit 1 |
| WEEK 4 | **Unit 2:** Introduction to transgenesis. Transgenic animals- mice, cow, pig |
| WEEK 5 | **Unit 2:** Contd. Transgenic animals- Sheep, Goat, Bird, Insect |
| WEEK 6 | **Unit 2:** Animal diseases that need help of biotechnology- FMD, coccidiosis, Trypanosomiasis and Theileriosis |
| WEEK 7 | Discussion and test of Unit 2 |
| WEEK 8 | **Unit 3:** Animal propagation- Artificial insemination and animal clones |
| WEEK 9 | **Unit 3:** Conservation Biology-embryo transfer techniques |
| WEEK 10 | **Unit 3:** Introduction to stem cell technology and its applications |
| WEEK 11 | Discussion and test of Unit 3 |
| WEEK 12 | **Unit 4:** Gene therapy and types of gene therapy |
| WEEK 13 | **Unit 4:** Vectors in gene therapy |
| WEEK 14 | **Unit 4:** Molecular engineering |
| WEEK 15 | **Unit 4:** Human genetic engineering, problems 7 ethics |
| WEEK 16 | Discussion and test of Unit 4. |

SESSION 2018-19

CLASS B.Sc BIOTECH III YEAR

TEACHER DR PUSHPA YADAV

SUBJECT BIOINFORMATICS

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | History of Bioinformatics |
| WEEK 2 | The notion of Homology. |
| WEEK 3 | Sequence Information Sources, EMBL, GENBANK, |
| WEEK 4 | Entrez, Unigene, Understanding the structure of each source and using it on the web. |
| WEEK 5 | Protein Information Sources, PDB, SWISSPROT, TREMBL, Understanding the structure of each source and using it on the web |
| WEEK 6 | Introduction of Data Generating Techniques and Bioinformatics problem posed by them- Restriction Digestion, |
| WEEK 7 | Chromatograms, Blots, |
| WEEK 8 | PCR, Microarrays, Mass Spectrometry |
| WEEK 9 | Sequence and Phylogeny analysis, Detecting Open Reading Frames |
| WEEK 10 | Outline of sequence Assembly, Mutation/Substitution Matrices, Pairwise Alignments, |
| WEEK 11 | Introduction to BLAST, using it on the web, Interpreting results |
| WEEK 12 | Multiple Sequence Alignment, Phylogenetic Analysis. |
| WEEK 13 | Searching Databases: SRS, Entrez, Sequence Similarity Searches-BLST, FASTA, |
| WEEK 14 | Data Submission. Genome Annotation: Pattern and repeat finding, |
| WEEK 15 | Gene identification tools. |
| WEEK 16 | REVISION AND DOUBTS CLASSES |

SESSION 2018-19

CLASS B.Sc BIOTECH III YEAR

TEACHER DR PUSHPA YADAV

SUBJECT IMMUNOLOGY

|  |  |
| --- | --- |
| S. No | Topic |
| Week 1 | Immune Response - An overview, components of mammalian immune system, molecular structure of Immunoglobulins or  Antibodies |
| Week 2 | Humoral & Cellular immune responses, T-lymphocytes & immune response (cytotoxic T-cell, helper Tcell,  suppressor T-cells), , |
| Week 3 | T-cell receptors, genome rearrangements during B-lymphocytedifferentiation |
| Week 4 | Antibody affinity  maturation class switching, assembly of T-cell receptor genes by somatic recombination. |
| Week 5 | Regulation of immunoglobulin gene expression – clonal selection theory, allotypes & idiotypes, |
| Week 6 | Alelic exclusion, immunologic memory |
| Week 7 | Heavy chain gene transcription, genetic basis of antibody diversity, |
| Week 8 | Hypotheses (germ line & somatic mutation), antibody diversity. |
| Week 9 | Major Histocompatibility complexes – class I & class II MHC antigens, |
| Week 10 | Antigen processing. avoidance of recognition. |
| Week 11 | Immunity to infection – immunity to different organisms, pathogen defense strategies, |
| Week 12 | Auto- immune diseases, Immunodeficiency- AIDS |
| Week 13 | Vaccines & Vaccination – adjuvants, cytokines, DNA vaccines, recombinant vaccines, bacterial vaccines, |
| Week 14 | Viral vaccines,Vaccines to other infectious agents |
| Week 15 | Passive & active immunization |
| Week 16 | Introduction to immunodiagnostics – RIA, ELISA. |

SESSION 2018-19

CLASS B.Sc BIOTECH III YEAR

TEACHER DR PUSHPA YADAV

SUBJECT ANIMAL BIOTECHNOLOGY

|  |  |
| --- | --- |
| **S. No** | **Topic** |
| Week 1 | Introduction to Gene transfer methods in Animals |
| Week 2 | Microinjection mediated gene transfer |
| Week 3 | Embryonic Stem cell mediated gene transfer |
| Week 4 | Retrovirus mediated Gene transfer and test of unit 1 |
| Week 5 | Introduction to transgenesis, Transgenic Animals – Mice, Cow |
| Week 6 | Transgenic Pig, Sheep, Goat |
| Week 7 | Transgenic Bird, Insect |
| Week 8 | Animal diseases need help of Biotechnology –Foot-and- mouth disease, Coccidiosis |
| Week 9 | Animal diseases need help of Biotechnology -Trypanosomiasis, Theileriosis and test of unit 2 |
| Week 10 | Artificial insemination, Animal Clones |
| Week 11 | Conservation Biology, Embryo transfer techniques. |
| Week 12 | Introduction to Stem Cell Technology and its applications and test of unit 3 |
| Week 13 | Genetic modification in Medicine - gene therapy |
| Week 14 | Types of gene therapy |
| Week 15 | Vectors in gene therapy, molecular engineering |
| Week 16 | Human genetic engineering, problems & ethics and test of unit 4 |

SESSION 2018-19

CLASS BSc BIOTECH II YEAR (IV SEM)

TEACHER DR PUSHPA YADAV

SUBJECT DEVELOPMENTAL BIOLOGY

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | Definition, scope & historical perspective of development Biology |
| WEEK 2 | Gametogenesis – Spermatogenesis, |
| WEEK 3 | Oogenesis |
| WEEK 4 | Fertilization - Definition, mechanism, types of fertilization |
| WEEK 5 | Different types of eggs on the basis of yolk |
| WEEK 6 | Cleavage: Definition, types, patterns & mechanism, Formation & differentiation of primary germ layers , Fate of different primary germlayers |
| WEEK 7 | Blastulation: Process, types & mechanism |
| WEEK 8 | Gastrulation: Morphogenetic movements– epiboly, emboly, extension, invagination, convergence, de-lamination. |
| WEEK 9 | Fate Maps in early embryos |
| WEEK 10 | Differentiation: Cell commitment and determination- the epigenetic landscape: a model of determination and differentiation |
| WEEK 11 | control of differentiation at the level of genome, transcription and post-translation level |
| WEEK 12 | Concept of embryonic induction Primary, secondary & tertiary embryonic induction |
| WEEK 13 | Neural induction and induction of vertebrate lens |
| WEEK 14 | Neurulation, notogenesis, development of vertebrate eye. |
| WEEK 15 | Development of behaviour: constancy & plasticity Extra embryonic membranes, placenta in Mammals |

SESSION 2019-20

CLASS BSc MED II YEAR

TEACHER DR PUSHPA YADAV

SUBJECT ZOOLOGY

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | Origin, Evolutionary tree. Parental Care in Amphibia |
| WEEK 2 | Type study of frog (Rana tigrina) continued |
| WEEK 3 | Type study of Lizard (Hemidactylus) |
| WEEK 4 | Origin, Evolutionary tree. Extinct reptiles; Poisonous and non-poisonous snakes; Poison apparatus in snakes. |
| WEEK 5 | Flight adaptation, Principles of aerodynamics in Bird flight, migration in birds. |
| WEEK 6 | Type study of Pigeon (Columba livia) |
| WEEK 7 | Classification, Adaptive radiations of mammals and dentition |
| WEEK 8 | type study of Rat |
| WEEK 9 | Origin, conduction and regulation of heart beat, cardiac cycle, electrocardiogram, cardiac output, fluid pressure and flow pressure in closed and open circulatory system; circulatory system; |
| WEEK 10 | Composition and functions of blood & lymph; Mechanism of coagulation of blood, coagulation factors, anticoagulants, hemopoiesis |
| WEEK 11 | Exchange of respiratory gases, transport of gases, lung air volumes, oxygen dissociation curve of hemoglobin, Bohr’s effect, Haburger’s phenomenon (Chloride shift), control / regulation of respiration. |
| WEEK 12 | Patterns of excretory products viz. Amonotelic, ureotlic uricotelic, ornithine cycle (Kreb’s– Henseleit cycle) for urea formation in liver |
| WEEK 13 | Urine formation, counter-current mechanism of urine concentration,osmoregulation, micturition. |
| WEEK 14 | Nature, origin and propagation of nerve impulse along with medullated & non-medullated nerve fibre, conduction of nerve impulse across synapse. |
| WEEK 15 | Structure and mechanism of hormone action; physiology of hypothalamus, pituitary, thyroid, parathyroid, adrenal, pancreas and gonads |
| WEEK 16 | REVISION AND DOUBT CLASSES |

SESSION 2019-20

CLASS BSc BIOTECH II YEAR (III SEM)

TEACHER DR PUSHPA YADAV

SUBJECT BIOANALYTICAL TOOLS

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | Simple microscopy, phase contrast microscopy, |
| WEEK 2 | florescence microscopy |
| WEEK 3 | electron microscopy |
| WEEK 4 | electron microscopy , pH meter |
| WEEK 5 | absorption and emission spectroscopy |
| WEEK 6 | Principle and law of absorption fluorimetry, |
| WEEK 7 | colorimetry |
| WEEK 8 | spectrophotometry (visible, UV, infra-red) |
| WEEK 9 | centrifugation, cell fractionation techniques, isolation of sub-cellular organelles and particles |
| WEEK 10 | centrifugation, cell fractionation techniques, isolation of sub-cellular organelles and particles |
| WEEK 11 | Introduction to electrophoresis. Starch-gel, |
| WEEK 12 | polyacrylamide gel (native and SDS-PAGE), |
| WEEK 13 | agrose-gel electrophoresis, immuno electrophoresis, isoelectric focusing, |
| WEEK 14 | western blotting. |
| WEEK 15 | western blotting. Introduction to Biosensor and Nanotechnology and their applications. |
| WEEK 16 | REVISION AND DOUBT CLASSES |

SESSION 2019-20

CLASS BSc BIOTECH I YEAR ( ISEM)

TEACHER DR PUSHPA YADAV

SUBJECT BIOCHEMISTRY AND METABOLISM

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | Introduction to Biochemistry: A historical prospective. Amino acids & Proteins: Structure & Function. Structure and properties of Amino acids, Purification of proteins and criteria of their purity. |
| WEEK 2 | Types of proteins and their classification, Forces stabilizing protein structure and shape. Different Level of structural organization of proteins, |
| WEEK 3 | Denaturation and renaturation of proteins. Fibrous and globular proteins. |
| WEEK 4 | Carbohydrates: Structure and Function : Structure and properties of Monosaccharides, Oligosaccharides and Polysaccharides. Homo & Hetero Polysaccharides,Mucopolysaccharides, Bacterial cell wall polysaccharides, Glycoprotein’s and their biological functions. |
| WEEK 5 | Lipids: Structure and functions – Classification, structures, nomenclature and properties of fatty acids, essential fatty acids |
| WEEK 6 | Phospholipids structure and properties of different types of phospholipids, sphingomyelins, glycolipids, cerebrosides, gangliosides, Prostaglandins |
| WEEK 7 | structure and biological properties, utilization of cholesterol. Nucleic acids: Structure and functions: Physical & chemical properties of Nucleic acids. |
| WEEK 8 | cholesterol – its Structure and properties of purines & pyrimidines Nucleosides & Nucleotides. Biologically important nucleotides, Double helical model of DNA structure and forces responsible for its A,B, & Z – DNA, denaturation and annealing of DNA. |
| WEEK 9 | Enzymes: Nomenclature and classification of Enzymes, Holoenzyme, apoenzyme, Cofactors, coenzyme, prosthetic groups common features of active sites, |
| WEEK 10 | metalloenzymes, monomeric & oligomeric enzymes, activation energy and transition state, enzyme activity, specific activity, |
| WEEK 11 | enzyme specificity: types & Theories, ribozymes, abzymes Biocatalysts from extreme thermophilic and hyperthermophilic archaea and bacteria. |
| WEEK 12 | Role of cofactors in enzyme catalysis: NAD+, NADP +, FMN/FAD, coenzymes A, thiamine pyrophosphate, pyridoxal phosphate, lipoic-acid, biotin vitamin B12 tetrahydrofolate and metallic ions. |
| WEEK 13 | Carbohydrates Metabolism: Glycolysis : reactions, energetics and regulation, |
| WEEK 14 | Fate of pyruvate under aerobic and anaerobic conditions. Pentose phosphate pathway and its significance, |
| WEEK 15 | Gluconeogenesis, Glycogenolysis and glycogenesis. |
| WEEK 16 | TCA cycle, ETC, Oxidative phosphorylation. Beta – oxidation of fatty acids. |

SESSION 2019-20

CLASS BSc MED II YEAR

TEACHER DR PUSHPA YADAV

SUBJECT ZOOLOGY

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | Origin, Evolutionary tree. Parental Care in Amphibia |
| WEEK 2 | Type study of frog (Rana tigrina) continued |
| WEEK 3 | Type study of Lizard (Hemidactylus) |
| WEEK 4 | Origin, Evolutionary tree. Extinct reptiles; Poisonous and non-poisonous snakes; Poison apparatus in snakes. |
| WEEK 5 | Flight adaptation, Principles of aerodynamics in Bird flight, migration in birds. |
| WEEK 6 | Type study of Pigeon (Columba livia) |
| WEEK 7 | Classification, Adaptive radiations of mammals and dentition |
| WEEK 8 | type study of Rat |
| WEEK 9 | Origin, conduction and regulation of heart beat, cardiac cycle, electrocardiogram, cardiac output, fluid pressure and flow pressure in closed and open circulatory system; circulatory system; |
| WEEK 10 | Composition and functions of blood & lymph; Mechanism of coagulation of blood, coagulation factors, anticoagulants, hemopoiesis |
| WEEK 11 | Exchange of respiratory gases, transport of gases, lung air volumes, oxygen dissociation curve of hemoglobin, Bohr’s effect, Haburger’s phenomenon (Chloride shift), control / regulation of respiration. |
| WEEK 12 | Patterns of excretory products viz. Amonotelic, ureotlic uricotelic, ornithine cycle (Kreb’s– Henseleit cycle) for urea formation in liver |
| WEEK 13 | Urine formation, counter-current mechanism of urine concentration,osmoregulation, micturition. |
| WEEK 14 | Nature, origin and propagation of nerve impulse along with medullated & non-medullated nerve fibre, conduction of nerve impulse across synapse. |
| WEEK 15 | Structure and mechanism of hormone action; physiology of hypothalamus, pituitary, thyroid, parathyroid, adrenal, pancreas and gonads |
| WEEK 16 | Spermatogenesis, Capacitation of spermatozoa, ovulation, formation of corpus luteum, oestrous-anoestrous cycle, Menstrual cycle in human; fertilization, implantation and gestation. |

SESSION 2019-20

CLASS BSc BIOTECH II YEAR (IV SEM)

TEACHER DR PUSHPA YADAV

SUBJECT DEVELOPMENTAL BIOLOGY

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | Definition, scope & historical perspective of development Biology |
| WEEK 2 | Gametogenesis – Spermatogenesis, |
| WEEK 3 | Oogenesis |
| WEEK 4 | Fertilization - Definition, mechanism, types of fertilization |
| WEEK 5 | Different types of eggs on the basis of yolk |
| WEEK 6 | Cleavage: Definition, types, patterns & mechanism, Formation & differentiation of primary germ layers , Fate of different primary germlayers |
| WEEK 7 | Blastulation: Process, types & mechanism |
| WEEK 8 | Gastrulation: Morphogenetic movements– epiboly, emboly, extension, invagination, convergence, de-lamination. |
| WEEK 9 | Fate Maps in early embryos |
| WEEK 10 | Differentiation: Cell commitment and determination- the epigenetic landscape: a model of determination and differentiation |
| WEEK 11 | control of differentiation at the level of genome, transcription and post-translation level |
| WEEK 12 | Concept of embryonic induction Primary, secondary & tertiary embryonic induction |
| WEEK 13 | Neural induction and induction of vertebrate lens |
| WEEK 14 | Neurulation, notogenesis, development of vertebrate eye. |
| WEEK 15 | Development of behaviour: constancy & plasticity Extra embryonic membranes, placenta in Mammals |

SESSION 2019-20

CLASS BSc BIOTECH II YEAR (IV SEM)

TEACHER DR PUSHPA YADAV

SUBJECT ANIMAL PHYSIOLOGY

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | Digestion: Mechanism of digestion & absorption of carbohydrates, Proteins, Lipids and nucleic acids. |
| WEEK 2 | Composition of bile, Saliva, Pancreatic, gastric and intestinal juice |
| WEEK 3 | Respiration:  Exchange of gases, Transport of O2 and CO2, Oxygen dissociation curve, Chloride shift |
| WEEK 4 | Composition of blood, Plasma proteins & their role, blood cells, |
| WEEK 5 | Haemopoisis, Mechanism of coagulation of blood |
| WEEK 6 | Mechanism of working of heart: Cardiac output, cardiac cycle, Origin & conduction of heart beat |
| WEEK 7 | Structure of cardiac, smooth & skeletal muscle, |
| WEEK 8 | All or None rule, single muscle twitch, muscle tone, isotonic and isometric contraction, |
| WEEK 9 | threshold stimulus,  Physical, chemical & electrical events of mechanism of muscle contraction |
| WEEK 10 | Excretion: modes of excretion, Ornithine cycle, Mechanism of urine formation. |
| WEEK 11 | Mechanism of generation & propagation of nerve impulse  Different endocrine glands– Hypothalamus, pituitary, pineal, thymus, thyroid, parathyroid and adrenals, hypo & hyper-secretions |
| WEEK 12 | , structure of synapse, synaptic conduction, saltatory conduction, |
| WEEK 13 | Neurotransmitters Mechanism of action of hormones (insulin and steroids) |
| WEEK 14 | Different endocrine glands– Hypothalamus, pituitary, pineal, thymus, thyroid, parathyroid and adrenals, hypo & hyper-secretions |
| WEEK 15 | REVISION AND DOUBT CLASSES |

SESSION 2020-21

CLASS BSc MED III YEAR

TEACHER DR PUSHPA YADAV

SUBJECT ZOOLOGY

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | Basic concepts of ecology: Definition, significance. Concepts of habitat and ecological niche |
| WEEK 2 | Factors affecting environment: Abiotic factors (light-intensity, quality and duration), temperature, humidity, topography; edaphic factors; biotic factors. |
| WEEK 3 | Ecosystem: Concept, components, properties and functions; Ecological energetics and energy flow-food chain, food web, trophic structure; ecological pyramids concept of productivity |
| WEEK 4 | Biogeochemical cycles: Concept, reservoir pool, gaseous cycles and sedimentary cycles. |
| WEEK 5 | Population: Growth and regulation |
| WEEK 6 | Concept and evidences of organic evolution |
| WEEK 7 | Theories of organic evolution  Concept of microevolution and concept of species |
| WEEK 8 | Concept of macro-and mega-evolution. |
| WEEK 9 | Phylogeny of horse. |
| WEEK 10 | Evolution of man. |
| WEEK 11 | Introduction to world fisheries: Production, utilization and demand. |
| WEEK 12 | Fresh Water fishes of India: River system, reservoir, pond, tank fisheries; captive and culture fisheries, cold water fisheries |
| WEEK 13 | Fishing crafts and gears, Fin fishes, Crustaceans, Molluscs and their culture. |
| WEEK 14 | Natural seed resources – its assessment, collection, Hatchery production. 2 Nutrition: Sources of food (Natural, Artificial) and feed composition (Calorie and Chemical ingredients). |
| WEEK 15 | Field Culture: Ponds-running water, recycled water, cage, culture; poly culture. 4. Culture technology: Biotechnology, gene manipulation and cryopreservation of gametes. |

SESSION 2020-21

CLASS B.Sc BIOTECH III YEAR

TEACHER DR PUSHPA YADAV

SUBJECT BIOINFORMATICS

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | History of Bioinformatics |
| WEEK 2 | The notion of Homology. |
| WEEK 3 | Sequence Information Sources, EMBL, GENBANK, |
| WEEK 4 | Entrez, Unigene, Understanding the structure of each source and using it on the web. |
| WEEK 5 | Protein Information Sources, PDB, SWISSPROT, TREMBL, Understanding the structure of each source and using it on the web |
| WEEK 6 | Introduction of Data Generating Techniques and Bioinformatics problem posed by them- Restriction Digestion, |
| WEEK 7 | Chromatograms, Blots, |
| WEEK 8 | PCR, Microarrays, Mass Spectrometry |
| WEEK 9 | Sequence and Phylogeny analysis, Detecting Open Reading Frames |
| WEEK 10 | Outline of sequence Assembly, Mutation/Substitution Matrices, Pairwise Alignments, |
| WEEK 11 | Introduction to BLAST, using it on the web, Interpreting results |
| WEEK 12 | Multiple Sequence Alignment, Phylogenetic Analysis. |
| WEEK 13 | Searching Databases: SRS, Entrez, Sequence Similarity Searches-BLST, FASTA, |
| WEEK 14 | Data Submission. Genome Annotation: Pattern and repeat finding, |
| WEEK 15 | Gene identification tools. |

SESSION 2020-21

CLASS BSc BIOTECH I YEAR (ISEM)

TEACHER DR PUSHPA YADAV

SUBJECT BIOCHEMISTRY AND METABOLISM

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| --- | --- |
| S NO | TOPIC |
| WEEK 1 | Introduction to Biochemistry: A historical prospective. Amino acids & Proteins: Structure & Function. Structure and properties of Amino acids, Purification of proteins and criteria of their purity. |
| WEEK 2 | Types of proteins and their classification, Forces stabilizing protein structure and shape. Different Level of structural organization of proteins, |
| WEEK 3 | Denaturation and renaturation of proteins. Fibrous and globular proteins. |
| WEEK 4 | Carbohydrates: Structure and Function : Structure and properties of Monosaccharides, Oligosaccharides and Polysaccharides. Homo & Hetero Polysaccharides,Mucopolysaccharides, Bacterial cell wall polysaccharides, Glycoprotein’s and their biological functions. |
| WEEK 5 | Lipids: Structure and functions – Classification, structures, nomenclature and properties of fatty acids, essential fatty acids |
| WEEK 6 | Phospholipids structure and properties of different types of phospholipids, sphingomyelins, glycolipids, cerebrosides, gangliosides, Prostaglandins |
| WEEK 7 | structure and biological properties, utilization of cholesterol. Nucleic acids: Structure and functions: Physical & chemical properties of Nucleic acids. |
| WEEK 8 | cholesterol – its Structure and properties of purines & pyrimidines Nucleosides & Nucleotides. Biologically important nucleotides, Double helical model of DNA structure and forces responsible for its A,B, & Z – DNA, denaturation and annealing of DNA. |
| WEEK 9 | Enzymes: Nomenclature and classification of Enzymes, Holoenzyme, apoenzyme, Cofactors, coenzyme, prosthetic groups common features of active sites, |
| WEEK 10 | metalloenzymes, monomeric & oligomeric enzymes, activation energy and transition state, enzyme activity, specific activity, |
| WEEK 11 | enzyme specificity: types & Theories, ribozymes, abzymes Biocatalysts from extreme thermophilic and hyperthermophilic archaea and bacteria. |
| WEEK 12 | Role of cofactors in enzyme catalysis: NAD+, NADP +, FMN/FAD, coenzymes A, thiamine pyrophosphate, pyridoxal phosphate, lipoic-acid, biotin vitamin B12 tetrahydrofolate and metallic ions. |
| WEEK 13 | Carbohydrates Metabolism: Glycolysis : reactions, energetics and regulation, |
| WEEK 14 | Fate of pyruvate under aerobic and anaerobic conditions. Pentose phosphate pathway and its significance, |
| WEEK 15 | Gluconeogenesis, Glycogenolysis and glycogenesis. |
| WEEK 16 | TCA cycle, ETC, Oxidative phosphorylation. Beta – oxidation of fatty acids. |

SESSION 2020-21

CLASS BSc MED II YEAR

TEACHER DR PUSHPA YADAV

SUBJECT Animal diversity

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| S NO | TOPIC |
| WEEK 1 | Origin, Evolutionary tree. Parental Care in Amphibia |
| WEEK 2 | Type study of frog (Rana tigrina) continued |
| WEEK 3 | Type study of Lizard (Hemidactylus) |
| WEEK 4 | Origin, Evolutionary tree. Extinct reptiles; Poisonous and non-poisonous snakes; Poison apparatus in snakes. |
| WEEK 5 | Flight adaptation, Principles of aerodynamics in Bird flight, migration in birds. |
| WEEK 6 | Type study of Pigeon (Columba livia) |
| WEEK 7 | Classification, Adaptive radiations of mammals and dentition |
| WEEK 8 | type study of Rat |
| WEEK 9 | Origin, conduction and regulation of heart beat, cardiac cycle, electrocardiogram, cardiac output, fluid pressure and flow pressure in closed and open circulatory system; circulatory system; |
| WEEK 10 | Composition and functions of blood & lymph; Mechanism of coagulation of blood, coagulation factors, anticoagulants, hemopoiesis |
| WEEK 11 | Exchange of respiratory gases, transport of gases, lung air volumes, oxygen dissociation curve of hemoglobin, Bohr’s effect, Haburger’s phenomenon (Chloride shift), control / regulation of respiration. |
| WEEK 12 | Patterns of excretory products viz. Amonotelic, ureotlic uricotelic, ornithine cycle (Kreb’s– Henseleit cycle) for urea formation in liver |
| WEEK 13 | Urine formation, counter-current mechanism of urine concentration,osmoregulation, micturition. |
| WEEK 14 | Nature, origin and propagation of nerve impulse along with medullated & non-medullated nerve fibre, conduction of nerve impulse across synapse. |
| WEEK 15 | Structure and mechanism of hormone action; physiology of hypothalamus, pituitary, thyroid, parathyroid, adrenal, pancreas and gonads |
| WEEK 16 | Spermatogenesis, Capacitation of spermatozoa, ovulation, formation of corpus luteum, oestrous-anoestrous cycle, Menstrual cycle in human; fertilization, implantation and gestation. |

SESSION 2020-21

CLASS BSc BIOTECH II YEAR (IV SEM)

TEACHER DR PUSHPA YADAV

SUBJECT DEVELOPMENTAL BIOLOGY

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | Definition, scope & historical perspective of development Biology |
| WEEK 2 | Gametogenesis – Spermatogenesis, |
| WEEK 3 | Oogenesis |
| WEEK 4 | Fertilization - Definition, mechanism, types of fertilization |
| WEEK 5 | Different types of eggs on the basis of yolk |
| WEEK 6 | Cleavage: Definition, types, patterns & mechanism, Formation & differentiation of primary germ layers , Fate of different primary germlayers |
| WEEK 7 | Blastulation: Process, types & mechanism |
| WEEK 8 | Gastrulation: Morphogenetic movements– epiboly, emboly, extension, invagination, convergence, de-lamination. |
| WEEK 9 | Fate Maps in early embryos |
| WEEK 10 | Differentiation: Cell commitment and determination- the epigenetic landscape: a model of determination and differentiation |
| WEEK 11 | control of differentiation at the level of genome, transcription and post-translation level |
| WEEK 12 | Concept of embryonic induction Primary, secondary & tertiary embryonic induction |
| WEEK 13 | Neural induction and induction of vertebrate lens |
| WEEK 14 | Neurulation, notogenesis, development of vertebrate eye. |
| WEEK 15 | Development of behaviour: constancy & plasticity Extra embryonic membranes, placenta in Mammals |

SESSION 2020-21

CLASS BSc BIOTECH II YEAR (IV SEM)

TEACHER DR PUSHPA YADAV

SUBJECT ANIMAL DIVERSITY

|  |  |
| --- | --- |
| S NO | TOPIC |
| WEEK 1 | Proto-chordates: Outline of classification, General features and important characters of Herdmania, |
| WEEK 2 | Proto-chordates: Outline of classification, General features and important characters of, Branchiostoma |
| WEEK 3 | Origin of Chordates, Pisces: Migration in Pisces, Outline of classification |
| WEEK 4 | Amphibia: Classification, Origin, Parental care, Paedogenesis |
| WEEK 5 | Reptelia: Classification, Origin |
| WEEK 6 | Aves: Classification, Origin, flight- adaptations, migration |
| WEEK 7 | Mammalia: Classification, Origin, dentition |
| WEEK 8 | Comparative anatomy of various systems of vertebrates: Integumentary, digestive respiratory systems. |
| WEEK 9 | Comparative Anatomy of vertebrates – Heart, Aortic arches, |
| WEEK 10 | Comparative Anatomy of vertebrates – Kidney & urinogenital system, Brain |
| WEEK 11 | Comparative Anatomy of vertebrates –Eye, Ear |
| WEEK 12 | Autonomic Nervous system in Mammals |
| WEEK 13 | REVISION OF UNIT -1,2 |
| WEEK 14 | REVISION OF UNIT -3 |
| WEEK 15 | REVISION OF UNIT -4 |

**Session : 2018-2019**

**Class: BSc Biotech Second year (III Sem)**

**Subject: Bioanalytical Tools**

**Teachers’s name: Dr Sujata Chauhan**

|  |  |
| --- | --- |
| S. No | Topic |
| Week 1 | Simple microscopy, pH meter |
| Week 2 | Phase contrast microscopy, florescence microscopy |
| Week 3 | Electron microscopy (TEM and SEM) |
| Week 4 | Absorption and emission spectroscopy |
| Week 5 | Principle and law of absorption fluorimetry |
| Week 6 | Colorimetry, centrifugation |
| Week 7 | Spectrophotometry (visible, UV, infra-red) |
| Week 8 | Cell fractionation techniques, isolation of sub-cellular organelles and particles |
| Week 9 | Introduction to the principle of chromatography. |
| Week 10 | Paper chromatography, thin layer chromatography |
| Week 11 | Column chromatography: silica and gel, filtration |
| Week 12 | Affinity and ion exchange chromatography, gas chromatography, |
| Week 13 | HPLC, Introduction to electrophoresis |
| Week 14 | Starch-gel, polyacrylamide gel (native and SDS-PAGE), agarose-gel electrophoresis |
| Week 15 | Immuno electrophoresis, isoelectric focusing, western blotting |
| Week 16 | Introduction to Biosensor and Nanotechnology and their applications |

**Session: 2018-2019**

**Class: BSc Medical Second year (III Sem)**

**Subject: Life and Diversity of Chordates I and Mammalian Physiology I**

**Teachers’s name: Dr Sujata Chauhan**

**Sec-B**

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| --- | --- |
| **S. No** | **Topic** |
| Week 1 | Chordates: Principles of classification; Origin and Evolutionary tree; Role of amnion in evolution; Salient features of chordates; |
| Week 2 | Functional morphology of the types with examples emphasizing their biodiversity, economic importance and conservation measures where required. |
| Week 3 | General characters and classification of phyla upto orders with examples emphasizing their biodiversity, economic importance and conservation measures where required. |
| Week 4 | Protochordates: Systematic position, distribution, ecology, morphology and affinities Urochordata: Herdmania – type study Cephalochordata; Amphioxus – type study |
| Week 5 | General characters and classification of phyla upto orders with examples emphasizing their biodiversity, economic importance and conservation measures where required. |
| Week 6 | Cyclostomes: Classification and ecological significance Type study of Petromyzon |
| Week 7 | General characters and classification of all phyla upto orders with examples emphasizing their biodiversity, economic importance and conservation measures where required. |
| Week 8 | Pisces intd, Scales & Fins, Parental care in fishes, fish migration. Types study of Labeo |
| Week 9 | Introduction, Classification, Structure, function and general properties of carbohydrates |
| Week 10 | Introduction, Classification, Structure, function and general properties of lipids |
| Week 11 | Introduction, Classification, Structure, function and general properties of proteins; |
| Week 12 | Nomenclature, Classification and mechanisms of enzyme action. Transport through biomembranes (Active and Passive), buffers |
| Week 13 | Nutritional components; Carbohydrates, fats, lipids, Vitamins and Minerals. Types of nutrition & feeding, Digestion of dietary constituents, viz. lipids, proteins |
| Week 14 | Digestion of carbohydrates & nucleic acids; symbiotic digestion. Absorption of nutrients & assimilation; control of enzyme secretion. |
| Week 15 | Muscles Intd, Types of muscles, ultra-structure of skeletal muscle. Bio-chemical and physical events during muscle contraction; single muscle twitch, tetanus, muscle fatigue muscle, tone, oxygen debt, Cori’s cycle, |
| Week 16 | Single unit smooth muscles, their physical and functional properties. Bones: Structure and types, classification, bone growth and resorption, effect of ageing on skeletal system and bone disorders |

**Session : 2018-2019**

**Class : BSc Biotech Second year (IV Sem)**

**Subject: Animal Diversity II (BT 401)**

**Teachers’s name: Dr Sujata Chauhan**

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| --- | --- |
| S. No | Topic |
| Week 1 | Proto-chordates: Outline of classification, General features and important characters of Herdmania |
| Week 2 | Branchiostoma, Origin of Chordates |
| Week 3 | Pisces: Migration in Pisces, Outline of classification, Amphibia: Classification, Origin |
| Week 4 | Parental care, Paedogenesis, Revision and test of unit 1 |
| Week 5 | Reptelia: Classification, Origin |
| Week 6 | Aves: Classification, |
| Week 7 | Origin, flight- adaptations, migration |
| Week 8 | Mammalia: Classification, Origin, dentition, Revision and test of unit 2 |
| Week 9 | Comparative anatomy of various systems of vertebrates: Integumentary systems. |
| Week 10 | Comparative anatomy of various systems of vertebrates: Digestive system |
| Week 11 | Comparative anatomy of various systems of vertebrates: respiratory systems. |
| Week 12 | Revision and test of unit 3 |
| Week 13 | Comparative Anatomy of vertebrates – Heart, Aortic arches, |
| Week 14 | Comparative Anatomy of vertebrates Kidney & urino- genital system, |
| Week 15 | Comparative Anatomy of vertebrates Brain, Eye, Ear |
| Week 16 | Comparative Anatomy of vertebrates of Autonomic Nervous system in Mammals, Revision and test, and Seminars held |

**Session: 2018-2019**

**Class: BSc Biotech Second year (IV Sem)**

**Subject: Mammalian Physiology (BT 404)**

**Teachers’s name: Dr Sujata Chauhan**

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| --- | --- |
| S NO | TOPIC |
| WEEK 1 | Digestion: Mechanism of digestion & absorption of carbohydrates, Proteins, Lipids and nucleic acids. |
| WEEK 2 | Composition of bile,  Saliva, Pancreatic, gastric and intestinal juice |
| WEEK 3 | Respiration: Exchange of gases, |
| WEEK 4 | Transport of O2 and CO2, Oxygen dissociation curve, Chloride shift, Test of Unit 1 |
| WEEK 5 | Composition of blood, Plasma proteins & their role, blood cells, |
| WEEK 6 | Haemopoisis, Mechanism of coagulation of blood |
| WEEK 7 | Mechanism of working of heart: Cardiac output, cardiac cycle, |
| WEEK 8 | Origin & conduction of heart beat, Test of Unit 2 |
| WEEK 9 | Structure of cardiac, smooth & skeletal muscle, threshold stimulus, All or None rule |
| WEEK 10 | single muscle twitch, muscle tone,  isotonic and isometric contraction |
| WEEK 11 | Physical, chemical & electrical events of mechanism of muscle contraction, Revision and test of Unit 3 |
| WEEK 12 | Excretion: modes of excretion, Ornithine cycle, Mechanism of urine formation. |
| WEEK 13 | Mechanism of generation & propagation of nerve impulse, structure of synapse, synaptic conduction, saltatory conduction, |
| WEEK 14 | Neurotransmitters Mechanism of action of hormones (insulin and steroids) |
| WEEK 15 | Different endocrine glands– Hypothalamus, pituitary, pineal, thymus, thyroid, parathyroid and adrenals, Hypo & hypersecretions |
| WEEK 16 | Test of Unit 4 and Seminars held |

**Session: 2019-2020**

**Class: BSc Biotech Final year (V Sem)**

**Subject: Immunology (BT 501)**

**Teachers’s name: Dr Sujata Chauhan**

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| --- | --- |
| S. No | Topic |
| Week 1 | Immune Response - An overview, components of mammalian immune system, molecular structure of Immunoglobulins or Antibodies |
| Week 2 | Humoral & Cellular immune responses, T-lymphocytes & immune response (cytotoxic T-cell, helper Tcell, suppressor T-cells) |
| Week 3 | T-cell receptors, genome rearrangements during B-lymphocytedifferentiation |
| Week 4 | Antibody affinity, maturation class switching, assembly of T-cell receptor genes by somatic recombination. |
| Week 5 | Regulation of immunoglobulin gene expression – clonal selection theory, allotypes & idiotypes |
| Week 6 | Alelic exclusion, immunologic memory |
| Week 7 | Heavy chain gene transcription, genetic basis of antibody diversity, |
| Week 8 | Hypotheses (germ line & somatic mutation), antibody diversity. |
| Week 9 | Major Histocompatibility complexes – class I & class II MHC antigens, |
| Week 10 | Antigen processing. avoidance of recognition. |
| Week 11 | Immunity to infection – immunity to different organisms, pathogen defense strategies |
| Week 12 | Auto- immune diseases, Immunodeficiency- AIDS |
| Week 13 | Vaccines & Vaccination – adjuvants, cytokines, DNA vaccines, recombinant vaccines, bacterial vaccines |
| Week 14 | Viral vaccines,Vaccines to other infectious agents |
| Week 15 | Passive & active immunization |
| Week 16 | Introduction to immunodiagnostics – RIA, ELISA. |

**Session: 2019-2020**

**Class: BSc Biotech Final year (V Sem)**

**Subject: Bioinformatics (BT 504)**

**Teachers’s name: Dr Sujata Chauhan**

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| --- | --- |
| S. No | Topic |
| Week 1 | History of Bioinformatics. The notion of Homology |
| Week 2 | Sequence Information Sources, EMBL |
| Week 3 | GENBANK, Entrez, Unigene |
| Week 4 | Understanding the structure of each source and using it on the web |
| Week 5 | Protein Information Sources, PDB, SWISSPROT, TREMBL |
| Week 6 | Understanding the structure of each source and using it on the web. Introduction of Data Generating Techniques and Bioinformatics problem posed by them |
| Week 7 | Restriction Digestion , Chromatograms, Blots, PCR |
| Week 8 | Microarrays, Mass Spectrometry |
| Week 9 | Sequence and Phylogeny analysis, Detecting Open Reading Frames |
| Week 10 | Outline of sequence Assembly, Mutation/Substitution Matrices, Pairwise Alignments |
| Week 11 | Introduction to BLAST, using it on the web, Interpreting results |
| Week 12 | Multiple Sequence Alignment, Phylogenetic Analysis |
| Week 13 | Searching Databases like SRS, Entrez, Sequence |
| Week 14 | Similarity Searches-BLAST, FASTA, Data Submission |
| Week 15 | Genome Annotation: Pattern and repeat finding, |
| Week 16 | Gene identification tools |

**Session: 2019-2020**

**Class: BSc Biotech First year (II Sem)**

**Subject: Animal Diversity and Economic Zoology (BT 204)**

**Teachers’s name: Dr Sujata Chauhan**

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| **S. No** | **Topic** |
| Week 1 | Outline of classification of Non- Chordates upto subclasses. Coelomata, Acoelomata, Symmetries, Deutrostomes, Protostomes. |
| Week 2 | Protozoa: Locomotion, Reproduction, evolution of Sex, General features and life history of Paramecium |
| Week 3 | Plasmodium life cycle, Pathogenic protozoans |
| Week 4 | Porifera introduction, General characters, outline of Classification, skeleton, Canal System |
| Week 5 | Coelenterata introduction, General Characters, Outline of classifications Polymorphism, Various types of stinging cells, Metagenesis, coral reefs and their formation. |
| Week 6 | Platyhelminthes introduction, General Characters Outline of classification, Pathogenic flatworms Parasitic adaptations. Important Larval forms |
| Week 7 | Aschelminthes introduction, General features, Outline of classification, Pathogenic roundworms and their vectors in relation to man |
| Week 8 | Parasite adaptation in helminthes, Revision and test |
| Week 9 | Annelida introduction, General features, Outline of classification, Coelom, Metameric segmentation, General features and life history of Earthworm, Vermicomposting |
| Week 10 | Arthropoda introduction, General Features, Outline of Classification; Larval forms  of crustacean, Respiration in Arthropoda; Metamorphosis in insects |
| Week 11 | Social insects, Insect vectors of diseases |
| Week 12 | Apiculture, Sericulture. Test |
| Week 13 | Mollusca introduction, general features, Outline of classification, Shell Diversity, Torsion in gastropoda, Life history of Pila |
| Week 14 | Echinodermata introduction, General features, Outline of Classification, Life history of starfish (Asterias) Larval forms and test |
| Week 15 | Hemichordata general characters, Phylogeny studies, Affinities of Balanoglossus |
| Week 16 | Seminars |

**Session : 2019-2020**

**Class : BSc Biotech Final year (VI Sem)**

**Subject: Animal Biotechnology**

**Teachers’s name: Dr Sujata Chauhan**

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| **S. No** | **Topic** |
| Week 1 | Introduction to Gene transfer methods in Animals |
| Week 2 | Microinjection mediated gene transfer |
| Week 3 | Embryonic Stem cell mediated gene transfer |
| Week 4 | Retrovirus mediated Gene transfer and test of unit 1 |
| Week 5 | Introduction to transgenesis, Transgenic Animals – Mice, Cow |
| Week 6 | Transgenic Pig, Sheep, Goat |
| Week 7 | Transgenic Bird, Insect |
| Week 8 | Animal diseases need help of Biotechnology –Foot-and- mouth disease, Coccidiosis |
| Week 9 | Animal diseases need help of Biotechnology -Trypanosomiasis, Theileriosis and test of unit 2 |
| Week 10 | Artificial insemination, Animal Clones |
| Week 11 | Conservation Biology, Embryo transfer techniques. |
| Week 12 | Introduction to Stem Cell Technology and its applications and test of unit 3 |
| Week 13 | Genetic modification in Medicine - gene therapy |
| Week 14 | Types of gene therapy |
| Week 15 | Vectors in gene therapy, molecular engineering |
| Week 16 | Human genetic engineering, problems & ethics and test of unit 4 |

**Session: 2020-2021**

**Class : BSc Medical First year (I Sem)**

**Subject: Animal Diversity and Cell Biology**

**Teachers’s name: Dr Sujata Chauhan**

**Sec. B**

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| --- | --- |
| **S. No** | **Topic** |
| Week 1 | General characters and classification up to order level, Biodiversity and economic importance, Type study of Plasmodium, |
| Week 2 | Parasitic protozoans: Life history, mode of infection and pathogenicity of Entamoeba, Trypanosoma, Leishmania and Giardia |
| Week 3 | Phylum- Porifera introduction, General characters and classification up to order level, Biodiversity and economic importance Type study – Sycon, |
| Week 4 | Canal system in sponges, Spicules in sponges, General characters and classification up to order level |
| Week 5 | Type Study – Obelia, Biodiversity, economic importance |
| Week 6 | Corals and coral reefs, Polymorphism in Siphonophores |
| Week 7 | General characters and classification up to order level, Biodiversity, economic importance, Type study - Fasciola hepatica, Helminths parasites: |
| Week 8 | Brief account of life history, mode of infection and pathogenesity of Schistosoma, Ancylostoma, Trichinella, Wuchereria and Oxyuris |
| Week 9 | Ultrastructure of different cell organelles of animal cell, Plasma Membrane: Fluid mosaic model, various modes of transport across the membrane, mechanism of active and passive transport, endocytosis and exocytosis |
| Week 10 | Endoplasmic reticulum (ER): types, role of ER in protein synthesis and transportation in animal cell, Golgi complex: Structure, Associated enzymes and role of golgi-complex in animal cell |
| Week 11 | Ribosomes: Types, biogenesis and role in protein synthesis. 2 Lysosomes: Structure, enzyme and their role; polymorphism 3 Mitochondria: Mitochondrial DNA; as semiautonomous body, biogenesis, mitochondrial enzymes ( only names), role of mitochondria |
| Week 12 | Cytoskeleton: Microtubules, microfilaments, centriole and basal body, Cilia and Flagella |
| Week 13 | Ultrastructure and functions of Nucleus: Nuclear· membrane, nuclear lamina, nucleolus, fine structure of chromosomes, nucleosome concept and role of histones |
| Week 14 | Euchromatin and heterochromatin, lampbrush chromosomes and polytene chromosomes. |
| Week 15 | Mitosis and Meiosis (Cell reproduction), Brief account of causes of cancer |
| Week 16 | Cancer cont., An elementary idea of cellular basis of Immunity |

**Session: 2020-2021**

**Class : BSc Biotech Second year (III Sem)**

**Subject: Bioanalytical Tools**

**Teachers’s name: Dr Sujata Chauhan**

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| --- | --- |
| S. No | Topic |
| Week 1 | Simple microscopy, and), pH meter |
| Week 2 | Phase contrast microscopy, florescence microscopy |
| Week 3 | Electron microscopy (TEM and SEM) |
| Week 4 | Absorption  and emission spectroscopy |
| Week 5 | Principle and law of absorption fluorimetry, |
| Week 6 | Colorimetry, centrifugation |
| Week 7 | Spectrophotometry (visible, UV, infra-red) |
| Week 8 | Cell fractionation  techniques, isolation of sub-cellular organelles and particles |
| Week 9 | Introduction to the principle of chromatography. |
| Week 10 | Paper chromatography, thin layer chromatography, |
| Week 11 | Column chromatography: silica and gel  filtration, |
| Week 12 | Affinity and ion exchange chromatography, gas chromatography, |
| Week 13 | HPLC, Introduction to electrophoresis., |
| Week 14 | Starch-gel, polyacrylamide gel (native and SDS-PAGE), agrose-gel electrophoresis |
| Week 15 | Immuno electrophoresis, isoelectric focusing, western blotting. |
| Week 16 | Introduction to Biosensor and Nanotechnology and their applications. |

**Session: 2020-2021**

**Class: BSc Biotech Second year (IV Sem)**

**Subject: Mammalian Physiology (BT 404)**

**Teachers’s name: Dr Sujata Chauhan**

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| S NO | TOPIC |
| WEEK 1 | Digestion: Mechanism of digestion & absorption of carbohydrates, Proteins, Lipids and nucleic acids. |
| WEEK 2 | Composition of bile,  Saliva, Pancreatic, gastric and intestinal juice |
| WEEK 3 | Respiration: Exchange of gases, |
| WEEK 4 | Transport of O2 and CO2, Oxygen dissociation curve, Chloride shift, Test of Unit 1 |
| WEEK 5 | Composition of blood, Plasma proteins & their role, blood cells, |
| WEEK 6 | Haemopoisis, Mechanism of coagulation of blood |
| WEEK 7 | Mechanism of working of heart: Cardiac output, cardiac cycle, |
| WEEK 8 | Origin & conduction of heart beat, Test of Unit 2 |
| WEEK 9 | Structure of cardiac, smooth & skeletal muscle, threshold stimulus, All or None rule |
| WEEK 10 | single muscle twitch, muscle tone,  isotonic and isometric contraction |
| WEEK 11 | Physical, chemical & electrical events of mechanism of muscle contraction, Revision and test of Unit 3 |
| WEEK 12 | Excretion: modes of excretion, Ornithine cycle, Mechanism of urine formation. |
| WEEK 13 | Mechanism of generation & propagation of nerve impulse, structure of synapse, synaptic conduction, saltatory conduction, |
| WEEK 14 | Neurotransmitters Mechanism of action of hormones (insulin and steroids) |
| WEEK 15 | Different endocrine glands– Hypothalamus, pituitary, pineal, thymus, thyroid, parathyroid and adrenals |
| WEEK 16 | Hypo & hypersecretions Test of Unit 4 and Seminars |

**Session: 2020-2021**

**Class : BSc Medical First year (II Sem)**

**Subject: Animal Diversity II and Genetics**

**Teachers’s name: Dr Sujata Chauhan**

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| S. No | Topic |
| Week 1 | Unit-I Elements of heredity and variation, varieties of gene interactions |
| Week 2 | Contd. varieties of gene interactions, linkage and recombination |
| Week 3 | Contd. linkage and recombination, Unit-II-sex determination and its mechanism |
| Week 4 | Contd. sex determination and its mechanism, sex linked inheritance and extrachromosomal cytoplasmic inheritance |
| Week 5 | Unit III- multiple allelism, Human Genetics and inborn errors of metabolism |
| Week 6 | Unit IV- nature and function of genetic material |
| Week 7 | Unit V- Applied Genetics |
| Week 8 | Paper- Life and Diversity of Annelida to Hemichordate  Unit-I: Annelida |
| Week 9 | Contd. Unit-I: Annelida |
| Week 10 | Unit II- Arthropoda |
| Week 11 | Contd. Unit II- Arthropoda |
| Week 12 | Unit III- Mollusca |
| Week 13 | Contd. Unit III- Mollusca |
| Week 14 | Unit IV- Echinodermata |
| Week 15 | Contd. Unit IV- Echinodermata |
| Week 16 | Unit V- hemichordate- Balanoglossus |