

SYLLABUS PLAN (2016-17)
ODD SEMESTERS

SYLLABUS PLAN (2016-17)

NAME OF THE TEACHER
CLASS
SUBJECT

- Prof. Imtiaz Khan
- B. Sc. I (Medical), Semester-I
- Zoology (Animal diversity)

Month	THEORY	PRACTICAL
July	Kingdom Protista: General characters and classification up to classes; Locomotory Organelles and locomotion in Protozoa. Salient features of and economic importance of Amoeba (reproduction), Plasmodium (Life history), and Paramecium (Conjugation). Phylum Porifera: General characters and classification up to classes (Sycon, Hyalonema, and Euplectella); different types of Canal System along with their examples. Phylum Cnidaria: General characters and classification up to classes; Polymorphism in Hydrozoa (Hydra and Obelia); Metagenesis in Obelia.	Study of the following specimens with classification upto order; morphological note economic/ecological importance: Amoeba, Euglena, Plasmodium, Paramecium, Sycon, Hyalonema, and Euplectella, Obelia, Physalia, Aurelia, Tubipora, Metridium, Taenia solium, Male and female Ascaris lumbricoides, Aphrodite,
August	Phylum Platyhelminthes: General characters and classification up to classes; Life history of Taenia solium and Fasciola hepatica; and their parasitic adaptations. Phylum Nematelminthes: General characters and classification up to classes; Life history of Ascaris lumbricoides and its parasitic adaptations Phylum Annelida: General characters and classification up to classes; Metamerism in Annelida (Pheretima).	Nereis, Pheretima, Hirudinaria, Palaemon, Cancer, Limulus, Palamnaeus, Scolopendra, Julus, Periplaneta, Apis, Chiton, Dentalium, Pila, Unio, Loligo, Sepia, Octopus, Pentaceros, Ophiura, Echinus, Cucumaria and Antedon,
SEPTEMBER	Phylum Arthropoda: General characters and classification up to classes; Vision in Arthropoda, Metamorphosis in Insects. Type study of Periplaneta. Phylum Mollusca: General characters and classification up to classes; Torsion in gastropods. Type study of Pila. Phylum Echinodermata: General characters and classification up to classes; Water-vascular system in Asteroidea with special mention to Starfish.	Balanoglossus, Petromyzon, Sphyrna, Pristis, Torpedo, Labeo, Exocoetus, Anguilla, Ichthyophis/Ureotyphlus, Salamandra, Bufo, Hyla, Chelone, Hemidactylus, Chamaeleon, Draco, Vipera, Naja, Crocodylus, Gavialis, Any six common birds from different orders, Sorex, Bat, Funambulus, Loris

OCTOBER	Protochordates: General features and Phylogeny of Protochordata (Balanoglossus) Agnatha: General features of Agnatha and classification of cyclostomes up to classes Pisces: General features and Classification up to orders; Bony and cartilaginous fishes; Osmoregulation in Fishes.	Study of the following permanent slides: T.S. and L.S. of Sycon, Study of life history stages of Taenia, T.S. of Male and female Ascaris 3. Key for Identification of poisonous and non-poisonous snakes
NOVEMBER	Amphibia: General features and Classification up to orders; Parental care Reptiles: General features and Classification up to orders; Poisonous and non-poisonous snakes, Biting mechanism in snakes Aves: General features and Classification up to orders; Flight adaptations in birds Mammals: Classification up to orders; Origin of mammals	

NAME OF THE TEACHER
CLASS
SUBJECT

- Dr. Manish Sharma
- B. Sc. II (Medical), Semester-III
- Zoology (Chordates & Evolution)

Month	Syllabus	
	Theory	Practical
July	Chordates : General Characters and Echinoderm Theory of Origin 2. Protochordates : a) Urochordata Type study-Herdmania. b) Cephalochordata—Type study-Amphioxus. c) Classification of following animals upto orders Herdmania, Molgula, Pyrosoma, Dolilum, Salpa, Oikopleura and Amphioxus. 3. Cyclostomata : a) External Characters of Petromyzon. b) Affinities of Cyclostomata. c) Classification of following animals upto orders Myxine, Petromyzon and Ammocoetus	Classification up to orders, excepting Pisces and Aves where classification up to subclasses only is required, habits, habitats, external characters and economic importance (if any) of the following animals: 1. Urochordata : Herdmania, Molgula, Pyrosoma, Dolilum, Salpa and Oikopleura. 2. Cephalochordata : Amphioxus. 3. Chondrichthyes : Zygaena (Hammer headed shark), Pristis (saw fish), Narcine (Electric ray), Trygon, Rhinobatus and Chimaera (Rabbit fish). 4. Actinopterygii : Polypterus, Acipenser, Lepidosteus, Muraena,

		Mystus, Catla, Hippocampus, Syngnathus, Exocoetus, Anabas, Diodon, Tetradon, Echeneis and Solea
August	<p>Pisces : a) Type study :Labeo. b) Types of Scales, Migration and Parental Care in fishes. c) Classification of following animals upto orders i. Chondrichthyes : Zygaena, Pristis, Narcine, Trygon, Rhinobatus and Chimaera. ii. Actinopterygii : Polypterus, Acipenser, Lepidosteus, Muraena, Mystus, Catla, Hippocampus, Syngnathus, Exocoetus, Anabas, Diodon, Tetradon, Echeneis and Solea. iii. Dipnusti (Dipnoi) : Protopterus (lung-fish).</p> <p>5. Amphibia : a) Type study –Frog. b) Parental Care. c) Classification of animals upto orders Uraeotyphlus, Necturus, Amphiuma, Amblystoma, Triton, Salamandra, Hyla, Rhacophorus.</p>	<p>Dipnusti (Dipnoi) : Protopterus (African lung fish). 6. Amphibia : Uraeotyphlus, Necturus, Amphiuma, Amblystoma and its Axolotl Larva, Triton, Salamandra, Hyla and Rhacophorus. 7. Reptilia : Hemidactylus, Calotes, Draco, Varanus, Phrynosoma, Chamaeleon, Typhlops, Python, Eryx, Ptyas, Bungarus, Naja, Hydrus, Viper, Crocodilus, Gavialis, Chelone (Turtle) and Testudo (Tortoise). 8. Aves : Ardea, Anas, Milvus, Pavo, Tyto, Alcedo, Eudynamis and Casuarius. 9. Mammalia : Ornithorhynchus, Echidna, Didelphys, Macropus, Loris, Macaca, Manis, Hystrix, Funambulus, Panthera, Canis, Herpestes and Pteropus.</p>
September	<p>Reptilia : a) Type study—Uromastix. b) Poison apparatus in snakes. c) Classification of following animals upto orders Chelone, Testudo, Hemidactylus, Calotes, Draco, Varanus, Phrynosoma, Chamaeleon, Typhlops, Python, Eryx, Bungarus, Naja, Hydrus, Viper, Crocodilus, Gavialis and Alligator. 3. Aves : a) Type study—Pigeon. b) Flight adaptation. c) Classification of following animals upto orders Ardea, Milvus, Pavo, Tyto, Alcedo, Eudynamis and Casuarius</p>	<p>. Examine and dissect the following animals : 1. Herdmania : General anatomy. 2. Labeo Digestive systems, reproductive systems and cranial nerves. 3. Chick : Digestive, arterial, venous and urinogenital systems. 4. White Rat : Digestive, arterial, venous and urinogenital systems.</p>
October	<p>Mammals : a) Type study—Rat. b) Dentition in Mammals. c) Classification of following animals up to orders Ornithorhynchus, Echidna, Didelphys, Macropus, Loris, Macaca, Manis, Hystrix, Funambulus, Panthera, Canis, Herpestes, Capra, Pteropus.</p>	<p>Make temporary preparation of following : 1. Temporary preparation of spicules of Herdmania. 2. Permanent preparation of whole mount of pharynx of Herdmania and Amphioxus, placoid scales of Scoliodon. 4. Study of following prepared slides : T.S. Amphioxus through various regions. Spicules, pharynx of Herdmania and</p>

		pharynx of Amphioxus. Histology of rat/rabbit (Compound tissues).
November	Organic Evolution: i) Origin of life ii) Evidences of organic evolution. iii) Theories of organic evolution. iv) Biological species concept. v) Evolution of man.	

NAME OF THE TEACHER
CLASS
SUBJECT

- Dr. Sukhvir Kaur
- B. Sc. III (Medical), Semester-V
- Zoology (Developmental Biology & Genetics)

Month	Syllabus	
	Theory	Practical
August	Gametogenesis with particular reference to differentiation of spermatozoa :vitellogenesis, role of follicle/ subtesticular cells in gametogenesis. 2. Egg maturation : egg membranes, polarity of egg. 3. Fertilization; parthenogenesis, Cleavage patterns. 4. Basic concepts of organizers and inducers and their role.	11. Study of the following prepared slides: a. Stages of gametogenesis, structure of egg and sperm of a mammal. b. Larva of Herdmania
September	Embryonic development: Cleavage, determination and differentiation, development upto three germ layers and their fate in Herdmania, Amphioxus, frog, chick and rabbit. Metamorphosis in Herdmania and Rana (Frog). 6. Foetal membranes, their formation and role. Mammalian placenta, its formation, types and functions.	9. Study of the development of frog from permanent slides. 10. Study of the development of chick embryo from permanent slides upto 96 hours. Segregation demonstration in preserved material (Maize).
October	Modification of Mendelian ratios : Non-allelic gene interaction, Modified F2 ratios (9 : 7, 9 : 3 : 4, 12 : 3 : 1, 13 : 3, 15 : 1, 9 : 6 : 1). Gene modifications due to incomplete dominance, lethal factors (2:1), Pleiotropic gene. 2. Multiple Alleles – Blood group inheritance, eye colour in Drosophila, pseudo-allelism. Multiple factors : Qualitative and quantitative characters, Inheritance of quantitative traits (skin colour in man). 4. Extranuclear inheritance : Chloroplast with	Demonstration of Law of Segregation, Independent assortment and epistasis (use of coloured beads, capsules etc). Numericals for segregation and independent assortment. 2. Segregation demonstration in preserved material (Maize). 3. Cytoplasmic inheritance in Mirabilis jalapa. 4. Inheritance of other human characteristics, ability to taste. PTC, thiourea. 5. Comparison of variance in respect of pod length and number of seeds in pods. 6. Gene frequencies and

	special reference to <i>Mirabilis jalapa</i> and Kappa particles in <i>Paramecium</i> . 5. Population Genetics : Equilibrium of gene frequencies and Hardy Weinberg Law.	random mating (coloured beads, capsules). 7. Study of Polytene chromosomes of <i>Chironomus/Drosophila</i> through permanent slide. 8. Dermatographics : Palm print taking and finger tip patterns.
November	6. Genetic recombination in bacteria (conjugation, transduction and transformation), Recombinant DNA – technology, Genetic cloning and its applications in medicine and agriculture, DNA finger printing.	Project regarding Inheritance of human characteristics, Dermatographics or developmental biology.

SYLLABUS PLAN (2016-17)

EVEN SEMESTERS

SYLLABUS PLAN (2016-17)

NAME OF THE TEACHER

- Dr. Sukhvir Kaur

CLASS

- B. Sc. II (Medical), Semester-IV

SUBJECT

- Zoology (Biochemistry, Animal Physiology)

Month	THEORY	PRACTICAL
January	Biochemistry and its scope; Carbohydrates, Proteins and Lipids. 2. Nucleic Acids : their classification and functions. 3. Enzymes : Nature, their classification and coenzymes.	Identification of food stuffs : starch, glucose, proteins and fats in a given solution. 2. Demonstration of osmosis and diffusion. 3. Demonstration of presence of amylase in saliva, denaturation with change of pH and temperature.
February	4. Carbohydrate Metabolism : The Embden Meyerhof, Parnas Pathway (Glycolysis), the tricarboxylic acid cycle, the hexose monophosphate shunt, glycogenesis and glycogenolysis. 5. Lipid Metabolism : β -oxidation of fatty acids, fate of glycerol and gluconeogenesis, interaction of carbohydrates and lipids, lipogenesis in tissues, ketosis. 6. Protein Metabolism : Metabolism of amino acids (Oxidative deamination, transamination and decarboxylation) hydrolysis of protein and ornithine cycle.	4. Analysis of urine for urea and glucose.
March	Digestion : Digestion of dietary constituents, regulation of digestive processes and absorption, types of nutrition, feeding mechanism, extra and intra cellular digestion, enzymatic digestion and symbiotic digestion. 2. Blood : Composition and functions of blood and lymph, molecular structure and function of haemoglobin, blood clotting, blood groups including Rh-factor, haemostasis and haemopoiesis. Heart : Origin and regulation of heart beat, cardiac cycle, electrocardiogram, cardiac output, blood flow and its regulation, blood pressure and micro-circulation. 4. Respiration : Transport of O ₂ and CO ₂ , Oxygen dissociation curve of haemoglobin, Bohr effect, chloride shift, Haldane effect and control of breathing.	5. Determination of coagulation and bleeding time of blood in man/rat/rabbit. 6. Determination of blood groups of human blood sample. 7. Recording of blood pressure of man. 8. Estimation of haemoglobin content. 9. Study of TLC and DLC. 10. Preparation and study of human blood smear.

April	5. Excretion : Urine formation and osmoregulation. 6. Muscles : Ultrastructure, chemical and physiological basis of skeletal muscle contraction. 7. Neural Integration : Structure of Neuron, resting membrane potential, origin and propagation of impulse along the axon, synapse and myoneural junction. 8. Endocrine : Structure and physiology of thyroid; Parathyroid, adrenal, hypothalamus, pituitary, pancreas and gonads	11. Preparation of permanent mount of striated muscles. 12. Preparation of permanent mount of myelinated nerve fibre. 13. Field study : Visit to a clinical lab. 14. Study of skeleton of Scoliodon Rana Varanus Gallus and Oryctolagus (Rabbit)
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NAME OF THE TEACHER

- Dr. Sukhvir Kaur

CLASS

- B. Sc. III (Medical), Semester-VI

SUBJECT

- Zoology (Applied Zoology)

Month	THEORY	PRACTICAL
January	Introduction to Parasitology (pertaining to various terminologies in use). 2. Brief Introduction to pathogenic microbes. Viruses, Rickettsiae, Spirochaetes and Bacteria. 3. Brief accounts of life history, mode of infection and pathogenicity of the following pathogens with reference to man; prophylaxis and treatment : a. Pathogenic protozoans : Entamoeba, Trypanosoma, Leishmania, Giardia, Trichomonas and Plasmodium. b. Pathogenic helminthes : Fasciolopsis, Schistosoma, Echinococcus, Ancylostoma, Trichinella, Wuchereria, Dracunculus and	Demonstration of safety rules in laboratory like proper handling of paints, specimens and disposal of syringes, needles etc. 2. Demonstration of the use of autoclave, centrifuge and spectrophotometer.
February	Life cycle and control measures of arthropod vectors of human diseases : Malaira (Anopheles stephensi, A. culicifacies) Yellow fever and Dengue, Haemorrhagic fever (Aedes aegypti, A. albopictus); Filariasis (Culex pipiens fatigans) Mansonia sp., Japanese Encephalitis (C. tritaeniorhynchus). 5. Epidemic diseases such as typhoid, cholera, small pox; their occurrence and eradication programmes. 6. Brief introduction to human defence mechanisms.	3. Cleaning and sterilization of glassware using hot air oven, autoclave etc. 4. Demonstration of parts of microscope, its functioning and care. 6. Estimation of haemoglobin using Shali's haemometer.
March	Humoral and cell mediated immune-response, Antigens-physical & chemical properties.	7. Preparation of thick and thin film for malarial parasite. 8. Counting of WBC, RBC & DLC. 9. Examination of

	<p>Antibodies-structure and function of immunoglobulin M, G, A, E and D. 8. Antigen and antibody interactions :Serodiagnostic assays. 9. Vaccines. Laboratory safety rules, hazards and precautions during sample collection and laboratory investigations. 2. Laboratory techniques :Colorimetry, Microscopy, Autoclaving, Centrifugation, Spectrophotometry. 3. Collection, Transportation and Preservation of different clinical samples. 4. Bacteriology :Sterilisation, (dry heat, moist heat, autoclave, filtration), Disinfection, Staining techniques (gram's stain, AFB stain, etc), Culture media (Defined & Synthetic media & routine laboratory media), Bacterial culture (aerobic and anaerobic), antibiotic sensitivity</p>	<p>stool for demonstration of intestinal parasites.</p>
<p>April</p>	<p>Haematology : Collection of blood (Venous and Capillary), Anticoagulants (merits and demerits). Romanowsky's stains. Total RBC count, Erythrocyte sedimentation rate, TLC, DLC, Eosinophil count, Platelet count, Reticulocyte count. 6. Biochemistry : Protein estimation, estimation of blood urea, sugar and cholesterol, serum creatinine and uric acid, urine analysis; estimation of protein, sugar, bile salts, bile pigments, ketone bodies; enzyme studies (serum transaminase, phosphatase, amylase and lipase), liver function test. 7. Histopathology : Common fixatives and staining techniques, Histochemistry : Principle and method : Staining of carbohydrates, proteins and fats with bromo phenol blue, Periodic acid Schiff, Sudan Black blue and Feulgen reaction.</p>	<p>5. Processing of clinical samples for culture and identification of pathogens : blood, throat swab, sputum, pus, urine, stool, CSF and other body fluids.</p>

NAME OF THE TEACHER
CLASS
SUBJECT

- Dr. Manish Sharma
- B. Sc. I (Medical), Semester-II
- Zoology (Comparative anatomy and developmental biology of vertebrates)

Month	THEORY	PRACTICAL
January	Integumentary System: Derivatives of integument w.r.t. glands and digital tips Skeletal System: Evolution of visceral arches Digestive System: Brief account of alimentary canal and digestive glands Respiratory System: Brief account of Gills, lungs, air sacs and swim bladder Circulatory System:	Osteology: a) Disarticulated skeleton of fowl and rabbit b) Carapace and plastron of turtle /tortoise c) Mammalian skulls: One herbivorous and one carnivorous animal.
February	Evolution of heart and aortic arches Urinogenital System: Succession of kidney, Evolution of urinogenital ducts Nervous System: Comparative account of brain Sense Organs: Types of receptors Early Embryonic Development: Gametogenesis: Spermatogenesis and oogenesis w.r.t. mammals, vitellogenesis in birds; Fertilization: external (amphibians), internal (mammals), blocks to polyspermy; Early development of frog and humans (structure of mature egg and its membranes, patterns of cleavage, fate map, up to formation of gastrula);types of morphogenetic movements; Fate of germ layers; Neurulation in frog embryo.	2. Frog - Study of developmental stages - whole mounts and sections through permanent slides – cleavage stages, blastula, gastrula, neurula, tail bud stage, tadpole external and internal gill stages.
March	Late Embryonic Development: Formation of fetal membranes; Implantation of embryo in humans, Formation of human placenta and functions, other types of placenta on the basis of histology; Metamorphic events in frog life cycle and its hormonal regulation.	3. Study of the different types of placenta- histological sections through permanent slides or photomicrographs. 4. Study of placental development in humans by ultrasound scans.
April	Control of Development: Fundamental processes in development (brief idea) – Gene activation, determination, induction, Differentiation, morphogenesis, intercellular communication, cell movements and cell death.	5. Examination of gametes - frog/rat - sperm and ova through permanent slides or photomicrographs.