

HKE Society's  
S.S Margol College of science, Arts & Commerce, Shahabad.

Teaching Schedule of: Prof Devdas Chetty

Department: zoology

(I, III and V Semesters, for the Academic year-2016-17)

Class	No. of hours allotted	July	August	September	October
I Sem.	40hrs	<p><b>Introduction (02)</b> Princial of animal classification-traditional and modren concept (Linnaean and Cladistics). Species concept Biodiversity (03) Levels of biodiversity- generic, species, ecosystem level. Number of species in different groupd of animals – Global and India.</p> <p><b>Phylum- Protozoa (03)</b> General character of phylum and classification up to classes, with distinctive character and suitable examples. Structure and life history of human parasitic protozoans, malarial parasitic (Plasmodium vivax ) and Entamoeba histolytica</p> <p><b>Phylum- Porifera (04)</b> General character of phylum and classification upto classes, with distinctive character and suitable example. Canal system in sponge, types of species.</p>	<p><b>Phylum- Coelenterata(04)</b> General characters of the phylum and classification up to classes, with distinctive character and suitable examples. Structure and life cycle of Obelia, coral reef.</p> <p><b>Phylu- Plathhelminthes(04)</b> General character of phylum and classification upto classes, with distinctive character and suitable examples. Morphology and life cycle of Taenia solium, host – parasite relationship and parasitic adaptataion.</p> <p><b>Phylum Nemanthelminths(03)</b> General character of phylum and classification upto classes, with distinctive character and suitable examples. Host – parasitic relationship and parasitic adaptataion of Ascaris and Wucheria bancrofti.</p>	<p><b>Phylum – Annelida (04)</b> General character of phylum and classification up to classes, with distinctive characters and suitable examples of tubicolous polychaetes- chaetipterus. Ecological adaptation of polychaeta. Vermiculture-concept and importance.</p> <p><b>Phylum- Mollusca(07)</b> General characters of phylum and classification upto classes, with distinctive characters and suitable examples. Habit and habitat and economic imprtance of mollusks.</p>	<p><b>Phylum- Arthropoda(03)</b> General characters of phylum and classiffaion upto classes, with distinctive characters and suitable examples. Life history of silk worm. Importance of sericulture ecology and distribution of bees, spiders, butterfly and termites. Arthropod pests and their management with relevance to sorghum, paddy, sugar cane, peagion pea</p> <p><b>Phylum- Echinodermata (03)</b> General characters of phylum and classification upto classes, with distinctive characters and suitable examples. Laraval forms and phylogeny</p>

<p>III Sem.</p> <p>40hrs 8hrs 8hrs 14hrs 10hrs</p>		<p><b>II study of comparative anatomy of Fish, Frog, Calotes, Pегion and Rabbit</b></p> <p>Integuments (05) Digestive system (03)</p>	<p>Circulatory system – Arotic arches and Heart (05) Excretory system – Kidney (Protonephric, Mesonephric and Mentanephric)(03)</p>	<p>Nervous system – Eye and Brain Skeleton – Girdles, Limbs and Vertebrae (07) Skeleton girdles, limbs and vertebrae (07)</p>	<p><b>Histology(10)</b> Histological study of following organs – i) Tongue (ii) Stomach (iii) Intestine (iv) Liver (v) Pancreas (vi) Kidney (vii) Adernal (ix) Testis and (x) Ovary.</p>
<p>V Sem.</p> <p>40hrs 10hrs 10hrs 10hrs 10hrs</p>		<p><b>Cell biology:</b> Tools and technique in cell biology. Ultrastructure of cell organelles: Mitochondria, golgi complex, lysosomes, endoplasmic reticulum, ribosomes, cytoskeletal, enzymes elemets( microfilaments and microtunules). Cell cycle : Mitosis and Meiosis. Regulation of cell cycle. Biology of cancer: types of cancer. Characteristic of canacer cell, carcinogenic agent</p>	<p><b>Developmental biology:</b> introduction: theories of development and differentiation, branches of embryology, scope of embryology. Gametogenesis: spermatogenesis, formation of spermatids, spermiogenesis. Structure of spermatozoans. Oogenesis – per vitellogenesis and vitellogenesis, comparison between spermatogenesis and oogenesis. Fertilization: kinds of fertilization- gametes approach, fertilizing and antifertilizin. Acrosome reaction, cotical reaction, amphimixix, monospermic and plyspermic. Signification of fertilization</p>	<p>Parthogenesis: kinds of pathogenesis ( natural- arrhenotoky, thelytoky and cyclical). Artificial parthenogenesis, significance of parthenogenesis. Cleavage: types of cleavage. Effects of yolk on cleavage. Early development of frog: structure of ovum, cleavage, bastulation, fate, maps, gastrulation - mesogenesis- notogenesis and neuralation.</p>	<p>Early development of chick: structure of hen egg, cleavage, blasturaion, gastrulation, organic and structure of primitive streak, structure of 18,24 and 48- hours chick embryos Organize phenomenon: definition potencies of the dorsal lips of the blastopore of amphinians gastrula. Experiment of spemann and mangold. Chemical structure of organizer. Extra embryonic membrane of chick: development structure and functions of yolk sac, minon chorion and allantosis. Placenta: morphological and histological classification of placenta, example. Structure and function of placenta – yolk sac placenta, allantoic placenta.</p>



<p>V Sem</p> <p>40hrs</p> <p>10hrs</p> <p>10hrs</p> <p>10hrs</p> <p>10hrs</p>	<p><b>Introduction:</b> History of genetics, branches of genetics, heredity and variation. Methods and material of genetic study. Practical application of genetics.</p> <p><b>Chromosomes:</b> Chromosome number, size types, chromosomal morphology - fine structure and model. Hetrochromatin and euchromatin, gaint chromosome - polytene and lampbrush.</p>	<p><b>Inetraction of gene:</b> supplementary factor - 9:3:3:1. Examples: comb pattern in fowls. Dominant epistasis -12:3:1 plumage color in leghorn and wyandotte, coat color in dog. Recessive epistasis 9:3:4 coat color in pigs, complementary factor -9:7 flower color in sweet peas. <b>Multiple factors/ polygenic inheritance</b> skin color in man</p> <p><b>Multiple alleles:</b> inheritance of coat color in mice. Isoalleles - pseudoalleles and position effect ABO blood group in human and Rh factor.</p>	<p><b>Linakge and crossing over:</b> Linkage in drosophila, linkage in man , theories of linkage and crossover.</p> <p><b>Sex determination</b> Chromosomal mechanism of sex determination. Genic balance theory gynandromorphs and intersexes. Klinefelter's and turner's syndrome.</p> <p>Sex linking inheritance in drosophila and man. Haemophilia and color blindness in man. Sex linkage in poultry. Y linking genes. Chromosomal aberration. Gene mutataion. Molecular basis of mautation.</p> <p>Human genetic and eugenic: common human genetic disorder in man, inborn erros of metabolism - albinism- phenylketonuria, sickle cell aneamia, thalassemia,huntigton's chorea eugenics.</p>	<p><b>Nucleic acid and protein biosynthesis</b> Introduction:identification of genetic material - Griffith's experiment. Chemistry of nucleic acids - structure of DNA, waston and crick model, replication of DNA. Enzymes in DNA relpliction. Forms of RNA. Components of protien biosynthesis. Mechanism of protein synthesis. Genetic code properties of genetic code. Wobble hypothesis</p> <p><b>Genetic enehineering:</b> r-Dna tools used in r-DNA technology. Plastids, cloning strategies. Application of genetic engineering in medicine and engineering.</p>
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
(II, IV and VI Semesters, for the Academic year-2016-17)

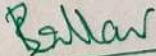
Class	No. of hours allotted	December	January	February	March
II Sem	40hrs 11 hrs 09hrs 08hrs 12hrs	<p><b>General character of phylum and classification up to subphyla:</b> Hemichordate, Urochordata, Cephalochordata with suitable exampl. Retrogressive metamorphosis in urochordata. Systemic position, general character of vertebrata and outline classification (up to classes)</p> <p><b>Cyclostomata:</b> General organization, distribution and ecology of Petromyzon.</p> <p><b>Pisces:</b> Chondrichthyes- general character and distribution with examples. Osteichthyes - general character and distribution with examples.</p>	<p><b>Amphibia:</b> General character and classification up to orders with suitable examples. Distribution and ecology of local amphibians (Ichthyophis, Ran, Bufo)</p> <p><b>Reptilia:</b> General character and classification up to orders (living order only) with suitable examples. Ecology and distribution of Chelonians, Crocodiles and Lizard, Indian snakes (Poisonous and non poisonous)</p>	<p><b>Aves:</b> General character and classification, distinctive feature of Archaeornithes and Neornithes with reference to paleogonathae, impennae and neognathae, giving suitable examples. Wetland and shore birds, adaptation to flight. Economic importance of birds.</p>	<p>General character and classification up to subclass, distinctive feature of prototheria and metatheria with important example. Eutherian mammals-importance character and distribution of rodents, chiroptera, perissodactyla, artiodactyla, cetacea and primates. Detailed study of rat morphology and anatomy.</p>
IV Sem	40hrs 10hrs 10hrs 10hrs 10hrs	<p><b>Physiology</b></p> <p><b>Digestion:</b> mechanical digestion and chemical digestion, digestion and absorption of proteins,</p>	<p><b>Circulation:</b> Types of circulation, structure, function and regulation of human heart. Blood pressure. Composition</p>	<p><b>Nervous coordination:</b> Nature and condition of nerve impulse- synaptic transmission. Neuromuscles junction and</p>	<p>Types of immunity – innate and acquired. Acquired humoral, types of immunoglobulins. Cell mediated immunity</p> <p><b>Biochemistry:</b></p>



		<p>carbohydrates and lipids.</p> <p><b>Respiration:</b> External and internal respiration – respiratory pigments- hemoglobin, haemocyanin and haemerythrin. Physiology of respiration- exchange of gases , transport of oxygen dissociation curves - Bohr effect, transport of carbon dioxide, chloride shift and respiratory quotient.</p>	<p>of human blood. Neurogenic and myogenic hearts.</p> <p><b>Nitrogen excretion:</b> Nitrogen excretion in aquatic and terrestrial animals- Ammonotelism and Ureotelism with examples. Ornithine( urea) cycle. Physiology of urine formation</p> <p><b>Muscle contraction:</b> Principle types of muscle : ultrastructure of striated muscle. Contractile protein- myosin, actin, tropomyosin, troponin and actinin. Mechanism of muscle contraction and relaxation- the sliding filament theory.</p>	<p>neurotransmitters</p> <p><b>Endocrine system:</b> Functions of mammalian endocrine glands – pituitary gland, thyroid, parathyroid, pancreas, adrenal, testis, ovaries, placenta and pineal gland. Hypothalamus its stimulatory and inhibitory hormones.</p> <p><b>Immunology:</b> Immune system – general characteristic. Organs and cell immune system Antigen and antigenectiy.</p>	<p><b>Enzymes:</b> classification of enzymes. Mechanism of enzyme catalyzed action lock and key method: enzymes - complex, specificity of enzymes and reversibility of enzyme action, enzyme inhibitory. A brief account of coenzyme, cofactors and ion.</p> <p><b>Vitamins:</b> Fat soluble and water soluble vitamins. Function and deficiency symptoms.</p> <p><b>Bioenergetics:</b> Concept of bioenergetics- free energy changes, glycolysis, aerobic and anaerobic. Bioenergetics and glycolysis. Krebs's cycle – electron transport chain and phosphorylation. Bioenergetics of krebs's cycle</p>
<p>VI Sem (6.1)</p>	<p>40hrs 10hrs 10hrs 10hrs</p>	<p><b>Animal behaviour</b> Definition and types of animal behaviour. Innate behaviour- taxes, reflexes, instincts and motivation, learned behaviour- habituation, imprinting, conditioned reflexes and insight learning.</p> <p><b>Social organization in animals:</b> honey bees, termites, macaques, langurs and birds.</p>	<p><b>Migratory behaviour:</b> migratory in fishes types of migration, anadromus and catadromous migration with Hilsa and Anguilla as indian example migration in birds – methods of studying migration, advantages of migration, pattern of migration, preparation for migration orientation and navigation.</p> <p><b>Courtship behaviour:</b> general principle. Courtship in cricket, hermit crab, scorpion, ophioccephalus, tilapia, frog and birds.</p>	<p><b>Parental care:</b> parental care in birds, fishes and amphibians.</p> <p><b>Nesting behaviour:</b> nests and nesting behaviour in wasps and birds.</p> <p><b>Mimicry:</b> definition, types of mimicry – Batesian and Mullerian mimicry, protective, aggressive and warning mimicry with suitable examples.</p>	<p><b>Evolution:</b> theories of organic evolution: Lamarckism and neolamarckism, Darwin – wallace theory of natural selection. Synthesis theory of evolution. Gene mutation, gene flow, genetic drift, natural selection and isolation, Hardy Weinberg law of equilibrium.</p> <p><b>Speciation:</b> concept of species, sympatric and allopatric speciation. Micro and macroevolution.</p> <p><b>Paleontology:</b> Fossil and fossilization: origin and evolution of man</p>

<b>VI</b> <b>Sem(6.2)</b>	<b>40hrs</b> <b>10hrs</b> <b>10hrs</b> <b>10hrs</b>	<b>Introduction:</b> Ecological spectrum, subdivision of ecology, scope of ecology. <b>Abiotic factors:</b> Light- effect of light on plants and animals, temperature – thermal stratification- extreme temperature – cyclomorphosis. Adaptation to extreme temperature. <b>Biotic factors:</b> Animal relationship- mutualism, commensalism, parasitism, ammenalism, predation and competition with suitable examples. <b>Habitat:</b> <b>Marine habitat:</b> zonation of the sea and ecology. Classification of marine biota, coastal ecology, estuarine ecology and mangroves. Fresh water habitat- lentic and lotic system.	Ecological classification of fresh water animals. Terrestrial habitat- a brief account of biomes. Ecological adaptations to marine, fresh water and terrestrial animals. <b>Population ecology:</b> population density- natality and mortality, age distribution, population growth rate, population growth curve, biotic potential- Allee's principle. <b>Community ecology:</b> Community structure, ecological determinants, ecological stratification – ecotone and edge effect. Ecological niches, ecological succession, climax community – alpha, beta, gamma diversity, shannon index	<b>Ecosystem:</b> tropical pond as an ecosystem – abiotic components, producers and consumers, interaction between components. Types of ecosystem with examples, natural ecosystem man engineered ecosystem and micro ecosystem. Food chains and energy flow: types of food chain with examples. Energy flow and laws of thermodynamics. <b>Zoogeography:</b> Zoogeographical realms of world, with climate conditions and examples of characteristics fauna brief account of wallaces's line. <b>Geographic distribution of animals:</b> continuous and discontinuous distribution with examples- barriers of dispersal- topographic and vegetation – large bodies of water as barriers- climatic barriers.	<b>Wildlife:</b> <b>Distribution of wildlife in Indian:</b> the Himalayan ranges, the Peninsula, India sub region, Deccan plateau, The Western ghats, Eastern hill chain, Aravali ranges, the Indian desert, tropical rain forest, wildlife in Andaman and Nicobar island. <b>Wildlife problems:</b> hunting over, harvesting, habitat destruction due to overpopulation, degradation, habitat shrinking and possibilities of climatic changes, transgenic changes. <b>Wildlife conservation:</b> need for wildlife conservation, agencies engaged in wildlife conservation. Government organization and non government organization. Wildlife Act 1972. CITES fauna and flora India. Red data book, Ramsar conservation, CBD, project Tiger.
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I Sem.	40hrs	<p><b>Introduction</b> Princial of animal classification- traditional and modren concept (Linnaean and Cladistics). Species concept Biodiversity Levels of biodiversity- generic, species, ecosystem level. Number of species in different group of animals – Global and India.</p> <p><b>Phylum- Protozoa</b> General character of phylum and classification up to classes, with distinctive character and suitable examples. Structure and life history of human parasitic protozoans, malarial parasitic (Plasmodium vivax ) and Entamoeba histolytica</p> <p><b>Phylum- Porifera</b> General character of phylum and classification upto classes, with distinctive character and suitable character and suitable example. Canal system in sponge, types of species.</p>	<p><b>Phylum- Coelenterata</b> General characters of the phylum and classification up to classes, with distinctive character and suitable examples. Structure and life cycle of Obelia, coral reef.</p> <p><b>Phylu- Plathhelminthes</b> General character of phylum and classification upto classes, with distinctive character and suitable examples. Morphology and life cycle of Taenia solium, host – parasite relationship and parasitic adaptataion.</p> <p><b>Phylum Nemanthelminths</b> General character of phylum and classification upto classes, with distinctive character and suitable examples. Host – parasitic relationship and parasitic adaptataion of Ascaris and Wucheria bancrofti.</p>	<p><b>Phylum – Annelida</b> General character of phylum and classification up to classes, with distinctive characters and suitable examples of tubicolous polychaetes- chaetipterus. Ecological adaptation of polychaeta. Vermiculture- concept and importance.</p> <p><b>Phylum- Mollusca</b> General characters of phylum and classification upto classes, with distinctive characters and suitable examples. Habit and habitat and economic imprtance of mollusks.</p>	<p><b>Phylum- Arthropoda</b> General characters of phylum and classification upto classes, with distinctive characters and suitable examples. Life history of silk worm. Importance of sericulture ecology and distribution of bees, spiders, butterfly and termites. Arthropod pests and their management with relevance to sorghum, paddy, sugar cane, peagion pea</p> <p><b>Phylum- Echinodermata</b> General characters of phylum and classification upto classes, with distinctive characters and suitable examples. Laraval forms and phylogeny</p>

III Sem.	40hrs 8hrs 8hrs 14hrs 10hrs	<b>II study of comparative anatomy of Fish, Frog, Calotes, Pigeon and Rabbit</b> Integuments Digestive system	Circulatory system – Aortic arches and Heart Excretory system – Kidney (Protonephric, Mesonephric and Metanephric)	Nervous system – Eye and Brain Skeleton – Girdles, Limbs and Vertebrae	<b>Histology:</b> Histological study of following organs – i) Tongue (ii) Stomach (iii) Intestine (iv) Liver (v) Pancreas (vi) Kidney (vii) Adrenal (ix) Testis and (x) Ovary.
V Sem.	40hrs 10hrs 10hrs 10hrs	<b>Cell biology:</b> Tools and technique in cell biology. Ultrastructure of cell organelles: Mitochondria, golgi complex, lysosomes, endoplasmic reticulum, ribosomes, cytoskeletal, enzymes elements (microfilaments and microtubules). Cell cycle : Mitosis and Meiosis. Regulation of cell cycle. Biology of cancer: types of cancer. Characteristic of cancer cell, carcinogenic agent	<b>Developmental biology:</b> introduction: theories of development and differentiation, branches of embryology, scope of embryology. Gametogenesis: spermatogenesis, formation of spermatids, spermiogenesis. Structure of spermatozoans. Oogenesis – per vitellogenesis and vitellogenesis, comparison between spermatogenesis and oogenesis. Fertilization: kinds of fertilization- gametes approach, fertilizing and antifertilizin. Acrosome reaction, cortical reaction, amphimixis, monospermic and polyspermic. Signification of fertilization	Parthenogenesis: kinds of pathogenesis ( natural-arrhenotoky, thelytoky and cyclical). Artificial parthenogenesis, significance of parthenogenesis. Cleavage: types of cleavage. Effects of yolk on cleavage. Early development of frog: structure of ovum, cleavage, blastulation, fate, maps, gastrulation - mesogenesis- notogenesis and neuralation.	Early development of chick: structure of hen egg, cleavage, blastulation, gastrulation, organic and structure of primitive streak, structure of 18,24 and 48- hours chick embryos Organize phenomenon: definition potencies of the dorsal lips of the blastopore of amphibians gastrula. Experiment of spemann and mangold. Chemical structure of organizer. Extra embryonic membrane of chick: development structure and functions of yolk sac, chorion and allantois. Placenta: morphological and histological classification of placenta, example. Structure and function of placenta – yolk sac placenta, allantoic placenta.



<b>V Sem</b> <b>40hrs</b> <b>10hrs</b> <b>10hrs</b> <b>10hrs</b>	<b>Introduction:</b> History of genetics, branches of genetics, heredity and variation. Methods and material of genetic study. Practical application of genetics. <b>Chromosomes:</b> Chromosome number, size types, chromosomal morphology – fine structure and model. Hetrochromatin and euchromatin, gaint chromosome – polytene and lampbrush.	<b>Inetraction of gene:</b> supplementary factor – 9:3:3:1. Examples: comb pattern in fowls. Dominant epistasis -12:3:1 plumage color in leghorn and wyandotte, coat color in dog. Recessive epistasis 9:3:4 coat color in pigs, complementary factor –9:7 flower color in sweet peas. Multiple factors/ polygenic inheritance skin color in man <b>Multiple alleles:</b> inheritance of coat color in mice. Isoalleles – pseudoalleles and position effect ABO blood group in human and Rh factor.	<b>Linkage and crossing over:</b> Linkage in drosophila, linkage in man , theories of linkage and crossover. <b>Sex determination</b> Chromosomal mechanism of sex determination. Genic balance theory gynandromorphs and intersexes. Klinefelter's and turner's syndrome. Sex linking inheritance in drosophila and man. Haemophilia and color blindness in man. Sex linkage in poultry. Y linking genes. Chromosomal aberration. Gene mutataion. Molecular basis of mautation. Human genetic and eugenic: common human genetic disorder in man, inborn erros of metabolism – albinism- phenylketonuria, sickle cell aneamia, thalassemia,huntigton's chorea eugenics.	<b>Nucleic acid and protein biosynthesis</b> Introduction:identification of genetic material – Griffth's experiment. Chemistry of nucleic acids - structure of DNA, waston and crick model, replication of DNA. Enzymes in DNA relpliction. Forms of RNA. Components of protien biosynthesis. Mechanism of protein synthesis. Genetic code properties of genetic code. Wobble hypothesis <b>Genetic enhineering:</b> r-Dna tools used in r-DNA technology. Plastids, cloning strategies. Application of genetic engineering in medicine and engineering.
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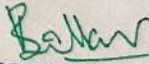
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IV Sem	40hrs 10hrs 10hrs 10hrs 10hrs	<p><b>Physiology</b> <b>Digestion:</b> mechanical digestion and chemical digestion, digestion and absorption of proteins,</p>	<p><b>Circulation:</b> Types of circulation, structure, function and regulation of human heart. Blood pressure. Composition</p>	<p><b>Nervous coordination:</b> Nature and condition of nerve impulse- synaptic transmission. Neuromuscular junction and</p>	<p>Types of immunity – innate and acquired. Acquired humoral, types of immunoglobulins. Cell mediated immunity <b>Biochemistry:</b></p>



		<p>carbohydrates and lipids.</p> <p><b>Respiration:</b> External and internal respiration – respiratory pigments- hemoglobin, haemocyanin and haemerythrin. Physiology of respiration- exchange of gases , transport of oxygen dissociation curves - Bohr effect, transport of carbon dioxide, chloride shift and respiratory quotient.</p>	<p>of human blood. Neurogenic and myogenic hearts.</p> <p><b>Nitrogen excretion:</b> Nitrogen excretion in aquatic and terrestrial animals- Ammonotelism and Ureotelism with examples. Ornithine( urea) cycle. Physiology of urine formation</p> <p><b>Muscle contraction:</b> Principle types of muscle : ultrastructure of striated muscle. Contractile protein- myosin, actin, tropomyosin, troponin and actinin. Mechanism of muscle contraction and relaxation- the sliding filament theory.</p>	<p>neurotransmitters</p> <p><b>Endocrine system:</b> Functions of mammalian endocrine glands – pituitary gland, thyroid, parathyroid, pancreas, adrenal, testis, ovaries, placenta and pineal gland. Hypothalamus its stimulatory and inhibitory hormones.</p> <p><b>Immunology:</b> Immune system – general characteristic. Organs and cell immune system Antigen and antigenicity.</p>	<p><b>Enzymes:</b> classification of enzymes. Mechanism of enzyme catalyzed action lock and key method: enzymes - complex, specificity of enzymes and reversibility of enzyme action, enzyme inhibition. A brief account of coenzyme, cofactors and ion.</p> <p><b>Vitamins:</b> Fat soluble and water soluble vitamins. Function and deficiency symptoms.</p> <p><b>Bioenergetics:</b> Concept of bioenergetics- free energy changes, glycolysis, aerobic and anaerobic. Bioenergetics and glycolysis. Krebs's cycle – electron transport chain and phosphorylation. Bioenergetics of Krebs's cycle</p>
VI Sem (6.1)	40hrs 10hrs 10hrs 10hrs	<p><b>Animal behaviour</b> Definition and types of animal behaviour. Innate behaviour- taxes, reflexes, instincts and motivation, learned behaviour- habituation, imprinting, conditioned reflexes and insight learning.</p> <p><b>Social organization in animals:</b> honey bees, termites, macaques, langurs and birds.</p>	<p><b>Migratory behaviour:</b> migratory in fishes types of migration, anadromous and catadromous migration with Hilsa and Anguilla as Indian example migration in birds – methods of studying migration, advantages of migration, pattern of migration, preparation for migration orientation and navigation.</p> <p><b>Courtship behaviour:</b> general principle. Courtship in cricket, hermit crab, scorpion, ophioccephalus, tilapia, frog and birds.</p>	<p><b>Parental care:</b> parental care in birds, fishes and amphibians.</p> <p><b>Nesting behaviour:</b> nests and nesting behaviour in wasps and birds.</p> <p><b>Mimicry:</b> definition, types of mimicry – Batesian and Mullerian mimicry, protective, aggressive and warning mimicry with suitable examples.</p>	<p><b>Evolution:</b> theories of organic evolution: Lamarckism and neolamarckism, Darwin – Wallace theory of natural selection. Synthesis theory of evolution. Gene mutation, gene flow, genetic drift, natural selection and isolation, Hardy Weinberg law of equilibrium.</p> <p><b>Speciation:</b> concept of species, sympatric and allopatric speciation. Micro and macroevolution.</p> <p><b>Paleontology:</b> Fossil and fossilization: origin and evolution of man</p>

<p><b>VI Sem(6.2)</b></p> <p>40hrs 10hrs 10hrs 10hrs</p>	<p><b>Introduction:</b> Ecological spectrum, subdivison of ecology, scope of ecology. <b>Abiotic factors:</b> Light- effect of light on plants and animals, temperature – thermal stratification-extreme temperature – cyclomorphosis. Adaptation to extreme temperature. <b>Biotic factors:</b> Animal relationship- mutualism, commensalism, parasitism, ammenalism, predation and competition with suitable examples. <b>Habitat:</b> <b>Marine habitat:</b> zonation of the sea and ecology. Classification of marine biota, costal ecology, estuarine ecology and mangroves. Fresh water habitat- lentic and lotic system.</p>	<p>Ecological classification of fresh water animals. Terrestrial habitat- a brief account of biomes. Ecological adaptations to marine, fresh water and terrestrial animals. <b>Population ecology:</b> population density- natality and mortality, age distribution, population growth rate, population growth curve, biotic potential- Allee's principle. <b>Community ecology:</b> Community structure, ecological determinants, ecological stratification – ecotone and edge effect. Ecological niches, ecological succession, climax community – alpha, beta, gamma diversity, shannon index</p>	<p><b>Ecosystem:</b> tropical pond as an ecosystem – abiotic components, producers and consumers, interaction between components. Types of ecosystem with examples, natural ecosystem man engineered ecosystem and micro ecosystem. Food chains and energy flow: types of food chain with examples. Energy flow and laws of thermodynamics. <b>Zoogeography:</b> Zoogeographical realms of world, with climate conditions and examples of characteristics fauna brief account of wallaces's line. <b>Geographic distribution of animals:</b> continuous and discontinuous distribution with examples- barriers of dispersal- topographic and vegetation – large bodies of water as barriers- climatic barriers.</p>	<p><b>Wildlife:</b> <b>Distribution of wildlife in Indian:</b> the Himalayan ranges, the Peninsula, India sub region, Deccan plateau, The Western ghats, Eastern hill chain, Aravalli ranges, the Indian desert, tropical rain forest, wildlife in Andaman and Nicobar island. <b>Wildlife problems:</b> hunting over, harvesting, habitat destruction due to overpopulation, degradation, habitat shrinking and possibilities of climatic changes, transgenic changes. <b>Wildlife conservation:</b> need for wildlife conservation, agencies engaged in wildlife conservation. Government organization and non government organization. Wildlife Act 1972. CITES fauna and flora India. Red data book , Ramsar conservation, CBD, project Tiger.</p>
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Teaching Schedule of Prof Devdas Chetty

Department: zoology


(I, III and V Semesters, for the Academic year-2018-19)


Class	No. of hours allotted	June	July	August	September
I Sem.	60hrs 13hrs 17hrs 12hrs 18hrs	<p><b>Unit 1: kingdom Protista</b> General characters and classification up to classes, locomotory organelles and locomotion in protozoa.</p> <p><b>Unit 2: phylum porifera</b> General characters and classification upto classes, canal system</p> <p><b>Unit 3: phylum cnidaria</b> General characters and classification upto classes, polymorphism in hydrozoa</p> <p><b>Unit 4: phylum plathyhelminthes</b> General characters and classification up to classes, Life history of Taenia solium</p>	<p><b>Unit 5: phylum Nematelminthes</b> General characters and classification up to classes; Life history of Ascaris lumbricoides and its parasitic adaptations</p> <p><b>Unit 6: phylum Annelida</b> General characters and classification up to classes; Metamerism in Annelida</p> <p><b>Unit 7: Phylum Arthropoda</b> General characters and classification up to classes; Vision in arthropoda, Metamorphosis in Insects</p> <p><b>Unit 8: Phylum Mollusca</b> General character and classification up to classes; Torsion in gastropods</p>	<p><b>Unit 9: phylum Echinodermata</b> General character and classification up to classes; water-vascular system in Asteroidea</p> <p><b>Unit 10: protochordates</b> General features and phylogeny of protochordata</p> <p><b>Unit 11: Agnatha</b> General features of Agnatha and classification of cyclostomes up to classes</p> <p><b>Unit 12: Pisces</b> General features and classification up to orders; Osmoregulation in Fishes</p>	<p><b>Unit 13: Amphibia</b> General features and classification up to orders; Parental care</p> <p><b>Unit 14: Reptiles</b> General features and classification up to orders; Poisonous and non-poisonous snakes, Biting mechanism in snakes</p> <p><b>Unit 15: Aves</b> General features and classification up to orders; Flight adaptations in birds</p> <p><b>Unit 16: Mammals</b> Classification up to orders; Origin of mammals</p>
III Sem.	40hrs 8hrs 8hrs 14hrs 10hrs	<p><b>II study of comparative anatomy of Fish, Frog, Calotes, Pегion and Rabbit</b> Integuments Digestive system</p>	<p>Circulatory system – Aortic arches and Heart Excretory system – Kidney (Protonephric, Mesonephric and Metanephric)</p>	<p>Nervous system – Eye and Brain Skeleton – Girdles, Limbs and Vertebrae</p>	<p><b>Histology:</b> Histological study of following organs – i) Tongue (ii) Stomach (iii) Intestine (iv) Liver (v) Pancreas (vi) Kidney (vii) Adrenal (ix) Testis and (x) Ovary.</p>

<b>VSem.</b> <b>40hrs</b> <b>10hrs</b> <b>10hrs</b> <b>10hrs</b>	<p><b>Cell biology:</b>  Tools and technique in cell biology.  Ultrastructure of cell organelles: Mitochondria, golgi complex, lysosomes, endoplasmic reticulum, ribosomes, cytoskeletal, enzymes elemets( microfilaments and microtunules).  Cell cycle : Mitosis and Meiosis. Regulation of cell cycle. Biology of cancer: types of cancer. Characteristic of canacer cell, carcinogenic agent</p>	<p><b>Developmental biology:</b>  introduction: theories of development and differentiation, branches of embryology, scope of embryology. Gametogenesis: spermatogenesis, formation of spermatids, spermiogenesis. Structure of spermatozoans. Oogenesis – per vitellogenesis and vitellogenesis, comparison between spermatogenesis and oogenesis. Fertilization: kinds of fertilization- gametes approach, fertilizing and antifertilizin. Acrosome reaction, cotical reaction, amphimixix, monospermic and plyspermic. Signification of fertilization</p>	<p>Parthogenesis: kinds of pathogenesis ( natural- arrhenotoky, thelytoky and cyclical). Artificial parthenogenesis, significance of parthenogenesis.  Cleavage: types of cleavage. Effects of yolk on cleavage.  Early development of frog: structure of ovum,cleavage, bastulation, fate, maps, gastrulation - mesogenesis- notogenesis and neuralation.</p>	<p>Early development of chick: structure of hen egg, cleavage, blastrutaion, gastrulation, organic and structure of primitive streak, structure of 18,24 and 48- hours chick embryos  Organize phenomenon: definition potencies of the dorsal lips of the blastopore of amphinians gastrula. Experiment of spemann and mangold. Chemical structure of organizer. Extra embryonic membrane of chick: development structure and functions of yolk sac, minon chorion and allantosis.  Placenta: morphological and histological classification of placenta, example. Structure and function of placenta – yolk sac placenta, allantoic placenta.</p>
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<p>V Sem</p>	<p>40hrs 10hrs 10hrs 10hrs</p>	<p><b>Introduction:</b> History of genetics, branches of genetics, heredity and variation. Methods and material of genetic study. Practical application of genetics.</p> <p><b>Chromosomes:</b> Chromosome number, size types, chromosomal morphology – fine structure and model. Hetrochromatin and euchromatin, gaint chromosome – polytene and lampbrush.</p>	<p><b>Inetraction of gene:</b> supplementary factor – 9:3:3:1. Examples: comb pattern in fowls. Dominant epistasis -12:3:1 plumage color in leghorn and wyandotte, coat color in dog. Recessive epistasis 9:3:4 coat color in pigs, complementary factor –9:7 flower color in sweet peas. Multiple factors/polygeneic inheritance skin color in man</p> <p><b>Multiple alleles:</b> inheritance of coat color in mice. Isoalleles – pseudoalleles and position effect ABO blood group in human and Rh factor.</p>	<p><b>Linakge and crossing over:</b> Linkage in drosophila, linkage in man , theories of linkage and crossover.</p> <p><b>Sex determination</b> Chromosomal mechanism of sex determination. Genic balance theory gynandromorphs and intersexes. Klinefelter's and turner's syndrome.</p> <p>Sex linking inheritance in drosophila and man. Haemophilia and color blindness in man. Sex linkage in poultry. Y linking genes. Chromosomal aberration. Gene mutataion. Molecular basis of mautation.</p> <p>Human genetic and eugenic: common human genetic disoder in man, inborn erros of metabolism – albinism-phenylketonuria, sickle cell aneamia, thalassemia,huntigton's chorea eugenics.</p>	<p><b>Nucleic acid and protein biosynthesis</b> Introduction:identification of genetic material – Griffith's experimnt. Chemistry of nucleic acids - structure of DNA, waston and crick model, replication of DNA. Enzymes in DNA relpliction. Forms of RNA. Components of protien biosynthesis. Mechanism of protein synthesis. Genetic code properties of genetic code. Wobble hypothesis</p> <p><b>Genetic ehniengineering:</b> r-Dna tools used in r-DNA technology. Plastids, cloning strategies. Application of genetic engineering in medicine and engineering.</p>
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Teaching Schedule of :Prof Devdas Chetty

Department: zoology

(II, IV and VI Semesters, for the Academic year-2018-19)


Class	No. of hours allotted	December	January	February	March
II Sem	60 hrs 17hrs 11hrs 15hrs 18hrs	<p><b>Unit 1: Integumentary system</b> 04 Derivates of Integuments; epirermal scales, glands and digital tips</p> <p><b>Unit 2: Osteology</b> 05 Vertebral column, limb bones, girdles</p> <p><b>Unit 3: Digestive system</b> 04 Brief account of alimentary canal and digestive glands</p> <p><b>Unti 4: Respiratory system</b> 04 Brief account of Gills, Lungs, air sacs and swim bladder</p>	<p><b>Unti 5: Circulatory system</b> 04 Evolution of heart and arotic arches</p> <p><b>Unti 6: Urinogenital system</b> 03 Succession of Kidney, Evolution of uriogenital ducts</p> <p><b>Unti 7: Nervous system</b> 03 Comparative account of brian</p>	<p><b>Unit 8: sense organs</b> 03 Types of receptors</p> <p><b>Unit 9: Early Embryonic Development</b> 12 Gametogenesis: spermatogenesis and oogenesis in mammals, vitellogenesis in birds;Fertilization: external (amphibians), internal ( mammals), blocks to polyspermy; Early development of frog and humans( structure of mature egg and its memembranes, patterns of cleavage, fate map, up to formation of gastrula); types of morphogenetic movements; Fate of germ layers; Neurulation in frog embryo.</p>	<p><b>Unti 10: Late Embryonic Development</b> 10 Implataion of embryo in humans, formtaion of human placenta and functions, other ypes of placenta on the basis of histology; metamorphic events in frog life cycle and its hormonal regulation</p> <p><b>Unti 11: control of developments</b> 08 Fundamental process in development – gene activation, determination, induction, differentiation, morphogenesis, intracellular communication, cell movements and cell death</p>
IV Sem	40hrs 10hrs 10hrs 10hrs	<p><b>Physiology</b></p> <p><b>Digestion:</b> mechanical digestion and chemical digestion, digestion and</p>	<p><b>Circulation:</b> Types of circulation, structure, function and regulation of human heart.</p>	<p><b>Nervous coordination:</b> Nature and condition of nerve impluse- synaptic transmission. Neuromuscles</p>	<p>Types od immunity – innate and acquired. Acquired humoral, types of immunoglobulins. Cell mediated immunity</p>



	10hrs	<p>absorption of proteins, carbohydrates and lipids.</p> <p><b>Respiration:</b> External and internal respiration – respiratory pigments- hemoglobin, haemocyanin and haemerythrin. Physiology of respiration- exchange of gases , transport of oxygen dissociation curves - Bohr effect, transport of carbon dioxide, chloride shift and respiratory quotient.</p>	<p>Blood pressure. Composition of human blood. Neurogenic and myogenic hearts.</p> <p><b>Nitrogen excretion:</b> Nitrogen excretion in aquatic and terrestrial animals- Ammonotelism and Ureotelism with examples. Ornithine( urea) cycle. Physiology of urine formation</p> <p><b>Muscle contraction:</b> Principle types of muscle : ultrastructure of striated muscle. Contractile protein- myosin, actin, tropomyosin, troponin and actinin. Mechanism of muscle contraction and relaxation- the sliding filament theory.</p>	<p>junction and neurotransmitters</p> <p><b>Endocrine system:</b> Functions of mammalian endocrine glands – pituitary gland, thyroid, parathyroid, pancreas, adrenal, testis, ovaries, placenta and pineal gland. Hypothalamus its stimulatory and inhibitory hormones.</p> <p><b>Immunology:</b> Immune system – general characteristic. Organs and cell immune system Antigen and antigenicity.</p>	<p><b>Biochemistry:</b> <b>Enzymes:</b> classification of enzymes. Mechanism of enzyme catalyzed action lock and key method: enzymes - complex, specificity of enzymes and reversibility of enzyme action, enzyme inhibitory. A brief account of coenzyme, cofactors and ion.</p> <p><b>Vitamins:</b> Fat soluble and water soluble vitamins. Function and deficiency symptoms.</p> <p><b>Bioenergetics:</b> Concept of bioenergetics- free energy changes, glycolysis, aerobic and anaerobic. Bioenergetics and glycolysis. Krebs' cycle – electron transport chain and phosphorylation. Bioenergetics of Krebs' cycle</p>
VI Sem (6.1)	40hrs 10hrs 10hrs 10hrs	<p><b>Animal behaviour</b> Definition and types of animal behaviour. Innate behaviour- taxes, reflexes, instincts and motivation, learned behaviour- habituation, imprinting, conditioned reflexes and insight learning.</p> <p><b>Social organization in animals:</b> honey bees, termites, macaques, langurs and birds.</p>	<p><b>Migratory behaviour:</b> migratory in fishes types of migration, anadromous and catadromous migration with Hilsa and Anguilla as Indian example migration in birds – methods of studying migration, advantages of migration, pattern of migration, preparation for migration orientation and navigation.</p> <p><b>Courtship behaviour:</b> general principle. Courtship in cricket, hermit crab, scorpion, ophioccephalus, tilapia, frog and birds.</p>	<p><b>Parental care:</b> parental care in birds, fishes and amphibians.</p> <p><b>Nesting behaviour:</b> nests and nesting behaviour in wasps and birds.</p> <p><b>Mimicry:</b> definition, types of mimicry – Batesian and Mullerian mimicry, protective, aggressive and warning mimicry with suitable examples.</p>	<p><b>Evolution:</b> theories of organic evolution: Lamarckism and neolamarckism, Darwin – Wallace theory of natural selection. Synthesis theory of evolution. Gene mutation, gene flow, genetic drift, natural selection and isolation, Hardy Weinberg law of equilibrium.</p> <p><b>Speciation:</b> concept of species, sympatric and allopatric speciation. Micro and macroevolution.</p> <p><b>Paleontology:</b> Fossil and fossilization: origin and evolution of man</p>

<p>VI Sem(6.2)</p>	<p>40hrs 10hrs 10hrs 10hrs 10hrs</p>	<p><b>Introduction:</b> Ecological spectrum, subdivision of ecology, scope of ecology. <b>Abiotic factors:</b> Light- effect of light on plants and animals, temperature – thermal stratification- extreme temperature – cyclomorphosis. Adaptation to extreme temperature. <b>Biotic factors:</b> Animal relationship- mutualism, commensalism, parasitism, ammenalism, predation and competition with suitable examples. <b>Habitat:</b> <b>Marine habitat:</b> zonation of the sea and ecology. Classification of marine biota, coastal ecology, estuarine ecology and mangroves. Fresh water habitat- lentic and lotic system.</p>	<p>Ecological classification of fresh water animals. Terrestrial habitat- a brief account of biomes. Ecological adaptations to marine, fresh water and terrestrial animals. <b>Population ecology:</b> population density- natality and mortality, age distribution, population growth rate, population growth curve, biotic potential- Allee's principle. <b>Community ecology:</b> Community structure, ecological determinants, ecological stratification – ecotone and edge effect. Ecological niches, ecological succession, climax community – alpha, beta, gamma diversity, shannon index</p>	<p><b>Ecosystem:</b> tropical pond as an ecosystem – abiotic components, producers and consumers, interaction between components. Types of ecosystem with examples, natural ecosystem man engineered ecosystem and micro ecosystem. Food chains and energy flow: types of food chain with examples. Energy flow and laws of thermodynamics. <b>Zoogeography:</b> Zoogeographical realms of world, with climate conditions and examples of characteristics fauna brief account of wallaces's line. <b>Geographic distribution of animals:</b> continuous and discontinuous distribution with examples- barriers of dispersal- topographic and vegetation – large bodies of water as barriers- climatic barriers.</p>	<p><b>Wildlife:</b> <b>Distribution of wildlife in India:</b> the Himalayan ranges, the Peninsula, India sub region, Deccan plateau, The Western ghats, Eastern hill chain, Aravali ranges, the Indian desert, tropical rain forest, wildlife in Andaman and Nicobar island. <b>Wildlife problems:</b> hunting over, harvesting, habitat destruction due to overpopulation, degradation, habitat shrinking and possibilities of climatic changes, transgenic changes. <b>Wildlife conservation:</b> need for wildlife conservation, agencies engaged in wildlife conservation. Government organization and non government organization. Wildlife Act 1972. CITES fauna and flora India. Red data book, Ramsar conservation, CBD, project Tiger.</p>
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Teaching Schedule of Prof Devdas Chetty

Department: zoology

(I, III and V Semesters, for the Academic year-2019-20)

Class	No. of hours allotted	June	July	August	September
III Sem.	60hrs 13hrs 16hrs 14hrs 16hrs	<p><b>Unit 1: nerve and muscle</b> Structure of a neuron, resting membrane potential, graded potential, origin of action potential and its propagation in myelinated and non-myelinated nerve fibers, ultra - structure of skeletal muscle, molecular and chemical basis of muscle contraction.</p> <p><b>Unit 2: Digestion</b> Physiology of digestion in the alimentary canal; Absorption of carbohydrates, proteins, lipids.</p>	<p><b>Unit 3: Respiration</b> Pulmonary ventilation, respiratory volumes and capacities, transport of oxygen and carbon dioxide in blood.</p> <p><b>Unit 4: Excretion</b> Structure of nephron, mechanism of urine formation, counter current mechanism</p> <p><b>Unit 5: Cardiovascular system</b> Composition of blood, hemostasis, structure of heart, origin and conduction of the cardiac impulse, cardiac cycle</p>	<p><b>Unit 6: Reproduction and Endocrine gland</b> Physiology of male reproduction: hormonal control of spermatogenesis; physiology of female reproduction: hormonal control of menstrual cycle, structure and function of pituitary, thyroid, parathyroid, pancreas and adrenal.</p> <p><b>Unit 7: Carbohydrates metabolism</b> Glycolysis, Krebs cycle, Pentose phosphate pathway, Gluconeogenesis, Glycogen metabolism, review of electron transport chain</p>	<p><b>Unit 8: lipid metabolism</b> Biosynthesis and <math>\beta</math>-oxidation of palmitic acid</p> <p><b>Unit 9: Protein metabolism</b> 05 Transamination, Deamination and Urea cycle</p> <p><b>Unit 10: Enzymes</b> Introduction, mechanism of action, enzyme kinetics, inhibition and regulation</p>

<p><b>VSem.</b></p>	<p><b>40hrs</b> <b>10hrs</b> <b>10hrs</b> <b>10hrs</b> <b>10hrs</b></p>	<p><b>Cell biology:</b> Tools and technique in cell biology. Ultrastructure of cell organelles: Mitochondria, golgi complex, lysosomes, endoplasmic reticulum, ribosomes, cytoskeletal, enzymes elemets( microfilaments and microtunules). Cell cycle : Mitosis and Meiosis. Regulation of cell cycle. Biology of cancer: types of cancer. Characteristic of canacer cell, carcinogenic agent</p>	<p><b>Developmental biology:</b> introduction: theories of development and differentiation, branches of embryology, scope of embryology. Gametogenesis: spermatogenesis, formation of spermatids, spermiogenesis. Structure of spermatozoans. Oogenesis – per vitellogenesis and vitellogenesis, comparison between spermatogenesis and oogenesis. Fertilization: kinds of fertilization- gametes approach, fertilizing and antifertilizin. Acrosome reaction, cotical reaction, amphimixix, monospermic and polyspermic. Signification of fertilization</p>	<p>Parthogenesis: kinds of pathogenesis ( natural- arrhenotoky, thelytoky and cyclical). Artificial parthenogenesis, significance of parthenogenesis. Cleavage: types of cleavage. Effects of yolk on cleavage. Early development of frog: structure of ovum, cleavage, bastulation, fate, maps, gastrulation - mesogenesis- notogenesis and neuralation.</p>	<p>Early development of chick: structure of hen egg, cleavage, blastutaion, gastrulation, organic and structure of primitive streak, structure of 18,24 and 48- hours chick embryos Organize phenomenon: definition potencies of the dorsal lips of the blastopore of amphinians gastrula. Experiment of spemann and mangold. Chemical structure of organizer. Extra embryonic membrane of chick: development structure and functions of yolk sac, minon chorion and allantosis. Placenta: morphological and histological classification of placenta, example. Structure and function of placenta – yolk sac placenta, allantoic placenta.</p>
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<b>V Sem</b> <b>40hrs</b> <b>10hrs</b> <b>10hrs</b> <b>10hrs</b>	<b>Introduction:</b> History of genetics, branches of genetics, heredity and variation. Methods and material of genetic study. Practical application of genetics. <b>Chromosomes:</b> Chromosome number, size types, chromosomal morphology – fine structure and model. Hetrochromatin and euchromatin, gaint chromosome – polytene and lampbrush.	<b>Inetraction of gene:</b> supplementary factor – 9:3:3:1. Examples: comb pattern in fowls. Dominant epistasis -12:3:1 plumage color in leghorn and wyandotte, coat color in dog. Recessive epistasis 9:3:4 coat color in pigs, complementary factor –9:7 flower color in sweet peas. Multiple factors/ polygenic inheritance skin color in man <b>Multiple alleles:</b> inheritance of coat color in mice. Isoalleles – pseudoalleles and position effect ABO blood group in human and Rh factor.	<b>Linakge and crossing over:</b> Linkage in drosophila, linkage in man , theories of linkage and crossover. <b>Sex determination</b> Chromosomal mechanism of sex determination. Genic balance theory gynandromorphs and intersexes. Klinefelter’s and turner’s syndrome. Sex linking inheritance in drosophila and man. Haemophilia and color blindness in man. Sex linkage in poultry. Y linking genes. Chromosomal aberration. Gene mutataion. Molecular basis of mautation. Human genetic and eugenic: common human genetic disorder in man, inborn erros of metabolism – albinism- phenylketonuria, sickle cell aneamia, thalassemia,huntigton’s chorea eugenics.	<b>Nucleic acid and protein biosynthesis</b> Introduction:identification of genetic material – Griffth’s experiment. Chemistry of nucleic acids - structure of DNA, waston and crick model, replication of DNA. Enzymes in DNA relpiction. Forms of RNA. Components of protien biosynthesis. Mechanism of protein synthesis. Genetic code properties of genetic code. Wobble hypothesis <b>Genetic enhineering:</b> r-Dna tools used in r-DNA technology. Plastids, cloning strategies. Application of genetic engineering in medicine and engineering.
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Teaching Schedule of : Prof Devdas Chetty

Department: zoology

(II, IV and VI Semesters, for the Academic year-2019-20)

Class	No.of allotted hours	December	December	January	February
IV Sem	60hrs 11hrs 15hrs 17hrs 20hrs	<b>Unti 1: introduction to genetics</b> <b>03</b> Mendle's work on transmission of traits, genetic variation, molecular basis of genetic information <b>Unit 2: Mendelian genetics and its Extension</b> <b>08</b> Principal of inheritance, chromosome theory of inheritance, incomplete dominance and codominance, multiple alleles, lethal alleles, epistasis, pleiotropy, sex linked inheritance, extra-chromosomal inheritance.	<b>Unti 3: Linkage, Crossing over and Chromosomal Mapping</b> <b>09</b> Linkage and crossing over, recombination frequency as a measure of linkage intensity, two factor and three factor crosses, interference and coincidence, somatic cell genetics- an alternative approach to gene mapping. <b>Unti 4: Muataion</b> <b>07</b> Chromosomal mutataion: Deletion, Duplication, Inversion, Translocation, Aneuploidy and Polyploidy; Gene mutataion: Induced versus Spontaneous muataion, Back versus Suppressor mutataion.	<b>Unit 5: Sex Detremination</b> <b>04</b> Chromosomal mechanisms, dosage compensation  <b>Unti 6: History of life</b> <b>04</b> Major events in history of life <b>Unit 7: introduction to evolutionary theories</b> <b>04</b> Lmarckism, Darwinism, Neo-Darwinism <b>Unti 8: Direct evidenece of evolution</b> <b>05</b> Types of fossils, Incompleteness of fossil record, dating of fossils, phylogeny of horse	<b>Unti 9: Process of evolutionary change</b> <b>08</b> Organic variation, Isolating mechanism, Natural selection, Types of natural selection, Artifical selection  <b>Unit 10: Species Concept</b> <b>05</b> Biological species concept; modes of speciation <b>Unit 11: Macro evolution</b> <b>03</b> Macro-evolution principles ( ex-Dwarni,s Finches) <b>Unti 12: Extinction</b> <b>04</b> Mass extinction( causes, name the five major extinctions, K-T extinction in detail), role of extinction in evolution
VI Sem (6.1)	40hrs 10hrs 10hrs	<b>Animal behaviour</b> Definiation and types of animal behaviour. Innate	<b>Migratory behaviour:</b> migratory in fishes types of migration, anadromus and	<b>Parental care:</b> parental care in birds, fishes and amphibians.	<b>Evolution:</b> theories of organic evolution: Lamarckism and neolamarckism, Darwin - wallace



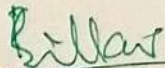
	<p>10hrs 10hrs</p>	<p>behaviour- taxes, reflexes, instincts and motivation, learned behaviour- habituation, imprinting, conditioned reflexes and insight learning. <b>Social organization in animals:</b> honey bees, termites, macaques, langurs and birds.</p>	<p>catadromous migration with Hilsa and Anguilla as indian example migration in birds – methods of studying migration, advantages of migration, pattern of migration, preparation for migration orientataion and navigation. <b>Courtship behaviour:</b> general principle. Courtship in cricket, hermit crab, scorpion, ophiocephalus, tilapia, frog and birds.</p>	<p><b>Nesting behaviour:</b> nests and nesting behaviour in wasps and birds. <b>Mimicry:</b> definition, types of mimicry – Batesian and Mullerian mimicry, protective, aggressive and warning mimicry with suitable examples.</p>	<p>theory of natural selection. Synthesis theory of evolution. Gene mutation, gene flow, genetic drift, natural selection and isolation, Hardy Weinberg law of equilibrium. <b>Specification:</b> concept of species, sympatric and allopatric speciation. Micro and macroevolution. <b>Paleontology:</b> Fossil and fossilization: origin and evolution of man</p>
<p>VI Sem(6.2)</p>	<p>40hrs 10hrs 10hrs 10hrs 10hrs</p>	<p><b>Introduction:</b> Ecological spectrum, subdivision of ecology, scope of ecology. <b>Abiotic factors:</b> Light- effect of light on plants and animals, temperature – thermal stratification- extreme temperature – cyclomorphosis. Adaptation to extreme temperature. <b>Biotic factors:</b> Animal relationship- mutualism, commensalism, parasitism, ammenalism, predation and competition with suitable examples. <b>Habitat:</b> <b>Marine habitat:</b> zonation of the sea and ecology. Classification of marine</p>	<p>Ecological classification of fresh water animals. Terrestrial habitat- a brief account of biomes. Ecological adaptations to marine, fresh water and terrestrial animals. <b>Population ecology:</b> population density- natality and mortality, age distribution, population growth rate, population growth curve, biotic potential- Allee's principle. <b>Community ecology:</b> Community structure, ecological determinants, ecological stratification – edge and edge effect. Ecological niches, ecological succession,</p>	<p><b>Ecosystem:</b> tropical pond as an ecosystem – abiotic components, producers and consumers, interaction between components. Types of ecosystem with examples, natural ecosystem man engineered ecosystem and micro ecosystem. Food chains and energy flow: types of food chain with examples. Energy flow and laws of thermodynamics. <b>Zoogeography:</b> Zoogeographical realms of world, with climate conditions and examples of characteristics fauna brief account of wallaces's line. <b>Geographic distribution of</b></p>	<p><b>Wildlife:</b> <b>Distribution of wildlife in Indian:</b> the Himalayan ranges, the Peninsula, India sub region, Deccan plateau, The Western ghats, Eastern hill chain, Aravalli ranges, the Indian desert, tropical rain forest, wildlife in Andaman and Nicobar island. <b>Wildlife problems:</b> hunting over, harvesting, habitat destruction due to overpopulation, degradation, habitat shrinking and possibilities of climatic changes, transgenic changes. <b>Wildlife conservation:</b> need for wildlife conservation, agencies engaged in wildlife conservation. Government organization and non government organization. Wildlife Act 1972. CITES fauna and flora</p>

		biota, costal ecology, estuarine ecology and magroves. Fresh water habitat- lentic and lotic system.	climax community – alpha, beta, gamma diversity, shanon index	animals: continuous and didcontinuous distribution with examples- barrires of dispersal- topographic and vegetation – large bodies of water as barriers- climatic barriers.	India. Red data book , Ramsar conseravtion, CBD, project Tiger.
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		and function of plasma membrane	1.4 Chromosomes- structure, types and gaint chromosome 1.5 Cell division- Mitosis, meiosis, cell cycle and its regulation	2.4 Gene Expression – Genetic Code; Operon concept 2.5 Molecular Biology Techniques- Polymerase Chain Reaction, Electrophoresis	3.3 chromosomal mutataion – Deletion, Duplation, Inversion, Translocation, Aneuploidy and Ploiploidy 3.4 Gene muataion- Induced vesus Sponatenous mutataions 3.5 Inborn errors of metabolism; one gene one enzyme, one gene one polypeptide theory
V Sem SEC	16hrs 8hrs 5hrs 3hrs	<b>Unti 1: Biology of Bees</b> <b>03</b> History, classification and biology of Honey Bees Social organization of Bees Colony  <b>Unit 2: Rearing of Bees</b> <b>05</b> Artfical Bee rearing, Beehives- Newton and Langstroth Bees pasturage, Selection of bee species for Apiculture Bee keeping equipment, methods of extraction of honey ( modren and indigenous)	<b>Unti 3: Disease and Enemies</b> <b>03</b> Bee disease and enemies, control and preventive measures <b>Unit 4: Bee Economy</b> <b>02</b> Products of Apiculture industry and its uses ( honey, bee was, propolis, pollen etc)	<b>Unit 5: Entrepreneurship in Apiculture</b> <b>03</b> Bee keeping industry – recent efforts, modern methods in employing artfical beehives for cross pollination in horticultural gardens	

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Teaching Schedule of : Prof Devdas Chetty

Department: zoology

(II, IV and VI Semesters, for the Academic year-2020-21)

Class	No of hours allotted	May	June	July	August
II Sem	60hrs 17hrs 11hrs 15hrs 18hrs	<p><b>Unit 1: Integumentary system</b> 04 Derivates of Integuments; epirermal scales, glands and digital tips</p> <p><b>Unit 2: Osteology</b> 05 Vertebral column, limb bones, girdles</p> <p><b>Unit 3: Digestive system</b> 04 Brief account of alimentary canal and digestive glands</p> <p><b>Unit 4: Respiratory system</b> 04 Brief account of Gills, Lungs, air sacs and swim bladder</p>	<p><b>Unit 5: Circulatory system</b> 04 Evolution of heart and arotic arches</p> <p><b>Unit 6: Urinogenital system</b> 03 Succession of Kidney, Evolution of uriogenital ducts</p> <p><b>Unit 7: Nervous system</b> 03 Comparative account of brian</p>	<p><b>Unit 8: sense organs</b> 03 Types of receptors</p> <p><b>Unit 9: Early Embryonic Development</b> 12 Gametogenesis: spermatogenesis and oogenesis in mammals, vitellogenesis in birds; Fertilization: external (amphibians), internal (mammals), blocks to polyspermy; Early development of frog and humans( structure of mature egg and its memebanes, patterns of cleavage, fate map, up to formation of gastrula); types of morphogenetic movements; Fate of germ layers; Neurulation in frog embryo.</p>	<p><b>Unit 10: Late Embryonic Development</b> 10 Implataion of embryo in humans, formtaion of human placenta and functions, other ypes of placenta on the basis of histology; metamorphic events in frog life cycle and its hormonal regulation</p> <p><b>Unit 11: control of developments</b> 08 Fundamental process in development – gene activation, determination, induction, differentiation, morphogenesis, intracellular communication, cell movements and cell death</p>



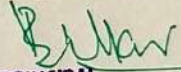
<b>VI Sem(SEC)</b>	<b>30hrs 5hrs 06hrs 03hrs 02hrs</b>	<b>Unit 1: Introduction 03</b> Sericulture: definition, history and present status; silk route, types of silk worms <b>Unit 2: Biology of silk worm 02</b> Life cycle of Bombyx mori, structure of silk gland and secretion of silk	<b>Unit 3: rearing of silk worm 06</b> Selection of mulberry variety and establishment of mulberry garden, rearing house and rearing appliances, disinfectants, formalin, bleaching powder, RKO, silkworm rearing technology, early age and late age rearing, types of moults, spinning, harvesting and storage of cocoons.	<b>Unit 4: pests and disease 03</b> Pests of silkworm: uzi fly, dermestid beetles and vertebrates. Pathogenesis of silkworm Diseases: protozoan, viral, fungal and bacterial. Control and prevention of pests and diseases.	<b>Unit 5: Entrepreneurship in sericulture 02</b> Prospectus of sericulture in India: sericulture industry in different states, employment potential in mulberry and non-mulberry sericulture. Visit to various sericulture unit.
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Subject Teacher

Principal

  
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Teaching Schedule of Prof Devdas Chetty

Department: zoology

(I, III and V Semesters, for the Academic year-2021-22)

Class	Subject	August	Septmber	January	Febuary
I Sem	14hrs 14hrs 14hrs 14hrs	<p><b>Chapter 1: structure and function of cell organelle I in animal cell</b> Plasma membrane and chemical structure , lipid and protein. Endomembrane system- protein targeting and shrinking. Transport- active, passive and bulk transport. Endocytosis and exocytosis.</p> <p><b>Chapter 2: structure and function of cell organelle II in animal cell</b> Cytoskeleton: microtubules, microfilaments, intermediate filaments Mitochondria: structure, oxidative phosphorylation; electron transport system Peroxisome and ribsome: structure and function</p> <p><b>Chapter 3: nucleus and chromatin structure</b> Structure and function of nucleus in eukaryotic cell Chemical structure and basic components of DNA and RNA</p>	<p>DNA supercoiling, chromatin organization, structure of chromosomes Types of DNA and RNA</p> <p><b>Chapter 4: cell cycle, cell division and cell signaling</b> Cell division: mitosis and meiosis Introduction to cell cycle and its regulation, apoptosis Signal transduction: intracellular 11 signaling and cell surface receptor via G- protein linked receptor Cell- cell interaction: cell adhesion molecule, cellular junctions</p> <p><b>Chapter 5: mendelism and sex dtermination</b> Basic principle of heredity: mendel's laws – monohybrid and dihybrid cross Complete and in-complete dominance Penetrance and expressivity</p>	<p>Genetic sex-determining system, environmental sex determination , sex determination and mechanism in Drosophila melanogaster Sex-linked characteristics in human and dosage compensation</p> <p><b>Chapter 6: extension of mendelism, genes and environment</b> Extension of mendlesim: multiple alleles, gene interaction. The interaction between sex and herididty: sex-influenced and se-limited characteristics Penetrance and expressivity Genetic sex-determining system, environmental sex determination , sex determination and mechanism in Drosophila melanogaster Sex-linked characteristics in human and dosage compensation</p>	<p><b>Chapter 6: extension of mendelism, genes and environment</b> Extension of mendlesim: multiple alleles, gene interaction. The interaction between sex and herididty: sex-influenced and se-limited characteristics Cytoplasmic inheritance, genetic maternal effects Inertaction between genes and environment: environmental effects on gene expression, inheritance of continuous characteristics.</p> <p><b>Chapter 8: infectious diseases</b> Introduction to pathogenic organism: virus, bacteria, fungi, protozoa abd worms Structure, life cycle, pathogenicity, including diseases, causes, symptoms and control of common parasites: Trypanosoma, Giardia and Wuchereria.</p>



<p>III Sem 60hrs 13hrs 16hrs 14hrs 16hrs</p>	<p><b>Unit 1: nerve and muscle</b> Structure of a neuron, resting membrane potential, graded potential, origin of action potential and its propagation in myelinated and non-myelinated nerve fibers, ultra – structure of skeletal muscle, molecular and chemical basis of muscle contraction. <b>Unit 2: Digestion</b> Physiology of digestion in the alimentary canal; Absorption of carbohydrates, proteins, lipids.</p>	<p><b>Unit 3: Respiration</b> Pulmonary ventilation, respiratory volumes and capacities, transport of oxygen and carbon dioxide in blood. <b>Unit 4: Excretion</b> Structure of nephron, mechanism of urine formation, counter current mechanism <b>Unit 5: Cardiovascular system</b> Composition of blood, hemostasis, structure of heart, origin and conduction of the cardiac impulse, cardiac cycle</p>	<p><b>Unit 6: Reproduction and Endocrine gland</b> Physiology of male reproduction: hormonal control of spermatogenesis; physiology of female reproduction: hormonal control of menstrual cycle, structure and function of pituitary, thyroid, parathyroid, pancreas and adrenal. <b>Unit 7: Carbohydrate metabolism</b> Glycolysis, Krebs cycle, Pentose phosphate pathway, Gluconeogenesis, Glycogen metabolism, review of electron transport chain</p>	<p><b>Unit 8: lipid metabolism</b> Biosynthesis and <math>\beta</math>-oxidation of palmitic acid <b>Unit 9: Protein metabolism</b> 05 Transamination, Deamination and Urea cycle <b>Unit 10: Enzymes</b> Introduction, mechanism of action, enzyme kinetics, inhibition and regulation</p>
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Teaching Schedule of : Prof Devdas Chetty


Department: zoology

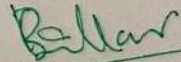
(II, IV and VI Semesters, for the Academic year-2021-22)

Class	No of hours allotted	May	June	July	August
II Sem	10hrs 14hrs 14hrs 14 hrs	<p><b>Structure and function of Biomolecules:</b> Structure and biological importance of carbohydrates ( monosaccharides, disaccharides, polysaccharides and glycoconjuates) Lipids ( saturated and unsaturated fatty acids, tri-acylglycerols, phosho lipids, glycolipid and steroid) Structure, classification and general properties of a-amino acid ; essential and non-essential amino acids, levels of organization in proteins; simple and conjugate proteins.</p> <p><b>Enzyme action and regulatuion:</b> Nomenclature and classification of enzymes ; cofactors; specificity of enzyme action. Isozymes; mechanism of enzyme action Enzyme kinetics; factors affecting rate of enzyme-catalyzed reaction: equation of Michaela's – Mendon, concept of Km and Vmax, enzyme</p>	<p><b>Metabolism of carbohydrates:</b> glycolysis, citric acid cycle, gluconeogenesis, phosphate pentose pathway, glycogenolysis and glycogenesis lipids biosynthesis of palmatic acids; ketogenesis. B- oxidation and omega oxidation of saturated fatty acids with even and odd no, of carbon atoms.</p> <p><b>Metabolism of proteins and nucleotides:</b> Catabolism of amino acids: transamination, deamination, urea cycle, nucleotides and vitamins. Peptide linkage.</p> <p><b>Digestion and respiration in humans:</b> Structural organization and function of gastrointestinal tract and associated glands. Mechanical and chemical digestion of food:</p>	<p>Physiology of trachea and lungs, mechanism of respiration, pulmonary ventilation, respiratory volumes and capacities, transport of oxygen and carbon dioxide in blood, respiratory pigments, dissociation curves and the factors influencing it: control of respiration.</p> <p><b>Circulation and excretion in humans:</b> Components of blood and their functions; hemopoiesis Blood clotting: blood clotting system, blood group, Rh –factor, ABO blood group and structure of human heart. Cardiac cycle; cardiac output and its regulation, electrocardiogram, blood pressure and its regulation. Structure of kidney and its functional unit: mechanism</p>	<p><b>Nervous system and endocrinology in humans:</b> Structure of neuron, resting memebrene potential Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers. Types of synapse.</p> <p><b>Endocrine glands:</b> pineal, pituitary, thyroid, parathyroid, pancreas, adrenal. Hormones secreted by them. Classification of hormones: mechanism of hormone action. <b>Muscular system in humans:</b> Histology of different types of muscle, ultra structure of skeletal muscle, molecular and chemical basis of muscle contraction: characteristics of muscle twitch, motor unit, summation and tetanus.</p>



		inhibition. Allosteric enzymes and their kinetic: regulation of enzyme action	absorption of carbohydrate. Lipids, proteins, water, minerals and vitamins.	of urine formation.	
IV Sem	60hrs 11hrs 15hrs 17hrs 20hrs	<b>Unit 1: introduction to genetics (03)</b> Mendel's work on transmission of traits, genetic variation, molecular basis of genetic information <b>Unit 2: Mendelian genetics and its Extension (08)</b> Principal of inheritance, chromosome theory of inheritance, incomplete dominance and codominance, multiple alleles, lethal alleles, epistasis, pleiotropy, sex linked inheritance, extra-chromosomal inheritance.	<b>Unit 3: Linkage, Crossing over and Chromosomal Mapping (09)</b> Linkage and crossing over, recombination frequency as a measure of linkage intensity, two factor and three factor crosses, interference and coincidence, somatic cell genetics- an alternative approach to gene mapping. <b>Unit 4: Mutation (07)</b> Chromosomal mutation: Deletion, Duplication, Inversion, Translocation, Aneuploidy and Polyploidy; Gene mutation: Induced versus Spontaneous mutation, Back versus Suppressor mutation.	<b>Unit 5: Sex Determination (04)</b> Chromosomal mechanisms, dosage compensation <b>Unit 6: History of life (04)</b> Major events in history of life <b>Unit 7: introduction to evolutionary theories (04)</b> Lamarckism, Darwinism, Neo-Darwinism <b>Unit 8: Direct evidence of evolution (05)</b> Types of fossils, incompleteness of fossil record, dating of fossils, phylogeny of horse	<b>Unit 9: Process of evolutionary change (08)</b> Organic variation, Isolating mechanism, Natural selection, Types of natural selection, Artificial selection <b>Unit 10: Species Concept (05)</b> Biological species concept; modes of speciation <b>Unit 11: Macro evolution (03)</b> Macro-evolution principles (ex-Darwin's Finches) <b>Unit 12: Extinction (04)</b> Mass extinction (causes, name the five major extinctions, K-T extinction in detail), role of extinction in evolution

  
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