

MAHARANA PRATAP GOVERNMENT DEGREE COLLEGE, AMB, DISTT. UNA, H.P.

DEPARTMENT OF ZOOLOGY
TENATIVE TEACHING/LESSON PLAN

CLASS: B.Sc. 1ST YEAR

PAPER: ANIMAL DIVERSITY (ZOOL101)

NAME OF THE TOPIC (THEORY)	PRACTICALS	MONTH	REMARKS
<p>Unit 1: Kingdom Protista : General characters and classification up to classes; Locomotory Organelles and locomotion in Protozoa</p> <p>Unit 2: Phylum Porifera : General characters and classification up to classes; Canal System in <i>Sycon</i></p> <p>Unit 3: Phylum Cnidaria : General characters and classification up to classes; Polymorphism in Hydrozoa</p> <p>Unit 4: Phylum Platyhelminthes : General characters and classification up to classes; Life history of <i>Taenia solium</i></p>	<p>Study of the following specimens: <i>Amoeba</i>, <i>Plasmodium</i>, <i>Paramecium</i>, <i>Sycon</i>, <i>Hyalonema</i>, and <i>Obelia</i>, <i>Physalia</i>, <i>Aurelia</i>, <i>Tubipora</i>, <i>Metridium</i>, <i>Taenia solium</i>,</p> <p>Study of the following permanent slides: T.S. and L.S. of <i>Sycon</i>, Study of life history stages of <i>Taenia</i>, T.S. of Male and female <i>Ascaris</i></p>	July	Routine assignments, seminars and weekly tests.
<p>Unit 5: Phylum Nematelminthes : General characters and classification up to classes; Life history of <i>Ascaris lumbricoides</i> and its parasitic adaptations</p> <p>Unit 6: Phylum Annelida : General characters and classification up to classes; Metamerism in Annelida</p>	<p>Male and female <i>Ascaris lumbricoides</i>, <i>Aphrodite</i>, <i>Nereis</i>, <i>Pheretima</i>, <i>Hirudinaria</i>,</p>	August	Routine assignments, seminars and weekly tests.
<p>Unit 7: Phylum Arthropoda : General characters and classification up to classes; Vision in Arthropoda, Metamorphosis in Insects</p> <p>Unit 8: Phylum Mollusca : General characters and classification up to classes; Torsion in gastropods</p> <p>Unit 9: Phylum Echinodermata : General characters and classification up to classes; Water-vascular system in Asteroidea</p>	<p><i>Palaemon</i>, <i>Cancer</i>, <i>Limulus</i>, <i>Palamnaeus</i>, <i>Scolopendra</i>, <i>Julus</i>, <i>Periplaneta</i>, <i>Apis</i>, <i>Chiton</i>, <i>Dentalium</i>, <i>Pila</i>, <i>Unio</i>, <i>Loligo</i>, <i>Sepia</i>, <i>Octopus</i>, <i>Echinus</i>, <i>Cucumaria</i>,</p>	September	Routine assignments, seminars and weekly tests.
<p>Unit 10: Protochordates : General features and Phylogeny of Protochordata</p> <p>Unit 11: Agnatha : General features of Agnatha and classification of cyclostomes up to classes</p> <p>Unit 12: Pisces : General features and Classification up to orders; Osmoregulation in Fishes</p>	<p><i>Balanoglossus</i>, <i>Herdmania</i>, , <i>Pristis</i>, <i>Torpedo</i>, <i>Labeo</i>, <i>Exocoetus</i>,</p>	October	Assignments for CCA, seminars and weekly tests.
<p>Unit 13: Amphibia : General features and Classification up to orders; Parental care</p>	<p><i>Salamandra</i>, <i>Bufo</i>, <i>Hyla</i>, <i>Chelone</i>,</p>	November	Routine assignments,

Unit 14: Reptiles : General features and Classification up to orders; Poisonous and non-poisonous snakes, Biting mechanism in snakes	<i>Hemidactylus, Chamaeleon, Draco, Vipera, Naja, Crocodylus,</i> Key for Identification of poisonous and non-poisonous snakes		seminars and weekly tests.
Unit 15: Aves : General features and Classification up to orders; Flight adaptations in birds	Any six common birds from different orders, Bat, <i>Funambulus,</i>	December	Mid Term Test
Unit 16: Mammals : Classification up to orders; Origin of mammals	Revision	February	Revision/Test

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**DEPARTMENT OF ZOOLOGY
TENATIVE TEACHING/LESSON PLAN**

CLASS: B.Sc. 1ST YEAR

PAPER: COMPARATIVE ANAMTOMY AND DEVELOPMENTAL BIOLOGY OF VERTEBRATES
(ZOOL102)

NAME OF THE TOPIC	PRACTICALS	MONTH	REMARKS
Unit 1: Integumentary System : Derivatives of integument w.r.t. glands and digital tips Unit 2: Skeletal System : Evolution of visceral arches	Osteology: a) Disarticulated skeleton of frog	July	Routine assignments, seminars and weekly tests.
Unit 3: Digestive System : Brief account of alimentary canal and digestive glands Unit 4: Respiratory System : Brief account of Gills, lungs, air sacs and swim bladder	b)Skeleton of Rabbit	August	Routine assignments, seminars and weekly tests.
Unit 5: Circulatory System Evolution of heart and aortic arches Unit 6: Urinogenital System : Succession of kidney, Evolution of urinogenital ducts	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.	September	Routine assignments, seminars and weekly tests.
Unit 7: Nervous System : Comparative account of brain Unit 8: Sense Organs : Types of receptors	Study of the different types of placenta-histological sections through permanent slides or photomicrographs	October	Assignments for CCA, seminars and weekly tests.
Unit 9: 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;	As per syllabus	November	Routine assignments, seminars and weekly tests.
Unit 10: Late Embryonic Development :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	Revision	December	Mid Term Test

cycle and its hormonal regulation.			
Unit 11: Control of Development : Intercellular communication, cell movements and cell death.	Revision	February	Routine assignments, seminars and weekly tests.

MAHARANA PRATAP GOVERNMENT DEGREE COLLEGE, AMB, DISTT. UNA, H.P.**DEPARTMENT OF ZOOLOGY
TENATIVE TEACHING/LESSON PLAN**CLASS: B.Sc. 2ND YEAR

PAPER: PHYSIOLOGY AND BIOCHEMISTRY (ZOOL201)

NAME OF THE TOPIC	PRACTICALS	MONTH	REMARKS
Unit 1: Nerve and muscle : Structure of a neuron, Resting membrane potential, Graded potential, Origin of Action potential and its propagation in myelinated and non-myelinated nerve fibres, Ultrastructure of skeletal muscle, Molecular and chemical basis of muscle contraction	Preparation of hemin and hemochromogen crystals	July	Routine assignments, seminars and weekly tests.
Unit 2: Digestion : Physiology of digestion in the alimentary canal; Absorption of carbohydrates, proteins, lipids Unit 3: Respiration : Pulmonary ventilation, Respiratory volumes and capacities, Transport of Oxygen and carbon dioxide in blood	Study of permanent histological sections of mammalian pituitary, thyroid, pancreas, adrenal gland	August	Routine assignments, seminars and weekly tests.
Unit 4: Excretion : Structure of nephron, Mechanism of Urine formation, Counter-current Mechanism Unit 5: Cardiovascular system : Composition of blood, Hemostasis, Structure of Heart, Origin and conduction of the cardiac impulse, Cardiac cycle	Study of permanent slides of spinal cord, duodenum, liver, lung, kidney, bone, cartilage	September	Routine assignments, seminars and weekly tests.
Unit 6: Reproduction and Endocrine Glands : 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	Qualitative tests to identify functional groups of carbohydrates in given solutions (Glucose, Fructose, Sucrose, Lactose).	October	Assignments for CCA, seminars and weekly tests.
Unit 7: Carbohydrate Metabolism : Glycolysis, Krebs Cycle, Pentose phosphate pathway, Gluconeogenesis, Glycogen metabolism, Review of electron transport chain	Study of activity of salivary amylase under optimum conditions	November	Routine assignments, seminars and weekly tests.
Unit 8: Lipid Metabolism : β oxidation of palmitic acid Unit 9: Protein metabolism : Transamination, Deamination and Urea Cycle	Revision	December	Mid Term Test
Unit 10: Enzymes : Introduction, Mechanism of action, Inhibition and Regulation	Revision	February	Test/Revision

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DEPARTMENT OF ZOOLOGY
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CLASS: B.Sc. 2ND YEAR

PAPER: GENETICS AND EVOLUTIONARY BIOLOGY (ZOO202)

NAME OF THE TOPIC	PRACTICALS	MONTH	REMARKS
<p>Unit 1: Introduction to Genetics : Mendel's work on transmission of traits, Genetic Variation, Molecular basis of Genetic Information</p> <p>Unit 2: Mendelian Genetics and its Extension : Principles of Inheritance, Chromosome theory of inheritance, Incomplete dominance and co-dominance, Multiple alleles, Lethal alleles, Epistasis, Pleiotropy, sex linked inheritance, extra-chromosomal inheritance</p>	<p>Study of Mendelian Inheritance and gene interactions (Non Mendelian Inheritance) using suitable examples. Verify the results using Chi-square test.</p>	July	Routine assignments, seminars and weekly tests.
<p>Unit 3: Linkage, Crossing Over and Chromosomal Mapping : Linkage and crossing over, Recombination frequency as a measure of linkage intensity, two factor and three factor crosses, Interference and coincidence. Unit 4: Mutations : Chromosomal Mutations: Deletion, Duplication, Inversion, Translocation, Aneuploidy and Polyploidy; Gene mutations: Induced versus Spontaneous mutations, Back versus Suppressor mutations,</p>	<p>Study of Linkage, recombination, gene mapping using the data.</p>	August	Routine assignments, seminars and weekly tests.
<p>Unit 5: Sex Determination : Chromosomal mechanisms, dosage compensation</p> <p>Unit 6: History of Life : Major Events in History of Life</p>	<p>Study of Human Karyotypes (normal and abnormal).</p>	September	Routine assignments, seminars and weekly tests.
<p>Unit 7: Introduction to Evolutionary Theories Lamarckism, Darwinism, Neo-Darwinism</p> <p>Unit 8: Direct Evidences of Evolution : Types of fossils, Incompleteness of fossil record, Dating of fossils, Phylogeny of horse</p>	<p>Study of fossil evidences from plaster cast models and pictures</p> <p>Study of homology and analogy from suitable specimens/ pictures</p>	October	Assignments for CCA, seminars and weekly tests.
<p>Unit 9: Processes of Evolutionary Change : Organic variations; Isolating Mechanisms;</p>	<p>Charts: a) Phylogeny of</p>	November	Routine assignments,

Natural selection (Example: Industrial melanism); Types of natural selection (Directional, Stabilizing, Disruptive), Artificial selection	horse with diagrams/ cut outs of limbs and teeth of horse ancestors b) Darwin's Finches with diagrams/ cut outs of beaks of different species		seminars and weekly tests.
Unit 10: Species Concept Biological species concept (Advantages and Limitations); Modes of speciation (Allopatric, Sympatric) Unit 11: Macro-evolution : Macro-evolutionary Principles (example: Darwin's Finches)	Revision	December	Mid Term Test
Unit 12: Extinction 4 Mass extinction (Causes, Names of five major extinctions), Role of extinction in evolution	Revision	February	Test/Revision

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CLASS: B.Sc. 2ND YEAR

PAPER: MEDICAL DIAGNOSTICS (ZOOL203)

NAME OF THE TOPIC	MONTH	REMARKS
Unit 1: Introduction to Medical Diagnostics and its Importance	July	Routine assignments, seminars and weekly tests.
Unit 2: Diagnostics Methods Used for Analysis of Blood : Blood composition, Preparation of blood smear and Differential Leucocyte Count (D.L.C) using Leishman's stain, Platelet count using haemocytometer, Erythrocyte Sedimentary Rate (E.S.R), Packed Cell Volume (P.C.V.)	August	Routine assignments, seminars and weekly tests.
Unit 3: Diagnostic Methods Used for Urine Analysis : Urine Analysis: Physical characteristics; Abnormal constituents	September	Routine assignments, seminars and weekly tests.
Unit 4: Non -infectious Diseases : Causes, types, symptoms, complications, diagnosis and prevention of Diabetes (Type I and Type II), Hypertension (Primary and secondary), Testing of blood glucose using Glucometer/Kit	October	Assignments for CCA, seminars and weekly tests.
Unit 5: Infectious Diseases : Causes, types, symptoms, diagnosis and prevention of Tuberculosis and Hepatitis	November	Routine assignments, seminars and weekly tests.
Unit 6: Tumours : Types (Benign/Malignant), Detection and metastasis; Medical imaging: X-Ray of Bone fracture, PET, MRI and CT Scan (using photographs).	December	Mid Term Test
Revision	February	Test

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CLASS: B.Sc. 2ND YEAR

PAPER: APICULTURE (ZOOL204)

NAME OF THE TOPIC	MONTH	REMARKS
Unit 1: Biology of Bees History, Classification and Biology of Honey Bees Social Organization of Bee Colony	July	Routine assignments, seminars and weekly tests.
Unit 2: Rearing of Bees Artificial Bee rearing (Apiary), Beehives – Newton and Langstroth, Bee Pasturage.	August	Routine assignments, seminars and weekly tests.
Unit 2 (contd.) : Selection of Bee Species for Apiculture Bee Keeping Equipment Methods of Extraction of Honey (Indigenous and Modern).	September	Routine assignments, seminars and weekly tests.
Unit 3: Diseases and Enemies Bee Diseases and Enemies Control and Preventive measures.	October	Assignments for CCA, seminars and weekly tests.
Unit 4: Bee Economy Products of Apiculture Industry and its Uses (Honey, Bees Wax, Propolis), Pollen Etc.	November	Routine assignments, seminars and weekly tests.
Unit 5: Entrepreneurship in Apiculture Bee Keeping Industry – Recent Efforts, Modern Methods in employing artificial Beehives for cross pollination in horticultural gardens.	December	Mid Term Test
Revision	February	Test

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DEPARTMENT OF ZOOLOGY
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CLASS: B.Sc. 3RD YEAR

PAPER: APPLIED ZOOLOGY (ZOOL301 (A))

NAME OF THE TOPIC	PRACTICALS	MONTH	REMARKS
Unit 1: Introduction to Host-parasite Relationship : Host, Definitive host, Intermediate host, Parasitism, Symbiosis, Commensalism, Reservoir, Zoonosis	Study of <i>Plasmodium vivax</i> , <i>Entamoeba histolytica</i> , <i>Trypanosoma gambiense</i> , <i>Ancylostoma duodenale</i> and <i>Wuchereria bancrofti</i> and their life stages through permanent slides/photomicrographs or specimens.	July	Routine assignments, seminars and weekly tests.
Unit 2: Epidemiology of Diseases : Transmission, Prevention and control of diseases: Tuberculosis, typhoid Unit 3: Rickettsiae and Spirochaetes : Brief account of <i>Rickettsia prowazekii</i> , <i>Borrelia recurrentis</i> and <i>Treponema pallidum</i>	Study of arthropod vectors associated with human diseases: <i>Pediculus</i> , <i>Culex</i> , <i>Anopheles</i> , <i>Aedes</i> and <i>Xenopsylla</i> .	August	Routine assignments, seminars and weekly tests.
Unit 4: Parasitic Protozoa : Life history and pathogenicity of <i>Entamoeba histolytica</i> , <i>Plasmodium vivax</i> and <i>Trypanosoma gambiense</i> Unit 5: Parasitic Helminthes : Life history and pathogenicity of <i>Ancylostoma duodenale</i> and <i>Wuchereria bancrofti</i>	Study of insect damage to different plant parts/stored grains through damaged products/photographs	September	Routine assignments, seminars and weekly tests.
Unit 6: Insects of Economic Importance : Biology, Control and damage caused by <i>Helicoverpa armigera</i> , <i>Pyrilla perpusilla</i> and <i>Papilio demoleus</i> , <i>Callosobruchus chinensis</i> , <i>Sitophilus oryzae</i> and <i>Tribolium castaneum</i>	Identifying feature and economic importance of <i>Helicoverpa (Heliothis) armigera</i> , <i>Papilio demoleus</i> , <i>Pyrilla perpusilla</i> , <i>Callosobruchus chinensis</i> , <i>Sitophilus oryzae</i> and <i>Tribolium castaneum</i>	October	Assignments for CCA, seminars and weekly tests.
Unit 7: Insects of Medical Importance : Medical importance and control of <i>Pediculus humanus corporis</i> , <i>Anopheles</i> , <i>Culex</i> , <i>Aedes</i> , <i>Xenopsylla cheopis</i> Unit 8: Animal Husbandry : Preservation and artificial insemination in cattle; Induction of early puberty and synchronization of estrus in cattle	Revision	November	Routine assignments, seminars and weekly tests.

Unit 9 : Poultry Farming : Principles of poultry breeding, Management of breeding stock and broilers, Processing and preservation of eggs	Revision	December	Mid Term Test
Unit 10: Fish Technology : Genetic improvements in aquaculture industry; Induced breeding and transportation of fish seed	Revision	February	Test

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**DEPARTMENT OF ZOOLOGY
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CLASS: B.Sc. 3RD YEAR

PAPER: REPRODUCTIVE BIOLOGY (ZOOL302 (C))

NAME OF THE TOPIC	PRACTICALS	MONTH	REMARKS
Unit 1: Reproductive Endocrinology : Gonadal hormones and mechanism of hormone action, steroids, glycoprotein hormones, and prostaglandins, hypothalamo – hypophyseal – gonadal axis, regulation of gonadotrophin secretion in male and female; Reproductive System: Development and differentiation of gonads, genital ducts, external genitalia, mechanism of sex differentiation.	Examination of histological sections from photomicrographs/ permanent slides of rat/human: testis, epididymis and accessory glands of male reproductive systems.	July	Routine assignments, seminars and weekly tests.
Unit 2: Functional anatomy of male reproduction : Outline and histological of male reproductive system in rat and human; Testis: Cellular functions, germ cell, system cell renewal;	Sections of ovary, fallopian tube, uterus (proliferative and secretory stages), cervix and vagina	August	Routine assignments, seminars and weekly tests.
Unit 2 (contd.): Spermatogenesis: kinetics and hormonal regulation; Androgen synthesis and metabolism; Epididymal function and sperm maturation; Accessory glands functions; Sperm transportation in male tract	Study of modern contraceptive devices.	September	Routine assignments, seminars and weekly tests.
Unit 3: Functional anatomy of female reproduction : Outline and histological of female reproductive system in rat and human; Ovary: folliculogenesis, ovulation, corpus luteum formation and regression; Steroidogenesis and secretion of ovarian hormones; Reproductive cycles (rat and human) and their regulation, changes in the female tract;	Revision	October	Assignments for CCA, seminars and weekly tests.
Unit 3 (contd.): Ovum transport in the fallopian tubes; Sperm transport in the female tract, fertilization; Hormonal control of implantation; Hormonal regulation of gestation, pregnancy diagnosis, foeto – maternal relationship; Mechanism of parturition and its hormonal regulation; Lactation and its regulation	Revision	November	Routine assignments, seminars and weekly tests.
Unit 4: Reproductive Health : Infertility in male and female: causes, diagnosis and management; Assisted Reproductive Technology: sex selection, sperm banks, frozen embryos, in vitro fertilization, ET, EFT, IUT, ZIFT, GIFT, ICSI, PROST;	Revision	December	Mid Term Test

Modern contraceptive technologies; Demographic terminology used in family planning			
Revision	Revision	February	Test

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DEPARTMENT OF ZOOLOGY
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CLASS: B.Sc. 3rd YEAR

PAPER: SERICULTURE (ZOOL303)

NAME OF THE TOPIC	MONTH	REMARKS
Unit 1: Introduction : Sericulture: Definition, history and present status; Silk route Types of silkworms, Distribution and Races Exotic and indigenous races Mulberry and non-mulberry Sericulture	July	Routine assignments, seminars and weekly tests.
Unit 2: Biology of Silkworm : Life cycle of <i>Bombyx mori</i> Structure of silk gland and secretion of silk	August	Routine assignments, seminars and weekly tests.
Unit 3: Rearing of Silkworms : Selection of mulberry variety and establishment of mulberry garden Rearing house and rearing appliances	September	Routine assignments, seminars and weekly tests.
Unit 3 (contd.): Disinfectants: Formalin, bleaching powder, RKO Silkworm rearing technology: Early age and Late age rearing Types of mountages Spinning, harvesting and storage of cocoons	October	Assignments for CCA, seminars and weekly tests.
Unit 4: Pests and Diseases : 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	November	Routine assignments, seminars and weekly tests.
Unit 5: Entrepreneurship in Sericulture: Prospectus of Sericulture in India: Sericulture industry in different states, employment, potential in mulberry and non-mulberry sericulture. Visit to various sericulture centres.	December	Mid Term Test
Revision	February	Test

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**DEPARTMENT OF ZOOLOGY
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CLASS: B.Sc. 3rd YEAR

PAPER: AQUARIUM FISH KEEPING (ZOOL304A)

NAME OF THE TOPIC	MONTH	REMARKS
Unit 1: Introduction to Aquarium Fish Keeping : The potential scope of Aquarium Fish Industry as a Cottage Industry, Exotic and Endemic species of Aquarium Fishes	July	Routine assignments, seminars and weekly tests.
Unit 2: Biology of Aquarium Fishes : Common characters and sexual dimorphism of Fresh water and Marine Aquarium fishes such as Guppy, Molly, Sword tail	August	Routine assignments, seminars and weekly tests.
Unit 2 (contd.): Common characters and sexual dimorphism of Fresh water and Marine Aquarium fishes such as Gold fish, Angel fish, Blue morph, Anemone fish and Butterfly fish	September	Routine assignments, seminars and weekly tests.
Unit 3 Food and feeding of Aquarium fishes : Use of live fish feed organisms. Preparation and composition of formulated fish feeds	October	Assignments for CCA, seminars and weekly tests.
Unit 4: Fish Transportation : Live fish transport - Fish handling, packing and forwarding techniques.	November	Routine assignments, seminars and weekly tests.
Unit 5: Maintenance of Aquarium : General Aquarium maintenance – budget for setting up an Aquarium Fish Farm as a Cottage Industry	December	Mid Term Test
Revision	February	Test

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