

Satyaniketan's

Adv. M. N. Deshmukh Arts, Science and Commerce College, Rajur

Annual Teaching Planning 2026-2027

F.Y. B.Sc. Zoology (NEP 2020) Semester I

Subject Name -: ZOO - 101 - T: Genetics and Medical Zoology (T)

Teacher's Name- Prof. Kasar R. N.

Sr. No.	Month	Topic	No. of Periods
1.	July 2026	Recapitulation of Mendelian Genetics Non-Mendelian Genetics Multiple alleles	07
2.	August 2026	Chromosomes Sex Determination	08
3.	September 2026	Sex-linked Inheritance Introduction to Medical Zoology Epidemic Diseases in Human Vector Borne Diseases in Human Microbial Diseases in Human	07
4.	October 2026	Microbial Diseases in Human Investigations and treatments of human physiological disorders	08
Total			30

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F.Y. B.A. OE-Zoology Semester I
Subject Name -: OE - 101 - ZOO: Apiculture (T)
Teacher's Name- Prof. Kasar R. N.

Sr. No.	Month	Topic	No. of Periods
1.	August 2026	Study of honey bees: 1.1 Introduction. 1.2 Systematic Position, habit, habitat, distribution, marks of identification and nesting behavior of <i>Apis dorsata</i> , <i>Apis indica</i> , <i>Apis florea</i> and <i>Apis mellifera</i> . 1.3 Life cycle of honey bee, colony organization and division of labour. Study of Behavior and Equipments: 2.1 Bee behavior and communication - Round dance and Wag-tail dance. 2.2 Artificial bee rearing (apiary) : Beehives (Langstroth), Beekeeping and seasonal management.	10
2.	September 2026	2.3 Bee keeping equipments – Comb foundation sheet, Honey extractor, Uncapping knife, Smoker, Hive tool, Overall, Bee veil, Bee gloves, High boots, Bee brush, D. B. feeder. 2.4 Methods of extraction of honey. (Indigenous and Modern) Study of Enemies and Diseases: 3.1 Enemies of honey bee : Wax moth, Wax beetle, Wasps, Ants, Birds (Green bee eater, King crow), Amphibians and Mammals.	10
3.	October 2026	3.2 Bee diseases : Protozoan (Nosema), Bacterial (American foul brood), Viral (Sac brood), Fungal (Chalk brood). 3.3 Control and preventive measures of Bee diseases. Bee economics and Marketing: 4.1 Bee Economy : Products of apiculture industry and its uses - honey, bees wax, propolis, pollen, bee venom, royal jelly. 4.2 Bee pollination and management. 4.3 Entrepreneurship in Apiculture.	10
Total			30

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S.Y. B.Sc. Zoology Semester III
Subject Name -: ZOO - 201 - MJ : Public Health and Hygiene (T)
Teacher's Name- Prof. Kasar R. N

Sr. No.	Month	Topic	No. of Periods
1.	July 2026	Introduction to public health : 1.1 Definition and scope. 1.2 Principles and key concepts of public health. 1.3 Determinants of health (biological, environmental, socio-economic). 1.4 Right to be healthy. Communicable and non-communicable diseases : 2.1 Communicable diseases: Causes, symptoms and preventive measures of Malaria, sexually transmitted diseases, Rabies.	06
2.	August 2026	2.2 Non-communicable diseases: Heart Attack and Strokes, Asthma, Diabetes, Hypotension, Hypertension. 2.3 Introduction to Cancer, Depression, Anxiety, Arthritis. Health Education : 3.1 Definition, principle and methods of health education. 3.2 Managing population growth and promoting family health, mental health challenges in children. 3.3 Harmful effects of junk food and street food, tobacco, alcohol and drugs on health. 3.4 Unhealthy lifestyle habits: Overusing digital devices (computer & mobile phones) and their impacts on health. 3.5 Role of health education in environment improvement and prevention of diseases, national health programs and policies.	10
3.	September 2026	Hygiene : 4.1 Definition, principle and importance of hygiene. 4.2 Kinds of hygiene: Personal hygiene - regular hand washing, dental care, body odour, proper grooming, good sleep habits, menstrual health. 4.3 Community hygiene: Keeping surroundings, public spaces and shared facilities clean to stop the spread of diseases and standard hygiene practices. 4.4 Food hygiene: Safe handling, preparation, and storage of food to prevent food borne illness. Public health & hygiene : 5.1 Common hygiene-related diseases: Food poisoning, giardiasis, diarrhea. 5.2 Importance of community hygiene and public sanitation. 5.3 Hygiene practices in schools and hostels. 5.4 Role of government and NGOs in promoting hygiene (Clean India Campaign, swachh bharat abhiyan, clean village campaigns).	10

4.	October 2026	Health administration : 6.1 Structure and management of health services from national to local levels. 6.2 National health policies and government health initiatives in India, health communication methods for spreading awareness. 6.3 WHO Programme - Government and voluntary organizations and their health services. 6.4 Case study: Covid -19 pandemic, significant changes and adaptation: testing and diagnosis (swab and RT - PCR), vaccine development and preventive measures.	04
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T.Y. B.Sc. Zoology Semester V
Subject Name :- ZO 353 – Biological Chemistry
Teacher's Name- Prof. Kasar R. N.

Sr. No.	Month	Topic	No. of Periods
1	July 2026	1. Foundation of Biochemistry: Foundation of Biochemistry : 1.1 Chemical constitution of life - Water and biomolecules. 1.2 Concept of Mole, Molarity and Normality. 1.3. Types of bonds and their functions in biomolecules. 2. p H and Buffers: pH and Buffers : 2.1 Water as biological solvent - Structure & polarity of water. 2.2. Concept of pH and pH scale, concept of acid and base balance with reference to Bronsted - Lowry concept, ionization of acids and bases. 2.3 Buffer - Definition, chemical nature of buffer, Derivation of Henderson-Hassel Balch equation & its applications, buffering capacity, Types of buffer system in body fluid - Bicarbonate & phosphate system.	04
2	August 2026	Carbohydrates : 3.1 Definition, Classification & Biological importance of Carbohydrates. 3.2 Monosaccharides - Classification based on number of carbon atom -from trioses to hexoses, and functional group - aldoses & ketoses, enantiomers, stereoisomerism of carbohydrates. 3.3 Monosaccharides – Properties, Mutarotation, epimerization, tautomerization or enolization, reducing properties - oxidation and reduction, dehydration, osazone formation. 3.4 Disaccharides - Glycosidic bond, reducing and non reducing disaccharides - lactose, maltose, sucrose, trehalose. 3.5 Polysaccharides - Homo and hetero polysaccharides - types and biological importance. 3.6 Biological significance of carbohydrates. 3.7 Clinical Significance – Type 1 diabetes , Type 2 diabetes.	07
3	September 2026	Amino acids and Proteins : 4.1 General structure of amino acids, classification of amino acids based on - structure, polarity & nutritional value. 4.2 Peptide bond, organization of protein structures - Primary, secondary, tertiary and quaternary with suitable example, forces responsible for their stability. 4.3 Ramchandran plot and protein conformation. 4.4 Biological importance of proteins – Biocatalysts, carrier proteins contractile proteins, Hormonal role of proteins. 4.5. Clinical significance - Maple syrup urine disease, AKU. Enzymes : 5.1 Nomenclature and classification, active site, substrate, cofactors, concept of lock and key and induced fit theory, types and properties of enzymes.	10

		5.2 Enzyme Kinetics: Enzyme activity and factors affecting enzyme activity - pH, temperature, substrate concentration, MM equation and its physiological significance.	
4	October 2026	5.3 Enzyme inhibition: Types of inhibitions with examples. 5.4 Coenzymes: Types and function. 5.5 Isoenzymes. 5.6 Regulatory enzymes: General properties of allosteric enzymes. 6. Lipids : 6.1 Introduction, classification of lipids. 6.2. Fatty acids - Types and nomenclature, saturated and unsaturated. 6.3 Physiologically important saturated and unsaturated fatty acids, tri-acylglycerols, phospholipids, glycolipids, steroids. 6.4 Clinical significance - Obesity, atherosclerosis, myocardial infraction.	09
Total			30

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F.Y. B.Sc. Zoology (NEP 2020) Semester II

Subject Name -: **ZOO - 151 - T: Cell Biology & Biomedical Techniques (T)**

Teacher's Name- **Prof. Kasar R. N.**

Sr. No.	Month	Topic	No. of Periods
1.	January 2027	Overview of cells Plasma membrane Cell organelles: Structure and functions	02 03 06
2.	February 2027	Cell Division Introduction and scope of biomedical techniques Laboratory instruments: Introduction, principle and working	04 01 04
3.	March 2027	Biomedical Instruments: Introduction, principle & brief working Clinical Techniques: Introduction and working principle	03 04
4.	April 2027	Urine analysis	03
Total			30

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S.Y. B.Sc. Zoology Semester IV
Subject Name -: ZOO - 251 – MJ : Ecology (T)
Teacher's Name- Prof. Kasar R. N.

Sr. No.	Month	Topic	No. of Periods
1.	January 2027	Introduction to Ecology : 1.1 Definition of Ecology, types of ecology, autecology and synecology. 1.2 Levels of ecological organisation from individual organism to the biosphere. 1.3 Importance of Ecology. Ecosystem : 2.1 Ecosystem - Definition and components - biotic and abiotic. 2.2 Functions of ecosystem. 2.3 Types of ecosystems: Aquatic - Freshwater ecosystem – Lentic and Lotic	08
2.	February 2027	and Marine ecosystem, Terrestrial - Forest, Grassland and Desert ecosystem. 2.4 Food chain and food web in ecosystem. 2.5 Energy flow through the ecosystem. 2.6 Ecological pyramids - energy, biomass and number. Population Ecology : 3.1 Introduction and concepts of population ecology. 3.2 Population characteristics, population density, population size. 3.4 Population growth, factors affecting population growth, natality, mortality, immigration, emigration. 3.5 Population growth curves, types of growth curves - exponential and logistic. 3.6 Sampling techniques for determining population size and density - quadrat, mark and recapture, camera traps. 3.7 Ecological sampling techniques used to study the distribution and abundance of organisms - Line transect and Belt transect method.	08
3.	March 2027	Community Ecology : 4.1 Introduction and concepts of community ecology. 4.2 Community characteristics - species richness, dominance, diversity, abundance. 4.3 Ecotone and edge effect. 4.4 Ecological succession, types of succession with example.	08
4.	April 2027	Population Interactions : 5.1 Concept of interspecific and intraspecific population interactions. 5.2. Protocooperation - Ants and Aphids, Amazonian bees and Scale ants. 5.3 Mutualism – Honey bee and Flowering plants, <i>Acacia</i> and <i>Pseudomyrmex</i> ants.	08

		5.4 Commensalisms - Hermit crabs and gastropod shell, Remora fish on shark. 5.5 Parasitism - Tapeworms and humans, copepods and fish. 5.6 Brood parasitism - Common cuckoo, Honey guide bird. 5.7 Predation - Tiger and deer, eagle and snake. 5.8 Competition - Interspecific and intraspecific with any two examples of each.	
Total			30

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T.Y. B.Sc. Zoology Semester VI
Subject Name :- ZO 363 - Molecular Biology
Teacher's Name- Prof. Kasar R. N.

Sr. No.	Month	Topic	No. of Periods
1	December 2026	Basics of Nucleic Acids : 1.1 Structure of RNA & DNA: Introduction to nitrogenous base, sugar and phosphate group, nucleosides and nucleotides - formation and types in RNA and DNA, types of bonds in RNA and DNA, covalent- phosphodiester and glycosidic bond; Non-covalent - hydrogen and base stacking, organization of RNA & DNA, structural models of RNA and DNA. 1.2 Types of RNA and type of DNA: Structural details of mRNA, rRNA and tRNA, other important RNAs- snRNA, miRNA, siRNA, IncRNA with reference to location and important biological function only, types of DNA- circular DNA of prokaryotes and linear form of DNA in eukaryotes - B, A and Z form. 1.3 Physical and chemical properties of DNA (B Form of DNA): Introduction to physical properties: Double helix, density, solubility, viscosity, hyperchromicity, T_m. 1.2 1.4 Introduction to chemical properties: Acidic nature, hydrolysis, denaturation, renaturation (Annealing), oxidation, alkylation.	05
2	January 2027	Chromatin : 2.1 Structure of chromatin: Basic organization - —String on bead structure, basic unit- Nucleosome: structural details, linker DNA, nucleoproteins: histones and their types; non-histones . 2.2 Packaging of DNA: Prokaryotic DNA: Supercoiling- Positive and Negative loop domains, nucleoid associated proteins (NAPs), eukaryotic DNA: chromatin fiber-10 and 30 nm fiber; loop domains; highly condensed form -chromosome. 2.3 Types of chromatins: Heterochromatin, euchromatin. Central Dogma of Molecular Biology 3.1 DNA replication: 3.2 Properties of replication: Semiconservative nature - Messelson and Stahl expt.), bi-directional replication, semi-discontinuous process, directionality, high fidelity / accuracy, template dependent process, requirement of RNA primer, requirement of dNTPs, enzymes involved / driven process.	08

3	February 2027	3.3 Types of replication : Based on models of replication - conservative, semiconservative and dispersive; Based on mode of replication -bidirectional and unidirectionalbasic mechanism of replication in prokaryotes and eukaryotes. 4.1 Transcription : Basic mechanism of transcription in prokaryotes and eukaryote, structure of RNA polymerase in prokaryotes and eukaryotes, eukaryotic RNA modifications and processing – splicing of mRNA, modifications at 3’and 5’ end. 4.2 Translation : Genetic code, properties of genetic code, basic mechanism of translation in prokaryotic and eukaryotic cells.	10
4	March 2027	. 5. Lac operon: 6. DNA Damage and repair mechanism : 6.1 Types of DNA Damage: 6.2 Introduction to DNA Damage,Base modification, single stranded break, double stranded break, pyrimidine dimers, DNA cross linking, replication error (mismatch bases), insertions and deletion,spontaneous damage -Depurination and Depyrimidination. 6.3 Causes of DNA Damage : Physical agents - UV radiation (thymine dimers) and X-rays (strand break), chemical agents - deamination, alkylation and oxidation. 6.4Photo repair, dark repair, base excision: a) Direct repair-Photoreactivation (thymine dimer removal). b) Base excision repair (BER). c) Nucleotide excision repair (NER). d) Double strand break repair.	07
Total			30