

SARDAR PATEL UNIVERSITY
Programme: B.Sc. (ZOOLOGY)
Semester: V, MAJOR ZOOLOGY
NEP Syllabus with effect from: June 2025

Paper Code: US05MAZOO01	Total Credit: 4
Title Of Paper: Genetics & Biotechnology	

Objectives	<ul style="list-style-type: none"> • To Provide Details Studies of Mendelism, Genetic Interaction, Mutation and Human Genetics • To Provide Basis of Biotechnology
Out Come	<ul style="list-style-type: none"> • To learn about Mendel and his work, Genetic Interactions, Mutation , Eugenics and Euthenics • To Learn about Polymorphism of DNA • To learn about Basic of Biotechnology and In Vitro Fertilization

Unit	Description in detail	Weighting (%)
1	Introduction: Definition, scope, branches and application of genetics. Mendel and his work: Phenomenon, mechanism, variation in Dominance relation - Monohybrid cross, Law of segregation, Law of independent assortment : Dihybrid cross, back cross, test cross Gene interaction: Kinds of Epistatic & Non-Epistatic interaction, ethal genes	25%
2	Cytoplasmic or Extra nuclear inheritance: Kappa particle in paramecium, Shell coiling in Limnea , Mitochondrial & Chloroplast DNA Sex linked inheritance & sex influenced genes Crossing over : Characteristics, types, mechanism and kinds of crossing over Gene linkage : Kinds of Linkage Mutation: classification in detailed, Nature of mutation	25%
3	Polymorphism in DNA Types of non-genetic RNA Biosynthesis of protein, Component of protein synthesis [amino acid, DNA, RNA, Ribosome, and enzymes]. Human genetics: pedigree analysis, amniocentesis, twins, disorders due to Mutant genes, karyotyping of human chromosomes, banding techniques. Eugenics: positive and negative Eugenics, Euthenics, Euphenics	25%
4	Animal cell and tissue culture: disaggregation, isolation, slide, flask, organ Culture, whole embryo culture. In vitro fertilization [IVF]: types and causes of infertility, assessment of patient, treatment of patient for IVF, oocyte recovery, preparation of semen, oocyte Culture and IVF, fertilization, embryo transfer. Superovulation, IVF and embryo transfer Transgenic animals.	25%

Basic Text & Reference Books:

Genetics: P S Verma.
 Genetics: M .P .Arora.
 Molecular biology and Genetics engineering: P. K. Gupta.
 Cell biology, Genetics and Molecular biology: P.S.Verma.
 The element of biotechnology: P S Verma.
 Animal biotechnology: M M Ranga
 Biotechnology fundamentals and applications: S S Purohit.

SARDAR PATEL UNIVERSITY
Programme: BSC (ZOOLOGY)
Semester: V, MAJOR ZOOLOGY
NEP Syllabus with effect from: June 2025

Paper Code: US05MAZOO02	Total Credit: 4
Title Of Paper: Ecology and Animal Behaviour	

Objectives	<ul style="list-style-type: none"> To Provide Details Studies of Ecology, Biodiversity, behaviour and Chronology
Out Come	<ul style="list-style-type: none"> To learn about Deferent Ecosystems, Biodiversity and Behaviours To learn about different methods of Animal behaviour, Types of animal behaviour and Biological Clock

Unit	Description in detail	Weighting (%)
1	<p>Community Ecology: General features of community Species richness, Dominance, Diversity, Abundance, Types of Stratification, Ecotone and edge effect.</p> <p>Ecological Niches: Parameters of the niches, Parallel niches, Niche separation, Niche overlap</p> <p>Ecological Succession: Characteristics & General process of Succession, Types of succession, Rate and causes of succession.</p>	25%
2	<p>Biodiversity: Measuring species diversity, Importance & Benefits of Biodiversity, Loss of Biodiversity, Natural Biodiversity, Threatened of Biodiversity, Endangered species management. Biodiversity Hotspots</p> <p>Major anthropogenic Global environmental problems:</p> <ul style="list-style-type: none"> Eutrophication Global warming & greenhouse effect Global ozone problems-[Ozone depletion-causes & effects] Acid rain Soil erosion, Impacts of soil erosion, 	25%
3	<p>Methods of studying behaviour: Naturalistic, Experimental, Statistical</p> <p>Reproductive behaviour: Introduction, Type of fertilization, Characteristics of courtship Attention and courtship: Visual, Sound, Light, Tactile, Courtship in Stickle back fish.</p> <p>Sexual behaviour: Asymmetry of sex, Sexual dimorphism, Mate choice, Intra-sexual selection [Male rivalry], Inter- sexual selection [Female choice], Sexual conflict in Parental care.</p>	25%

4	Chronobiology: Biological clock and Biological Rhythm Circadian Rhythm, Circaannual Rhythm, Lunar Rhythm, Tidally Rhythm, Photoperiod and regulation of Seasonal reproduction of Vertebrate Role of Melatonin Chronopharmacology	25%
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Basic Text & Reference Books:

Ecology & Environment: P.D.Sharma

Ecology: Mohan P. Arora

Environmental Science-S.C.Santra

Environmental biology: P.S.Verma & V.K.Agrawal

Zoology for IAS: Satguru Prasad

Animal behavior: Reena mathur

Text Book of Animal Behaviour: Fatik Baran Mandal

<https://byjus.com/free-ias-prep/biodiversity/>

SARDAR PATELL UNIVERSITY
Programme: B.Sc. (ZOOLOGY)
Semester: V- MAJOR ZOOLOGY PRACTICAL
NEP Syllabus with effect from: June 2025

Paper Code: US05MAZOO03	Total Credit: 4
Title Of Paper: Zoology Practical	

Objectives	To Provide Hands on Practical experience to the students
Out Come	Part-1: To learn Mitosis and Meiosis stages from relevant organisms and Genetic preparations Part-2: To learn about water & soil characteristics and Animal relationship & Behaviour studies

Part -1	<ul style="list-style-type: none"> • Study of mitosis by Squash preparation of onion root tip. • Study of meiosis from grass hopper testis. • Mounting of giant chromosomes from chironomous larva. • Study of different characteristics of drosophila. • Genetics problems. • Isolation of DNA from tissue. • Bioinformatics.[phylogeny] • Visit to SICART • Study of tissue culture 	2 credits
Part-2	<ul style="list-style-type: none"> • Soil analysis • Water analysis: Dissolved oxygen, Chloride content, Acidity & alklinity • To study abiotic components.[pH , turbidity, Temperature and light intensity] • To study community by quadrate method. • Study of different method of animal behavior by visiting in field and project work. • Study of different animals with reference to their behavior. • Visit to field and submission of project work. 	2 credits

Basic Text & Reference Books:

Environmental biology: P.S.Verma & V.K.Agrawal
 Zoology for IAS: Satguru Prasad
 Animal behavior: Reena mathur
 Text Book of Animal Behaviour: Fatik Baran Mandal
 Practical biochemistry: Plumer

SARDAR PATEL UNIVERSITY
Programme: BSC (ZOOLOGY)
Semester: V - MINOR ZOOLOGY-1[T]
NEP Syllabus with effect from: June 2025

Paper Code: US05MIZOO01	Total Credit: 2
Title Of Paper: ENVIRONMENTAL BIOLOGY	

Objectives	To aware the students about different Human diseases & Mechanism of Immune system.
Out Come	Students learned & understand about Human diseases and taking preventive Care of it.

Unit	Description in detail	Weighting (%)
1	Health and Environment: Human diseases, Climate change & Human health, Vector borne diseases, Metal toxicity, Radiation damage, Mechanisms of the Immune system- Antigen & Antibody Antigen-Antibody Reaction, Hypersensitivity, Autoimmunity, Allergy- Allergic Rhinitis[Hay fever], Pollen and their Allergens, Asthma, Ingestant allergy, Dermatitis.	25%
2	Major anthropogenic Global environmental problems: <ul style="list-style-type: none"> • Global warming & greenhouse effect • Global ozone problems-[Ozone depletion-causes & effects] • Acid rain • Soil erosion, Impacts of soil erosion • Environmental impacts of Agriculture, The failure of green revolution, Impact of modernisation in Agriculture 	25%

Basic Text & Reference Books:

Ecology & Environment: P. D. Sharma

Ecology: Mohan P. Arora

Environmental Science-S. C. Santra

Environmental biology: P. S. Verma & V. K. Agrawal

SARDAR PATEL UNIVERSITY
Programme: B.Sc. (ZOOLOGY)
Semester: V- MINOR PRACTICAL
NEP Syllabus with effect from: June 2025

Paper Code: US05MIZOO02	Total Credit: 2
Title Of Paper: Zoology Practical	

Objectives	To Provide Hands on Practical experience to the students
Out Come	To learn about Human diseases and taking preventive care of it.

	<ul style="list-style-type: none"> • Malaria- Signet ring stage, Entamoeba histolytica, Anopheles and Culex mosquitoes, Ascaris, Filarial worm, Trypanosoma, Leishmania, Guinea worm • Widal Test for Typhoid[Antigen-antibody reaction] • Study of the pollen grains of different plants. • Visit to Hospital and preparing the report. • To study abiotic components.[pH , turbidity, Temperature and light intensity] • Soil analysis • Water analysis: Dissolved oxygen, Chloride content, • Water Acidity & alklinity 	2 credits
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SARDAR PATEL UNIVERSITY
Programme: BSC (ZOOLOGY)
Semester: V - MINOR ZOOLOGY-2[T]
NEP Syllabus with effect from: June 2025

Paper Code: US05MIZOO03	Total Credit: 2
Title Of Paper: PHYSIOLOGY	

Objectives	To provide exposure to histology, Physiology and related abnormalities.
Out Come	The students will learn about detail physiology of Respiratory and Excretory system and related disorders.

Unit	Description in detail	Weighting (%)
1	RESPIRATION: <ul style="list-style-type: none"> • Respiratory Organs • Pulmonary Ventilation • Lung Volumes & Capacity • Transportation of Gases • Regulation of Respiration • Disorders: Asthma, Cystic fibrosis, Emphysema, Pneumonia, Bronchitis, Tuberculosis. 	50%
2	Human Urinary system: <ul style="list-style-type: none"> • Structure of kidney, Renal physiology (Glomerular filtration, Tubular reabsorption and tubular secretion in brief), • Production of dilute and concentrated urine (counter current system) Urine transportation, • Storage and elimination. Disorders: Polycystic kidney disease, urinary tract infection and renal failure	50%

Basic Text & Reference Books:

A Text book of Animal Physiology by A.K.BERRY.
A Text book of Animal Physiology by M.P.ARORA.
Principles of Anatomy & Physiology by TORTORA and GRABOWSKI

SARDAR PATEL UNIVERSITY
Programme: B.Sc. (ZOOLOGY)
Semester: V- MAINOR PRACTICAL
NEP Syllabus with effect from: June 2025

Paper Code: US05MIZOO04	Total Credit: 2
Title Of Paper: Practical	

Objectives	To provide exposure to histology, Physiology and related abnormalities.
Out Come	The students will learn about identifying Respiratory and Excretory system related disorders by performing different practicals.

	<ul style="list-style-type: none"> • Mammalian Histology: T.S of lung, Trachea, Alveoli, Kidney, Artery, Vein & Capillaries • Effects of osmotic pressure on Human R.B.Cs. • Estimation of Haemoglobin. • Physical properties and examination of Urine. • Qualitative Analysis of urine for Inorganic and organic constituents. • Qualitative Analysis of urine for Pathological constituents of clinical importance. • Project Submission 	2 credits
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Basic Text & Reference Books:

A Manual of Practical Zoology- Chordata by P.S.VERMA

Practical Physiology, Anatomy & Biochemistry by SHAH, PATEL& GOEL

SARDAR PATEL UNIVERSITY
Programme: BSC (ZOOLOGY)
Semester: V – SEC – ZOOLOGY [T]
NEP Syllabus with effect from: June 2025

Paper Code: US05SEZOO01	Total Credit: 2
Title Of Paper: Animal Rescue, care and Rehabilitation	

Objectives	<ul style="list-style-type: none"> • To aware the students- • How to assess animals and identify symptoms and causes of distress • Show you how to safely handle, restrain, transport, and release wildlife • Show you exactly what a wildlife rehabilitator does in their day to day work
Out Come	<ul style="list-style-type: none"> • Students will be able to identify animals in distress and know when to step in. • Students will be able to treat common injuries such as broken limbs and wings and rearing them. • Students will learn what they can do to assist in the community

Unit	Description in detail	Weighting (%)
1	Principles of capture, handling and transportation Telephone advice to the general public Wildlife capture and handling Health and Safety Legal considerations Care and Hand-rearing of young wild animals Considerations for rearing wildlife casualties Rearing juvenile mammals Rearing neonatal birds	50%
2	Rehabilitations and Release Management during rehabilitation Pre-release assessment Release Post-release monitoring Licenses for release and post release monitoring	50%

Basic Text & Reference Books:

Wildlife Rescue Handbook: The first 24 hours- Foundation for National Parks & Wild life
MINIMUM STANDARDS FOR WILDLIFE REHABILITATION Fourth Edition, 2012, - Erica A. Miller, DVM
BSAVA Manual of Wildlife Casualties- Second Edition- Elizabeth Mullineaux and Emma Keeble



SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar, Gujarat

(Reaccredited with 'A' Grade by NAAC (CGPA 3.25)

Syllabus with effect from the Academic Year 2026-2027

Bachelor of Science ZOOLOGY (Semester-5, UG)

Bachelor of Science (ZOOLOGY)
Skill Enhancement Course (ZOOLOGY)
Semester: V

Course Code	US05SEZOO02 (P)	Title of the Course	Basic Zoology & Human Health Studies (Practical)
Total Credits of the Course	2	Hours per Week	4

Course Objectives:	<ol style="list-style-type: none">1. To develop basic skills in zoological specimen preparation and identification.2. To introduce students to basic human health monitoring techniques.3. To familiarize students with human anatomy, physiology, and diagnostic methods.4. To enhance observational and analytical skills through field study and project work.
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Course Content: Aim for Practical	Weightage* (%)
<ol style="list-style-type: none">1. Preparation of permanent slides and whole mount of mosquito.2. Identification of local insects and birds.3. Study of hybrid mammals.4. Measurement of blood pressure (B.P.) and pulse rate.5. Identification and differentiation of human hair and animal hair.6. Study of fingerprint patterns.7. Study of types of human endocrine glands.8. Study and interpretation of human blood test reports.9. Guidelines for living a healthy life.10. Field study / Project submission / Case study.	100%

Teaching-Learning Methodology	<ul style="list-style-type: none">□ Demonstration of practical techniques□ Laboratory-based learning□ Field visits and specimen observation□ Use of charts, models, and digital resources□ Student presentations and project work
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Syllabus with effect from the Academic Year 2026-2027

Bachelor of Science ZOOLOGY (Semester-5, UG)

Evaluation Pattern		
Sr. No.	Details of the Evaluation –NEP 2020, KCG and CCE (Continuous and Comprehensive evaluation.	Weightage
1.	Internal Examination evaluation includes Lab Work -10 (40%), Viva voice/Lab Quiz-10 (40%), Attendance-05 (20%) Which makes total 25 Marks.	50%
2.	Semester End Examination evaluation includes Lab Work -20(80%), Viva voice/Lab Quiz-05(20%), Which makes total 25 Marks.	50%

Course Outcomes:
Having completed this course, the learner will be able to: <ol style="list-style-type: none">1. Prepare permanent mounts and zoological specimens.2. Identify local insects, birds, and mammals.3. Measure vital health parameters such as blood pressure and pulse rate.4. Differentiate human hair and analyze fingerprint patterns for identification.5. Interpret basic human blood reports and understand endocrine functions.6. Develop awareness of healthy lifestyle practices.

Suggested References:
<ol style="list-style-type: none">1. Practical Zoology – P.S. Verma2. Human Physiology – Guyton & Hall3. Basic Zoology – Kotpal

On-line resources to be used if available as reference material Online resources: NPTEL, BISAG Video Lectures
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