

**SARDAR PATEL UNIVERSITY**  
**B.Sc. SEMESTER–III,**  
**ZOOLOGY PAPER CODE:US03MAZOO01**  
**TITLE OF PAPER: INVERTEBRATA & ECONOMIC ZOOLOGY**  
**SYLLABUS EFFECTIVE FROM: JUNE 2024**  
**(TOTAL CREDIT: 4)**

Objectives	<ul style="list-style-type: none"> <li>• To Give an Overview Invertebrate, Applied Zoology,</li> <li>• To provide Detail about the Types study of Major Invertebrates and General account.</li> <li>• To Provide out line of Economic aspect of Zoology</li> </ul>	
Out Come	<ul style="list-style-type: none"> <li>• The students can have General account Idea of the Invertebrates and Economic Usefulness of Invertebrate Animals.</li> <li>• Type study will provide detail about anatomy and physiology of the Major Invertebrate animals.</li> </ul>	
Unit-1	<ul style="list-style-type: none"> <li>• Type: Hydra (Habit &amp; Habitat, External morphology, Internal structure, Nematocysts, Locomotion, Nutrition, Respiration, Excretion, Osmoregulation, Nervous, Behaviour, Reproduction, Regeneration, Immortality in Hydra)</li> <li>• Polymorphism</li> <li>• Corals and Coral reefs</li> </ul>	25%
Unit-2	<ul style="list-style-type: none"> <li>• Type: Taenia Solium (Habit &amp; Habitat, External Morphology, Digestive System, Respiration, Excretory System, Reproductive System, Life cycle &amp; Development, Parasitic Adaptations.</li> <li>• Type: Leech ((Habit &amp; Habitat, External Morphology, Body wall, Locomotion, Digestive System, Respiration, Excretory System, Nervous System, Sense organs, Reproductive System, Lifecycle &amp; Development, Parasitic Adaptations of Leech)</li> </ul>	25%
Unit-3	<ul style="list-style-type: none"> <li>• Type: Prawn (Habit &amp; Habitat, External Morphology, Locomotion, Digestive System, Respiratory system, Excretory System, Nervous System, Sense organs, Reproductive System, Lifecycle &amp; Development)</li> <li>• Types of mouth parts in Insects</li> <li>• House hold insects and methods of Insects control</li> <li>• Respiration in Arthropod</li> </ul>	25%

Unit-4	Economic Zoology: Including Life Cycle <ul style="list-style-type: none"> <li>• Apiculture</li> <li>• Lac culture</li> <li>• Sericulture</li> <li>• Prawn culture</li> <li>• Pearl culture</li> </ul>	25%
--------	---	-----

Basic text & Reference Books:

- Modern Textbook of Zoology–Invertebrate by R. L. Kotpal.
- Invertebrate Zoology by -Jordan & Verma
- Economic Zoology by Shukla & Upadhyay

<b>SARDAR PATEL UNIVERSITY</b> <b>B.Sc. SEMESTER–III,</b> <b>ZOOLOGY PAPER CODE:US03MAZOO02,</b> <b>TITLE OF PAPER: PHYSIOLOGY &amp; ADAPTATION</b> <b>SYLLABUS EFFECTIVE FROM: JUNE2024</b> <b>(TOTALCREDIT:4)</b>		
Objectives	<ul style="list-style-type: none"> <li>• To Provide details about the three system Physiology of mammals like Mammals</li> <li>• To provide adaptive changes which acquired by the animals indifferent ecosystem.</li> </ul>	
OutCome	<ul style="list-style-type: none"> <li>• the students will learn about detail physiology of digestive, Respiratory and Circulatory Systems helps respiration</li> <li>• The students will learn about the acquired adaptations due to different ecosystem</li> </ul>	
Unit-1	<b>ENDOCRINOLOGY</b> <ul style="list-style-type: none"> <li>• Hypothalamus and Pituitary</li> <li>• Thymus</li> <li>• Thyroid and Parathyroid</li> <li>• Pancreas</li> <li>• Adrenal</li> <li>• Ovary and testis</li> <li>• Pineal</li> <li>• Disorders: Diabetes Type 1,2 and Insipidus, Hyperthyroidism.</li> </ul>	25%

Unit-2	<b>RESPIRATION&amp; CIRCULATION</b> <ul style="list-style-type: none"> <li>• Respiratory Organs</li> <li>• Pulmonary Ventilation</li> <li>• Lung Volumes &amp; Capacity</li> <li>• Regulation of Respiration</li> <li>• Disorders: Asthma, Cystic fibrosis, Emphysema, Pneumonia, Bronchitis, Tuberculosis.</li> <li>• Structure &amp; working mechanism of Heart</li> <li>• Cardiac Cycle &amp; ECG, Transport of Gases</li> </ul>	25%
Unit-3	<b>NERVOUS SYSTEM</b> <ul style="list-style-type: none"> <li>• Structure and Functions of Neurons and Nerves</li> <li>• Transmission of Impulses</li> <li>• Central nervous System</li> <li>• Peripheral Nervous System</li> <li>• Disorders: Catalepsy, Alzimer's, Epilepsy, Meningitis</li> </ul>	25%
Unit-4	<b>ADAPTATIONS IN ANIMALS</b> <ul style="list-style-type: none"> <li>• Terrestrial: Desert, Burrowing, Cursorial, Arboreal, Volant</li> <li>• Aquatic adaptation</li> <li>• Special: Mimicry, Camouflage, Echolocation in Bat, Electric organs in Fish.</li> </ul>	25%

**Basic Text & Reference Books:**

- A Text book of Animal Physiology by A.K. BERRY.
- Animal Physiology by M.P. ARORA.
- Principles of Anatomy & Physiology by TORTORA and GRABOWSKI
- Zoology for IAS by SATGURUPRASAD.
- Animal Ecology by SUKLA & UPADHYAY.

**SARDARPATELUNIVERSITY**  
**B.Sc. SEMESTER-III,**  
**ZOOLOGY PRACTICAL PAPER**  
**CODE:US03MAZOO03**  
**ZOOLOGY PRACTICAL-I (CREDIT:2)**

**CLASSIFICATION OF INVERTEBRATES (UP TO ORDERS):**

- **PROTOZOA & PORIFERA:** Ceratium, Arcella, Polystomella, Opalina, Vorticella, Trypanosoma, Sicon, Hylonema, Spongilla, Spicules, Gemmule and Spongin fibres of sponges
- **COELENTRATA & HELMINTHES:** Hydra, Obelia, Milipora, Aurelia, Pennatula, Zooanthus, L. S. of Hydra, T. S. passing through Testis and Ovary of Hydra, Obelia medusa, Planaria, Bipalium, Pin worm, Guinea worm
- **ANNELIDA & ARTHROPODA:** Aphrodite, Arenicola, Earthworm, Leech, Centipede, Cyclops, Prawn, Mantis, Beetle, Lac insect, Honeybee, Termite, Limulus, Scorpion
- **MOLLUSCA & ECHINODERMATA:** Murex, Aplysia, Sepia, Pearl oyster, Nautilus, Starfish, Brittlestar, Featherstar, Seaurchin, Sea cucumber, Balanoglossus
- Taenia Solium life cycle stages  
Dissection by Simulation, Animation or Charts
- Leech: External characters, Digestive System, Reproductive System, Nervous System  
Mountings of Salivary glands, Jaws, Testicular nephridia  
Prawn: External characters, Digestive System, Reproductive System, Nervous System  
Appendages of Prawn
- Types of mouth parts in Insects
- Field Visit

Objectives	<ul style="list-style-type: none"> <li>• To Provide detail about animals and their Identification through Preserved animals</li> <li>• Study of system through animation and chart</li> </ul>	
Outcome	<ul style="list-style-type: none"> <li>• The students will learn Characteristics from real preserved animals and type of Animals through Animation</li> </ul>	

**Basic Text & Reference Books:**

- Practical Zoology Invertebrate by S.S. LAL.

**SARDARPATELUNIVERSITY  
B.Sc. SEMESTER–III,  
ZOOLOGYPRACTICALPAPER  
CODE:US03MAZOO03  
ZOOLOGYPRACTICAL–II (CREDIT:2)**

- Mammalian Histology: T.S. of Pituitary gland, Adrenal Gland, Thyroid Gland, Thymus Gland, Pineal Gland, Pancreases, Testis and Overy
- T.S of lung, trachea, alveoli, Neuron, Nerve, Heart, Artery and Vein

**Hematology test effecting oxygen carrying**

- RBC counting
- Hb Estimation
- Effect of osmotic pressure on RBC
- To Observe Rouleaux condition of RBC
- Terrestrial Adaptation
- Aquatic Adaptation
- Aerial Adaptation

Objectives	<ul style="list-style-type: none"> <li>• To Provide an Idea of mammalian Physiology Through real time practical</li> <li>• To provide Behavioral aspect of Animals</li> </ul>	
OutCome	<ul style="list-style-type: none"> <li>• Students can learn working of enzymes, anatomy of tissues and Blood physiology</li> </ul>	

**BasicText&Reference Books:**

- A Manual of Practical Zoology- vertebrate by P.S.VERMA
- Practical Physiology, Anatomy & Biochemistry by SHAH,PATEL&GOEL  
Practical Zoology vertebrate by S.S. LAL.

<p style="text-align: center;"><b>SARDAR PATEL UNIVERSITY</b>  <b>B.Sc. SEMESTER-III,</b>  <b>ZOOLOGY PAPER</b>  <b>CODE:US03IDZOO01</b>  <b>TITLE OF PAPER: FOOD AND NUTRITION</b>  <b>SYLLABUS EFFECTIVE FROM: JUNE 2024</b>  <b>(TOTAL CREDIT:2)</b></p>		
Objectives	<ul style="list-style-type: none"> <li>• To Give an Idea of Different food sources from various food items and preparations for balanced nutrition,</li> <li>• Sources of Minerals and Vitamins from food</li> </ul>	
Out Come	<ul style="list-style-type: none"> <li>• The students will learn about Different types of Food stuff with specialized source of food</li> <li>• Nutritional value of food containing, Vitamins and Minerals</li> </ul>	
Unit-1	<p><b>Food and Sources:</b>  Source and Types of Carbohydrate.  Source and Types of Protein  Source and Types of Fat [Lipid]  Source and Types of Nucleic Acids  Guidelines for Healthy Eating</p>	50%
Unit-2	<p><b>Nutrition:</b>  Source and Types of Minerals  Source and Types of Vitamins  Digestion of Carbohydrate, Protein, Fat [Lipid], Nucleic Acids  heat and energy balance  Disorders: Hypothermia, Fever and Obesity</p>	50%

Basic Text & Reference Books:

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

**SARDARPATELUNIVERSITY**  
**B.Sc. SEMESTER-III,**  
**PAPER CODE: US03IDZOO02**  
**ZOOLOGY PRACTICAL**  
**SYLLABUS EFFECTIVE FROM: JUNE 2024**  
**(TOTAL CREDIT: 2)**

- Samples of Food of carbohydrate
- Samples of Food of Protein
- Samples of food of Lipids
- Samples of Food of Vitamins
- Acid and Alkaline water test
- Colour and Precipitation Reactions on Carbohydrates
- Colour and Precipitation Reactions on Protein
- Colour and Precipitation Reactions on Lipids

Objectives	<ul style="list-style-type: none"> <li>• To Provide detail about animals and their Identification through Preserved animals</li> <li>• Study of system through animation and chart</li> </ul>	
OutCome	<ul style="list-style-type: none"> <li>• The students will learn Characteristics from real preserved animals and type of Animals through Animation</li> </ul>	

**Basic Text & Reference Books:**

- Practical Anatomy, Physiology and Biochemistry by Goyal and patel



# 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-3, UG)

Bachelor of Science (ZOOLOGY)

(ID ZOOLOGY)

Semester: III

Course Code	US03IDZOO03	Title of the Course	Food, Nutrition and Circulation
Total Credits of the Course	2	Hours per Week	2

Course Objectives:	<ol style="list-style-type: none"><li>1. To provide basic knowledge of food components and human nutrition.</li><li>2. To understand the process of digestion of major biomolecules.</li><li>3. To study the structure and function of the circulatory system.</li><li>4. To create awareness about common health disorders related to nutrition and circulation.</li></ol>
--------------------	---

Course Content		
Unit	Description	Weightage* (%)
1.	<b>Food and Nutrition:</b> <ul style="list-style-type: none"><li>□ Food and sources of carbohydrates, proteins, and lipids.</li><li>□ Sources and types of vitamins.</li><li>□ Digestion of carbohydrates.</li><li>□ Digestion of proteins.</li><li>□ Digestion of lipids.</li><li>□ Guidelines for healthy eating.</li><li>□ Disorders: Fever and obesity.</li></ul>	50%
2.	<b>Circulation:</b> <ul style="list-style-type: none"><li>□ Types of circulatory systems.</li><li>□ Types of hearts.</li><li>□ Composition of blood.</li><li>□ Coagulation of blood and anticoagulants.</li><li>□ Structure and working of the human heart.</li><li>□ Nodal tissues of the heart and cardiac cycle.</li><li>□ Structure of blood vessels.</li><li>□ Disorders: High and low blood pressure.</li></ul>	50%

Klee





# 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-3, UG)

Teaching-Learning Methodology	<ul style="list-style-type: none"><li>□ Classroom lectures and discussions</li><li>□ Use of charts, models, and diagrams</li><li>□ ICT tools such as presentations and videos</li><li>□ Case studies and health-based discussions</li><li>□ Assignments and student presentations</li></ul>
-------------------------------	---

Evaluation Pattern		
Sr. No.	Details of the Evaluation –NEP 2020, KCG and CCE (Continuous and Comprehensive Evaluation.	Weightage
1.	Internal Examination Evaluation includes Class Test (At least one)-10(40%), Quiz (At least one)-05(20%), Home Assignment-05(20%), Attendance-05(10%) This makes total 25 Marks.	50%
2.	Semester End Examination (25 Marks)	50%

Course Outcomes: Having completed this course, the learner will be able to
<ol style="list-style-type: none"><li>1. Understand the importance of balanced diet and nutrients.</li><li>2. Explain the digestion of carbohydrates, proteins, and lipids.</li><li>3. Identify sources and functions of vitamins.</li><li>4. Describe the structure and function of the circulatory system.</li><li>5. Understand the working of the human heart and blood vessels.</li><li>6. Recognize common disorders related to nutrition and blood pressure.</li></ol>

Suggested References:
<ol style="list-style-type: none"><li>1. A text of Animal physiology by A K Berry</li><li>2. Human Physiology – Guyton &amp; Hall</li><li>3. Textbook of Biochemistry – U. Satyanarayana</li><li>4. Basic Zoology – Kotpal</li><li>5. Fundamentals of Human Physiology – Lauralee Sherwood</li></ol>

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

Klee

\*\*\*\*\*





# 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-3, UG)

Bachelor of Science  
(ID ZOOLOGY)  
Semester: III

Course Code	US03IDZOO04	Title of the Course	Zoology Practical (Food, Nutrition and Circulation)
Total Credits of the Course	2	Hours per Week	4

Course Objectives:	<ol style="list-style-type: none"><li>1. To introduce students to basic biochemical tests for biomolecules.</li><li>2. To develop practical skills in simple clinical laboratory techniques.</li><li>3. To understand the structure and function of blood components.</li><li>4. To enhance analytical and observational skills through practical work and case studies.</li></ol>
--------------------	--

Course Content	
Practical Aim	Weightage* (%)
<ol style="list-style-type: none"><li>1. Biochemical tests for carbohydrates.</li><li>2. Biochemical tests for proteins.</li><li>3. Biochemical tests for lipids.</li><li>4. Preparation of haemin crystals.</li><li>5. Study of types of leucocytes.</li><li>6. Study of the effect of osmotic pressure on red blood cells (RBCs).</li><li>7. Histology of blood vessels.</li><li>8. Project submission / Case study report.</li></ol>	100%

Teaching-Learning Methodology	<ul style="list-style-type: none"><li>□ Laboratory-based practical work</li><li>□ Demonstration of biochemical tests</li><li>□ Microscopic observation and slide study</li><li>□ Use of charts, models, and digital tools</li><li>□ Case studies and student presentations</li></ul>
-------------------------------	--

Klee





# 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-3, 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
<ul style="list-style-type: none"><li><input type="checkbox"/> Perform basic biochemical tests for carbohydrates, proteins, and lipids.</li><li><input type="checkbox"/> Prepare and identify haemin crystals.</li><li><input type="checkbox"/> Identify different types of leucocytes.</li><li><input type="checkbox"/> Understand the effect of osmotic pressure on RBCs.</li><li><input type="checkbox"/> Describe the histological structure of blood vessels.</li><li><input type="checkbox"/> Develop analytical and practical skills in clinical laboratory techniques.</li></ul>

Suggested References:
<ol style="list-style-type: none"><li>1. Practical Biochemistry – David T. Plummer</li><li>2. Textbook of Biochemistry – U. Satyanarayana</li><li>3. Human Physiology – Guyton &amp; Hall</li><li>4. Histology Techniques – K. Laxminarayan</li></ol>

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

Klee

