

**SARDAR PATEL UNIVERSITY**  
**B.Sc. Zoology Semester I**  
**Effective from June 2023**  
**Zoology Core Course**

<b>Course Code</b>	<b>US1MAZOO01 (T)</b>	<b>Title of the Course</b>	<b>Animal Diversity and Physiology-1</b>
<b>Total Credits of the Course</b>	<b>04</b>	<b>Hours per Week</b>	<b>04</b>
<b>Programme outcome (PO) for B.Sc.</b>	<ol style="list-style-type: none"> <li>1. Bachelor of Science degree program provides theoretical and practical knowledge of different Science subjects in consonance with National Education Policy 2020.</li> <li>2. This programme provides a flexibility to students to acquire certificate course, diploma course, degree programme, honours degree with or without research having multi entry and multi exit facilities.</li> <li>3. Bachelor of Science programme at Sardar Patel University is designed keeping the overall back ground preparation in mind for the student to either opt for a Master programme or jobs or to become an entrepreneur.</li> <li>4. At the entry level of the programme, i.e., semester one, various subjects offered as major subject, minor subject, interdisciplinary subject as per choice of the students.</li> <li>5. In addition to that, some skill enhancement courses, ability enhancement courses and value-added courses are also offered for overall development of the students.</li> <li>6. After end of the even semesters, the students may take exit after fulfilling the minimum requirements.</li> <li>7. The students have the enough opportunity to complete four-year graduation programme with any major subject as per their choice.</li> <li>8. The students, after completion of the program from Sardar Patel University, can opt for the master's degree programme in the subject they have had at the final semester, or in a related discipline.</li> </ol>		
<b>Course Outcome (CO) For Zoology</b>	<ol style="list-style-type: none"> <li>1. To improve the scientific awareness among the students.</li> <li>2. To make students to understand the role and contribution of Zoology in the development of science.</li> <li>3. To improve scientific attitude and to give emphasis on the development of experimental skills, data analysis, calculations, and also on the limitations of the experimental method and Scientific data as well as results obtained.</li> <li>4. To help students in understanding the concepts of Zoology.</li> </ol>		

Course Specific Outcome (CPO) For Zoology, Theory and Practicals	<ol style="list-style-type: none"> <li>1. The students will learn about the Lower and Higher Invertebrates</li> <li>2. The General account of Protozoan, Sponge and Coelomates</li> <li>3. The General Account of Higher Invertebrates</li> <li>4. The Physiology of Digestion and Enzymatic activities and Diseses</li> </ol>
Course Objectives:	<ol style="list-style-type: none"> <li>1. To understand the Zoological concepts of Animal with particular emphasis on their Experimental outcomes.</li> <li>2. To understand the basic concepts of types of Invertebrates. The unit also introduces understanding of General Aspects of Invertebrate Phyla and Animals.</li> <li>3. To provide exposure to Digestion process</li> </ol>
Unit	Description
1	<p>General characteristics and outline classification of lower Invertebrate Phyla, [up to helminthes]</p> <p>Physiology of Nutrition and reproduction in <i>Protozoa</i></p> <p>Life cycle and pathogenicity of <i>Plasmodium vivax</i> and <i>Entamoeba histolytica</i></p> <p>Sponges: Canal system and Skeleton</p> <p>alternation of generations between sexual and asexual in <i>Obelia</i></p> <p>Life cycle and pathogenicity of <i>Fesciola hepatica</i> <u>and</u> <i>Wuchereria bancrofti</i></p>
2	<p>General characteristics and outline classification of Higher Invertebrate Phyla [up to Echinodermata]</p> <p>General characters of <i>Annelida</i></p> <p>Type Study: <i>Pheritima</i></p> <p>Economic importance of <i>Annelida</i></p>
3	<p>Social Life of Insect</p> <p>Type study: <i>periplaneta</i></p> <p>Economic Importance of <i>Mollusca</i></p> <p>Water vascular system in <i>Asteroidea</i></p>
4	<p>Physiology Of Digestion:</p> <p>Digestive organs and Digestive glands</p> <p>Digestion of food</p> <p>Absorption of food</p> <p>Defecation</p> <p>Disorders: Peptic Ulcer, Ulcerative Colitis, Gastro enteritis.</p>

Reference Books:

- Modern Text book of Zoology – Invertebrate by R.L.Kotpal
- Invertebrate Zoology by- Jordan & Verma
- A Text book of Animal Physiology by A.K.BERRY.
- Animal Physiology by M.P.ARORA.
- Principles of Anatomy & Physiology by TORTORA and GRABOWSKI

**SARDAR PATEL UNIVERSITY**  
**B.Sc. FIRST SEMESTER**  
**PRACTICAL - ZOOLOGY**  
**Effective from June 2023**  
**4 Credits, 8 periods per week**

Course Code	<b>US1MAZOO02 (P)</b>	Title of the Course	<b>Animal Diversity and Physiology-1</b>
Total Credits of the Course	<b>04</b>	Hours per Week	<b>04</b>
Part-1	<ul style="list-style-type: none"> <li>• Classification upto class using Permanent slides and Specimen of <i>Entamoeba histolytica</i>, <i>Plasmodium Vivax</i>, Leucosolenia, Sycon, <i>Hydra viridis</i>, Jellyfish(<i>Aurelia</i>), Sea anemone (<i>Metridium</i>),</li> <li>• Classification upto class using Permanent slides and Specimen of Tap worm ( <i>Tenebrio Solium</i>), Liver fluke (<i>Fasciola hepatica</i>)<i>Ascaris Lumbricoides</i>, Filaria ( <i>Wuchereria bancrofti</i>)</li> <li>• Reproduction like Binary Fission Amoeba, Euglena, Paramecium, Ceratium, Conjugation in Paramecium</li> <li>• Permanent Slides, Sponges Canal system Asconoid, Syconoid and Leuconoid and all types of Spicules</li> <li>• Study of <i>Obelia</i> with permanent slides</li> <li>• Life cycle and pathogenicity of <i>Fasciola hepatica</i> <u>and</u> <i>Wuchereria bancrofti</i></li> <li>• On field study of vermiculture</li> </ul> <p><i>(Specimen other than the list can be exhibit to the students as per the availability in the Institutes)</i></p>		
Part-2	<ul style="list-style-type: none"> <li>• Classification upto Class. Earthworm(<i>Pheretima posthuma</i>), Neries, Leech(<i>Hirudinaria granulose</i>), Cockroach (<i>Periplaneta americana</i>), Locust (swarming grasshopper), Prawn (<i>Palaemon</i>), Sea Cucumber(<i>Holothuria Linnaeus</i>), Starfish (asteroid).</li> <li>• Permanent slides, Chaetae (setae), jaws of leech, parapodia of Nereis, mouth parts of Cockroach, Spiracles, Trachea</li> <li>• <i>Social organization of Honey Bee</i></li> <li>• <i>Complete Metamorphosis in Insects</i></li> <li>• To Study Amylase effect on Starch</li> <li>• To Study Trypsin effect on Protein</li> <li>• On field study of Insect Diversity</li> </ul> <p><i>(Specimen other than the list can be exhibit to the students as per the availability in the Institutes)</i></p>		

Reference Books:

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

**SARDAR PATEL UNIVERSITY**  
**B.Sc. Zoology Semester I**  
**US01MIZOO01 (T) Invertebrate Diversity**  
**Effective from June 2023**  
**Zoology Core Course**

Course Code	<b>US1MIZOO01 (T)</b>	Title of the Course	<b>Invertebrate Diversity</b>
Total Credits of the Course	<b>02</b>	Hours per Week	<b>02</b>
Programme outcome (PO) for B.Sc.	<ol style="list-style-type: none"> <li>1. Bachelor of Science degree program provides theoretical and practical knowledge of different Science subjects in consonance with National Education Policy 2020.</li> <li>2. This programme provides a flexibility to students to acquire certificate course, diploma course, degree programme, honours degree with or without research having multi entry and multi exit facilities.</li> <li>3. Bachelor of Science programme at Sardar Patel University is designed keeping the overall back ground preparation in mind for the student to either opt for a Master programme or jobs or to become an entrepreneur.</li> <li>4. the entry level of the programme, i.e., semester one, various subjects offered as major subject, minor subject, interdisciplinary subject as per choice of the students.</li> <li>5. In addition to that, some skill enhancement courses, ability enhancement courses and value-added courses are also offered for overall development of the students.</li> <li>6. After end of the even semesters, the students may take exit after fulfilling the minimum requirements.</li> <li>7. The students have the enough opportunity to complete four-year graduation programme with any major subject as per their choice.</li> <li>8. The students, after completion of the program from Sardar Patel University, can opt for the master's degree programme in the subject they have had at the final semester, or in a related discipline.</li> </ol>		
Course Outcome (CO) For Zoology	<ol style="list-style-type: none"> <li>1. To improve the scientific awareness among the students.</li> <li>2. To make students to understand the role and contribution of Zoology in the development of science.</li> <li>3. To improve scientific attitude and to give emphasis on the development of experimental skills, data analysis, calculations, and also on the limitations of the experimental method and Scientific data as well as results obtained.</li> <li>4. To help students in understanding the concepts of Zoology.</li> </ol>		
Course Specific Outcome (CPO) For Zoology, Theory and Practicals	<ol style="list-style-type: none"> <li>1. The students will learn about the Lower and Higher Invertebrates</li> <li>2. The General account of Protozoan, Sponge and Coelomates</li> <li>3. The General Account of Higher Invertebrates</li> <li>4. The Physiology of Digestion and Enzymatic activities and Dyes</li> </ol>		

Course Objectives:	<ol style="list-style-type: none"> <li>1. To understand the Zoological concepts of Animal with particular emphasis on their Experimental outcomes.</li> <li>2. To understand the basic concepts of types of Invertebrates. The unit also introduces understanding of General Aspects of Invertebrate Phyla and Animals.</li> <li>3. To provide exposure to Digestion process</li> </ol>
Unit	Description
1	<p>General characteristics and outline classification of lower Invertebrate Phyla, [up to helminthes]</p> <p>Physiology of Nutrition and reproduction in <i>Protozoa</i></p> <p>Life cycle and pathogenicity of <i>Plasmodium vivax</i> and <i>Entamoeba histolytica</i></p> <p>Sponges: Canal system and Skeleton</p> <p>Life cycle and pathogenicity of <i>Fasciola hepatica</i> <u>and</u> <i>Wuchereria bancrofti</i></p>
2	<p>General characteristics and outline classification of Higher Invertebrate Phyla [up to Echinodermata]</p> <p>General characters of <i>Annelida</i></p> <p>Economic importance of <i>Annelida</i></p> <p>Social Life of Insect</p> <p>Economic Importance of <i>Mollusca</i></p> <p>Water vascular system in <i>Asteroidea</i></p>

Reference Books:

- Modern Text book of Zoology – Invertebrate by R.L.Kotpal
- Invertebrate Zoology by- Jordan & Verma
- A Text book of Animal Physiology by A.K.BERRY.

**SARDAR PATEL UNIVERSITY**  
**B.Sc. FIRST SEMESTER**  
**PRACTICAL - ZOOLOGY**  
**US1MIZOO02 (P) Invertebrate Diversity**  
**Effective from June 2023**

<b>Course Code</b>	<b>US1MIZOO02 (P)</b>	<b>Title of the Course</b>	<b>Invertebrate Diversity</b>
<b>Total Credits of the Course</b>	<b>02</b>	<b>Hours per Week</b>	<b>04</b>
	<ul style="list-style-type: none"> <li>• Classification upto class using Permanent slides and Specimen of <i>Entamoeba histolytica</i>, <i>Plasmodium Vivax</i>, Leucosolenia, Sycon, <i>Hydra viridis</i>, Jellyfish(<i>Aurelia</i>), Sea anemone (<i>Metridium</i>), Tap worm ( <i>Tenia Solium</i>), Liver fluke (<i>Fasciola hepatica</i>)<i>Ascaris Lumbricoides</i>, Filaria ( <i>Wuchereria bancrofti</i>)</li> <li>• Classification upto Class. Earthworm(<i>pheretimaposthuma</i>), Neries, Leech(<i>hirudinariagranulose</i>), Cockroach (<i>Periplanetaamericana</i>), Locust (swarming grasshopper), Prawn (<i>Palaemon</i>), Sea Cucumber(<i>HolothuriaLinnaeus</i>), Starfish (asteroid).</li> <li>• Reproduction like Binary Fission Amoeba, Euglena, Paramecium, Ceratium, Conjugation in Paramecium</li> <li>• Permanent Slides, Sponges Canal system Asconoid, Sycanoid and Leuconoid and all types of Spicules</li> <li>• Permanent slides, Chaetae (setae), jaws of leech, parapodia of Nereis, mouth parts of Cockroach, Spiracles, Trachea</li> <li>• <i>Social organization of Honey Bee</i></li> <li>• <i>Complete Metamorphosis in Insects</i></li> <li>• <i>Field Study</i></li> </ul>		

Reference Books:

- A Manual of Practical Zoology- Invertebrate by P.S.VERMA
- Practical Zoology Invertebrate by S.S. LAL

**SARDAR PATEL UNIVERSITY**  
**B.Sc. Zoology Semester I**  
**US01IDZOO01 (T) Invertebrates**  
**Effective from June 2023**  
**Zoology Core Course**

Course Code	<b>US1IDZOO01 (T)</b>	Title of the Course	<b>Invertebrates</b>
Total Credits of the Course	<b>02</b>	Hours per Week	<b>02</b>
Programme outcome (PO) for B.Sc.	<ol style="list-style-type: none"> <li>1. Bachelor of Science degree program provides theoretical and practical knowledge of different Science subjects in consonance with National Education Policy 2020.</li> <li>2. This programme provides a flexibility to students to acquire certificate course, diploma course, degree programme, honours degree with or without research having multi entry and multi exit facilities.</li> <li>3. Bachelor of Science programme at Sardar Patel University is designed keeping the overall back ground preparation in mind for the student to either opt for a Master programme or jobs or to become an entrepreneur.</li> <li>4. the entry level of the programme, i.e., semester one, various subjects offered as major subject, minor subject, interdisciplinary subject as per choice of the students.</li> <li>5. In addition to that, some skill enhancement courses, ability enhancement courses and value-added courses are also offered for overall development of the students.</li> <li>6. After end of the even semesters, the students may take exit after fulfilling the minimum requirements.</li> <li>7. The students have the enough opportunity to complete four-year graduation programme with any major subject as per their choice. The students, after completion of the program from Sardar Patel University, can opt for the master's degree programme in the subject they have had at the final semester, or in a related discipline.</li> </ol>		
Course Outcome (CO) For Zoology	<ol style="list-style-type: none"> <li>1. To improve the scientific awareness among the students.</li> <li>2. To make students to understand the role and contribution of Zoology in the development of science.</li> <li>3. To improve scientific attitude and to give emphasis on the development of experimental skills, data analysis, calculations, and also on the limitations of the experimental method and Scientific data as well as results obtained.</li> <li>4. To help students in understanding the concepts of Zoology.</li> </ol>		
Course Specific Outcome (CPO) For Zoology, Theory and Practicals	<ol style="list-style-type: none"> <li>1. The students will learn about the Lower and Higher Invertebrates</li> <li>2. The General account of Protozoan, Sponge and Coelomates</li> <li>3. The General Account of Higher Invertebrates</li> <li>4. The Physiology of Digestion and Enzymatic activities and Dyes</li> </ol>		

Course Objectives:	<ol style="list-style-type: none"> <li>1. To understand the Zoological concepts of Animal with particular emphasis on their Experimental outcomes.</li> <li>2. To understand the basic concepts of types of Invertebrates. The unit also introduces understanding of General Aspects of Invertebrate Phyla and Animals. To provide exposure to Digestion process</li> </ol>
Unit	Description
1	<p>General characteristics and outline classification of lower Invertebrate Phyla, [up to helminthes]</p> <p>Physiology of Nutrition and reproduction in <i>Protozoa</i>  pathogenicity of <i>Plasmodium vivax</i> and <i>Entamoeba histolytica</i>  Sponges: Canal system and Skeleton  pathogenicity of <i>Fasciola hepatica</i> and <i>Wuchereria bancrofti</i></p>
2	<p>General characteristics and outline classification of Higher Invertebrate Phyla [up to Echinodermata]</p> <p>General characters of <i>Annelida</i>  Economic importance of <i>Annelida</i>  Social Life of Insect  Economic Importance of <i>Mollusca</i>  Water vascular system in <i>Asteroidea</i></p>

Reference Books:

- Modern Text book of Zoology – Invertebrate by R.L.Kotpal
- Invertebrate Zoology by- Jordan & Verma
- A Text book of Animal Physiology by A.K.BERRY.



**SARDAR PATEL UNIVERSITY**  
**B.Sc. FIRST SEMESTER**  
**PRACTICAL - ZOOLOGY**  
**US1IDZOO02 (P) Invertebrates**  
**Effective from June 2023**

<b>Course Code</b>	<b>US1IDZOO02 (P)</b>	<b>Title of the Course</b>	<b>Invertebrates</b>
<b>Total Credits of the Course</b>	<b>02</b>	<b>Hours per Week</b>	<b>02</b>
	<ul style="list-style-type: none"> <li>• Classification upto class using Permanent slides and Specimen of <i>Entamoeba histolytica</i>, <i>Plasmodium Vivax</i>, Leucosolenia, Sycon, <i>Hydra viridis</i>, Jellyfish(<i>Aurelia</i>), Sea anemone (<i>Metridium</i>), Tap worm ( <i>Tenebrio Solium</i>), Liver fluke (<i>Fasciola hepatica</i>)<i>Ascaris Lumbricoides</i>, Filaria ( <i>Wuchereria bancrofti</i>)</li> <li>• Classification upto Class. Earthworm(<i>pheretimaposthuma</i>), Neries, Leech(<i>hirudinariagranulose</i>), Cockroach (<i>Periplanetaamericana</i>), Locust (swarming grasshopper), Prawn (<i>Palaemon</i>), Sea Cucumber(<i>HolothuriaLinnaeus</i>), Starfish (asteroid).</li> <li>• Reproduction like Binary Fission Amoeba, Euglena, Paramecium, Ceratium, Conjugation in Paramecium</li> <li>• Permanent Slides, Sponges Canal system Asconoid, Syconoid and Leuconoid and all types of Spicules</li> <li>• Permanent slides, Chaetae (setae), jaws of leech, parapodia of Nereis, mouth parts of Cockroach, Spiracles, Trachea</li> <li>• <i>Social organization of Honey Bee</i></li> <li>• <i>Complete Metamorphosis in Insects</i></li> <li>• <i>Field Study</i></li> </ul>		

Reference Books:

- A Manual of Practical Zoology- Invertebrate by P.S.VERMA
- Practical Zoology Invertebrate by S.S. LAL

**SARDAR PATEL UNIVERSITY**  
**B.Sc. Zoology Semester II**  
**US1SEZOO01 (T) Wildlife and Techniques**  
**Effective from June 2023**  
**Zoology Core Course**

<b>Course Code</b>	<b>US1SEZOO01 (T)</b>	<b>Title of the Course</b>	<b>Wildlife and Techniques</b>
<b>Total Credits of the Course</b>	<b>02</b>	<b>Hours per Week</b>	<b>02</b>
<b>Programme outcome (PO) for B.Sc.</b>	<ol style="list-style-type: none"> <li>1. Bachelor of Science degree program provides theoretical and practical knowledge of different Science subjects in consonance with National Education Policy 2020.</li> <li>2. This programme provides a flexibility to students to acquire certificate course, diploma course, degree programme, honours degree with or without research having multi entry and multi exit facilities.</li> <li>3. Bachelor of Science programme at Sardar Patel University is designed keeping the overall back ground preparation in mind for the student to either opt for a Master programme or jobs or to become an entrepreneur.</li> <li>4. At the entry level of the programme, i.e., semester one, various subjects offered as major subject, minor subject, interdisciplinary subject as per choice of the students.</li> <li>5. In addition to that, some skill enhancement courses, ability enhancement courses and value-added courses are also offered for overall development of the students.</li> <li>6. After end of the even semesters, the students may take exit after fulfilling the minimum requirements.</li> <li>7. The students have the enough opportunity to complete four-year graduation programme with any major subject as per their choice.</li> </ol> <p>The students, after completion of the program from Sardar Patel University, can opt for the master's degree programme in the subject they have had at the final semester, or in a related discipline.</p>		
<b>Course Outcome (CO) For Zoology</b>	<ol style="list-style-type: none"> <li>1. To improve the scientific Skills and awareness among the students.</li> <li>2. To make students to understand the role and contribution of wildlife Zoology in the development of science.</li> <li>3. To improve scientific attitude and to give emphasis on the development of experimental skills, data analysis, calculations, and also on the limitations of the experimental method and Scientific data as well as results obtained.</li> <li>4. To help students in understanding the concepts of wild life Zoology.</li> </ol>		
<b>Course Specific Outcome (CPO) For Zoology, Theory and Practicals</b>	<ol style="list-style-type: none"> <li>1. The students will learn about the Wildlife Techniques</li> <li>2. The General Account Techniques</li> <li>3. The Importance of Wildlife</li> </ol>		

Course Objectives:	<ol style="list-style-type: none"> <li>1. To understand the Zoological concepts of Animal with particular emphasis on their Fields outcomes.</li> <li>2. To understand the basic concepts of wildlife and there studies</li> </ol>
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Unit	Description
1	Wild life of India, Sanctuary of India. National parks under special Projects: Tiger, Lion, Elephant, Crocodile, Spotted dear breeding Projects Endangered species
2	Wildlife Photography Wildlife Handy tools Magnifying glass, Scale, Camera traps GPS collars Telemetry equipment Weatherproof stationery cases and bags Tongs, Hooks Data sheets

Reference Books:

- Modern Text Book of zoology - Vertebrate by R .L. KOTPAL.
- Chordate Zoology by Jordan and Verma.