



**B.Sc. Semester II**  
**US02MAZOO01**  
**ZOOLOGY MAJOR,**  
**Effective from June 2024**

|                                    |                                                                                                                                                                                                                                                                                                                                                                         |                            |                                          |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------------------------|
| <b>Course Code</b>                 | <b>US02MAZOO01 [T]</b>                                                                                                                                                                                                                                                                                                                                                  | <b>Title of the Course</b> | <b>Animal Diversity and Physiology-2</b> |
| <b>Total Credits of the Course</b> | <b>04</b>                                                                                                                                                                                                                                                                                                                                                               | <b>Hours per Week</b>      | <b>04</b>                                |
| <b>Course Objectives:</b>          | To make students familiar with:<br>1. To understand the Zoological concepts of Animal with particular emphasis on their Experimental outcomes.<br>2. To understand the basic concepts of types of vertebrates. The unit also introduces understanding of General Aspects of vertebrate Phyla and Animals.<br>3. To provide exposure to Circulation process and Diseases |                            |                                          |

| Course Content |                                                                                                                                                                                                                                                         |                |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Unit           | Description                                                                                                                                                                                                                                             | Weightage* (%) |
| 1.             | General characteristics and outline classification of Lower Vertebrates<br>Comparative account of Hemichordata, Urochordata, Cephalochordata and Protochordata<br>Type Study: Scoliodon<br>Migration of Fishes with examples<br>Parental care in fishes | 25%            |
| 2.             | General characteristics and outline classification of Higher Vertebrates<br>Parental care in amphibians<br>Neoteny, Paedogenesis and Economic importance of Amphibians<br>Identification of poisonous and non-poisonous snakes                          | 25%            |



# Vitthalbhai Patel & Rajratna P. T. Patel Science College

(Autonomous)

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Affiliated to SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar, Gujarat

Syllabus effective from the Academic Year 2024-2025



|    |                                                                                                                                                                                                                                                                                 |     |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
|    | Mesozoic Reptiles and Dinosaurs                                                                                                                                                                                                                                                 |     |
| 3. | Migration of Birds – types, causes and significance<br>Flightless birds and Flying adaptations in birds<br>Types of Beaks<br>Type study: Columba livia [Pigeon]                                                                                                                 | 25% |
| 4. | HUMAN PHYSIOLOGY OF CIRCULATION:<br>Circulatory media, Blood composition & functions<br>Formation of blood cells, Types Structure & functions of Blood cells<br>Blood group ABO System & Rh factor<br>Blood transfusion<br>Disorders: Anemia and Types , Hypertension, Leukemia | 25% |

|                               |                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Teaching-Learning Methodology | <ul style="list-style-type: none"> <li>• Class room interactions</li> <li>• By chalk –duster method</li> <li>• By using OHP- Powerpoint presentation</li> <li>• By Giving project work</li> <li>• By giving Students seminar, unit test, assignment</li> <li>• Question bank circulation</li> <li>• Arranging guest talk</li> </ul> |
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| Evaluation Pattern |                                                                                                                                                                                                     |           |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Sr. No.            | Details of the Evaluation                                                                                                                                                                           | Weightage |
| 1.                 | Internal Marks-Exam Pattern: Class test-15marks(30%), Quiz-15marks(30%), Active learning-5marks(10%),Home assignment-5marks(10%), Class assignment-5marks(10%),Attendance-5marks(10%) Total 50marks | 50%       |
| 2.                 | External Marks ( 10marks MCQs + 10marks descriptive Questions From each 4- unit) Total 50 marks                                                                                                     | 50%       |

| Course Outcomes: |                                                         |
|------------------|---------------------------------------------------------|
| 1.               | To improve the scientific awareness among the students. |



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|    |                                                                                                                                                                                                                                     |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2. | To make students to understand the role and contribution of Zoology in the development of science.                                                                                                                                  |
| 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. |

**Suggested Reference Books:**

| Sr. No. | Reference Books                                             |
|---------|-------------------------------------------------------------|
| 1.      | Modern Text Book of zoology - Vertebrate by R .L. KOTPAL.   |
| 2.      | Chordate Zoology by Jordan and Verma.                       |
| 3       | Animal Physiology by M.P.ARORA.                             |
| 4       | Principles of Anatomy & Physiology by TORTORA and GRABOWSKI |

**On-line resources :**

<https://www.slideshare.net/>

<https://www.biologydiscussion.com/zoology/>

**B.Sc. ZOOLOGY SEMESTER-II**



## US02MAZOO02 – ZOOLOGY MAJOR PRACTICAL

**Effective from June 2024**

|                                    |                                                                                                                                                                                                                                                                                                                                                                          |                            |                                          |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------------------------|
| <b>Course Code</b>                 | <b>US02MAZOO02</b>                                                                                                                                                                                                                                                                                                                                                       | <b>Title of the Course</b> | <b>Animal Diversity and Physiology-2</b> |
| <b>Total Credits of the Course</b> | <b>04</b>                                                                                                                                                                                                                                                                                                                                                                | <b>Hours per Week</b>      | <b>08</b>                                |
| <b>Course Objectives:</b>          | To make students familiar with:<br>1. To understand the Zoological concepts of Animal with particular emphasis on their Experimental outcomes.<br>2. To understand the basic concepts of types of vertebrates. The unit also introduces understanding of General Aspects of vertebrate Phyla and Animals.<br>3. To provide exposure to Circulation process and Diseases. |                            |                                          |

| Course Content |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|                | PRACTICALS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Weightage* (%) |
| PART-1.        | Classification upto class using Permanent slides and Specimen<br>Balanoglossus,<br>Hardmania, Amphioxus, Lamprey, Dogfish(scoliodon), Skate fish ,<br>Ray fish,<br>Lebeo, Rana tigrina, Uromastix, snake, Columbalivia, Rabbit<br>• To study Scales By Permanent Slides,<br>• To Study Types of Fins<br>• Parental Care: Ichthyophis, Desmognathous fuscus, Alytes, Pipa,<br>Neoteny: Axolotl larva by specimen<br>• To Study Types of Poisonous and Nonpoisonous Snakes with their fangs<br>• .On field study of Amphibians and Reptiles<br>(Specimen other than the list can be exhibit to the students as per the availability in the Institutes) | 50%            |

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Syllabus effective from the Academic Year 2024-2025



|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 2. | <p>To study Functions of Microscope</p> <ul style="list-style-type: none"> <li>• To Study Types of Feathers</li> <li>• To Study Types of Beaks in different Birds Specimen.</li> <li>• Pecten of Pigeon, V.S of skin Pigeon, T S of Gizzard Pigeon</li> <li>• To Study Haemin Crystals from own blood</li> <li>• To Study Blood Group of own blood</li> <li>• To Study types of WBC through blood smear</li> <li>• On field study of Birds</li> </ul> <p>(Specimen other than the list can be exhibit to the students as per the availability in the Institutes)</p> | 50% |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|

|                               |                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Teaching-Learning Methodology | <ul style="list-style-type: none"> <li>• Using student's Microscope</li> <li>• Observation of specimens</li> <li>• Using certain chemicals for test</li> <li>• Learn through chart /Model/ Video/ PPTs</li> <li>• Field visit, Project submission</li> <li>• Preparing journal through various diagrams &amp; description</li> </ul> |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Evaluation Pattern |                                                                                                                                                                 |           |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Sr. No.            | Details of the Evaluation                                                                                                                                       | Weightage |
| 1.                 | Internal Examination evaluation includes Lab Work Assignment-20 marks (40%), Viva-voce/Lab Quiz-20marks(40%),Attendance-10marks(20%)which makes total 50 Marks. | 50%       |
| 2.                 | External Examination Evaluation includes Lab work Assignment-40 marks (80%), Viva-voce/Lab Quiz-10marks (20%),which makes total 50 Marks.                       | 50%       |

| Course Outcomes: |                                                                    |
|------------------|--------------------------------------------------------------------|
| 1.               | To improve the scientific awareness of animals among the students. |



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|    |                                                                                                                                                                                                                                     |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2. | To make students to understand the role of animals and their importance in life.                                                                                                                                                    |
| 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. |
| 4  | To help students in understanding the importance of Blood groups, Types of WBCs and Haemin crystals.                                                                                                                                |

**Suggested Reference Books:**

| Sr. No. | Reference Books                                                   |
|---------|-------------------------------------------------------------------|
| 1.      | A Manual of Practical Zoology- vertebrate by P.S.VERMA            |
| 2.      | Practical Physiology, Anatomy & Biochemistry by SHAH, PATEL& GOEL |
| 3       | Practical Zoology vertebrate by S.S. LAL.                         |

**On-line resources**

<https://www.biologydiscussion.com/zoology/>

<https://www.slideshare.net/>

**B.Sc. Semester II- Minor Zoology**

**US02MIZOO01 (T) Chordate Diversity**



**Effective from June 2024**

|                                    |                                                                                                                                                                                                                                                                                                           |                            |                           |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------|
| <b>Course Code</b>                 | <b>US02MIZOO01</b>                                                                                                                                                                                                                                                                                        | <b>Title of the Course</b> | <b>Chordate Diversity</b> |
| <b>Total Credits of the Course</b> | <b>02</b>                                                                                                                                                                                                                                                                                                 | <b>Hours per Week</b>      | <b>02</b>                 |
| <b>Course Objectives:</b>          | To make students familiar with:<br>1. To understand the Zoological concepts of Animal with particular emphasis on their Experimental outcomes.<br>2. To understand the basic concepts of types of vertebrates. The unit also introduces understanding of General Aspects of vertebrate Phyla and Animals. |                            |                           |

| Course Content |                                                                                                                                                                                                                                                                                                                      |                |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Unit           | Description                                                                                                                                                                                                                                                                                                          | Weightage* (%) |
| 1.             | General characteristics and outline classification of Chordates<br>Comparative account of Hemichordata, Urochordata, Cephalochordata and Protochordata<br>Migration of Fishes with examples<br>Parental care in fishes<br>Parental care in amphibians<br>Neoteny, Paedogenesis and Economic importance of Amphibians | 50%            |
| 2.             | Identification of poisonous and non-poisonous snakes<br>Mesozoic Reptiles and Dinosaurs<br>Migration of Birds – types, causes and significance<br>Flightless and Flying adaptations in birds<br>Types of Beaks                                                                                                       | 50%            |

|                                      |                                                                                                                                                             |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Teaching-Learning Methodology</b> | <ul style="list-style-type: none"><li>• Class room interactions</li><li>• By chalk –duster method</li><li>• By using OHP- Powerpoint presentation</li></ul> |
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Syllabus effective from the Academic Year 2024-2025



|  |                                                                                                                                                                                                         |
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|  | <ul style="list-style-type: none"><li>• By Giving project work</li><li>• By giving Students seminar, unit test, assignment</li><li>• Question bank circulation</li><li>• Arranging guest talk</li></ul> |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Evaluation Pattern

| Sr. No. | Details of the Evaluation                                                                                                                                                | Weightage |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 1.      | Internal Examination Evaluation includes Class test-10 marks(40%), Quiz -5 marks(20%), Home assignment-5 marks (20%), Attendance-5 marks(10%) which makes total 25 marks | 50%       |
| 2.      | External Examination [MCQs (5marks from all units) + Descriptive Questions(10 marks from each unit) total -25marks                                                       | 50%       |

## Course Outcomes:

|    |                                                                                                                                                                                                                                     |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | To improve the scientific awareness among the students.                                                                                                                                                                             |
| 2. | To make students to understand the role and contribution of Zoology in the development of science.                                                                                                                                  |
| 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. |
| 4. | To help students in understanding the concepts of Zoology.                                                                                                                                                                          |

## Suggested Reference Books:

| Sr. No. | Reference Books                                           |
|---------|-----------------------------------------------------------|
| 1.      | Modern Text Book of zoology - Vertebrate by R .L. KOTPAL. |
| 2.      | Chordate Zoology by Jordan and Verma.                     |



On-line resources

<https://www.biologydiscussion.com/zoology/>

<https://www.slideshare.net/>

## B.Sc. ZOOLOGY SEMESTER-II

### US02MIZOO02 (P) – ZOOLOGY MINOR PRACTICAL

Effective from June 2024

|                                    |                                                                                                                                                                                                                                                                                                           |                            |                          |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------------------|
| <b>Course Code</b>                 | <b>US02MIZOO02</b>                                                                                                                                                                                                                                                                                        | <b>Title of the Course</b> | <b>Zoology Practical</b> |
| <b>Total Credits of the Course</b> | <b>02</b>                                                                                                                                                                                                                                                                                                 | <b>Hours per Week</b>      | <b>04</b>                |
| <b>Course Objectives:</b>          | To make students familiar with:<br>1. To understand the Zoological concepts of Animal with particular emphasis on their Experimental outcomes.<br>2. To understand the basic concepts of types of vertebrates. The unit also introduces understanding of General Aspects of vertebrate Phyla and Animals. |                            |                          |

#### Course Content

|  |            |                |
|--|------------|----------------|
|  | PRACTICALS | Weightage* (%) |
|--|------------|----------------|



|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|  | <p>Classification upto class using Permanent slides and Specimen Balanoglossus, Hardmania, Amphioxus, Lamprey, Dogfish(scoliodon), Skate fish, Ray fish, Lebeo, Rana tigrina, Uromastix, , Columbalivia, Rabbit</p> <ul style="list-style-type: none"> <li>• To study Scales By Permanent Slides,</li> <li>• To Study Types of Fins</li> <li>• Parental Care: Ichthyophis, Desmognathous fuscuss, Alytes, Pipa, Neoteny in Axolotl larva by specimen</li> <li>• To Study Types of Poisonous and Nonpoisonous Snakes with their fangs</li> <li>• To Study Types of Feathers</li> <li>• To Study Types of Birds Specimen with Different Beaks</li> <li>• Field Study</li> </ul> <p>(Specimen other than the list can be exhibit to the students as per the availability in the Institutes)</p> |  |
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|                               |                                                                                                                                                                                                                 |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Teaching-Learning Methodology | <ul style="list-style-type: none"> <li>• Using student's Microscope</li> <li>• Observation of specimens</li> <li>• Learn through chart /Model/ Video/ ppt</li> <li>• Field visit, Project submission</li> </ul> |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Evaluation Pattern |                                                                                                                                                                     |           |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Sr. No.            | Details of the Evaluation                                                                                                                                           | Weightage |
| 1.                 | Internal Examination Evaluation includes--Lab work Assignment-10marks (40%), Viva-voce/Lab quiz-10 marks(40%), Attendance-5marks (20%) which makes total 25 marks   | 50%       |
| 2.                 | External Examination Evaluation includes- --Lab work Assignment-10marks (40%), Viva-voce/Lab quiz-10 marks(40%), Attendance-5marks (20%) which makes total 25 marks | 50%       |

| Course Outcomes: |                                                                    |
|------------------|--------------------------------------------------------------------|
| 1.               | To improve the scientific awareness of animals among the students. |



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|    |                                                                                                                                                                                                                                     |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2. | To make students to understand the role of animals and their importance in life.                                                                                                                                                    |
| 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. |

**Suggested Reference Books:**

| Sr. No. | Reference Books                                        |
|---------|--------------------------------------------------------|
| 1.      | A Manual of Practical Zoology- vertebrate by P.S.VERMA |
| 2.      | Practical Zoology vertebrate by S.S. LAL.              |

**On-line resources**

<https://www.biologydiscussion.com/zoology/>

<https://www.slideshare.net/>

**B.Sc. ZOOLOGY SEMESTER-II**  
**INTER DISCIPLINARY ZOOLOGY**



**Effective from June 2024**

|                                    |                        |                            |                  |
|------------------------------------|------------------------|----------------------------|------------------|
| <b>Course Code</b>                 | <b>US02IDZOO01 (T)</b> | <b>Title of the Course</b> | <b>Chordates</b> |
| <b>Total Credits of the Course</b> | <b>02</b>              | <b>Hours per Week</b>      | <b>02</b>        |

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Course Objectives:</b> | <p>To make students familiar with:</p> <ol style="list-style-type: none"> <li>1. To make students familiar with:</li> <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 vertebrates. The unit also introduces understanding of General Aspects of vertebrate Phyla and Animals.</li> </ol> |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Course Content |                                                                                                                                                                                                                                                                                                                                                 |                |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Unit           | Description                                                                                                                                                                                                                                                                                                                                     | Weightage* (%) |
| 1.             | <p>General characteristics and outline classification of Chordates</p> <p>Comparative account of Hemichordata, Urochordata, Cephalochordata and Protochordata</p> <p>Migration of Fishes with examples</p> <p>Parental care in fishes</p> <p>Parental care in amphibians</p> <p>Neoteny, Paedogenesis and Economic importance of Amphibians</p> | 50%            |
| 2.             | <p>Identification of poisonous and non-poisonous snakes</p> <p>Mesozoic Reptiles and Dinosaurs</p> <p>Migration of Birds – types, causes and significance</p> <p>Flightless and Flying adaptations in birds</p> <p>Types of Beaks</p>                                                                                                           | 50%            |

|                                      |                                                                                                                                                                 |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Teaching-Learning Methodology</b> | <ul style="list-style-type: none"> <li>• Class room interactions</li> <li>• By chalk –duster method</li> <li>• By using OHP- Powerpoint presentation</li> </ul> |
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|  |                                                                                                                                                                                                         |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"><li>• By Giving project work</li><li>• By giving Students seminar, unit test, assignment</li><li>• Question bank circulation</li><li>• Arranging guest talk</li></ul> |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Evaluation Pattern

| Sr. No. | Details of the Evaluation                                                                                                                                                | Weightage |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 1.      | Internal Examination Evaluation includes Class test-10 marks(40%), Quiz -5 marks(20%), Home assignment-5 marks (20%), Attendance-5 marks(10%) which makes total 25 marks | 50%       |
| 2.      | External Examination [MCQs (5marks from all units) + Descriptive Questions(10 marks from each unit) total -25marks                                                       | 50%       |

## Course Outcomes:

|    |                                                                                                                                                                                                                                     |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | To improve the scientific awareness of animals among the students.                                                                                                                                                                  |
| 2. | To make students to understand the role of animals and their importance in life.                                                                                                                                                    |
| 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. |

## Suggested Reference Books:

| Sr. No. | Reference Books                                           |
|---------|-----------------------------------------------------------|
| 1.      | Modern Text Book of zoology - Vertebrate by R .L. KOTPAL. |
| 2.      | Chordate Zoology by Jordan and Verma.                     |

## On-line resources



<https://www.biologydiscussion.com/zoology/>

<https://www.slideshare.net/>

## B.Sc. Zoology Semester II

### US02IDZOO02, Zoology Practical

Effective from June 2024

|                                    |                                                                                                                                                                                                                                                                                                           |                            |                          |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------------------|
| <b>Course Code</b>                 | <b>US02IDZOO02 (P)</b>                                                                                                                                                                                                                                                                                    | <b>Title of the Course</b> | <b>Zoology Practical</b> |
| <b>Total Credits of the Course</b> | <b>02</b>                                                                                                                                                                                                                                                                                                 | <b>Hours per Week</b>      | <b>04</b>                |
| <b>Course Objectives:</b>          | To make students familiar with:<br>1. To understand the Zoological concepts of Animal with particular emphasis on their Experimental outcomes.<br>2. To understand the basic concepts of types of vertebrates. The unit also introduces understanding of General Aspects of vertebrate Phyla and Animals. |                            |                          |

| Course Content |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|                | PRACTICALS                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Weightage* (%) |
|                | Classification upto class using Permanent slides and Specimen<br>Balanoglossus, Hardmania, Amphioxus, Lamprey, Dogfish(scoliodon), Skate fish, Ray fish, Lebeo, Rana tigrina, Uromastix, , Columbalivia, Rabbit<br>• To study Scales By Permanent Slides,<br>• To Study Types of Fins<br>• Parental Care: Ichthyophis, Desmognathous fuscuss, Alytes, Pipa, Neoteny in Axolotl larva by specimen<br>• To Study Types of Poisonous and Nonpoisonous Snakes with their |                |

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|  |                                                                                                                                                                                                                              |  |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|  | fangs<br>• To Study Types of Feathers<br>• To Study Types of Birds Specimen with Different Beaks<br>• Field Study<br>(Specimen other than the list can be exhibit to the students as per the availability in the Institutes) |  |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

|                               |                                                                                                                                                                                                                                                                                         |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Teaching-Learning Methodology | <ul style="list-style-type: none"> <li>• Using student's Microscope</li> <li>• Observation of specimens</li> <li>• Learn through chart /Model/ Video/ ppt</li> <li>• Field visit, Project submission</li> <li>• Preparing journal through various diagrams &amp; description</li> </ul> |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Evaluation Pattern**

| Sr. No. | Details of the Evaluation                                                                                                                                           | Weightage |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 1.      | Internal Examination Evaluation includes--Lab work Assignment-10marks (40%), Viva-voce/Lab quiz-10 marks(40%), Attendance-5marks (20%) which makes total 25 marks   | 50%       |
| 2.      | External Examination Evaluation includes- --Lab work Assignment-10marks (40%), Viva-voce/Lab quiz-10 marks(40%), Attendance-5marks (20%) which makes total 25 marks | 50%       |

**Course Outcomes:**

|    |                                                                                                                                                                                                                                     |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | To improve the scientific awareness of animals among the students.                                                                                                                                                                  |
| 2. | To make students to understand the role of animals and their importance in life.                                                                                                                                                    |
| 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. |

| Sr. No. | Suggested Reference Books                              |
|---------|--------------------------------------------------------|
| 1.      | A Manual of Practical Zoology- vertebrate by P.S.VERMA |



|    |                                           |
|----|-------------------------------------------|
| 2. | Practical Zoology vertebrate by S.S. LAL. |
|----|-------------------------------------------|

On-line resources : <https://www.biologydiscussion.com/zooology/>

**B.Sc. Zoology Semester II**  
**US02SEZOO01 (T) Economic Zoology**  
**Effective from June 2024**

|                                    |                                                                                                                                                                                                                                                                                                                       |                            |                         |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------------------------|
| <b>Course Code</b>                 | <b>US02SEZOO01</b>                                                                                                                                                                                                                                                                                                    | <b>Title of the Course</b> | <b>Economic Zoology</b> |
| <b>Total Credits of the Course</b> | <b>02</b>                                                                                                                                                                                                                                                                                                             | <b>Hours per Week</b>      | <b>02</b>               |
| <b>Course Objectives:</b>          | To make students familiar with:<br>1. To understand the Zoological concepts of Animal with particular emphasis on their Experimental outcomes.<br>2. To understand the basic concepts of types of vertebrates.<br>The unit also introduces understanding of General Aspects of Fisheries, Poultry and Dairy industry. |                            |                         |

| Course Content |                                                                                                                                                                                   |                |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Unit           | Description                                                                                                                                                                       | Weightage* (%) |
| 1.             | Fresh water Fishes of India,<br>Breeding Techniques of Inland Fisheries<br>Fresh water fishery marketing and by products<br>Brackish water fishery [Prawn culture]and by products | 50%            |
| 2.             | Poultry:<br>Farm, design and Breeds ,Food, Diseases and Care<br>Dairy industry:                                                                                                   | 50%            |



# Vitthalbhai Patel & Rajratna P. T. Patel Science College

(Autonomous)

(Reaccredited with 'A' Grade by NAAC (CGPA 3.14)

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Vallabh Vidyanagar, Gujarat

Syllabus effective from the Academic Year 2024-2025



|  |                                                                                                                                    |  |
|--|------------------------------------------------------------------------------------------------------------------------------------|--|
|  | Animal Husbandary concept and Care, Cooperative society<br>Pharmaceuticals from animals:<br>Ancient concept and Advance Technology |  |
|--|------------------------------------------------------------------------------------------------------------------------------------|--|

|                                      |                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Teaching-<br>Learning<br>Methodology | <ul style="list-style-type: none"><li>• Class room interactions</li><li>• By chalk –duster method</li><li>• By using OHP- Powerpoint presentation</li><li>• By Giving project work</li><li>• By giving Students seminar, unit test, assignment</li><li>• Question bank circulation</li><li>• Arranging guest talk and visit</li></ul> |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Evaluation Pattern

| Sr.<br>No. | Details of the Evaluation                                                                                                                                                | Weightage |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 1.         | Internal Examination Evaluation includes Class test-10 marks(40%), Quiz -5 marks(20%), Home assignment-5 marks (20%), Attendance-5 marks(10%) which makes total 25 marks | 50%       |
| 2.         | External Examination [MCQs (5marks from all units) + Descriptive Questions(10 marks from each unit) total -25marks                                                       | 50%       |

## Course Outcomes:

|    |                                                                                                                                                                                                                                     |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | To improve the scientific awareness among the students.                                                                                                                                                                             |
| 2. | To make students to understand the role and contribution of Zoology in the development of science.                                                                                                                                  |
| 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. |
| 4. | To help students in understanding the concepts of Economic Zoology.                                                                                                                                                                 |



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**Suggested Reference Books:**

| Sr. No. | Reference Books                                   |
|---------|---------------------------------------------------|
| 1.      | Economic Zoology : Shukla and Upadhyay            |
| 2.      | Economic and applied – entomology: Ashok kumar    |
| 3       | Fishery science and Indian fisheries : Srivastava |
| 4       | Poultry science: Dr N T Mehta and Dr Dhasura      |

**On-line resources**

<https://www.biologydiscussion.com/zoology/>

<https://www.slideshare.net/>