



B.Sc. – ZOOLOGY
SEMESTER - VI
US06MAZOO01 (T)

Effective from December 2026

Course Code	US06MAZOO01 [T]	Title of the Course	Developmental Biology
Total Credits of the Course	04	Hours per Week	04
Course Objectives	- To Provide Basics of types of Egg membranes, Eggs, Fertilization and The stages of Embryogenesis - Student will also aware about placentation in mammals & Teratology - To provide Developmental Studies of Amphioxus, Frog and Chick		

Course Content		
Unit	Description	Weightage* (%)
1.	General account of Developmental Biology: The Egg membranes, Types of Eggs, Fertilization :[Cytofertilization, Mechanism of Fertilization, Monospermy and Polyspermy, Significance] , Parthenogenesis: [Natural, Artificial & Significance] Cleavage:[Characteristics, Planes , Patterns, Definite and Indefinite Cleavage, Types of Cleavage], Morula, Blastula and Blastulation: Types of Blastulae	25%
2.	Gastrulation: [Prominent features, General Processes Involved in Gastrulation, Significance] Brief account of Growth and Differentiation Placentation in Mammal[Origin, Types, Physiology] Teratology:[Introduction, Causes and Examples, Principals] Development of Amphioxus: Gametes, Fertilization, Organization of Fertilized Egg, Cleavage, Blastula, gastrulating, Formation of the Primary Organ Rudiments, Hatching, Larval Development, Metamorphosis]	25%



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3.	Development of frog: Ovulation and spawning Cleavage and Blastula, Fate-map Gastrulation Neurulation Metamorphosis of Frog	25%
4.	Development of chick Gametes and fertilization Cleavage and blastulation Gastrulation Differentiation of mesoderm and coelom Neurulation Development of chick according to incubation Extra embryonic membranes of Chick	25%

Teaching-Learning Methodology	• Class room interactions • By chalk –duster method • By using OHP- Power point presentation • By giving Students seminar, unit test, assignment • Question bank circulation • Arranging guest talk
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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.	The students will learn about types of Eggs , Fertilization, Parthenogenesis



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2.	Students will also learn about development of embryo
3.	Student will also learn about Types of Placenta & Teratology
4.	Development of Amphioxus, Frog and Chick.

Suggested Reference Books:

Sr. No.	Reference Books
1.	Introduction to embryology: A K Berry
2.	Chordate embryology: Verma and Agrawal
3.	Developmental biology: Sastry and Shukla

On-line resources

ePathshala. Egnyan, <https://swayam.gov.in>

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

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

B.Sc. – ZOOLOGY

SEMESTER - VI

US06MAZOO02 (T)

Effective from December 2026

Course Code	US06MAZOO02 [T]	Title of the Course	Comparative Anatomy of Chordates
Total Credits of the Course	04	Hours per Week	04
Course Objectives	To Provide Comparative anatomy of chordates animals of Major systems. To understand the evolution of anatomy in different classes of Chordate animals.		



Course Content		
Unit	Description	Weightage* (%)
1.	Comparative Anatomy of Integumentary System: Integument proper Integumentary glands Scales, Feathers Hair, Beaks Claws, Nail and hoofs, Horns and antlers	25%
2.	Comparative Anatomy of Digestive system Mouth and associated structure, Lips, Vestibule, Oral cavity and oral glands Teeth Tongue Esophagus Stomach Intestine Liver Pancreas	25%
3.	Comparative Anatomy of Reproductive System: Ovaries Oviducts Testes Male duct Copulatory organs	25%
4.	Comparative Anatomy of Circulatory System: Blood & blood vessels Evolution of Heart Arterial system Venous system Lymph & lymphatic system	25%
Teaching-	Class room interactions	



Learning Methodology	• By chalk –duster method • By using OHP- Power point presentation • By giving Students seminar, unit test, assignment • Question bank circulation • Arranging guest talk
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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.	The students will learn Differences between Entire Vertebrate systems
2.	The common characters and comparative anatomy among Integumentary system, Digestive system, Reproductive system and Circulatory system
3.	Students will also learn about the how evolution is occurs in animals.

Suggested Reference Books:

Sr. No.	Reference Books
1.	Elements of Chordate anatomy- Charles Weichert
2.	Vertebrate body – Romar
3	Modern text book of Vertebrate Zoology- R. L. Kotpal



4	Biology of Chordate – H.C. Nigam
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On-line resources
https://byjus.com/free-ias-prep/biodiversity/
https://www.biologydiscussion.com/zoology/
https://www.slideshare.net/ , https://swayam.gov.in

B.Sc. ZOOLOGY
SEMESTER -VI
US06MAZOO03, PRACTICAL
Effective from December- 2026

Course Code	US06MAZOO03 [P]	Title of the Course	ZOOLOGY PRACTICAL
Total Credits of the Course	04	Hours per Week	08

Course Content		
PART	PRACTICALS	Weightage* (%)
1.	- Study of different types of eggs by permanent slides. - Study of fate map of Frog by permanent slide. - Development of Amphioxus By Permanent Slides - Development of frog By Permanent Slides - Development of chick By Permanent Slides - Study the extra embryonic membranes of chick & prepare the temporary mounting of chick embryo. - Prepare some slide by using embryological material. (Amphibian eggs, cleavage, blastula, gastrula, tadpole larva)	50%
2.	- Comparative study of vertebrate Skin by permanent slides. - Study types of scales in fishes & prepared temporary mounting of different types of scales.	50%



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	- Study of different types of feathers & Collect the types of feathers. - Study the different types of teeth of vertebrate animals. - Study the comparative anatomy of vertebrate hearts by model or charts. - Bull's Sperm Counting - Bull's Sperm Motility and Mortality - Observation of migratory birds & observed different type of beaks & feets. [Field Study /Photographs] Visit to national park and sanctuary	
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Teaching-Learning Methodology	- Using student's Microscope - Observation of specimens - Using certain chemicals for test - Learn through chart /Model/ Video/ PPTs - Field visit, Project submission - Preparing journal through various diagrams & description
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Evaluation Pattern

Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination evaluation includes Lab Work Assignment-20 marks (40%), Viva-voce- 10marks & Lab Quiz-10 marks (40%), Journal certification- 6 marks & Attendance-active participation- 4 marks(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.	Students will learn about different stages of development of embryo
2.	Students also learned to count sperms and analysis related to this
3	Students also become skilled by mounting and preparing different slides.



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Suggested Reference Books:

Sr. No.	Reference Books
1.	Practical zoology vertebrate: P. S. Verma.
2.	Practical zoology vertebrate: S. S. Lal.
3	Practical physiology anatomy and biochemistry: Patel and Goel

On-line resources : egyankosh, Swayam

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

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



B.Sc. MINOR ZOOLOGY

SEMESTER - VI

US06MIZOO01 (T)

Effective from December- 2026

Course Code	US06MIZOO01 [T]	Title of the Course	Economic Zoology
Total Credits of the Course	02	Hours per Week	02
Course Objectives:	To provide detail of Economic importance of Zoology.		

Course Content		
Unit	Description	Weightage* (%)
1.	Habit and habitat, Social organization, Life cycle, Processing and its importance of : - Apiculture - Lac culture - Sericulture - Poultry - Pharmaceuticals from animals	50%
2.	Insect Pests of some crops of Economic Importance: Pests of Sugarcane, Paddy, Pulse, crops, Grampod Borer, Vegetables, Fruits, Cotton, Oil seed crops, Coconut Palm, Tea, Coffee, Jute Crop. Insect Pest Management: Natural Control, Applied Control, Integrated Pest Management	50%

Teaching-Learning Methodology	- Class room interactions - By chalk –duster method - By using OHP- Powerpoint presentation - By giving Students seminar, unit test, assignment - Question bank circulation
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	• Arranging guest talk
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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.	Students learned & understand about Human diseases and taking preventive Care of it.
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Suggested Reference Books:

Sr. No.	Reference Books
1.	Economic Zoology by Shukla and Upadhyay
2.	A text book of Invertebrate Zoology by R.L. Kotpal
3.	Invertebrate Zoology by- Jordan & Verma

On-line resources

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<https://swayam.gov.in>



B.Sc. MINOR ZOOLOGY

VI- SEMESTER PRACTICAL

US06MIZOO02

Effective from December- 2026

Course Code	US06MIZOO02 [P]	Title of the Course	ZOOLOGY PRACTICAL
Total Credits of the Course	02	Hours per Week	04
Course Objectives:	To Provide Hands on Practical experience to the students		

Course Content		
	PRACTICALS	Weightage* (%)
	• Study the Life cycle of Honey Bee • Study the Life cycle of Silk moth • Study the Life cycle of Lac Insect • To study the different breeds of Fowls • To study and observe the structure of egg • To mount the chick embryo. • Poultry visit and preparing report. • To study the different insect pests. • Collection of various insect pests and prepared insect box. • Field visit	

Teaching-Learning Methodology	• Using student's Microscope • By qualitative analysis of different food. • Learn through Video/ ppt • Field visit, Project submission
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage



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1.	Internal Examination Evaluation includes--Lab work Assignment-10marks (40%), Viva-voce & Lab quiz-10 marks(40%), Journal certification-3marks & Attendance- active participation-2marks (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.	Students will learn about economic importance of animals
2.	Students also understand and able to do their own start up

Suggested Reference Books:

Sr. No.	Reference Books
1.	Practical zoology vertebrate: P S Verma.
2.	Practical zoology vertebrate: S S Lal
3.	Economic Zoology by Shukla & Upadhyay

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