



B.Sc. – ZOOLOGY
Semester IV
US04MAZOO01 (T)

Effective from December 2025

Course Code	US04MAZOO01 [T]	Title of the Course	VERTEBRATA & WILD LIFE
Total Credits of the Course	04	Hours per Week	04
Course Objectives:	To make students familiar with: 1. Detail Anatomy and Physiology about the Vertebrate animals 2. General account of fishes and snakes. 3. Wild life importance, vanishing, conservation, Sancturies and National parks.		

Course Content		
Unit	Description	Weightage* (%)
1.	Types of Osteichthyes : Lobe-Finned fish, Lung Fish, Ganoid fish, Advanced Ray finned Fishes Economic importance of fishes. Osmoregulation in fishes. Type: Frog (Rana tigrina): (External features, Digestive system, Respiratory system, blood & Heart, Nervous system, sense organs, Urinogenital system and Metamorphosis of Frog	25%
2.	Type: Calotes versicolor : (External features, Digestive system, Respiratory system, Blood & Heart, Nervous system and Urinogenital system) General account on snakes: Locomotion, hearing, feeding mechanism, poison apparatus, biting mechanism, snake venom, effects and its first aid treatment)	25%
3.	Type: Rabbit- (Oryctolagus) (External features, Skin, Digestive system, Respiratory system, Heart, Excretory system, Nervous system, Sense organs, Reproductive system.)	25%



4.	Wild life Introduction, brief history of wildlife. Importance of wild life. Vanishing of wild life. Conservation of wild life in India Sanctuaries and national parks of Gujarat. Concept of threatened species. Wild life organizations.	25%
----	--	-----

Teaching-Learning Methodology	• Class room interactions • By chalk –duster method • By using OHP- Powerpoint presentation • By Giving project work • By giving Students seminar, unit test, assignment • Question bank circulation • Arranging guest talk
-------------------------------	---

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.	Students will learned about anatomy and physiology of the major vertebrate animals.
2.	They came to know about wild life importance, vanishing, conservation, Sancturies and National parks.
3.	The students were came to know about the locomotion, feeding & venom and antivenom of snakes.



4.	Students learned about the economic importance of fishes.
----	---

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 IV

US04MAZOO02 (T)

Effective from December 2025

Course Code	US04MAZOO02 [T]	Title of the Course	PHYSIOLOGY
Total Credits of the Course	04	Hours per Week	04
Course Objectives:	To make students familiar with: 1. The detail Physiology of mammals like human. 2. Muscular, lymphatic & immune system, Urinary and reproductive physiology and related disorders.		

Course Content

Unit	Description	Weightage* (%)
------	-------------	-------------------



Vitthalbhai Patel & Rajratna P. T. Patel Science College

(Autonomous)

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

Affiliated to SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar, Gujarat

Syllabus effective from the Academic Year 2025-2026



1.	Muscular Physiology: • Types of muscle tissue (structure & Functions of all types) • Properties of muscle tissue • Types of muscle protein • Mechanism of muscle contraction • Muscle metabolism • Disorders: Brief account of Muscular dystrophy, Fibromyalgia.	25%
2.	Human Urinary system: Structure of kidney, Renal physiology (Glomerular filtration, Tubular reabsorption and tubular secretion in brief), Production of dilute and concentrated urine (counter current system) Urine transportation, storage and elimination. Disorders: Polycystic kidney disease, urinary tract infection and renal failure.	25%
3.	Human reproduction: Male and female reproductive organs. Female reproductive cycle. Fertilization and implantation of embryo, Embryonic and fetal development. Maternal changes during pregnancy and labor. Methods of birth control. Disorders: AIDS and STD.	25%
4.	Lymphatic system of human: Structure and function of primary and secondary lymphoid organs. Immunology: Non specific resistance to diseases. Specific resistance to diseases: (Immunity, maturation of T-cells ,B-cells, antigen, types of immune response) Cell mediated and antibody mediated immunity. Diseases: Rheumatoid arthritis, myasthenia gravis and multiple sclerosis.	25%
Teaching-Learning Methodology	• Class room interactions • By chalk –duster method • By using OHP- Power point presentation • By Giving project work • By giving Students seminar, unit test, assignment	

Vitthalbhai Patel & Rajratna P. T. Patel Science College**(Autonomous)****(Reaccredited with 'A' Grade by NAAC (CGPA 3.14)****Affiliated to SARDAR PATEL UNIVERSITY****Vallabh Vidyanagar, Gujarat****Syllabus effective from the Academic Year 2025-2026**

	• Question bank circulation • Arranging guest talk
--	---

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 detail types, physiology of Muscles and its working mechanism and related abnormalities.
2.	The students will learned about the reproductive organs, reproductive cycle, AIDS and STDs.
3.	Students will also understand the importance of immune system and urinary system.

Suggested Reference Books:

Sr. No.	Reference Books
1.	Principles of Anatomy & Physiology by TORTORA and GRABOWSKI
2.	Animal Physiology by A.K.BERRY
3	Animal Physiology by M.P.ARORA.
4	Animal Physiology by GUYTON



On-line resources

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

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

B.Sc. ZOOLOGY

IV- SEMESTER

US04MAZOO03, PRACTICAL

Effective from December 2025

Course Code	US04MAZOO03	Title of the Course	ZOOLOGY PRACTICAL
Total Credits of the Course	04	Hours per Week	08
Course Objectives:	To make students familiar with: 1. To understand the Zoological concepts of Animal with particular emphasis on their Experimental outcomes. 2. To understand the basic concepts of types of vertebrates. The unit also introduces understanding of General Aspects of vertebrate Phyla and Animals. 3. To provide exposure to histology, Physiology and related abnormalities.		

Course Content		
	PRACTICALS	Weightage* (%)
PART-1.	Dissection by Simulation, Animation or Charts • External characters, Digestive system of Frog • Reproductive System & Development of Frog • Brain of Frog, Mountings of Muscle & Nerve fibers • Study of Frog Bones • External characters, Digestive system of Calotes • Urinogenital system of Calotes	50%

**Vitthalbhai Patel & Rajratna P. T. Patel Science College
(Autonomous)**



(Reaccredited with 'A' Grade by NAAC (CGPA 3.14)
Affiliated to SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar, Gujarat
Syllabus effective from the Academic Year 2025-2026



	• Brain of Calotes, External characters, Digestive system of Rabbit, Mounting: Rabbit Dentition, tongue, T.S. of salivary gland • Urinogenital system of Rabbit • Brain of Rabbit	
2.	Classification of Chordata upto orders • Protochordata, Cyclostomata & Fishes: Herdmania, Doliolum, Amphioxus, Lamprey, Hammer headed Shark, Stingray, Sea horse, Eel, Catfish, Suckerfish, Flatfish. • Amphibia & Reptiles: Ichthyophis, Salamander, Axolotal larva, Alytes, Tortoise, Varanus, Chamaeleon, Gecko, Alligator, Krait, Viper, Rat Snake, Sea Snake • Aves & Mammals: Kite, Woodpecker, Kingfisher, Sparrow, Weaver bird, Hedgehog, Rat, Shrew, Loris, Porcupine, Squirrel. • Mammalian Histology: T.S. of Skeletal, smooth and Cardiac muscles, Testis, Ovary, Spleen, Kidney. • Birth control methods • Antigen– Antibody Reaction by Widal Test • Physical properties and examination of Urine. • Normal & Abnormal Qualitative Analysis of Human urine. • Project Submission Study tour	50%

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
-------------------------------	--

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination evaluation includes Lab Work Assignment-20 marks (40%), Viva-voce- 10marks (20%), Lab Quiz-10 marks (20%), Journal certification- 6 marks (12%), Attendance-active participation- 4 marks(8%)which makes total 50 Marks.	50%



Vitthalbhai Patel & Rajratna P. T. Patel Science College

(Autonomous)

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

Affiliated to SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar, Gujarat

Syllabus effective from the Academic Year 2025-2026



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.
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. MINOR ZOOLOGY

Semester - IV

US04MIZOO01 (T)

Effective from December 2025

Course Code	US04MIZOO01	Title of the Course	BASIC PHYSIOLOGY
Total Credits of the Course	02	Hours per Week	02
Course Objectives:	To make students familiar with: 1. To provide details about the Physiology of Digestive and circulatory system of mammals like human. 2. To aware about blood groups and its importance.		

Course Content		
Unit	Description	Weightage* (%)
1.	DIGESTION: Brief account of Digestive system Digestion of Starch, Protein, Fat [oil] and Nucleic acid etc. Absorption of food in Intestine Defecation Disorders: Peptic Ulcer, Ulcerative Colitis	50%
2.	CIRCULATION: Circulatory media, Blood composition & functions Formation of blood cells, Types Structure & functions of Blood cells Blood group ABO System & Rh factor Blood transfusion Disorders: Anemia and Types , Hypertension, Leukemia	50%

Teaching-	• Class room interactions
-----------	---



Vitthalbhai Patel & Rajratna P. T. Patel Science College

(Autonomous)

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

Affiliated to SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar, Gujarat

Syllabus effective from the Academic Year 2025-2026



Learning Methodology	• By chalk –duster method • By using OHP- Powerpoint presentation • By Giving project work • By giving Students seminar, unit test, assignment • Question bank circulation • Arranging guest talk
----------------------	---

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.	The students will learn about detail physiology of Digestion and Circulation
2.	To make students to understand about the ABO blood group system, Rh factors and its importance in blood transfusion.

Suggested Reference Books:	
Sr. No.	Reference Books
1.	A text book of animal physiology - A. K. Berry
2.	Principles of anatomy and physiology- Gerard J Tortora & Bryan Derrickson
3.	Animal physiology – M.P.Arora



On-line resources

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

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

B.Sc. MINOR ZOOLOGY

IV- SEMESTER PRACTICAL

US04MIZOO02

Effective from December 2025

Course Code	US04MIZOO02	Title of the Course	ZOOLOGY PRACTICAL
Total Credits of the Course	02	Hours per Week	04
Course Objectives:	To make students familiar with: 1. Students will know about how to test different nutrients and its digestion. 2. Students know about blood groups and types of WBCs cells.		

Course Content		
	PRACTICALS	Weightage* (%)
	To Study Amylase effect on Starch • Carbohydrate test from food • Protein test from food • Lipid test from food • To Study Haemin Crystals from own blood • To Study Blood Group of own blood • To Study types of WBC through blood smear	



Vitthalbhai Patel & Rajratna P. T. Patel Science College

(Autonomous)

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

Affiliated to SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar, Gujarat

Syllabus effective from the Academic Year 2025-2026



Teaching-Learning Methodology	• Using student's Microscope • By qualitative analysis of different food. • Learn through Video/ ppt • Field visit, Project submission
-------------------------------	--

Evaluation Pattern

Sr. No.	Details of the Evaluation	Weightage
1.	Internal Examination Evaluation includes--Lab work Assignment-10marks (40%), Viva-voce-5marks (20%), Lab quiz-5 marks(20%), Journal certification-3marks(12%), Attendance- active participation-2marks (8%) 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 different nutrients and its digestion.
2.	To learned about types of blood groups and different types of cells

Suggested Reference Books:

Sr. No.	Reference Books
1.	Practical Physiology, Anatomy & Biochemistry by SHAH, PATEL & GOEL

On-line resources

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

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