



SIRP. T. SARVAJANIK COLLEGE OF SCIENCE, SURAT.
Autonomous
(Affiliated with Veer Narmad South Gujarat University)
Reaccredited 'A+' 3.35 CGPA by NAAC, College with Potential for Excellence



Sir P. T. Sarvajani College of Science

(Autonomous)

**Affiliated to Veer Narmad South Gujarat University,
Surat**

Re-Accredited 'A⁺' with CGPA 3.35

SYLLABUS

FOR

SEM VI

Program: B. Sc.

Course: ZOOLOGY

For

Academic year

2026-27

(NEP-2020)

Effective from June 2026-27



Board of Studies in Zoology

Undergraduate and Post Graduate

	Name	Designation	Institute/Industry
Head of the Department			
1	Dr. Jaya Patel	Chairperson	Sir P. T. Sarvajani College of Science
Two experts from other than the parent University			
1	Dr. Nikunj Bhatt	Associate Professor	Department of Zoology, V. P. & R. P. T. P. Science College, (Autonomous), Vallabh Vidyanagar, Anand
2	Dr. Amol Patwardhan	Assistant Professor	K. J. Somaiya College of Science and Commerce (Autonomous), Mumbai
Subject Expert nominated by Vice-Chancellor			
1	Dr. Krupal Patel	Assistant Professor	Department of Zoology, Govt. Arts, Commerce & Science College, Limbayat, Surat
Meritorious Alumnus			
1	Mr. Bhavesh Chevli	Chief of Manufacturing	Envision Scientific Pvt. Ltd Sachin-Hazira Road
Experts from outside the Autonomous College, whenever special courses of studies are to be formulated, to be nominated by the Principal.			
1	Dr. Arun Dholakia	Retd. Associate Professor	Department of Zoology, Sir P. T. Sarvajani College of Science, Surat
Representative from Industry/corporate sector/allied area			
1	Ms. Pinal Patel	Board of Member	TINSA, Ecological Foundation Bhopal, Madhya Pradesh
Faculty of the specialization			
1	Dr. Jaya Patel	Associate Professor & Head	Sir P. T. Sarvajani College of Science
2	Dr. Nitin Solanki	Assistant Professor	Sir P. T. Sarvajani College of Science



3	Dr. Neelam Mishra	Adhyapak Sahayak	Sir P. T. Sarvajani College of Science
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Detailed B. Sc. Zoology Syllabus

T. Y. B. Sc. Syllabus with effect from the Academic year 2025-26

Content

Sr. No	Semester	Course number	Course Code	Course Title
Core Course (CC)				
1	VI	CC XIV	ZOOMJ-S6P14-2CR26	Non Chordates and Chordates-V
2		CC XV	ZOOMJ-S6P15-2CR26	Animal Physiology
3		CC XVI	ZOOMJ-S6P16-2CR26	Histology
4		CC MJ Practical XII	ZOOMJ-S6PR12-2CR26	Zoology Practical-XII
5		CC MJ Practical XIII	ZOOMJ-S6PR13-2CR26	Zoology Practical-XIII
6		CC MJ Practical XIV	ZOOMJ-S6PR14-2CR26	Zoology Practical-XIV
7		CC MN VI	ZOOMN-S6P6-2CR26	Immunology
8		MN Practical VI	ZOOMN-S6PR6-2CR26	Zoology Minor Practical-VI
9		Internship	ZOINT-S6P1-4CR26	Internship

Credit Frame work of T.Y. B.Sc. Zoology Syllabus

Semester	Major (Core Course)	Minor (Elective Course)	SEC	Internship	Total Credit
5	12	08	02	-	22
6	12	04	-	04	20
Total Credit (Year wise)					



Detailed B. Sc. Zoology Syllabus

T. Y. B. Sc. Syllabus with effect from the Academic year 2025-26

Course No.	Course Title	Course Code	Credits	Hour	Module	Lectures per module (1 Hr)	Examination		
							Internal Marks	External Marks	Total Marks
SEMESTER VI									
Major Courses Theory and Practical									
CC XIV	Non Chordates and Chordates-V	ZOOMJ-S6P14-2CR26	2	30	2	15	25	25	50
CC XII	CC MJ Practical XII	ZOOMJ-S6PR12-2CR26	2	60	-	-	25	25	50
CC XV	Animal Physiology	ZOOMJ-S6P15-2CR26	2	30	2	15	25	25	50
CC XIII Practical	CC MJ Practical IX	ZOOMJ-S6PR13-2CR26	2	60	-	-	25	25	50
CC XVI	Histology	ZOOMJ-S6P16-2CR26	2	30	2	15	25	25	50
CC XVI Practical	CC MJ Practical XVI	ZOOMJ-S6PR14-2CR26	2	60	-	-	25	25	50
CC MN VI	Immunology [CC VI]	ZOOMN-S6P6-2CR26	2	30	2	15	25	25	50
MN Practical VI	Zoology Minor Practical VI	ZOOMN-S6PR6-2CR26	2	60	-	-	25	25	50
Internship	Internship	ZOoint-S6P1-4CR26	4	120	-	-	50	50	100



T. Y. B. Sc.
SEMESTER V
Course Name: Forensic Science and Toxicology
Course Code: ZOOMJ-S5PR11-2CR26
Practical [Credits - 02]

Course Learning Outcome

After the successful completion of the Course ,the learner will be able to:

- To provide a foundational understanding of the history, scope, and legal evolution of forensic science.
- To introduce the core scientific principles and "laws" that govern forensic investigations.

PracticalModule–I(ZOOMJ-S5PR11-2CR25)

[60L]

The following practical are to be studied with the help of charts, models,videos, photographs, permanent slides, working models, etc.

1	To study different types of finger prints.
2	To develop, visualize, and lift latent fingerprints from various non-porous and semi-porous surfaces using fingerprint powder and lifting tape for identification purposes.
3	To study different types of tattoo marks in human.
4	To study different types of occupational marks in human.
5	To study the morphology of different hairs - man, dog, horse, cow, buffalo and goat.
6	To study different bite marks and sting marks.
7	Study of various samples of food additives/preservatives and their usages. (vinegar, benzoic acid, formic acid, citric acid, gelatin)
8	Detection of coloring substances in red chilli and turmeric powder.
9	Detection of adulteration in ghee and paneer.
10	Detection of copper sulphate or malachite green solution on surface of green vegetables.



11	To perform a systematic investigation of a simulated (artificial) crime scene by identifying, documenting, and collecting physical evidence.	
12	To study the DNA fingerprinting.	

T. Y. B. Sc.
SEMESTER V
Course Name: Tissue System - II and Molecular Biology
Course Code: ZOOMN-S5P4-2CR26
Theory [Credits - 02]

Mapping of COs and POs

Course Outcomes	Programme Outcomes					
	1	2	3	4	5	6
Analyze different types of tissues based on their structure, location, and function.		X		X		
Differentiate muscular, connective, and nervous tissues with suitable examples.	X					
Explain the functional significance of tissues in maintaining body organization.			X			
Sketch and label the microscopic details of tissues	X	X				
Analyze different types of tissues based on their structure, location, and function.	X					
Differentiate muscular, connective, and nervous tissues with suitable examples.			X			
Explain the functional significance of tissues in maintaining body organization.			X			
Analyze the structural components of nucleic acids including nucleotides and nitrogenous bases.			X			
Explain the structure of DNA and RNA with key features such as base pairing and double helix.		X				
Differentiate types of DNA and RNA based on structure and function.				X		
Interpret the biological significance of nucleic acids in genetic information and cellular processes.			X			



Unit	Remembering (1)	Understanding (2)	Applying (3)	Analyzing (4)	Evaluating (5)	Creating (6)	Total
I	20%	50%	30%	-	-	-	100%
II	20%	50%	30%	-	-	-	100%

T. Y. B. Sc.
SEMESTER - VI
Course Name: Non Chordates and Chordates - V
Course Code: ZOOMJ-S6P14-2CR26
Theory [Credits -02]

Course learning outcome		
After successfully completing these course students will be able to: Classify different Non– Chordates phyla and Classification of Chordates up to orders with suitable examples and reasons		
Module1	Non– Chordates	[15L]
Learning Objective - Students know and understand taxonomy of Non– chordates up to orders - Students know taxonomic status of different non chordates organisms - Students can explain salient features of invertebrate phyla		
Learning Outcomes: - Students can classify Non– Chordates phyla up to orders with reasons - Students will understand the evolutionary trends among lower animals. - Students will identify Helminthes, Annelida, Arthropoda, Mollusca and Echinodermata - Students know examples of different phyla with characteristics		



1.1	Classification of Non– Chordates phyla up to orders • Helminthes • Annelida • Arthropoda • Mollusca • Echinodermata • Ectoprocta • Endoprocta	
Module2	Chordates	[15L]
Learning Objective • Students will understand different system of pigeon • Students will draw and understand different system of pigeon • Students will know different internal organs structure of pigeon • Students will explain different internal organ functions of pigeon		
Learning Outcomes: • Students will understand different system of pigeon like Digestive system, Respiratory system, Nervous system and its organs • Students will know different internal organs structure of pigeon • Students will explain different internal organs functions of pigeon • Students can draw and label diagrams of pigeon system		
2.1	Animal Type Study: Pigeon • External features and Digestive system • Respiratory system • Circulatory system: - Heart - Arterial system - Venous system • Brain • Urinogenital system	



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1. A Text Book of General Biology –Tomer& Singh. RastogiPublication,Meerut
2. A Text book of Zoology Invertebrates, Vol. I 1992, 7th Edn. Parker and Haswell edited by Marshall William, C B S publishers and distributors, New Delhi.
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21. JUNQEIRA'S Basic Histology Text & Atlas by Anthony L. Mescher
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32. Text Book of Chordates - A. Thangamani, S. Prasanna Kumar
33. Text Book of Zoology - Dalela and Verma. Jay Prash Nath & co. Meeru
34. Text book of Zoology - R. D. Vidyarthi. S. Chand
35. Text Book of Zoology - S.N. Prasad. Vikas Publishing House pvt. ltd. Delhi
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Mapping of Cos and POs

Course Outcomes	Programme Outcomes					
	1	2	3	4	5	6
Classify Non– Chordates phyla up to orders with reasons	X	X				
Understand the evolutionary trends among lower animals		X				
Understand different system of pigeon like Digestive system, Respiratory system, Nervous system and its organs	X	X				
Know different internal organs structure of pigeon	X	X				
Explain different internal organs functions of pigeon		X				
Draw and label diagrams of pigeon system	X	X	X			
Understand different system of pigeon like Digestive system, Respiratory system, Nervous system and its organs	X					
Know different internal organs structure of pigeon		X				

Unit	Remembering (1)	Understanding (2)	Applying (3)	Analyzing (4)	Evaluating (5)	Creating (6)	Total
I	30	70	-	-	-	-	100%
II	30	60	10	-	-	-	100%

**T. Y. B. Sc.
SEMESTER VI
Course Name: Non Chordates and Chordates - V
Course Code: ZOOMJ-S6PR12-2CR26
Practical [Credits -02]**

Course Learning Outcome
After the successful completion of the Course, the learner will be able to: - Classify invertebrate animals up to orders - Know different organisms with its features and class - Students will understand different system of pigeon like Digestive system, Respiratory system, Nervous system and its organs - Students will know different internal organs structure and function of pigeon
The following practical are to be studied with the help of charts, models ,videos, photographs, permanent slides, working models, etc.



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1	Classification of following animals up to orders: Helminthes: Fasciolahepatica, Taeniasaginata, Wuchereriabancrofti
2	Classification of following animals up to orders: Annelida: Sabella, Lumbricus, Acanthobdella
3	Classification of following animals up to orders: Arthropoda: Lobster, Spider, LeafInsect, Nepa
4	Classification of following animals up to orders: Mollusca: Cyprea, Limnea, Mytilus, Sepia, Nautilus
5	Classification of following animals up to orders: Echinodermata: Astropecten, Ophioderma, Strongylocentrous, Synapta Minor Phyla: Pedicellina, Loxosoma, Urnatella, Bugula
6	External characters & Digestive system of Pigeon
7	Respiratory system of Pigeon Syrinx
8	Heart and arterial system of Pigeon
9	Venous system of Pigeon
10	Urinogenital system of Pigeon
11	Brain of Pigeon& Sense organ
12	Pigeon – Pecten, Hyoid apparatus and types of feathers

Course Learning Outcomes	Programme Outcomes					
	1	2	3	4	5	6
Classify different Non– Chordates phyla up to orders		X				
Identify different organisms as per characters		X				
Understand different system of pigeon like Digestive system, Respiratory system, Nervous system and its organs	X					
Understand different system of pigeon like Digestive system, Respiratory system, Nervous system and its organs		X				



T. Y. B. Sc.
SEMESTER VI
Course Name: Animal Physiology
Course Code: ZOOMJ-S6P15-2CR26
Theory [Credits - 02]

Course learning outcome		
After successfully completing this course, students will be able to: - Understand and explain physiology of respiration and circulation - Analyze respiratory and circulatory mechanisms - Apply knowledge to interpret physiological processes and functions		
Module 1	PHYSIOLOGY OF RESPIRATION:	[15L]
Learning Objective: To understand the mechanisms, types, and regulation of respiration		
Learning Outcomes: - Explain process and types of respiration - Describe respiratory volumes and capacities - Understand respiratory pigments and gas transport - Analyze oxygen and carbon dioxide transport mechanisms - Explain regulation of respiration		
1.1	1.1.1. Respiration - Physiological mechanism of respiration - Respiratory mechanism (inspiration & expiration) 1.1.2. Types of Respiration - External respiration - Internal respiration - Cellular respiration 1.1.3. Respiratory Volumes and Capacities - Tidal volume - Inspiratory reserve volume - Expiratory reserve volume - Residual volume - Vital capacity - Total lung capacity 1.1.4. Respiratory Pigments - Respiratory pigments (general account) Types of respiratory pigments: - Haemoglobin - Hemocyanin - Hemerythrin - Chlorocruorin - Structure and functions of haemoglobin 1.1.5. Transport of Oxygen	
1.2		



	• Transport of oxygen by haemoglobin • Oxygen dissociation curve • Factors affecting oxygen dissociation curve • Bohr effect 1.1.6. Transport of Carbon Dioxide • Forms of CO₂ transport in blood • Chloride shift • Carbon monoxide poisoning 1.1.7. Regulation of Respiration • Nervous regulation of respiration • Chemical regulation of respiration	
Module 2	PHYSIOLOGY OF CIRCULATION	15L
Learning Objective		
• To understand the structure and functioning of circulatory system		
Learning Outcomes:		
• Describe types of circulation • Explain composition and functions of blood • Understand structure and function of heart • Analyze cardiac cycle and regulation of heartbeat • Evaluate circulatory dynamics (blood pressure, cardiac output)		
2.1	2.1.1. Types of Circulation • Open circulation • Closed circulation 2.1.2. Blood • Components of blood • Structure and functions of haemoglobin • Blood pigments • Homeostasis • Blood clotting system • Hematopoiesis and its regulation 2.1.3. Heart • Structure of mammalian heart • Types of hearts: ◦ Neurogenic heart ◦ Myogenic heart 2.1.4. Heartbeat and Cardiac Function • Functions of heart • Conduction system of heart • Cardiac cycle • Regulation of heartbeat • Regulation of heart rate 2.1.5. Circulatory Dynamics • Cardiac output • Blood pressure	



References:

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Mapping of COs and POs

Course Outcomes	Programme Outcomes					
	1	2	3	4	5	6
Explain process and types of respiration		X		X		
Describe respiratory volumes and capacities	X					
Understand respiratory pigments and gas transport			X			
Analyze oxygen and carbon dioxide transport mechanisms	X	X				
Explain regulation of respiration	X					
Explain process and types of respiration			X			
Describe respiratory volumes and capacities			X			
Describe types of circulation		X				
Explain composition and functions of blood		X				
Understand structure and function of heart		X				



Analyze cardiac cycle and regulation of heartbeat			X			
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Unit	Remembering (1)	Understanding (2)	Applying (3)	Analyzing (4)	Evaluating (5)	Creating (6)	Total
I	20%	50%	30%	-	-	-	100%
II	20%	50%	30%	-	-	-	100%

T. Y. B. Sc.
SEMESTER VI
Course Name: Animal Physiology
Course Code: ZOOMJ-S6PR13-2CR26
[Credits - 02]

Course learning outcome

After successfully completing this course, students will be able to:

- Measure and interpret respiratory volumes and capacities such as tidal volume, vital capacity, and reserve volumes.
- Understand and explain the mechanisms of transport of oxygen and carbon dioxide in blood.
- Identify and describe the structure of the mammalian heart and its functional components.
- Illustrate and interpret the stages of the cardiac cycle using diagrams.
- Measure and interpret blood pressure including systolic and diastolic values using standard techniques.

Practical Module

[10L]

The following practical are to be taught / studied only with the help of charts, models, videos, photographs, permanent slides, working models etc.

1	Practical 1: Study of respiratory volumes and capacities ○ Tidal volume ○ Vital capacity ○ Inspiratory and expiratory reserve volumes Practical 2: Study of oxygen dissociation curve ○ Shape of curve ○ Factors affecting oxygen dissociation Practical 3: Study of respiratory pigments ○ Haemoglobin ○ Other respiratory pigments (general study) Practical 4: Study of transport of gases in blood ○ Transport of oxygen ○ Transport of carbon dioxide
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	Practical 5: Study of structure of mammalian heart (using model/chart) Practical 6: Study of cardiac cycle (diagrammatic representation) Practical 7: Measurement of blood pressure Systolic and diastolic pressure Practical 8: Calculation of cardiac output (using model/chart & numerical problems) Practical 9: RBC Counting from given Sample. Practical 9: Differential Count from given Sample	
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Mapping of COs and POs

Course Outcomes	Programme Outcomes					
	1	2	3	4	5	6
Measure and interpret respiratory volumes and capacities such as tidal volume, vital capacity, and reserve volumes.	X					
Explain and analyze the oxygen dissociation curve, including its shape and factors affecting oxygen binding and release.	X					
Describe the role of respiratory pigments such as Hemoglobin and their importance in gas transport.		X				
Understand and explain the mechanisms of transport of oxygen and carbon dioxide in blood.	X					
Identify and describe the structure of the mammalian heart and its functional components.	X					
Illustrate and interpret the stages of the cardiac cycle using diagrams.	X					
Measure and interpret blood pressure including systolic and diastolic values using standard techniques.		X				
Measure and interpret respiratory volumes and capacities such as tidal volume, vital capacity, and reserve volumes.		X				
Explain and analyze the oxygen dissociation curve, including its shape and factors affecting oxygen binding and release.	X		X			



T.Y. B.Sc.
SEMESTER VI
Course Name: Human Histology
Course Code: ZOOMJ-S6P16-2CR26

Course learning outcome

After successfully completing this course, students will be able to:

- Identify specific organs under a microscope based on cellular markers of Digestive System, Nervous System, Urinary System and Reproductive System

Module 1	Histology of Digestive System and Urinary System	[15L]
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Learning Objective

- Identify the four classic layers of the alimentary canal (mucosa, submucosa, muscularis externa, and adventitia/serosa)
- Differentiate between the types of lingual papillae on the tongue and the secretory units of the salivary glands.
- Explain the functional unit of the liver and the dual blood supply system.
- Describe the filtration barrier in the urinary system and the unique transition epithelium of the bladder.

Learning Outcomes:

- Tissue Recognition: identify specific organs under a microscope based on cellular markers.
- Functional Correlation: understand how the structure of an organ facilitates its job, such as how the microvilli in the small intestine maximize nutrient absorption.

- | | | |
|-----|--|--|
| 1.1 | Histological Structure of: Digestive System <ul style="list-style-type: none">• Oral Cavity: Tongue and Salivary gland• Alimentary canal: Oesophagus, Stomach and Intestine• Liver and Pancreas Urinary System <ul style="list-style-type: none">• Kidneys• Uraters• Bladder• Urethra | |
|-----|--|--|

Module 2	Histology of Reproductive System	[15L]
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Learning Objective

- Identify the Histological structure of Male and Female Reproductive Organs
- Differentiate between Male and Female Reproductive Organs



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Learning Outcomes:

- Compare the stages of gametogenesis as seen in the histology of the testes (spermatogenesis) and the ovaries (follicular development).

2.1

Histological Structure of: Male Reproductive System

- Testes
- Excretory Genital Ducts
- Seminal vesicles, Prostate gland

Female Reproductive System

- Ovaries,
- Uterine tubes
- Uterus
- Cervix
- Vagina
- External genitalia
- Mammary Glands

References:

1. Textbook of Human Histology (4th edition) By Inderbir Singh
2. Endocrine Physiology (4th edition) By Patricia E. Molina
3. Modern Experimental Zoology by Dr.Preeti Gupta and Dr.MridulaChatuevedi

T.Y.B. Sc.

SEMESTER VI

Course Name: Human Histology

Course Code: ZOOMJ-S6PR14-2CR26

Course learning outcome

After successfully completing this course, students will be able to:

- Accurately identify the specialized tissues of the Oral Cavity and Alimentary Canal (Oesophagus, Stomach, Intestine) by distinguishing unique cellular markers, such as goblet cells, gastric pits, and villi.
- Relate the histological structure of the Kidney (Nephron) and Reproductive Organs (Testis/Ovary) to their primary physiological roles in filtration and gametogenesis.
- Identify the Histological structure of Male and Female Reproductive Organs
- Differentiate between Male and Female Reproductive Organs

PRACTICAL

1. Study of Histological Structure of oral cavity through slide, chart and photographs:
 - Tongue
 - Salivary gland
2. Study of Histological Structure of alimentary canal through slide, chart and photographs:
 - Oesophagus
 - Stomach
 - Intestine



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3. Study of Histological Structure through slide, chart and photographs:
 - Liver
 - Pancreas
4. Study of Histological Structure of Urinary organ through slide, chart and photographs:
 - Kidney
5. Study of Histological Structure through slide, chart and photographs:
Male Reproductive Organs-Testis, Seminiferous Tubules, Seminal vesicles, Prostate gland
6. Study of Histological Structure through slide, chart and photographs:
Female reproductive organ – Ovary, Cervix, Vagina ,Mammary Gland

T. Y. B. Sc.

SEMESTER VI

Course Name: Immunology

Course Code: ZOOMN- S6P6-2CR26

Theory [Credits -02]

Course learning outcome		
After successfully completing this course, students will be able to:		
- Explain the fundamental concepts and historical development of Immunology - Describe immune cells, lymphoid organs, and their functions - Understand modern techniques like recombinant DNA technology and antibody engineering - Apply immunological knowledge in health, disease, and research contexts		
Module 1	Historical Background of Immunology	[15L]
Learning Objective:		
- To introduce the basic concepts and evolution of Immunology - To familiarize students with modern immunological technologies		
Learning Outcomes:		
- Explain the origin and development of Immunology - Identify major immune cells and their functions - Understand the importance of immunology in science and medicine - Describe applications of recombinant DNA technology in immunology		
1.1	1.1.1 Introduction of Immunology 1.1.2 Important aspects of Immunology: Immune Component Organs and Cells, Immunodeficiency Diseases, Hypersensitivity Reactions 1.1.3 Autoimmunity, Outstanding features of Vertebrate B-cell, Recombinant DNA Technology(RDT) and Antibody Engineering, Expectations of man from Science of Immunology 1.1.4 Vaccines and Vaccinations, Tolerance, Antigen Antibody Reactions- Passive Agglutination	
Module 2	Lymphoid Organs	15L
Learning Objective		



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- To understand the structure and function of lymphoid organs
- To study lymphocyte development and circulation
- To differentiate between primary and secondary lymphoid organs

Learning Outcomes:

- Describe lymphoid organ structure and function
- Explain lymphocyte formation and maturation
- Differentiate primary and secondary lymphoid organs
- Understand lymphocyte circulation in the body

2.1	2.1.1.Introduction 2.1.2.Early lymphocyte production 2.1.3. Haematopoietic stem cells 2.1.4. Primary Lymphoid Organs: Bone marrow, Bursa of Fabricius in Birds, Thymus 2.1.5. Secondary Lymphoid Organs: Spleen, Lymph nodes and lymphatic system, Mucosal Associated Lymphoid Tissue, Tonsils, Lymphoid Organs and circulation of lymphocyte
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References:

1. Khanna R. (2011) Immunology. Oxford Uni. Press
2. Murphy, K., & Weaver, C. (2016). Janeway's Immunobiology(9th Edition) Garland Science.
3. Owen, J. A., Punt, J., & Stranford, S. A. (2023). Kuby Immunology(8th Edn). NewYork: WH Freeman.
4. Rao, C.V Immunology- a Textbook
5. S.S.Lal, S. Kumar, Immunology 2nd edition

Mapping of COs and POs

Course Outcomes	Programme Outcomes					
	1	2	3	4	5	6
Identify major immune cells and their functions		X		X		
Understand the importance of immunology in science and medicine	X					
Describe applications of recombinant DNA technology in immunology			X			
Describe lymphoid organ structure and function	X	X				
Explain lymphocyte formation and maturation	X					
Differentiate primary and secondary lymphoid organs			X			
Understand lymphocyte circulation in the body			X			

Unit	Remembering (1)	Understanding (2)	Applying (3)	Analyzing (4)	Evaluating (5)	Creating (6)	Total
I	20%	50%	30%	-	-	-	100%
II	20%	50%	30%	-	-	-	100%



**T.Y.B. Sc.
SEMESTER VI
Course Name: Immunology
Course Code: ZOOMN-S6PR6-2CR26
Practical [CREDITS - 02]**

Course learning outcome

After successfully completing this course, students will be able to:

- Explain the fundamental concepts and historical development of Immunology
- Describe immune cells, lymphoid organs, and their functions
- Understand modern techniques like recombinant DNA technology and antibody engineering
- Apply immunological knowledge in health, disease, and research contexts

PRACTICAL

1. Study of Primary and Secondary Lymphoid Organs and development of Immune response cells through slide, chart and photographs:
2. Study of different Lymphoid Organs in Human
3. Study of Primary Lymphoid Organs:
 - T.S.passing through Bone marrow in Human,
 - T.S.passing through Bursa of Fabricius in chick,
4. Study of Histological Structure of Thymus in chick and in Human
5. Study of Secondary Lymphoid Organs:
 - T.S.passing through spleen in Human,
 - T.S.passing through Intestine,
 - T.S.passing through Mucosal cells,
 - Cross section of palatine tonsil, ,
 - Cross section of lingual tonsil,
 - L.S. nasopharyngeal tonsil Human,
6. Study of Lymphocytes circulation from different Lymphoid Organs in human
7. Study of Haemagglutination for ABO Blood Typing.

Mapping of COs and POs

Course Outcomes	Programme Outcomes					
	1	2	3	4	5	6
Explain the fundamental concepts and historical development of Immunology		X		X		
Describe immune cells, lymphoid organs, and their functions	X					
Understand modern techniques like recombinant DNA technology and antibody engineering			X			
Apply immunological knowledge in health, disease, and research contexts	X	X				
Explain the fundamental concepts and historical development of Immunology	X					