

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF ZOOLOGY
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in life Science <i>(Degree / Honors)</i>		Semester - V	Session: 2024-2025
1	Course Code	ZOSC- 05T	
2	Course Title	Vertebrate Physiology	
3	Course Type	Discipline Specific Course	
4	Pre-requisite (if, any)	<i>As per Program</i>	
5	Course Learning Outcomes (CLO)	<p>After successfully completing this course, the students will be able to-</p> <ul style="list-style-type: none"> ➤ Understand the physiological mechanism at cellular and system level. ➤ Learn the significance of nutrients, breathing mechanism, blood coagulation. ➤ Understand the water balance in body and working of different senses response. ➤ Understand the reproductive physiology and muscles contraction. ➤ Apply this knowledge to understand working and disorders of physiological activities. 	
6	Credit Value	3 Credits	<i>Credit = 15 Hours - learning & Observation</i>
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40
PART -B: Content of the Course			
Total No. of Teaching-learning Periods (01 Hr. per period) - 45 Periods (45 Hours)			
Unit	Topics (Course contents)		No. of Period
I	Cell Physiology: Cell membrane and transport mechanism: Transport across membrane: osmosis, passive diffusion- simple and facilitated, & Active transport Mechanism of active transport Primary & secondary active transport, endocytosis and exocytosis, Vesicular Transport: Protein sorting from ER to Golgi, Retrograde transport, Transport across Mitochondrial membrane; pH and its biological significance, Buffer: buffers in biological system, Regulation of pH by Lung and Kidney.		12
II	Physiology of Digestion Respiration and Circulation: Physiology of Digestion: Biological significance of nutrients: carbohydrates, proteins, fats, vitamins and minerals. Physiology of digestion with special reference to enzyme involved, Absorption of Carbohydrate, protein and lipid. Breathing mechanism: Pulmonary ventilation, Respiratory volumes and capacities. Transport of Oxygen and Carbon dioxide in blood. Composition of blood, blood groups, Theories of blood coagulation. Conduction and Regulation of Heart beat, Cardiac cycle, Cardiac output, Integration of cardiovascular function, electrocardiogram (ECG).		11
III	Physiology of Excretion, nerve impulse transmission and Receptor Physiology: Physiology of excretion: Nephron: Structure, Types and their functions Mechanism of Urine formation, Counter-current Mechanism, role of ADH and Renin-Angiotensin-Aldosterone system in Excretion, Mechanism of Osmoregulation in fresh water and marine and terrestrial vertebrates, Stenohalinity and Euryhalinity. Nerve Physiology: Structure and functions of neuron, ionic basis of resting and action potentials, nerve impulse and its transmission, synapse and synaptic transmission, Reflex action. Receptor physiology- Physiology of Vision, Physiology of Hearing and balancing, Mechano, chemo reception, Bioluminescence.		11
IV	Physiology of Reproduction, Muscle Contraction and Tharmoregulation: Physiology of Reproduction: male reproduction: hormonal control of Spermatogenesis, female reproduction: hormonal Control of Oogenesis, menstrual cycle and its hormonal control. Muscle Contraction: Structure and types of muscles, striated, non-striated and cardiac muscles. Molecular structure of muscles protein Actin and Myosin. Physiology of muscles contraction. Theories of Muscles Contraction. Thermoregulation: Mechanism in Homeotherms and Poikilotherm.		11
Keywords	<i>Vertebrate Physiology, Physiology of Respiration, Digestion, Circulation, Blood, Cardiac Cycle, Excretion, Nerve impulse, Thermoregulation, Muscle Contraction, Physiology of Reproduction & Endocrine Glands</i>		
Signature of Convener & Members (CBoS) :			

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended –

- Verma P S , Tyagi B S, Agarwal VK *Animal Physiology. Author.*, Edition, illustrated. Publisher, S. Chand Publishing, 2000 - Science - 432 pages
- *Berry AK, A Textbook of Animal Physiology By* (Second edition Emkay publication
- Dr. C. C. Chatterjee, Human physiology, Vol. I & II, 1980, 12th Edn., Medical Applied Agency, Kolkata
- Nagabhushanam, S. V. S. Rana, S. Kalavathy Text book of Animal Physiology, 2008, 2nd Edn., Oxford University Press, India.

Reference Books Recommended –

- Ian Kay, 2000, Introduction to Animal Physiology, Bios Scientific Publishers Limited.
- Guyton A. C. & Hall J. E., 2006, Textbook of Medical Physiology, 11th Edition, Hercourt Asia Pvt. Ltd. / W. B. Saunders Company
- Tortora G. J. & Grabowski S., Principles of Anatomy & Physiology, 2006, 11th Edition, John Wiley & sons, Inc.
- Schmidt-Nielsen, Knut, Animal Physiology: Adaptation and Environment, 1997, Cambridge University Press.
- Hoar W. S., General and Comparative Physiology, 1983, 3rd Edn., Prentice Hall, UK.7.
- Barret, K.; Brooks, H.; Boitano, S. and Barman, S. (2010) Ganong's Review of Medical Physiology (23rd edition) Lange Medical.
- Guyton, A.C. and Hall, J.E. (2006) A text book of Medical Physiology (11th edition) Saunders.
- Keele, C.A. & Neil, E. (1989) Samson Wright's Applied Physiology (13th edition) Oxford.

Online Resources–

- E PG Pathshala:

<https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=2rAs1Puvga4LW93zMe83aA==>

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PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks


Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 +20	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar - 10	
	Total Marks - 30	
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20 Marks Section B: Descriptive answer type qts., 1out of 2 from each unit-4x10=40 Marks	

Name and Signature of Convener & Members of CBoS:









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1	Course Code	ZOSC-05 P	
2	Course Title	Vertebrate Physiology	
3	Course Type	Discipline Specific Lab Course	
4	Pre-requisite (if, any)	<i>As per Program</i>	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to- ➤ Perform and demonstrate some physiological exercises ➤ Learn to record Blood pressure and analyze it ➤ Calculate Oxygen Consumption in model animal ➤ Learn the structure and working of eye and ear. ➤ Apply this knowledge to identify tissues by learning Histological details	
6	Credit Value	1 Credits	<i>Credit = 15 Hours - learning & Observation</i>
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
PART -B: Content of the Course			
Total No. of Teaching-learning Periods (01 Hr. per period) - 30 Periods (30 Hours)			
Unit	Topics (Course contents)		No. of Period
	<ul style="list-style-type: none"> Hematological practical : Determine blood group, RBC and WBC counting technique, clotting time Preparation of haemine crystal Measurement of Blood Pressure through sphygmomanometer. Action of salivary amylase on starch Biochemical analysis of food Determination of oxygen consumption with the help of Respirometer Preparation of casein from milk Study of permanent histological section slides of (esophagus , stomach, duodenum, ilium , pancreas ,liver trachea kidney spinal cord, bone, cartilage & blood cells) mammal, Demonstration of technique of microtome to have hands-on experience and learning of the technique Glycolysis, Krebs's cycle, electron transportation demonstrate through Chart / Photographs Preparation of Practical record group discussion /quiz / A small project report applying the knowledge 		15
Keywords	Vertebrate Physiology, Human Physiology, Physiology of Respiration, Digestion, Circulation, Blood, Cardiac Cycle, Excretion, Nerve impulse, Thermoregulation, Muscle Contraction, Physiology of Reproduction & Endocrine Glands		
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- Verma P S , Tyagi B S, Agarwal VK *Animal Physiology. Author.*, Edition, illustrated. Publisher, S. Chand Publishing, 2000 - Science - 432 pages
- Berry AK, A Textbook of Animal Physiology By (Second edition Emkay publication
- Pal GK & Pal Parvati, Text book of Practical Physiology, Universities Press
- V P Varshaney and Mona Bedi, Ghai's Text Book of Practical Physiology, Jaypee Brothers Medical Publication

Reference Books Recommended –

- Ian Kay, 2000, Introduction to Animal Physiology, Bios Scientific Publishers Limited.
- Guyton A. C. & Hall J. E., 2006, Textbook of Medical Physiology, 11th Edition, Hercourt Asia Pvt. Ltd. / W. B. Saunders Company
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- Schmidt-Nielsen, Knut, Animal Physiology: Adaptation and Environment, 1997, Cambridge University Press.

Online Resources–

- <http://ndl.iitkgp.ac.in/he document/swayam prabha/m zly6dppqu>
- <http://ndl.iitkgp.ac.in/he document/swayam prabha/y 0ag clvw0>

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) – 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:

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