Course Code: ZOC 202 **Course Title: Comparative Physiology of Animals**
Number of Credits: 3
Effective from AY: 2020 -21

Prerequisite for the Course:	Elementary knowledge on animal anatomy, Physiology taxonomy and systematics.	
Objectives:	To provide knowledge of animal body system to reveal physiological homologies, patterns of physiological adaptation to various environments. To introduce various principles that underlies higher level integrative bodily functions. To provide a comprehensive knowledge of functional physiological pathways common to all animals.	
Content:	**Module 1** Nutrition (Feeding and digestion) in Non-chordates. Metagenome of mammalian Gut, Rumen fermentation. Movements of GI tract, control and reflexes. Concept of Gut brain Axis. Excretion and Osmoregulation in Non-chordates in fresh water, marine water and terrestrial environment. Contributions of Crustacean Antennal Glands and Molluscan Mantle to Acid-Base Regulation. Urine formation in Metanephros kidney, Nephrolithiasis-mechanism of Renal stone formation. **Module 2** Composition of Coelomic fluid and hemolymph of Non-chordates, Formation lymph. Physiological difference between Pulmonary and Systemic circulation of higher vertebrates and changes during pregnancy. Lung volumes and their physiological interpretations and changes in lung volumes during pregnancy. Ventilation – Perfusion Physiology. Conducting system of heart, Comparison of action potentials of Pacemaker cell and cardiomyocyte.	**6 hours** **6 hours** **4 hours** **5 hours** **3 hours**

	Module 3 Various types of reproductive modes across Non-chordates, Uterine Physiology, Delayed implantation/Embryonic Diapause and its regulation, Estrous cycles and types of anestrous.	**12 hours**
Pedagogy:	Lectures/ tutorials /online teaching mode/self-study.	
Learning Outcome:	1. Understanding of the basic concepts and processes of physiological regulation, from cellular to organ to organismal. 2. Evaluation of physiological possibilities that animals have developed through natural selection.	
References /Reading:	1. Barnes RSK, Calow P, Olive PJW, Golding DW and Spicer JI (2001), The Invertebrates: A Synthesis, Third edition, Blackwell Science. 2. Moyces C and Schulte P (2013), Principles of Animal Physiology, Second Edition, Pearson International Edition, USA. 3. Prosser CL (1991), Comparative Animal Physiology, Part A, Environmental and Metabolic Animal Physiology, Fourth Edition, John Wiley & Sons Publication, Oxford. 4. Randall D, Burggren W and French KE (2001), Animal Physiology, Fifth edition, WH Freeman and Co, New York. 5. Schmidt-Nielsen K (2001), Animal Physiology: Adaptation and Environment, Fifth Edition, Cambridge University Press. 6. Withers PC (1992), Comparative Animal Physiology, First Edition, Fort Worth, Saunders College Publication.	