

Course Code: ZOO 305
Number of Credits: 3 credits
Effective from AY: 2020 -21

Course Title: Environmental Physiology

Prerequisite for the Course:	Basic knowledge of Animal Physiology and biochemistry	
Objectives:	1. To learn the meaning of adaptation. 2. To understand how the various physiological processes adjusted during the fluctuation of the various environmental parameters	
Content	Module 1: Nature and levels of adaptation; Mechanism of adaptation; Cellular metabolism, regulation and homeostasis; Concept of stress and strain in animal. Thermal adaptation: structural and functional effects of temperature; Biochemical and physiological effects of temperature; Regulation of heat gain and heat loss, Dubois temperature balance; Role of nervous system and endocrine system in thermal biology; Homeoviscous adaptation of membrane.	6 hrs
	Module 2: Salinity adaptation: biochemical and physiological effects of salinity; Regulation and movements of water and solute; Osmoregulatory organs and their excretory products; Cost and energy of regulation of water and ions. Role of membrane in osmoregulation.	8 hrs
	Module 3: Strategies and mechanism in physiological adaptation with reference to marine life, estuarine life, freshwater life and terrestrial life. Physiological and morphological adaptation of the animals living at extreme environment.	10 hrs
	Circadian rhythm: Biological clock; Analysis of circadian rhythmicity; Ultradian and infradian rhythm; Behavioural and autonomous rhythm; Endogenous mechanism of rhythm; Homeostasis and circadian rhythmicity	6 hrs
Pedagogy:	Lectures/ tutorials/self-study	
Learning Outcome:	1. Understanding the concept of adaptation. 2. Understanding the life processes at various environmental condition. 3. Understanding the concept of biological rhythm.	

References /Reading	<ol style="list-style-type: none"> 1. Russel G Foster and Leon Kretzman, (2017) ; Circadian rhythm, A very short Introduction, Oxford University Press, UK 2. Roberto Refinetti , (2016) ; Circadian Physiology , CRC Press, USA. 3. Hochachka PW and Somero GN, (); Biochemical Adaptation, Oxford University Press, UK. 4. Nielsen S, (1997); Animal Physiology: Adaptation and Environment, Cambridge University Press, Cambridge. 5. Wilimer P, Stone G and Johnston IA, (2004); Environmental Physiology. of Animals, Wiley Blackwell Publishing Co, USA
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