

Semester	6		
Course code	ZOOL 42564		
Course Name:	Environmental Physiology and Ecotoxicology		
Credit Value:	4		
Core/Optional	Optional		
Pre requisites	ZOOL 21512		
Co-requisites	None		
Hourly Breakdown	Theory	Practical	Independent Learning
	44	32	124
Course Aim/Intended Learning Outcomes: After completion of the course unit, the student will be able to; <ul style="list-style-type: none"> ➤ describe and discuss physiological strategies adopted by animals for specific environmental problems emphasizing mechanistic basis of adaptations, ➤ discuss impacts of environmental contaminants on biota at molecular, cellular, individual, population, community and ecosystem levels and assess the ecological health risks posed by environmental contaminants, and ➤ apply selected techniques/tools for monitoring/assessing environmental stress to biota, analyze laboratory based physiological/toxicological data and interpret and present the results in a scientific manner. 			
Course Content: Specific problems in different types of environments and physiological adaptations for survival: Strategies to survive in hypoxic and anoxic conditions; Temperature relations of ectotherms in cold and hot environments; Temperature strategies of Heterotherms; Temperature relations of endotherms in cold and hot environments; dormancy in unfavorable ambient temperatures; Osmoregulatory strategies in freshwater, marine, brackish and hypersaline waters and terrestrial environments; nitrogen waste excretion strategies. Ecotoxicology- scientific/technological and practical goals; Major classes of contaminants, inorganics, organics and radiation, genetic contaminants; Contaminant uptake, biotransformation/detoxification, elimination and accumulation, Bioaccumulation from food and trophic transfer; Toxicant effects at molecular, cellular, tissue and organ levels; acute and chronic effects on individuals; Effects on populations, communities and ecosystems; Global effects of environmental contaminations; Evaluation of toxic effects, bioassays and biomarkers; Risk assessment of contaminants: human health risk assessment, ecological risk assessment; radiation risk assessment. Practical sessions on monitoring biological effects of environmental stress, toxic effects of selected environmental contaminants at molecular, cellular and organ levels; bioassays and estimation of toxicity thresholds; prediction of hazardous concentrations and species protection levels based on species sensitivity distribution analysis			
Teaching /Learning Methods: A combination of lectures, computer based learning, laboratory studies and preparation of scientific reports, self-studies, assignments, tutorial and small group discussions.			
Assessment Strategy: Continuous assessment and end of course examination.			
Continuous Assessment 30%		Final Assessment 70%	
Details: Practical Reports: 20% Assignments and Presentations: 10%		Theory (%) 70%	Practical (%) NA Other (%) (specify) NA
Recommended reading: <ol style="list-style-type: none"> 1. Newman, M.C. (2010). Fundamental of Ecotoxicology. Third Edition. CRC Press, New York. 2. Willmer, P., G. Stones & I. Johnston (2009). Environmental Physiology of Animals, Wiley-Blackwell Publishers. 3. Withers, P. C. (1992). Comparative Animal Physiology. Saunders College publishing. New Jersey. 4. Wright, D. A. & P. Welbourne (2002). Environmental Toxicology. Cambridge. 			