Course Code: ZOO 334 **Course Title: Ornithology**
Number of Credits: 3
Effective from AY: 2020 -21

Prerequisite for the Course:	Elementary knowledge about Taxonomy and Animal Systematics, Anatomy, Physiology and Ecology of Birds.	
Objectives:	1. This course develops major concepts in ornithology, including Avian Taxonomy and Systematics, Diversity and Identification, Physiology and Ecological aspects of birds and their applications.	
Content	**Module 1** Avian morphology, anatomy and physiology: Review of bird as glorified reptile, Avian flight (forms, Mechanism and energetics), Bird vocalization-anatomy of vocal organ, Neurophysiology of song control system, Analysis of bird song using Acoustic spectroscopy, Auditory feedback in birdsong learning, Learning through cultural transmission, The cultural trap hypothesis (Evolutionary preservation of bird vocal learning), Colour physiology of iridescent and non- iridescent feathers and gloss production, types of pigments, thermoregulatory mechanisms, avian eye and its adaptations, Biology of moulting in birds (periodic and forced moulting). Module 2 Bird identification, systematics and ecology: Fundamental keys of bird identification and Systematics, parameters for molecular taxonomy, Endemism of Indian avifauna, Bird sanctuaries of India, Importance Types of migration, migratory flyways, orientation and navigation, threats to migratory bird population, Nesting success in birds, Comparison of adaptations of Palaeognathae and Neognathae. Ecosystem services provided by birds, Birds as indicators of environmental health, importance of Important Bird Areas. Module 3 Applied ornithology: Importance of bird population monitoring, Census techniques, Causes of extinction and depletion of bird population of certain species, Conservation of threatened avifauna, Birds as pests in Pisciculture, Apiculture, sericulture and free ranging Poultry farms, Role of birds in dispersal of weeds, parasitic and invasive plants, Birds as vectors of pathogens and parasites, zoonoses, bird strike hazard to aircraft and its management, Bird-watching as an emerging eco-tourism venture, Bio-mimicry and birds in relation to Aerodynamic studies, bionic bird, bullet train inspired by kingfisher, other recent research in ornithology.	**12 hours** **12 hours** **12 hours**

Pedagogy:	Lectures/Tutorials/Videos/Assignments/Group discussion/Self-study.
Learning Outcome:	1. Understand in detail the various aspects of avian biology such asTaxonomy, their specialized Anatomy, Physiology, Migration, Breeding systems and applications. 2. Identification of birds with the help of field guides which will be helpful for field trips or conducting surveys. 3. Knowledge on the crucial Census methods. 4. Learn about Bird diversity, status and Conservation of Birds.
References /Reading	1. Lovette I. J. and Fitzpatrick J. W. Handbook of Bird biology (3rd Ed) Wiley publishers. 2. Meyer D.B. (1977) The Avian Eye and its Adaptations. In: Crescitelli F. (eds) The Visual System in Vertebrates. Handbook of Sensory Physiology, vol 7 / 5. Springer, Berlin, Heidelberg. 3. Gill, F. B. 2007. Ornithology. (3rd ed.) W. H. Freeman and Company, New York, NY. 758 pp 4. Sturkie, P. D. (1998). Sturkie's Avian Physiology. 5th Edition. Academic Press, San Diego. 5. Ziegler, Harris Philip; Bisch of, Hans-Joachim, eds. (1993). Vision, Brain, and Behavior in Birds: A comparative review. MIT Press 6. Brainard, M. S. and Doupe, A. J. (2000). Auditory feedback in learning and maintenance of vocal behavior. Nature Rev. Neurosci. 1, 31-40. 7. Ali S (2016): The Book of Indian Birds. Bombay Natural History Society and Oxford University Press, India. 8. Inskipp C, Grimmett R and Inskipp T (2011): Birds of the Indian Subcontinent, Princeton University Press. 9. Bibby CJ, Burgess ND, Hill A (1992): Bird Census Techniques. Academic Press, UK. 10. Faborg J and Chaplin SB (1988): Ornithology: an Ecological Approach. Prentice Hall Inc. New Jersey. 11. Goodfellow P (1977): Birds as Builders. Arco Publishing Co., New York. 12. Giles RH (1978): Wildlife management Techniques, Wildlife Society, Washington.