

Name of the Programme: M.Sc. in Zoology

Course Code: ZOO-634

Title of the Course: Animal Architecture

Number of Credits: 04

Effective from AY: 2023-24

Pre-requisites for the Course:	Basic knowledge on Zoology, Anatomy, Physiology, Ecology.	
Course Objectives:	1. To provide knowledge on the major definitions and key concepts of animal architecture, functionality, and basic principles of animal engineering 2. To incite curiosity in the learner regarding the interface of behaviour, ecology and evolution 3. To reflect on the collective behaviours/ interactions among communities and whole ecosystems. 4. To instill in the learner and the society an appreciation towards animals and their building behaviour through observation	
Content:	Module 1 Introduction, innate and learned behaviours Allogenic and autogenic engineers. Why animals build? Function – habitat, feeding – burrowers and nest builders (prey capture architecture, trap builders), Intraspecific communication - Courtship and territoriality.	15 hours
	Module 2 Construction and civil engineering Building materials – materials obtained from nature – Mud, soil and stones (ants), self- created materials (edible nest swiftlet, Honey bees, Silk from Trichoptera and Lepidoptera, silkworm, spiders), processed materials (wasp nests, Psychidae cocoons, Weaverbirds) – Urbanisation in selection of building materials (Carton, Paper, steel wool) Case study of corvidae.	15 hours
	Module 3 Building behaviour – piling up (Yellow head jawfish, herons, pelicans etc,) Interlocking and weaving (tailorbird, spiderhunter, baya weaver), Sticking together (Polychaete), folding and rolling (tent making bats, arthropods- spiders and lepidoptera), spinning and weaving (insect cocoons, spider webs), Burrows (Uca crabs, Alpheid shrimp, Kingfishers, mice	15 hours

	and rats), Bioturbation Patch dynamics and species diversity, Mutualism and associations (Blind shrimp – goby). Module 4 Habitat modifiers: Ecosystem engineers vs keystone species Animal architecture as evolutionary evidence – habitat range extension, speciation, and social evolution. Animal architecture as behavioural evidence, atavism, niche construction, ecological and cultural inheritance.	15 hours
Pedagogy:	Lectures/ tutorials/ presentations/ Colloquia/ Group discussions /self–study/ field visits/ field reports/ Mini Projects	
References/ Readings:	1. M. Hansell, Animal Architecture, First Edition, Oxford: Oxford University Press, 2005. 2. K. Cuddington, J. E. Byers, W. G. Wilson, A. Hastings, Ecosystem engineers: plants to protists. Academic Press, 2011. 3. M. Hansell, Bird nests and construction behaviour. Cambridge University Press, 2000. 4. M. Hansell, Built by animals: the natural history of animal architecture. Oxford: Oxford University Press, 2007. 5. G. B. Wiggins, Caddisflies: the underwater architects. University of Toronto Press, 2004. 6. J. S. Turner, The extended organism: the physiology of animal-built structures. Harvard University Press, 2009.	
Course Outcomes:	The learner will 1. Demonstrate knowledge concerning the key concepts of animal architecture and ecosystem engineering. 2. Characterise species behaviour and interactions among community and ecosystems 3. Develop skill to compare and contrast between the most important types of materials used and building behaviour observed in animals. 4. Evaluate habitat modifiers and their evolutionary significance.	