

Course	Discipline Specific Elective
Semester	VI
Paper Number	MBTDS6031T
Paper Title	PLANT AND ANIMAL DIVERSITY
No. of Credits	6
Theory/Composite	Theory
No. of periods assigned	5 Theory + 1Tutorial
Course description/objective	<p>The course aims to</p> <ul style="list-style-type: none"> · introduce students to plant groups and their overall morphological and anatomical structures. · provide knowledge about complexity of plant groups and their evolutionary relationship. · provide an overview of angiosperm morphology and embryology in plants. · provide an overview of animal diversity and comparative anatomy of vertebrate phyla. · compare and contrast the life processes in different animal phyla and learn how the different systems evolved in their complexity. · familiarize the students with diverse aspects of animal biology and enable them to develop an understanding of the animal kingdom.

Syllabus	<p>Module A: (40 Marks)</p> <p>UNIT I: Plant Kingdom: Life cycle patterns of algae. Evolutionary trends in algae with reference to chloroplast ultrastructure, pigments, reproduction. Algal Biotechnology. Evolutionary position of Fungi. Salient features of major groups of fungi with special reference to life cycle patterns; economic importance and uses in biotechnology. Bryophytes, Pteridophytes and Gymnosperms - Evolutionary trends and lifecycle patterns; Biotechnological and Economic importance.</p> <p>UNIT II: Evolutionary trends in external morphology of plants; Angiosperm Morphology -root system –modifications; bud and shoot system -branching, modifications -aerial, sub-aerial and underground; leaf -simple and compound, phyllotaxy, modifications of leaf, stipules, inflorescences - types: racemose, cymose, mixed and special types; flower as a modified shoot, forms of corolla, types of stamen and carpel, placentation, pollination types, fruit types</p> <p>UNIT III: Embryology - Microsporangium, Microsporogenesis, Development of male gametophyte; Megasporangium - Different types, Megasporeogenesis, Development of female gametophyte; Triple fusion; Development of dicot and monocot embryo. Endosperm -Definition, different types -free nuclear, cellular, helobial endosperm; haustoria, Apomixis - Definition and types.</p>
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	<p>No. of Classes: 3 / week</p> <p>Module B: (40 Marks)</p> <p>UNIT IV: Animal Diversity: Polymorphism in Cnidaria; Torsion in Gastropoda; Snake Venom, venom apparatus, types of venom and therapeutic uses; Volant adaptations and the principles of flight, migration and mechanisms of navigation in Aves; Animal Electricity; Thermoregulation; Zoogeographical realms, animal distribution, island biogeography; Territoriality: territorial defense and contests, costs and benefits of territoriality.</p> <p>UNIT V: Comparative Anatomy: Comparative anatomy and structural organization of the</p> <p>(a) digestive system: dentition, the vertebrate stomach, digestion in ruminants</p> <p>(b) circulatory system: types of hearts, circulation in vertebrates</p> <p>(c) respiratory system: respiratory organs, accessory respiratory organs and modes of respiration in vertebrates</p> <p>(d) excretory system: modes of excretion in vertebrates, osmoregulation</p> <p>(e) nervous system: comparison of brain in vertebrate groups, EQ, structure of mammalian eye and ear.</p> <p>UNIT VI: Field Trip for study of animal diversity.</p> <p>No. of Classes: 3 Classes per week including tutorial</p>
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Readings	<p>Module A:</p> <ol style="list-style-type: none"> 1) R. E. Lee Phycology. 2) Bhattacharya, Hait and Ghosh. A Text Book of Botany. Vol I & II. 3) Ganguly and Kar, College Botany. Vol I, II and III. 4) Mitra, Mitra, Chowdhuri. Studies in Botany. Vol I. and II. <p>Review papers</p> <p>Module B:</p> <ol style="list-style-type: none"> 6) J.Z. Young. The Life of Vertebrates. 7) E.E. Ruppert, R.S. Fox, R.B. Barnes. Invertebrate Zoology. 8) K.V. Kardong. Vertebrates – Comparative Anatomy, Function, Evolution. 9) K. Schmidt-Nielsen. Animal Physiology: Adaptation and Environment. 10) B.B. Ganguly, A.K. Sinha, S. Adhikari. Biology of Animals Vol.1 11) B.B. Ganguly, A.K. Sinha, S. Adhikari, B.C.B. Goswami. Biology of Animals Vol. 2. 12) S. Adhikari, A.K. Sinha. Fundamentals of Biology of Animals.
Evaluation	<p>Continuous Internal Assessment (including field trip report): 20 marks</p> <p>End-Semester Theory Examination: 80 marks</p>
Paper Structure for End Sem Theory	<p>Module A (40 marks)</p> <p>Compulsory objective questions: 10 marks</p> <p>Any 3 from 5 subjective questions with subparts: = 10 x 3 = 30 marks</p> <p>Module B (40 Marks)</p>

	<p>Compulsory objective questions: $1 \times 10 = 10$ marks Any three from five subjective questions with subparts: $= 10 \times 3 = 30$ marks. (No sub-part will be less than 1 mark or more than 5 marks).</p>
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