UNIVERSITY OF MADRAS

B.Sc. DEGREE PROGRAMME IN ADVANCED ZOOLOGY AND BIOTECHNOLOGY

SYLLABUS WITH EFFECT FROM 2023-2024

YEAR – I **SEMESTER – I**

CORE-I: INVERTEBRATA

Course Code CC1	Course Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
121C1A	**Invertebrata**	Core	Y	-	-	-	5	5	25	75	100

Learning Objectives	
CO1	To understand the basic concepts of lower animals and observe the structure and functions.
CO2	To differentiate and classify the various groups of animal modes of life and to estimate the biodiversity.
CO3	To understand the economic importance of invertebrates
CO4	To understand the interaction of invertebrates with the environment.
CO5	To understand the evolutionary significance of different functional adaptations in different groups of invertebrates

UNIT	Details	No. of Hours	Course Objectives
I	**Protozoa:** Introduction to Classification, taxonomy and nomenclature. General characters and classification of Phylum Protozoa up to classes. Type study - *Paramecium* and *Plasmodium* - Parasitic protozoans (*Entamoeba*, *Trypanasoma* &*Leishmania*) **Porifera:** General characters and classification up to Classes. Type study-Sycon - Canal system in sponges	12	CO1,CO3, CO4,
II	**Coelenterata :** General characters and classification up to classes – Type study - *Obelia* Corals and coral reefs - Polymorphism - Economic importance. **Platyhelminthes:** General characters and classification of up to classes. Type study – *Taenia solium* – Parasitic adaptations. Host-parasitic interactions of Helminth parasites.	12	CO2
III	**Aschelminthes** : General characters and classification of up to classes - Type study - *Ascaris lumbricoides.* Nematode Parasites and diseases - *Wuchereria bancrofti*, *Enterobius vermicularis*, *Ancylostoma duodenale*.Parasitic adaptations. **Annelida:** General characters and classification up to Classes. Type study –*Nereis* ,Metamerism Modes of life in Annelids.	12	CO3,CO4, CO5

IV	**Arthropoda:** General characters and classification of Phylum Arthropoda up to Classes. Detailed study: *Penaeus indicus*. Affinities of *Peripatus* – Larval forms in Crustacea..,Economic importance of Insects. Insect pests of Agricultural Importance- - Pest of rice: Rice stem borer (*Scirpophaga incertulas*) – Pest of Sugarcane: The shoot borer (*Chilo infuscatellus*) – Pest of coconut: The rhinoceros beetle (*Oryctes rhinoceros*). Principles of Integrated Pest Management.	12	CO1,CO2, CO4,CO5
V	**Mollusca:** General characters and classification of Phylum Mollusca up to Classes. Detailed study: *Pila globosa*. Foot and torsion in Mollusca. **Echinodermata:** General characters and classification of Phylum Echinodermata up to Classes. Detailed study: *Asterias.* Water vascular system in Echinodermata – Larval forms of Echinoderms.	12	CO1,CO2, CO4,CO5
		60	

Course Outcomes

Course Outcomes	On completion of this course, students will;	
CO1	Understand the basic concepts of invertebrate animals and recall its structure and functions.	PO1
CO2	Differentiate and classify the animal's mode of life in various taxa and estimate the biodiversity.	PO1,PO4, PO6
CO3	Explain, and relate the origin, structural organization and evolutionary aspects of invertebrates.	PO1, PO4
CO4	Correlate the interaction of invertebrates with humans and understand its economic importance.	PO3,PO4, PO5, PO6
CO5	Analyze, compare and distinguish and describe the important biological process.	PO4, PO5, PO6,PO8

Text Books
(Latest Editions)

1. Ekambaranatha Iyer, 2000. A Manual of Zoology, 10th edition, Viswanathan, S., Printers & Publishers Pvt Ltd
2. Jordan, E.L. and Verma P.S, 1995. Invertebrate Zoology, 12th edn. S. Chand& Co.
3. Kotpal, R.L, 1992. Protozoa, Porifera, Coelenterata, Annelida, Arthropoda.

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References Books (Latest editions, and the style as given below must be strictly adhered to)	
1.	Ruppert and Barnes, R.D. (2006). Invertebrate Zoology, VIII Edition. Holt Saunders International Edition.
2.	**Barnes, R.S.K., Calow, P., Olive, P.J.W., Golding, D.W. and Spicer, J.I. (2002). The Invertebrates: A New Synthesis, III Edition, Blackwell Science**
3.	Barrington, E.J.W. (1979). Invertebrate Structure and Functions. II Edition, E.L.B.S. and Nelson
4.	Hyman L.H, 1955. The invertebrates - Vol. I to Vol. VII – Mc Graw Hill Book Co.
5.	Parker, J. and Haswell , 1978. A text book of Zoology Vol. I - Williams and Williams.
Web Resources	
1.	https://www.nationalgeographic.com/animals/invertebrates/
2.	https://bit.ly/3kABzKa
3.	https://www.nio.org/
4.	https://greatbarrierreef.org/

Methods of Evaluation		
Internal Evaluation	Continuous Internal Assessment Test	25 Marks
	Assignments	
	Seminars	
	Attendance and Class Participation	
External Evaluation	End Semester Examination	75 Marks
	Total	100 Marks

Methods of Assessment	
Recall (K1)	Simple definitions, MCQ, Recall steps, Concept definitions
Understand/ Comprehend (K2)	MCQ, True/False, Short essays, Concept explanations, Short summary or overview
Application (K3)	Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain
Analyze (K4)	Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge
Evaluate (K5)	Longer essay/ Evaluation essay, Critique or justify with pros and cons
Create (K6)	Check knowledge in specific or off beat situations, Discussion, Debating or Presentations

Mapping with Programme Outcomes:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1	S							
CO 2	M	M		S		M		
CO 3				S		S		
CO 4			M	S	S	M		
CO 5			S					S

S-Strong(3) M-Medium (2) L-Low (1) B N