Semester -I

Major Course 1 (MJC-1)

Course Title	Credit	Credit Distribution	
		Theory	Practical
Diversity of Non-Chordata	6	4	2

Course outcomes: After completion of the course, students should be able to:

CO-1: Learn about the importance of systematics, taxonomy, and structural organization of non-chordates.

CO-2: Understand & Appreciate the diversity of non-chordates living in varied habits and habitats.

CO-3: Understand evolutionary history and relationships of different non-chordates through functional and structural affinities.

CO-4: Critically analyse the organization, complexity and characteristic features of non chordates.

CO-5: Recognize the life functions and the ecological roles of the animals belonging to different phyla.

CO-6: Enhance collaborative learning and communication skills through practical sessions, teamwork, group discussions, assignments, and projects.

MJC-1: Diversity of Non-Chordata (Theory: 4 credits) 40 hrs		
Unit	**Topics to be covered**	**No. of Lectures**
1	1. Introduction to Non-chordates: General characteristics and classification (up to order) of the following Phyla: Protozoa, Porifera, Cnidaria, Ctenophora, Platyhelminthes and Nemathelminths, Annelida, Arthropoda, Mollusca, Echinodermata.	8
2	2.1. Protozoa: Structure and Life cycle of Paramecium, Plasmodium, Entamoeba histolytica, Trypanosoma, L. donovani 2.2. Porifera: Spicules and Canal system in sponges; affinities of the Phylum	10
3	3.1. Cnidaria: Structure and Life Cycle: Obelia, Aurelia 3.2. Ctenophora: General organization of Hormiphora; affinities of the phylum. 3.3 Platyhelminthes and Nemathelminthes: Structure and Life cycle of *Fasciola hepatica, Taenia solium, Ascaris lumbricoides.*	10
4	4.1. Annelida: Earthworm, Leech: Structure, locomotion, alimentary canal Reproduction. 4.2. Arthropoda: Peripatus, Adaptive variations in insect mouth parts. 4.3. Mollusca: Structure and Life cycle: Unio, Pila. Torsion and Detorsion in Gastropoda 4.4. Echinodermata: Structure: Star fish; Larval forms in Echinoderms; Water Vascular System in Echinoderms	12
	TOTAL	**40**

14.06.23 14/6/23 14/06/2023

MJC-1: Diversity of Non-Chordata (Practical: 2 credits) 20 hrs

Practical:

1. Study of whole mount of Euglena, Amoeba, Paramecium,Monocystis; Binary fission and Conjugation in Paramecium.
2. Study of Sycon; T.S. of Sycon, L.S. of Sycon; Gemmule, Hyalonema.
3. Permanent stained preparation of spicules of sponges.
4. Study of *Obelia, Aurelia, Metridium ,Physalia.*
5. Specimen/slide of any one Ctenophore.
6. Study of adult *Fasciola hepatica, Taenia solium*and*Ascaris* (male & female).
7. Study of Aphrodite, Septal nephridia and Ovary of Earthworm; Jaws of leech;Trochophore larva.
8. Study of T.S. through pharynx, gizzard, and typhlosolar region of earthworm.
9. Study of Limulus, Scolopendra, Grasshopper, Phyllium,Praying mantis, &Palaemon, Sacculina, Cancer, Eupagurus, Apis, Musca. Salivary gland of Cockroach,Mouth parts of Mosquito.
10. Study of Chiton, Dentalium, Octopus, Glochidim larva.
11. Study of Asterias, Echinus, Antedon.

Suggested Books:

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. Verma P S, Jordan E L. (2009). Invertebrate Zoology. S. Chand publishers.
5. Brusca R C (2016). Invertebrates. Published by Sinauer Associates, an imprint of Oxford University Press.
6. S.S.Lal, Practical Zoology Invertebrate.

14.06.23 14/6/23 14/06/2023