

<i>DEPARTMENT OF ZOOLOGY</i>				<i>CLASS: I B.Sc. Zoology</i>				
Semester	Course Type	Course Code	Course Title	Credits	Contact Hours/week	CIA	Ext	Total
I	Core	20U1ZMC2	Invertebrata– II	3	3	25	75	100

**Course Objectives:**

1. To understand the taxonomy and systematic classification from Aschelminthes to Echinodermata.
2. To identify the animals from Aschelminthes to Echinodermata and to recognize their distinguishing features.
3. To appraise the diversity of animals in a phylogenetic context.
4. To understand how different body designs solve biological problems related to physiological and environmental challenges.
5. To develop an appreciation for the role of invertebrates in biological communities, ecological interactions, and conservation problems.

**Unit-I: Aschelminthes**

Characters & classification (up to class) of Aschelminthes with examples.

**Type study:** *Ascaris*

**General topics:** Nematode parasites & their adaptations.

**Unit-II: Annelida**

Characters & classification (up to class) of Annelida with examples.

**Type study:** *Megascolex*

**General topics:** Coelom & coelomoducts, Metamerism in Annelida, Filter feeding in Polychaetes.

**Unit-III: Arthropoda**

Characters & classification (up to class) of Arthropoda with examples. Brief descriptions of *Limulus* & *Sacculina*,

**Type study:** Prawn

**General topics:** Mouth parts of Insects, Beneficial Insects, Salient features of Arachnids, Affinities of *Peripatus*.

**Unit-IV: Mollusca**

Characters & classification (up to class) of Mollusca with examples.

**Type study:** *Pila*

**General topics:** Torsion & de-torsion in Gastropods, Cephalopods as an advanced Mollusc, Economically important Mollusca.

**Unit-V: Echinodermata**

Characters & classification (up to class) of Echinodermata with examples.

**Type study:** Starfish

**General topics:** Echinoderm larva.

### **Books for Study**

1. Nair N.C, Leelavathy S, Soundara Pandian N, Murugan T and Arumugam N, 2017. *A Text Book of Invertebrates*, Saras Publication, Nagercoil.
2. Nair N.C, Thangamani A, Leelavathy S, Prasanakumar S, Soundrapandian N, Murugan T, Narayanan L.M and Arumugam N, 2017. *Animal diversity (Invertebrata & Chordata)*, Saras Publication, Nagarcoil.
3. Jordan E.L and Verma P.S, 2009. *Invertebrate Zoology*, S. Chand & Co, New Delhi.
4. Kotpal R.L, 2017. *Modern text book of Zoology: Invertebrate*, Rastogi Publication, Meerut.

### **Books for References**

1. Barnes R.D, 2006. *Invertebrate Zoology* VII<sup>th</sup> Edition, Holt Saunders International Edition.
2. Ekambaranatha Ayyar and Ananthakrishnan T.N. 1982. *Manual of Zoology Vol-I, Part I & II*, S. Viswanathan Pvt. Ltd. Chennai.
3. Kotpal R.L, Agarwal S.K and Khetarpal R.P, 1990. *Invertebrates*, Rastogi Publications, Meerut.
4. Anderson D.T, 2001. *Invertebrate Zoology*, Oxford University Press, New Delhi.
5. Barrington E.J.W, 1967. *Invertebrate Structure and Functions*, English Language Book Society.

### **Web Resources**

1. <https://www.nwf.org/Educational-Resources/Wildlife-Guide/Invertebrates>
2. <https://biologydictionary.net/invertebrate/>
3. <https://basicbiology.net/animal/invertebrates>
4. <https://www.khanacademy.org/science/biology/crash-course-bio-ecology/crash-course-biology-science/v/crash-course-biology-121>
5. <https://www.khanacademy.org/science/biology/crash-course-bio-ecology/crash-course-biology-science/v/crash-course-biology-122>

### **Pedagogy**

Chalk and Talk, PPT, group discussion, seminar, interaction, quiz, tutorial and virtual labs.

**Course Learning Outcomes:**

	<b>CLO Statement</b>	<b>Knowledge level</b>
<b>CLO-1</b>	Understand the diversity and basic taxonomy from Aschelminthes to Echinodermata.	K1
<b>CLO-2</b>	Recall the general characters and outline classification from Aschelminthes to Echinodermata.	K2
<b>CLO-3</b>	Apply the knowledge to identify the fauna based on their unique characters.	K3
<b>CLO-4</b>	Analyse the importance and adaptation of the fauna in their habitat.	K4
<b>CLO-5</b>	Evaluate the role of Invertebrates in biological communities and ecological interactions.	K4

**Mapping with Programme Specific Outcomes:**

	<b>PSO-1</b>	<b>PSO-2</b>	<b>PSO-3</b>	<b>PSO-4</b>	<b>PSO-5</b>	<b>PSO-6</b>	<b>PSO-7</b>	<b>PSO-8</b>
<b>CLO-1</b>	1	3		2			1	
<b>CLO-2</b>	1	3	2	2			2	
<b>CLO-3</b>	1	3	3	3			2	
<b>CLO-4</b>	1	2	3	3			2	1
<b>CLO-5</b>	1	2	3	2			2	

3- Advance application; 2- Intermediate level; 1- Basic level

**Mapping with Programme Outcomes:**

	<b>PO-1</b>	<b>PO-2</b>	<b>PO-3</b>	<b>PO-4</b>	<b>PO-5</b>
<b>CLO-1</b>	1				
<b>CLO-2</b>	2	2	1	2	
<b>CLO-3</b>	2	2	1	2	1
<b>CLO-4</b>	2	2	2	2	
<b>CLO-5</b>	2	2	2	2	3

3- Advance application; 2- Intermediate level; 1- Basic level

**LESSON PLAN (Total hours: 45)**

Unit	Description	Staff Name	Hours	Mode
I	Characters of Aschelminthes		1	Group Discussion
	Classification (up to class) of Aschelminthes with examples		2	Interaction
	Type study: <i>Ascaris</i>		4	Chalk and Talk
	Nematode parasites & their adaptations.		2	Lecture
II	Characters of Annelida		1	Group Discussion
	Classification (up to class) of Annelida with examples		1	Interaction
	Type study: <i>Megascolex</i>		4	Chalk and Talk
	Coelom & coelomoducts		1	Interaction
	Metamerism in Annelida		1	PPT
	Filter feeding in Polychaetes		1	Interaction
III	Characters of Arthropoda.		1	Group Discussion
	Classification (up to class) of Arthropoda with examples.		1	Interaction
	Brief descriptions of <i>Limulus</i> & <i>Sacculina</i>		1	Lecture
	Type study:Prawn		3	Chalk and Talk Interaction
	Mouth parts of Insects, Beneficial Insects		2	PPT, Group Discussion
	Salient features of Arachnids, Affinities of <i>Peripatus</i>		1	Lecture, Interaction
IV	Characters of Mollusca		1	Group Discussion
	Classification (up to class) of Mollusca with examples		1	Interaction
	Type study: <i>Pila</i>		4	Chalk and Talk
	Torsion & de-torsion in Gastropods		1	Lecture
	Cephalopods as an advanced Mollusc		1	PPT
	Economically important Mollusca		1	Interaction
V	Characters of Echinodermata		1	Group Discussion
	Classification (up to class) of Echinodermata with examples.		2	Interaction
	Type study:Starfish		4	Chalk and Talk
	Echinoderm larva		2	Lecture

**Course designers: Dr. R. Eswaran and Dr. L.D. Devasree**