FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF ZOOLOGY
COURSE CURRICULUM

PART- A: Introduction				
Program: Bachelor in Life Science *(Diploma / Degree/ Honors)*			**Semester - III**	Session: **2024-2025**
1	**Course Code**	**ZOSC-03T**		
2	**Course Title**	**Diversity of Invertebrates**		
3	**Course Type**	**Discipline Specific Course**		
4	**Pre-requisite** (if, any)	*As per Program*		
5	**Course Learning. Outcomes (CLO)**	**After successfully completing this course, the students will be able to -** ➢ Develop understanding on Invertebrate Animals on the basis of classification and Nomenclature. ➢ Develop understanding how simple/unicellular animals changed into multicellular and diploblastic forms through their anatomy and physiology. ➢ Gain Knowledge of key processes like formation of triploblastic animals (simple to complex form of body plan). ➢ Develop understanding on parasitic adaptations and life cycle of Helminthes. ➢ Develop understanding on the diversity in Artropoda, Mollusca and Echinodermata.		
6	**Credit Value**	**3 Credits**	*Credit = 15 Hours - learning & Observation*	
7	**Total Marks**	**Max. Marks: 100**		**Min Passing Marks: 40**

PART -B: Content of the Course

Total No. of Teaching–learning Periods (01 Hr. per period) - 45 Periods (45 Hours)

Unit	Topics (Course contents)	No. of Period
I	**General Characters, Classification up to order and Type Study of Phylum Protozoa and Porifera with some special features: Protozoa:** General Characters and Classification of Phylum Protozoa up to order. **Type study:** Paramoecium, Protozoa and Disease. **Porifera:** General Characters and Classification of Phylum Porifera up to order. **Type study: Sycon.**	**11**
II	**General Characters, Classification and Type Study of Phylum Coelenterata, Helminthes and Annelida: Coelenterata** - General Characters and Classification of Phylum Coelenterata up to order. **Type Study:** Obelia. **Helminthes** - Classification of Phylum Helminthes up to order. **Type study:** Fasciola. **Annelida**- Classification of Phylum Annelida up to order. **Type study:** Pheretima (Earthworm).	**11**
III	**General Characters, Classification and Type Study of Phylum Arthropoda and Mollusca: Arthropoda** - General Characters and Classification of Phylum Arthropoda up to order. **Type study: Prawn. Mollusc**- General Characters and Classification of Phylum Mollusca up to order. **Type study: Pila.**	**12**
IV	**General Characters, Classification and Type Study of Phylum Echinodermata and Hemichordata:** General Characters and Classification of Phylum Echinodermata up to order. **Type Study:** Asterias (Starfish). General Characters and Classification of Phylum Hemichordata **Type Study:** Balonoglossus	**11**
Keywords	*Taxonomy, Nomenclature, Canal System, Protozoa, Balanoglossus, Torsion*	

Signature of Convener & Members (CBoS) :

PART–C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended –

- R.L. Kotpal, Modern Textbook of Zoology Invertebrates. Rastogi Publication, Gangotri, Shivaji Road, Meerut
- V.K. Tiwari, Unified Zoology, Shivlal Agrawal and Company, Pustak Prakashak, Khajuri Bazar, Indore.
- Dr. S.M. Saxsen, Zoology, Ist Year, by a, Ram Prasad and Sons, Aagra and Bhopal.
- N. Arumugam, M.G. Ragunathan, T. Murugan, B. Ramnathan, A Textbook of Invertebrates by Saras Publication

Reference Books Recommended –

- Barrington, E.J.W. (1979). Invertebrate Structure and Functions. II Edition. E.L.B.S. and Nelson.
- Boradale, L.A. and Potts, E.A.(1961) Invertebrates: A Manual for the use of Students. Asia Publishing Home.
- Bushbaum, R. (1964). Animals without Backbones. University of Chicago Press.
- Hyman, L H. (1940-67). The Invertebrates, Vol. I-VI. McGraw-Hill, New York.
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Online Resources–

- **http://ndl.iitkgp.ac.in/he_document/inflibnet_epgp/inflibnet_epgp/IN_I_e_P_P_1_Z_512_96_P_0_B_o_p_51542_M_1_M_L_c_P_D_a_P_o_E_P_1_51562_51563?e=9|*|||**

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): **20** +**20** Assignment / Seminar - **10** Total Marks - **30**	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against **30** Marks
End Semester Exam (ESE):	**Two section – A & B** Section A: **Q1**. Objective – **10 x1= 10** Mark; **Q2**. Short answer type- **5x4 =20 Marks** Section B: Descriptive answer type qts.,**1out of 2** from each unit-**4x10=40 Marks**	

Name and Signature of Convener & Members of CBoS:

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PART- A: Introduction				
Program: Bachelor in life Science *(Diploma / Degree/ Honors)*			**Semester - III**	Session: **2024-2025**
1	**Course Code**	**ZOSC-03P**		
2	**Course Title**	**Diversity of Invertebrates**		
3	**Course Type**	**Discipline Specific Lab Course**		
4	**Pre-requisite** (if, any)	***As per Program***		
5	**Course Learning. Outcomes (CLO)**	**After successfully completing lab course the students will be able to-** ➢ Develop understanding on the diversity of life with regard nonchordates. ➢ Gain Knowledge of grouping of animals on the basis of their morphological characteristics. ➢ Develop critical understanding how animals have changed from simple form to complex body plan. ➢ Acquired the detailed knowledge to think and interpret different animal species individually.		
6	**Credit Value**	**1 Credits**	***Credit =30 Hours Laboratory or Field learning/Training***	
7	**Total Marks**	**Max. Marks: 50**	**Min Passing Marks: 20**	

PART -B: Content of the Course

Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)

Module	Topics (Course contents)	No. of Period
Lab./Field Training/ Experiment Contents of Course	**List of labs to be conducted** • Study of different non-chordate taxa animals through models, slides and museum specimens in the laboratory. Emphasising classification, biogeography and diagnostic features of: Protozoa, Porifera, Coelenterata (also with special reference to Corals of Cnidarians), Helminthes, Annelida, Arthropoda, Mollusca and Echinodermata. • Histological slides of different Non chordate Taxa, slides of various larval forms of Helminthes, Crustacea and Echinodermata • **Dissection** of *Pheretima* to expose Alimentry canal and circum pharyngeal ganglia through Alternative methods of dissection. • Dissection of *Periplaneta* to expose the digestive system, salivary glands and Mouth Parts through Alternative methods of dissection. • Dissection of Prawn to expose appendages and statocyst through Alternative methods of dissection • Dissection of *Pila* to expose Nervous System through Alternative methods of dissection. • Study of Invertebrate animals in nature during a survey of a National Park/ Forest area/College campus. • **Group discussion/Viva or Seminar presentation on two related topics:** Polymorphism, Parasitic adaptations, Freshwater sponges, Biodiversity and climate change, Tree of Life, Marine zooplanktons and their ecological importance including oxygen evolution. • An "**animal album or Practical Record**" containing sketches, photographs, cut outs, with appropriate write up about the above mentioned taxa. • Study of some videos to develop understanding on the animals of different taxa.	**30**
Keywords	*Museum specimens, Histological slides, Alternative of Dissection, Animal album*	

Signature of Convener & Members (CBoS) :

PART–C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended –

- S.S. Lal, Practical Zoology, Invertebrate. 12th Edition Rastogi Publications, Meerut, New Delhi.
- A manual of practical Zoology. Dr. P.S Verma, S. Chand Publication, New Delhi

Reference Books Recommended-

- Barrington, E.J.W. (1979). Invertebrate Structure and Functions. II Edition. E.L.B.S. and Nelson.
- Hyman, L H. (1940-67). The Invertebrates, Vol. I-VI. McGraw-Hill, New York.

Online Resources–

- **https://www.youtube.com/watch?v=GC5Ua6m873I**
- **https://www.youtube.com/watch?v=-qyM2Hskj84**

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks:	**50 Marks**
Continuous Internal Assessment (CIA):	**15 Marks**
End Semester Exam (ESE):	**35 Marks**

Continuous Internal Assessment (CIA): **(By Course Teacher)**	Internal Test / Quiz-(2): **10 & 10** Assignment/Seminar +Attendance - **05** Total Marks - **15**	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against **15** Marks
End Semester Exam (ESE):	**Laboratory / Field Skill Performance: On spot Assessment** **A. Performed the Task based on lab. work - 20 Marks** **B. Spotting based on tools & technology (written) – 10 Marks** **C. Viva-voce (based on principle/technology) - 05 Marks**	**Managed by Course teacher as per lab. status**

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