

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF ZOOLOGY
Course Curriculum

PART- A: Introduction			
Program: Bachelor in Life Science <i>(Honors / Honors With Research)</i>		Semester - VII	Session: 2024-25
1	Course Code	ZOSC-07T	
2	Course Title	Biosystematics and Taxonomy	
3	Course Type	Discipline Specific Course	
4	Pre-requisite (if, any)	<i>As per Program</i>	
5	Course Learning Outcomes (CLO)	<p>After successfully completing this course the students will be able to -</p> <ul style="list-style-type: none"> ➤ Comprehend the basic concepts of Biosystematics and Txonomy. ➤ Understand and learn the Taxonomic Hierarchy in animal kingdom. ➤ Gain a basic knowledge and grasp the rules and philosophy of scientific nomenclature. ➤ Develop the critical understanding to identify the animals up to species level with the help of taxonomic keys. ➤ Learn the Newer trends in biosystematics and apply it in Research. 	
6	Credit Value	3 Credits	<i>Credit = 15 Hours - learning & Observation</i>
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	Introduction to systematic and classification: Definition & basic concepts of Biosystematics and Taxonomy. Historical resume of systematic. Taxonomic Hierarchy: Definition, Linnean hierarchy and categories. Classification: Purpose, use and basis. Theories of classification: Biological, artificial and natural classification. Levels of taxonomy: alpha, beta and gamma taxonomy. Micro and macro taxonomy. Scope and applications of biosystematics in biology. The relevance of systematics in conservation programs.		11
II	Taxonomic Characters and Scientific Nomenclature: Different types of taxonomic characters (morphological, physiological, ecological, ethological and geographical characters). Zoological nomenclature: binominal and trinomial system, Principles and rules of International Code of Nomenclature (ICN), type material, author citation, criteria for publication, types of names, principle of priority and its limitations.		11
III	Taxonomic Keys, Taxonomic treatment and Phylogenetics: Types of taxonomic key their merits and demerits. Type concept: Process of typification and different Zoological types and their applications. Taxonomic treatment of Allopatric variation, homology and Reproductive and geographical isolating mechanisms and their role in speciation process. Evolutionary taxonomy: Cladistics. Constructing trees/dendrograms: Phenogram, phylogram and cladogram and turning them into classifications. Mechanism of speciation in panmictic and apomictic species. Species concept: different species concepts, Species category: sub-species and other infra species categories.		12
IV	Taxonomic procedure and Newer trends in biosystematics: Taxonomic Collection, curation, preservation, identification and classification. Newer trends in biosystematics: Morphological, Embryological, Behavioral, Ecological, Cytological and Biochemical approach. Numerical taxonomy. Differential systematic. Molecular taxonomy. DNA bar coding for identification of species.		11
Keywords	<i>Systematic, classification, Linnean hierarchy, dendrograms, Nomenclature, Cladistics, Species category</i>		
Signature of Convener & Members (CBoS) :			

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended –

- R.C. Dalella & R.S. Sharma, (2017) Animal Taxonomy & Museology. Jai Prakashnath & Co., Meerut.
- V.C. Kapoor (2019). Theory and practice of animal taxonomy and biodiversity, 8th Edn.

Reference Books Recommended –

- E. Mayer, (1991). Principles of Systematic Zoology.
- G.G. Simpson (2012). Principles of animal taxonomy. Scientific Publisher, India
- E.O. Wilson, (1988). Biodiversity. John Wiley & Sons.
- Futuyama, D. J. (1986). Evolution, Systematics and Animal Behaviour. Evolutionary Biology. Sinauer Associates Inc.
- Mayr, E. & Ashlock, P. D. (1991) Principles of Systematic Zoology (2nd edition) McGraw Hill Int.

Online Resources–

- <http://ndl.iitkgp.ac.in/he document/swayamprabha/swayam prabha/qtrdnp2xfxe?e=0/species%20concept|||>
- <http://ndl.iitkgp.ac.in/he document/swayam ugc moocs/214 21777 self learning>

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	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Assignment / Seminar - 10	
	Total Marks - 30	
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:

Shahabuddin

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DEPARTMENT OF ZOOLOGY
COURSE CURRICULUM

PART- A: Introduction			
Program: Bachelor in Life Science <i>(Honors / Honors with Research)</i>		Semester -VII	Session: 2024-2025
1	Course Code	ZOSC- 07P	
2	Course Title	Biosystematics and Taxonomy	
3	Course Type	Discipline Specific Lab Course	
4	Pre-requisite (if, any)	<i>As per Program</i>	
5	Course Learning Outcomes (CLO)	<p style="text-align: center;">After successfully completing this course the students will be able to</p> <ul style="list-style-type: none"> ➤ Comprehend the basic concepts of Biosystematics and Taxonomy. ➤ Understand and learn the Taxonomic Hierarchy in animal kingdom. ➤ Gain a basic grasp on the rules and philosophy of scientific nomenclature. ➤ Develop the critical understanding to identify the animals up to species level with the help of taxonomic keys. ➤ Learn the Newer trends in biosystematics and apply it in Research. 	
6	Credit Value	1 Credits	<i>Credit =30 Hours Laboratory or Field learning/Training</i>
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	<ul style="list-style-type: none"> • Study and sketch of museum specimens of Invertebrates and Vertebrates on the basis of systematic and Taxonomic Hierarchy • Preparation of identification keys for select specimens of non chordate (e.g., insects) and chordates (e.g., birds). • Make a record of biodiversity of college campus. • Construct the dendrograms, through Interactive software for exploring phylogeny and analyzing character • Use DNA bar coding for identification of species. • General discussion, distinguishing characters and classification of selected animals. • Generation of a character-state matrix by selecting and scoring diagnostic taxonomic characters. • Distance-based methods of phylogenetic reconstruction using manual and computer methods. • Group discussion/Viva or Seminar presentation on two related topics. • An “animal album or Practical Record” containing sketches, photographs, cut outs, with appropriate writes up about the above mentioned taxa. • Study of some videos to develop understanding on the animals of different taxa. 	30
Keywords	<i>Museum specimens, dendrograms, bar coding, identification keys, phylogenetic</i>	

Signature of Convener & Members (CBoS) :

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended –

- R.C. Dalella & R.S. Sharma, (2017) Animal Taxonomy & Museology. Jai Prakashnath & Co., Meerut.
- V.C. Kapoor (2019). Theory and practice of animal taxonomy and biodiversity, 8th Edn.
- 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 –

- E. Mayer, (1991). Principles of Systematic Zoology.
- G.G. Simpson (2012). Principles of animal taxonomy. Scientific Publisher, India

Online Resources–

- <http://ndl.iitkgp.ac.in/he document/swayamprabha/swayam prabha/qtrdnp2xfxe?e=0|speci es%20concept||>
- <http://ndl.iitkgp.ac.in/he document/swayam ugc moocs/214 21777 self learning>

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

Name and Signature of Convener & Members of CBoS:

Shahankar *mbh* *Law* *Prof* *Sun*