St. Aloysius College (Autonomous), Jabalpur
Department of Higher Education, Govt. of M.P.

Under Graduate Syllabus for B.Sc. (Bio)

As recommended by Central board of Studies in Zoology

Class - B.Sc. III Year

(Session 2023-24)

Theory Paper

Part A Introduction			
Program: Degree	**Class : B.Sc**	**Year :III**	**Session :2023-24**
Subject : Zoology			
1	**Course Code**	**S3-ZOOL4D**	
2	**Course Title**	**Ecology, Biodiversity and Evolution (Paper-II) Group-B**	
3	**Course Type (Core Course /Elective/Generic Elective/ Vocational/...)**	**Discipline Specify Elective (DSE)**	
4	**Pre-requisite (if any)**	**To study this course ,a student must have had the subject Zoology in Diploma.**	
5	**Course Learning Outcome (CLO)**	After the completion of the course the student will be able to: 1. Have comprehensive understanding of the basic terms, principles, rules, values & concept of ecological science. 2. Identify the different types of Ecosystem and relationship between the organisms and their environment. 3. Identify the significance of Biodiversity with emphasis on various groups of animals. 4. Get clear understanding on the major issues of Biodiversity. 5. Get knowledge of the theories of origin and development of early life on earth. 6. Identify how the Evolution takes place from single cell to man.	
6	**Credit Value**	4	
7	**Total Marks**	**Max. Marks : 30+70**	**Min. Passing Marks – 35**

Part B- Content of the Course

Total No. of Lectures – Tutorials – Practical (2 hour per week): L-T-P-60

Unit	Topic	No. of Lectures
I	1. Concept of Ecology 1.1 Introduction and History of Ecology. 1.2 Component of Ecosystem. 1.3 Classification of Ecosystem. 1.4 Function of Ecosystem- Productivity of ecosystem. Energy flow of the ecosystem - food chain, food web, ecological pyramid and trophic level. Ecological footprint and Carbon footprint. 12. Bio-Geochemical cycle - Carbon, Oxygen, Nitrogen, Phosphorus cycle. Keywords: Ecosystem, Bio-geochemical cycle	10
II	1. Population Concept 1.1 Basic concept and characteristics of population. 1.2 Factors affecting population. 1.3 Population interaction - Mutualism, Predation, Competition. 1.4 Species interaction - Herbivory, Carnivory, Symbiosis. 2. Community Concept 2.1 Characteristics of community. 2.2 Stratification in terrestrial and aquatic habitat. 3. Ecological Succession 3.1 Types of succession. Keywords: Population concept, Community concept, Ecological succession.	10
III	1. Habitat Ecology 1.1 Concept of Habitat and Ecological Niche. 1.2 Fresh water habitat and its conservation. 1.3 Marine water habitat and its conservation. 1.4 Estuarine habitat and its conservation. 1.5 Terrestrial habitat and its conservation. 2. General idea of Ecological and Biological indicators. 3. Ecological division of India Keywords: Habitat ecology, Ecological division, Bio indicators	12
IV	1. Biodiversity 1.1 Meaning, values and ethics of Biodiversity.	14

	1.2 Importance of biodiversity. 1.3 Types of biodiversity - genetic, species and ecological biodiversity. 1.4 Causes of depletion of biodiversity. 1.5 Hotspots of biodiversity in India. 1.6 Conservation of biodiversity. -In Situ - protected areas. - Ex Situ - Germplasm bank, Gene bank, Seed bank, Zoo and Botanical garden. 1.7 Biodiversity Protection Act - 2002. 2 Role of People for conservation of biodiversity. 3 Emerging trends in conservation of biodiversity. 4 Medicinal Plants of Forest and its Uses. Mahua, Harad, Baheda, Amla, Oak. Keywords: Biodiversity, Conservation, Forest medicinal plants.	
V	1. Evolution 1.1 Definition and History of evolution. 1.2 Origin of life - Theories of evolution. - Lamarckism -Darwinism -Neo-darwinism 1.3 Modern synthetic theory of evolution. 1.4 Evidence of organic evolution - anatomical, paleontological, embryological. 2. Micro, Macro and Mega evolution. 3. Evolution of man. 4. Elementary idea of Geological timescale. 5. Adaptation - Definition and types of adaptation. 6. Mimicry - Definition and kinds of mimicry. Keywords: Evolution, Adaptation, Mimicry, Geological timescale.	14

Part C – Leaning Resources

Text Book , Reference Books , Other resources

Suggested Readings:

1. Odum, E P. "Fundamental of Ecology", Saunders, USA
2. Smith, TH, Smith, R L, "Elements of Ecology"
3. Ricklefs, R E, Miller, G L, "Ecology", Mc Milan
4. Rastogi. V B. "Animal Ecology and distribution of animals", Rastogi publications,Meerat
5. Sharma, P D. "Ecology and Environment", Rastogi publications, Meerat,2007
6. Kotwal, P C, "Biodiversity and Conservation"
7. Wilson, E O, "Diversity", National Academic Press
8. Ghosh, A, Agarwal, S P, Sau, B, "Loss of Biodiversity and its Ethical implications", Sadesh
9. Negi, SS, "Biodiversity and Conservation in India", Indian publ. co.
10. Seth, P K. "Understanding evolution of Man: An introduction to Palaeontology"
11. Arora, M P, "Organic Evolution", Himalayan Publication, 2000
12. Rastogi, V B, "Evolutionary Biology"
13. Tomar, B.S., Singh, S.P., "Evolution", 2000
14. Books Published by MP Hindi Granth Academy, Bhopal

14/7/23

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Syllabus of practical

Part A Introduction			
Program	Calss : B.Sc	Year :III	Session :2023-24
Subject : Zoology			
1	Course Code	S3-ZOOL4Q	
2	Course Title	Environment Biology (Paper -II) Group	
3	Course Type (Core Course /Elective/Generic Elective/ Vocational/...)	Discipline Specific Elective (DSE)	
4	Pre-requisite (if any)	To study this course ,a student must have had the subject Zoology in Diploma.	
5	Course Learning Outcome (CLO)	On Completion of this course, learners with be able to : 5. Identify and Understand the fresh water, marine water and terrestrial habitat –economically 6. To determine the population, estimate biomass by experiment, visit and know the pond ecosystem. 7. Identify and study of different types of adaptation and mimicry by the specimens. 8. Recognise and known the uses of Forest Medicinal Plant. 9. Develop an understanding of how evolution occurred by using various evolutionary experiment 10. Enhance Collaborative Learning and Communication Skill through Practical Work, Team Work, Group Discussion, Assignment and project.	
6.	Credit Value	2	
7.	Total Marks	Max. Marks : 100	Min. Passing Marks

Part B- Content of the Course

Total No. of Lectures – Tutorials – Practical (2 hour per week): L-T-P: 30

Unit	Topic	No. of Lectures
I	Identification and study of fresh water fauna and its economical importance – Paramoecium, Spongilla, Leech, Prawn, Unio, Crab, Frog, Catla.	03
II	Identification & study of marine water fauna and its economic important – Euplectella, Neries, King crab, Pinctada, Asterias, Balanoglossus, Sea Horse, Scoliodon.	03
III	Identification & Study of terrestrial fauna and its economic importance – Earthworm, Millipede, Peripatus, Scorpion, Naja, Tortoise, Echidna, Kangaroo.	03
IV	Study of ecological experiments: a. To Determine the population of some species of organism by Quadrat sampling method. b. To measure the population of a locality by mark and Recapture method. c. To estimate the biomass of particular area.	05

V	To identify, study and prepare slide/preservation of micro and macro- organisms from any wate body.	04
VI	Study of pond ecosystem.- Visit to a nearby pond/lake	03
VII	Identify, comment and use of important forest medicinal plants- Mahua, Harad, Bah eda , Amla, Oak.	02
VIII	Identify and comment on specimen related to adaption and mimicry – Scolidon , Pigeon , Phrynosoma , Chameleon , Draco , Stick Insect , Leaf Insect.	03
IX	Evolutionary experiment: a. Connection link – -Peripatus , Archaeopteryx Platypus. b. Homology and Homologous organs – - Homology in four limbs structure of vertebrates - Serial homology – Crustacean appendages. c. Analogy – - Wing of Bird and Bate.	04

Keyword/ tags: Pond Ecosystem , Biodiversity , Evolution , Connection Link , Homology , Analogy

Part C – Leaning Resources

Text Book , Reference Books , Other resources

Suggested Readings:

9. Saxena, O.P.," Modern Approach to Non Chordate Zoology" , Rajhang Publication, Meerat, 1992
10. Trigunayat , M.M., Trigunayat , Kritika, " A Monual of Practical Zoology : Biodiversity ", Scientific Publishers , jodhpur 2019
11. Lal.S.S. "A Textbook of Practical Zoology- Invertebrate", Rastogi Pulication, Meerat, 2016
12. Lal. S.S., " A Textbook of Practical Zoology- Vertebrate", Rastogi Publication, Meerat, 2016
13. Books Published by MP Hindi Granth Academy, Bhopal

Suggestive digital platforms web links

7. https://nios.ac.in>documents
8. https://www.hzu.edu.in>bed
9. https://www.uou.ac.in>slm
10. https://www.ccolab.bas.bg>s
11. https://www.mphindigranthacademy.org/