

Enclosure –I A2

Department: Biology

Programme: **B.Sc. Biochemistry**

Semester – III		
Course Code	Course Title	Credits
21UBCID301	DSE - Zoology Zoology: Ecology and Wild life	3 Credits

Course Description:

The course “**Zoology – Ecology and Wild life**” is specially designed to understand the Ecology environment and Nature. Students can learn functions of Abiotic factors, importance of Habitat and its ecology, communication among population and community. It enlightens what is importance of wild life and how living organisms are come in existence and each group of organisms arose. It also deals with agro-biodiversity and its differences with natural ecosystem. This course also emphasis wild species status, the protected areas and wildlife projects.

Course Purpose:

This course is required for life science majors with a focus in fundamentals of ecology and environmental conservation. With this course, the students can understand the needs of sustainability and utilization for the conservation of Biodiversity. The goal of the course is to inspire the knowledge across diverse fields of zoology. By this course, students get the complete awareness regarding the conservation and sustainable use of natural resources, importance of wild life and its conservation. Student can also get good practice in hands for self sustain economy.

Course Outcomes: Upon completion of this course, the learner will be able to

CO No.	CO Statement	Blooms taxonomy Level (K₁ to K₆)
CO ₁	Describe a basic knowledge and understanding on the ecology, ecosystem and its types. It also describe Biological and chemical evolution of life and students can learn about the whole effect of some of Abiotic factors.	K ₁ and K ₂
CO ₂	Illustrate habitat ecology, Soil as medium, forest habitat and effects of Habitat loss.	K ₂ and K ₃
CO ₃	Develop understanding and roll of population and community to maintain the environment. Also it give understanding regarding to community interactions.	K ₂ and K ₁
CO ₄	Observe cyclic functions of some biogeochemical cycles.	K ₁ and K ₃
CO ₅	Demonstrate application, importance and principals of wild life for sustainability. It also give hands on practice to establish wild life conservation.	K ₃ and K ₄

Course Content	Hours
Unit -I: Introduction to Ecology	9Hrs
<ul style="list-style-type: none"> ● History, basic concepts and Applications. ● Chemical evolution for the Origin of life. ● Biological evolution for the Origin of life. ● Ecosystem – structure, function and types. ● Abiotic factors – Water, Light and Temperature. 	
Unit-II Habitat Ecology	9 Hrs
<ul style="list-style-type: none"> ● Soil formation, Constituents and its types, Soil profile. ● Soil organism in Terrestrial habitat, Soil Erosion. ● Types, Stratification and Zonation in Aquatic habitat. ● Atmosphere – Structure and Stratification, Air and Gases, ● Causes and Effects of Habitat loss 	
Unit- III Community and interaction	9 Hrs
<ul style="list-style-type: none"> ● Population Ecology- Introduction, Natality, Mortality, Age structure and Dispersion. ● Population characteristics - Frequency, Density and Abundance. ● Composition, Structure, Quantitative characters, Qualitative characters of Community ● Ecological Interaction – Mutualism, Commensalism, Antagonism, competition ● Ecological Succession - Introduction, General process, Causes and types. 	
Unit- IV Biogeochemical Cycles	9 Hrs
<ul style="list-style-type: none"> ● Carbon cycle ● Nitrogen Cycle ● Phosphorous cycle ● Sulfur cycle ● Oxygen and Water cycle. 	
Unit-V Wild Life	9 Hrs

<ul style="list-style-type: none"> ● Introduction to Wild life and its Status. ● Protected Areas. ● Threatened species and its conservation. ● Wild life Projects- Projects tiger, Asian elephant project, Conservation of Rhinos. ● Migration and its type. 	
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Text Books:

1. Jordan E. L &Varma P.S.(2010) Non-chordate Zoology, S.Chand& Co. Ltd. New Delhi, 4th edition.(for unit 1, 2 &5).
2. PowarNagendra S. (2018) Apllied Zoology2nd edition, Adhyayan Publisher and Distributor.
3. Kotpal R. L.Mordern Text Book of Zoology: Invertibrate, Rastogi Publications, Merrut.
4. Rastogi, V. B. (1994) Organic evolution. KedernathRamnath, India.(for unit 4).

References:

1. 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 .
2. Walter, H.E. and Sayles, L.P; Biology of Vertebrates, Khosla Publishing House

PRACTICALS:

DSE – Zoology Practical

	DSE - Zoology Practicals Ecology and Wild life	6 Hrs/Week	2 Credit
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Course Description:

The practical course is framed to give sound knowledge with understanding of “Zoolog – Ecology and Wild life”. This course is specially designed to understand the environment, nature and basic concept of Ecology. Students can learn Estimation and Measurements and analysis of some ecological parameters. It gives complete understanding about Biostatistical calculation of the data. It enlightens how each group of organisms arose and how did they establish themselves in the environment with their special characteristics. It also deals with the habitat study and community dynamics.

Course Purpose:

This course practical work is in the laboratory to study through specimen, slide, chart and performing work. They gain introductory experience in applying each of the following skills and gain greater proficiency in the selection of them depending on their practicals.

- To develop understanding on the ecosystem of specific environment.
- Understand water analysis and water quality measurements.
- Develop understanding on Biotic interaction and ecological adaptations.
- Acquire knowledge with practice on Community parameters.
- Apply the principals of population strength and quadrat for different Ecological parameters.

Course Outcomes: Upon completion of this course, the learner will be able to

CO No.	CO Statement	Blooms taxonomy Level (S1 to S6)
CO ₁	Demonstrate aquatic ecology and chemical analysis.	S3
CO ₂	Practices for water quality Estimation and Measurements.	S1
CO ₃	Understand biotic interaction and its importance for ecology.	S1 & S3
CO ₄	Learn and study the Biostatistics and data analysis.	S4 & S6
CO ₅	Practices and Demonstrate population parameters and habitat study.	S2 & S3

Practicals:

1. Study of Aquatic ecosystem
 - a. Pond ecosystem
 - b. Oceanic Zonation
2. To Compare the chemical characteristics of soil - I

- a. pH
 - b. Moisture content
3. To Compare the chemical characteristics of soil - II
 - a. Carbonate content
 - b. Nitrate content.
4. Estimation of Chlorinity in water.
5. Estimation of Carbon dioxide in tap water.
6. Measurement of water quality, based on Hardness.
7. Measurement of water quality, based on BOD and COD.
8. Study of Ecological (Biotic) interaction.
9. Study of Ecological adaptation part I.
10. Study of Ecological adaptation part II.
11. To determine 'species Area curve' and community size by quadrature method.
12. To determine Frequency of the community by quadrature method.
13. To determine Density of the community by quadrature method.
14. To determine Abundance of the community by quadrature method.
15. To calculate Mean for community dynamics.
16. To calculate Median for community dynamics.
17. To calculate Mode for community dynamics.
18. To determine population strength by quadrature method.
19. To determine Water holding capacity of the soil from deferent soil samples.
20. Study of Marine Zonetion and stratification.
21. Habitat study - Desert Area, Forest Area, Fresh water Area

Reference books

- Lal S. S., Practical book of Non-chordate.,.
- Lal S. S., Practical book of Chordate., 2014, Rastogi publication, Meerut .
- Jaysurya, Arumugam A., Zoology Practical, 2015, Saras Publication, South India.

Pedagogic tools:

- Chalk and Board
- Power point presentation
- Seminar
- Videos
- By field visit
- e-learning – Facebook page Royal Botany

- By models, specimens, charts, permanent slides
- By workshop

Methods of Assessment & Tools:

Components of CIE: 30 marks : Theory:

Sr. No.	Component	Content	Duration (if any)	Marks	Sub Total
A	Test 1	1 st 2 units	1 ^{1/2} hours	5 (Set for 30)	20
	Test 2	All 5 units	3 hours	15 (Set for 70)	
B	Assignment			05 (Set for 20)	10
C	Class activity			05 (Set for 20)	
Grand Total					30
Assignment		<ul style="list-style-type: none"> • Question answer • Student generated hand book • Essay writing • Case study • Abstract and exclusive study • Power presentation • Chart/model • Poster • Herbarium preparation 			
Class activity		<ul style="list-style-type: none"> • Quiz • One minute game on the base of the topic • Group discussion, • Student talk, etc... 			

Components of CIE: 30 marks : Practical:

Sr. No.	Component	Content	Duration (if any)	Marks	Sub Total
A	Test	60% of Practical course	2 hours	15 (Set for 30)	15
B	Observation books and record	All Practicals	-	05 (Set for 05)	5

	Grand Total	20
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