BSLS 202 Ecology, Biodiversity and Evolution

COURSE CODE	Category	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*	Th	T	P	CREDITS
BSLS 202	DC	Ecology, Biodiversity and Evolution	60	20	20	30	20	4	1	2	7

Legends: L – Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** – Credit;
***Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.**

Course Objective:

1. To give a comprehensive idea of origin and diversity of plants and animals
2. To give a comprehensive idea of ecological principle, natural environment and environmental pollution

Course Outcome:

1. Student will have the knowledge of evolution and diversity of plants and animals
2. Student will have the knowledge of ecological principles and natural environment
3. Student will be able to understand problems related to biological conservation and prevention of environmental pollution

A. Ecology

Unit - I

Ecosystem Concept and Structure; Trophic Levels – Producers, Consumers, Decomposers;
Ecological Pyramids; Pyramids of Number, Biomass and Energy
Energy Flow in Ecosystem; Food Chains and Food Web
Biotic and Abiotic Factors of Ecosystem; Positive and Negative Biotic interactions

Unit – II

Ecological adaptations of hydrophytes, xerophytes and halophytes
Ecological succession: Primary and Secondary Succession; Hydrarch and Xerach Succession.
Biogeochemical cycles: Nitrogen, Carbon, Sulphur and Phosphorus cycles.

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Unit – III

Air Pollution: Climate Change: Green House Gases and Global Warming; Acid Rain: Ozone Depletion and Solar UV

Water Pollution; BOD; COD; Pollution by Heavy Metals, Pesticides: Waste water treatment

Solid Waste: Domestic, Hospital and Industrial

B. Biodiversity and Evolution

Unit – IV

Theories of Organic evolution: Lamarckism and Neo Lamarckism, Darwinism and Neo Darwinism, Germplasm theory, Mutation theory.
Origin of prokaryotic and eukaryotic cell; Gaia Hypothesis
Gene pool, Random genetic drift, Hardy Weinberg law
Isolation - types and mechanisms; Speciation

Unit – V

Plant Diversity: Major groups and salient features of Algae, Fungi, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms
Animal Diversity: Major groups and salient features of Invertebrates and Vertebrates

BSLSL205 Practical:

1. Determination of frequency, density and abundance of vegetation by quadrate method.
2. Soil analysis (pH, temperature, moisture, inorganic content and bacterial count)
3. Isolation of symbiotic and non-symbiotc nitrogen fixing bacteria and actinimycetes from soil.
4. Determination of total organic component (TOC) in soil sample
5. Biotic components of pond
6. Water analysis (pH, DO, carbon dioxide and number of bacteria)
7. Determination of total dissolved solids (TDS) in water.
8. Determination of DO, BOD and COD of polluted and unpolluted water
9. Analysis of drinking water by MTT and MFT
10. Detection of fecal pollution of water by performing presumptive test, confirmed test and completed test.
11. Determination of MPN n coliforms in water
12. Bioremediation of waste water and its toxicity check

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13. Characterization of waste water:
    a. Physical: odor, color, turbidity, temperature, salinity
    b. Chemical: acidity, alkalinity, sulphate, copper
14. Estimation of alkaline and acid phosphatase activity of soil
15. Microbiological quality analysis of air.
16. Specimens / Slides of Plant diversity.
17. Specimens / Slides of Animal diversity.

Books:

1. Environmental Science: *A New Approach* .Dahiya, P.andAhlawat, M. Narosa Publishers.
2. Ecology - Subrahmanyam, N.S. and Sambamurty, A. V. S. S. Narosa Publishing House.
3. Concepts of Ecology – Kormondy, E. J. Prentice Hall, USA, 5th Edition.
4. Ecology and Environment Sharma P. D. Rastogi Publication, Meerut, India.
5. Biology Raven P.H., Johnson G.B., Losos J.B. and Singer S.R. Tata McGraw Hill, Delhi, India.

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