SEMESTER 2nd

MAJOR COURSE

EVS222J: ENVIRONMENTAL SCIENCE (NATURAL RESOURCES AND BIODIVERSITY)

(4+2 CREDITS)

Paper outcome: *This paper is expected to have a broad understanding of various natural resources including biodiversity in terms of availability and diverse consumptive patterns.*

THEORY (4 CREDITS)

UNIT I: FOREST AND FOOD RESOURCES

Importance of forests, Timber and non-timber products, Forest types of India and J&K, Food resources of India: An overview, Green, white and blue revolution, Inland fisheries resources of India, World food problem and food security.

UNIT II: SOIL AND WATER RESOURCES

Soil as a natural resource, Pedogenesis and soil horizons, Soil types of India, Soil and food connect, An overview of Global water resources, Fresh water resources of India (Rivers, lakes, wetlands and Ground water), Population, food grain and water connect, Water resource of J&K (Rivers and Glaciers).

UNIT III: MINERAL AND ENERGY RESOURCES

Concept of resources and reserves, Mineral resources and types, Properties of minerals, of Mineral resources in India: distribution and consumption patterns Environmental impacts of mining. Classification of Energy Resources: Renewable (Solar, hydropower and green hydrogen) and Non-renewable (Coal, oil and Natural gas), Global Energy demand and supply, Energy scenario in India.

UNIT IV: BIODIVERSITY

Definition and concept, Components (Species richness and evenness), Levels of biodiversity: Organisational (genetic, species and ecosystem) and Spatial (alpha, beta and gamma) Endemism, Global biodiversity hotspots, Values of biodiversity: Direct (Productive and consumptive) and Indirect use (Ecosystem services), Ethical values, Threats to biodiversity, IUCN's Red list (Scheme and Status).

LABORATORY COURSE (02 CREDITS)

1. Visit to a Natural ecosystem (Forest, National park, Sanctuary, Lake)
2. Case study of Mining area and assessing the impacts (Boulder mining, sand mining, etc.)
3. Waste/water audit of your institution
4. Energy audit of your institution
5. Socioeconomic survey of any town/village
6. Phytosociology of plant communities
7. Identification of major rock types
8. Calculation of species biodiversity (alpha, beta and gamma)

BIBLIOGRAPHY

1. Environmental Science: Botkin, Keller
2. Environmental Science: Jackson & Jackson
3. Environmental Science: Tyler Miller
4. Essentials of Geology: Chernicoff, Fox, Venkatakrishnan
5. Concepts of Ecology: E.J. Kormondy
6. Environment Principles & Applications: Chris Park.
7. Fundamentals of Ecology: E.P. Odum
8. Population Ecology: P.S. Aaradhana
9. Ecology and Environment: P.D.Sharma
10. Ecology, Environment and Resource Conservation, Singh, J.S., Singh, S.P. and Gupta, S.R.
11. Environmental Chemistry, De, A.K.
12. Biodiversity of the Himalaya: Jammu and Kashmir State: Dar, G.H. & Khuroo, Anzar, A.