

ESP510 HUMAN POPULATION AND ENVIRONMENT LAB.

Course Outcomes:

CO1 Measure population growth.

CO2 Collect and identify medicinal plants.

CO3 Learning different methods of representation of population growth rates.

CO4 Know to identify common medicinal plants and learn their medicinal properties.

1. Study on population growth.
2. Graphical representation of Indian and world population.
3. Diagrammatic representation of population growth rates.
4. Regional population growth.
5. Study of medicinal properties by collecting and identifying some common medicinal plants.
6. Measurement of population.
7. Study of population density in India and world.

OPEN ELECTIVE COURSES

ESE511 NATURAL RESOURCES

39 hrs.

Course Outcomes:

CO1 Discuss about natural resources and their management.

CO2 Describe energy crisis and conservation of energy resources.

CO3 Get a detailed knowledge of various renewable and non-renewable energy sources.

CO4 Understand energy crisis, conservation and management.

UNIT I (13 hours)

Natural Resources: Classification, uses, distribution. Threats to natural resources. Protection and conservation of natural resources – air, water, soil, forest resource, wildlife resource, fossil fuel, mineral resource. Management of natural resources.

UNIT II (13 hours)

Renewable energy sources: Definition, classification, solar energy - solar cells and solar photovoltaic technology, solar thermal technology, solar energy programmes; wind energy, wind energy programmes; hydropower - hydel projects in India; Geothermal energy, Geothermal energy programmes; Ocean energy – Tidal power, thermal energy, wave energy, salinity energy; biogas, biogas programmes.

UNIT III (13 hours)

Non-renewable energy sources: Definition, classification. Coal – composition. Petroleum - components and refinery process, natural gas - reserves, fuel wood. Nuclear Power – Nuclear reactors – types. Energy crisis and conservation of energy resources. Management of biotic and abiotic energy sources.

References:

1. Agrawal, K.C. 2001. Fundamentals of Environmental Biology, Nidhi Publishers, Bikaner, India.
2. Bennett, H.H. 2002. Soil Conservation.
3. Deka, M.M. 2002. Joint Forest Management of Water Projects.
4. Gangstad, E.O. 2002. Environment Managements of Water Projects.
5. Khan, T.I. 2000. Global Biodiversity and Environment Conservations. Pointer Publishers, Jaipur.
6. Khenshoo, T.N. Environment Concerns and Strategies.
7. Maitra, M.K. 2002. Watershed Management; Project, Planning, Development and Implementation.
8. RajendraManeria, Environment Conservation and Planning.
9. Tiwari, S.K. 1997. Wildlife Sanctuaries of Madhya Pradesh.
10. Ural, O. 1980. Soil and Water Conservation.

ESE512 WASTEMANAGEMENT**39 hrs.****Course Outcomes:**

CO1 Discuss about the production of waste from different sources.

CO2 Understand different methods of solid waste management and liquid waste treatment.

CO3 Learning different type of waste released to the environment from different sources.

CO4 Know various methods of liquid waste treatment and solid waste management.

UNIT I (13 hours)

Waste: Introduction, classification - Solid waste and liquid waste. Solid waste - Definition, classification and components; Municipal, industrial, domestic, hazardous, biomedical waste. Environmental standards - emission standards, drinking water standards. Effects of solid waste on environment; physical and chemical properties of solid waste.

UNIT II (13 hours)

Solid waste Management: Physical, chemical and biological methods. Microbiological treatment of solid wastes – composting, land farming, bioreactors. Waste management and utilization of plantation crop wastes, aquatic weeds, kitchen, garden and poultry waste. Recycling and reuse of solid and liquid wastes.

UNIT III (13 hours)

Liquid waste: Sewage and effluents, effect of liquid waste on environmental components. Biological treatment of liquid wastes - aerobic and anaerobic treatment of sewage and effluents. Physical, chemical and biological treatment of liquid waste. Disposal of textile, radioactive, pharmaceutical, refinery, detergent and leather waste.

References:

1. Agrawal, K.C. 2001. Fundamentals of Environmental Biology, Nidhi Publishers, Bikaner, India.

2. Diwakar Rao, P.L. 1990. Pollution control Hand book, Utility Publications Ltd., Secunderabad. India.
3. Hosetti, B.B. and Arvind Kumar.1998. Environmental Impact Assessment and Management, DayaPublishing House, Delhi.
4. John Arundel, Sewage and Industrial Effluent Treatment, Blackwell Science Publishers.
5. Metcalf and Eddy, Waste Water Engineering, McGraw-Hill International.
6. Schmitz, R.J.1996. Introduction to water pollution biology. Asian Books Pvt. Ltd., New Delhi.

IV SEMESTER

HARD CORE COURSES

ESH551 CONSERVATION OF BIODIVERSITY52 hrs.

Course Outcomes:

CO1 Explain the concept of biodiversity and its conservation.

CO2 Describe the policies that have been developed to conserve biodiversity.

CO3 Get the knowledge of biodiversity and causes for biodiversity depletion.

CO4 Understand different Acts for biodiversity conservation.

UNIT I (13 Hours)

Biodiversity – Definition, types - Genetic, Species, Ecosystem diversity; Alpha, Beta and Gamma diversity, values of Biodiversity – consumptive use value, optional values, productive use value, social value. Biowealth, endemism, significance of the endemism, hotspots of Biodiversity.

UNIT II (13 Hours)

Endangered flora and fauna of India. Red data book and IUCN categories. Endangered, Vulnerable and Rare species. Man - Wildlife conflicts. Ecological consequences of reduction in biodiversity. Biodiversity issues – Deforestation and its impact. Two paradigms of Biodiversity, Convention on Biological diversity (CBD), Man and Biosphere programme (MAB).

UNIT III (13 Hours)

Causes for depletion of biodiversity in India, Biodiversity in Karnataka. Conservation measures of biodiversity in Karnataka, Sacred grooves. Prospects and Perspectives of keystone species with special reference to Tiger.

UNIT IV (13 Hours)

Concept of conservation – objectives and management. Biosphere Reserves. Nilgiri Biosphere Reserve - Biosphere Reserves in India, *In situ* and *ex situ* conservation, Role of Zoos, National Parks and Sanctuaries in conservation, Biological Diversity Act of India.

References:

1. Agarwal, S.K. 2002. Biodiversity and Environment, APH Publishers, New Delhi.