

Shivaji University, Kolhapur
Syllabus of Environmental Studies
as a Compulsory Paper for all Undergraduate Courses

- 1. Nature of Environmental Studies :** (2 lectures)
Definition, scope and importance.
Multidisciplinary nature of environmental studies
Need for public awareness.

- 2. Natural Resources and Associated Problems :** (8 lectures)
 - a) Forest resources: Use and over-exploitation, deforestation, dams and their effects on forests and tribal people.
 - b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
 - c) Mineral resources: Usage and exploitation. Environmental effects of extracting and using mineral resources.
 - d) Food resources: World food problem, changes caused by agriculture effect of modern agriculture, fertilizer-pesticide problems.
 - e) Energy resources: Growing energy needs, renewable and non-renewable energy resources, use of alternate energy sources. Solar energy, Biomass energy, Nuclear energy,
 - e) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.Role of an individuals in conservation of natural resources.

- 3. Ecosystems :** (8 lectures)
Concept of an ecosystem.
Structure and function of an ecosystem.
Producers, consumers and decomposers.
Energy flow in the ecosystem.
Ecological succession.
Food chains, food webs and ecological pyramids.
Introduction, types, characteristics features, structure and function of the following ecosystem :-
 - a) Forest ecosystem, b) Grassland ecosystem, c) Desert ecosystem, d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

- 4. Biodiversity and its conservation :** (8 lectures)
Introduction- Definition: genetic, species and ecosystem diversity.
Bio-geographical classification of India.
Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.
India as a mega- diversity nation.
Western Ghat as a biodiversity region.

Hot-spots of biodiversity.

Threats to biodiversity habitat loss, poaching of wildlife, man- wildlife conflicts.

Endangered and endemic species of India.

Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

- 5. Environmental Pollution : (8 lectures)**
Definition: Causes, effects and control measures of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards.
Solid waste Management: Causes, effects and control measures of urban and industrial wastes.
Role of a individual in prevention of pollution.
- 6. Social Issues and the Environment : (8 lectures)**
Disaster management: floods, earthquake, cyclone, tsunami and landslides
Urban problems related to energy.
Water conservation, rain water harvesting, watershed management.
Resettlement and rehabilitation of people; its problems and concerns.
Environmental ethics: Issue and possible solutions.
Global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.
Wasteland reclamation.
Consumerism and waste products.
- 7. Environmental Protection : (8 lectures)**
From Unsustainable to Sustainable development
Environmental Protection Act.
Air (Prevention and Control of Pollution) Act.
Water (Prevention and control of Pollution) Act
Wildlife Protection Act
Forest Conservation Act
Population Growth and Human Health, Human Rights.
- 8. Field Work : (10 lectures)**
Visit to a local area to document environmental assets-
River/forest/grassland/hill/mountain.
or
Visit to a local polluted site – Urban/Rural/Industrial/Agricultural
or
Study of common plants, insects, birds.
or
Study of simple ecosystems - ponds, river, hill slopes, etc.
(Field work is equal to 10 lecture hours)

References :

- 1) Agarwal, K.C.2001, Environmental Biology, Nidi Pubi. Ltd., Bikaner.
- 2) Bharucha Erach, The Biodiversity of India, Mapin Publishing pvt. Ltd., Ahmedabad 380013, India, Email:mapin@icenet.net (R)
- 3) Brunner R.C.,1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
- 4) Clank R.S. Marine Pollution, Clanderson Press Oxford (TB)
- 5) Cunningham, W.P. Cooper, T.H.Gorhani, E. & Hepworth, M.T.2001, Environmental Encyclopedia, Jaico Publ. Hpise, Mumbai, 1196p
- 6) De A.K., Environmental Chemistry, Wiley Wastern Ltd.
- 7) Down to Earth , Cebtre fir Scuebce and Environment (R)
- 8) Gleick, H.,1993, Water in crisis, Pacific Institute for studies in Dev., Environment & Security. Stockholm Env. Institute. Oxford Univ. Press 473p
- 9) Hawkins R.e., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
- 10) Heywood, V.H.& Watson, R.T.1995, Global Biodiversity Assessment, Cmbridge Univ. Press 1140p.
- 11) Jadhav, H.& Bhosale, V.M.1995, Environmental Protection and Laws, Himalaya Pub. Hcuse, Delhi 284p.
- 12) Mickinney, M.L.& School. R.M.1196, Environmental Science Systems & Solutions, Web enhanced edition, 639p.
- 13) Mhaskar A.K., Mastter Hazardous, Techno-Science Publications (TB)
- 14) Miller T.G.Jr., Environmental Science. Wadsworth Publications Co. (TB)
- 15) Odum, E.P.1971, Fundamentals of Ecology, W.B.Saunders Co. USA, 574p.
- 16) Rao M.N.& Datta, A.K.1987, Waste Water Treatment, Oxford & IBH Publ. Co. Pvt. Ltd., 345p
- 17) Sharma B.K., 2001, Environmental Chemistry, Gokel Publ. Hkouse, Meerut
- 18) Survey of the Environment, The Hindu (M)
- 19) Townsend C., Harper, J. and Michael Begon, Essentials of Ecology, Blackwell Science (TB)
- 20) Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, vol. I anfd II, Environmental Media (R)
- 21) Trivedi R.K. and P.K. Gokel, Intriduction to air pollution, Tecgbi-Science Publications (TB)
- 22) Wagner K.D.,1998, Environmental management, W.B. Saunders Co. Philadelphia, USA 499p.
- 23) Paryavaran shastra – Gholap T.N.
- 24) Paryavaran Sahastra – Gharapure
(M) Magazine (R) Reference (TB) Textbook