

SCHOOL OF ENVIRONMENTAL SCIENCES
Mahatma Gandhi University

Open Course

SES M III O 16 97 : SANITATION, HEALTH AND ENVIRONMENT [4 credits]

Unit – I Environment - Basics

- 1.1 Earth – components : lithosphere, hydrosphere, atmosphere and biosphere
- 1.2 Soil formation and structure
- 1.3 Rivers and streams
- 1.4 Concept of watershed
- 1.5 Surface and ground water
- 1.6 Ecosystems- definition, component, structure and function
- 1.7 Energy flow through ecosystem
- 1.7 Biodiversity and conservation

Unit – II Environmental pollution

- 2.1 Pollution – definition and types
- 2.2 Pollutants – types and sources
- 2.3 Indoor air pollution
- 2.4 Environmental monitoring- water, soil and air quality parameters

Unit – III: Sanitation and Health

- 3.1 Sanitation and Health- introduction and Current situation
- 3.2 Water and sanitation related diseases, respiratory infections, under nutrition
- 3.3 Successful approaches to sanitation-strategies
- 3.4 Role of health sector
- 3.5 Global experience in improving sanitation and hygiene
- 3.6 Climate change and diseases
- 3.7 Occupational health

Unit IV : Waste Management

- 4.1 Solid and liquid waste : Types, sources , properties and impacts
- 4.2 Treatment / processing techniques for solid wastes :, Thermal and Biological processes
- 4.3 Disposal techniques : Landfills – design , operation and management.

4.4 Hazardous waste management.

4.5 Wastewater treatment : an overview ; Concept of Zero waste

Unit V : Ecological Sanitation

5.1 Conventional sanitation : a linear flow system – its limitations

5.2 Eco San –Circular flow and closing the loop : concept, goals and advantages

5.3 Eco San for human night soil management: Dry Toilets, Composting Toilets

5.4 Grey water management

5.5 Eco San - Human Health and Food Security

Unit VI : Interaction of toxicants with the environment

6.1 Ecotoxicology- definition

6.2 Transboundary pollutants

6.3 Fate of pollutants in the aquatic system

6.4 Bioaccumulation/bioconcentration and biomagnification

6.5 Bioindicators and biomarkers

Unit-VII Pollutants and individual organisms

7.1 Routes and types of exposure to toxic substance

7.2 Toxicity of pollutants such as metals, pesticides, radioactive minerals etc.

7.3 Effects of pollutants on individual organisms

7.4 Contaminants in food

7.5 Occupational exposure to toxics

7.6 Toxicity from substances used in daily life : cosmetics, cleansing agents etc.

7.7 Toxicity testing

References

Manahan Stanley E., Environmental Chemistry, Lewis Publishers, London

Walker, CH., Hopkin, S.P., Sibly RM., Peakall DB. Principles of Ecotoxicology, Taylor and Francis, New York

Nyle C Brady, Nature and Properties of soil, Macmillan

Cunningham William P., Saigo Barbara Woodworth. Environmental Science McGraw Hill, London

Lippman Morton. Environmental Toxicants human exposure and their health effects, John Wiley & Sons New York

Prabhakar VK. Toxic and Hazardous chemicals, Anmol, New Delhi

Sarkar Bibudhendra. Heavy metals in the environment, Marcel Dekker, New York

Sharma, B.K and Kaur H. Water Pollution, Krishna Prakashan , Meerut.