

Government Degree College, Baramulla (Autonomous)

Semester 8th

Major

ENVIRONMENTAL SCIENCE (For Honours with Research and Honours courses)

COURSE CODE: EVSC2822M/ EVSR2822M

COURSE TITLE: Environmental Health, Climate Change, and Sustainable Future

CREDITS: (4+2)

Credit Hours (64 + 64)

Course Objectives

1. To understand the linkages between environmental determinants and human health.
2. To study the health impacts of pollution, climate change, and ecosystem degradation.
3. To examine occupational health issues within the broader framework of environmental health.
4. To explore adaptation and mitigation strategies for climate and health risks.
5. To analyze environmental health governance in India and at the global level

Learning Outcomes

By the end of this course, students will be able to:

1. Identify and explain major environmental factors influencing health.
2. Assess the health impacts of pollution, climate change, and occupational exposures.
3. Conduct basic environmental health risk assessments.
4. Critically evaluate Indian and international environmental health policies.
5. Suggest sustainable interventions to reduce health risks from environmental change.

Unit I: Foundations of Environmental Health

1. Environmental determinants of health – air, water, soil, food, climate
2. Toxicology basics – exposure pathways, dose-response, bioaccumulation
3. Epidemiology of environmental diseases
4. Environmental justice and vulnerable populations

Unit II: Pollution, Climate Change, and Health

1. Air and water pollution – respiratory, cardiovascular, and waterborne diseases
2. Climate change impacts – heat stress, vector-borne diseases, food and nutrition security
3. Urbanization and environmental health – slums, sanitation, solid waste
4. Case studies – Delhi air crisis, Kerala floods and disease outbreaks, global examples (Heatwaves in Europe, Dengue spread in Southeast Asia)

Unit III: Occupational and Workplace Health

1. Major occupational diseases – silicosis, asbestosis, pesticide poisoning, industrial cancers
2. Ergonomic and physical hazards – noise, radiation, heat stress
3. Case studies – Bhopal Gas Tragedy, Asbestos exposure in India, Agricultural workers & pesticide exposure
4. Occupational safety frameworks – ILO standards, Indian laws, occupational safety code 2020

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Unit IV: Risk Management, Policy, and Sustainable Futures

1. Environmental health risk assessment – hazard identification, exposure assessment, risk characterization
2. Public health policies and occupational safety regulations in India
3. Global governance – WHO, UNEP, IPCC reports on health and environment
4. Sustainable development and health co-benefits –green jobs, renewable energy transitions

Practical:

1. Noise Pollution and Health Impacts – Noise mapping of a busy road/market and assessment against CPCB permissible limits.
2. Occupational Health Study – Preparation of a case profile of a local occupation (e.g., stone-cutting, welding, pesticide application) and associated diseases.
3. Vector-Borne Diseases and Climate – Data analysis of malaria/dengue incidence vs temperature and rainfall trends (secondary datasets).
4. Health Risk Assessment – Risk analysis for heavy metals in food/water (HQ, HI calculation).
5. Sustainable Agriculture Case Study – Comparative study of conventional vs organic farming practices in terms of input use and sustainability indicators.
6. Carbon Footprint Assessment – Estimation of institutional carbon footprint (energy, transport, waste) with mitigation strategies.

Bibliography

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2. WHO (2021). Climate Change and Health. WHO Reports.
3. Lippmann, M. (2020). Environmental Toxicants: Human Exposures and Their Health Effects. Wiley.
4. Patz, J., & Frumkin, H. (2016). Climate Change and Public Health. Oxford University Press.
5. Rosenstock, L., Cullen, M., & Brodtkin, C. (2014). Textbook of Clinical Occupational and Environmental Medicine. Elsevier.
6. Park, K. (2021). Preventive and Social Medicine. Banarsidas Bhanot Publishers.
7. Gupta, B.N., & Maheshwari, M.C. (1999). Occupational Health. National Book Trust, India.
8. Mukherjee, A.K. (2010). Environmental Health in India: Contemporary Issues and Emerging Concerns. OUP.
9. Rao, M.N., & Rao, H.V.N. (2017). Air Pollution. Tata McGraw Hill.
10. MoEFCC & Ministry of Health Reports on Environmental Health Impacts in India.