

ENVIRONMENTAL SCIENCE
VII SEMESTER
(For Research with Honours courses)

COURSE CODE: EVSC1722M

COURSE TYPE: MAJOR

COURSE TITLE: Environmental Impact Assessment

CREDITS: 4

Course Objectives

1. Introduce principles, concepts, and methodologies of EIA.
2. Familiarize students with screening, scoping, baseline data, and impact prediction techniques.
3. Provide knowledge of Environmental Management Plans (EMP) and mitigation strategies.
4. Expose students to national and international legal frameworks of EIA.
5. Develop critical skills to evaluate EIA reports through real case studies.

Learning Outcomes

After completion, students will be able to:

1. Explain the role of EIA in sustainable development.
2. Apply screening, scoping, and baseline study methods to project evaluation.
3. Use qualitative and quantitative techniques for impact prediction.
4. Prepare EMPs and suggest mitigation strategies.
5. Interpret Indian EIA legislation and global guidelines.
6. Critically analyze sectoral EIA case studies and propose sustainable solutions.

Unit I: Fundamentals of EIA

16 hours

1. Concept, origin, and need for EIA
2. Evolution of EIA – global and Indian perspective
3. Principles and objectives of EIA in sustainable development
4. EIA process (Basic) – screening, scoping, baseline data

Unit II: Methods and Techniques of Impact Assessment

16 hours

1. Impact identification and prediction methods – checklists, matrices, networks, overlays
2. Quantitative methods – Leopold matrix, Battelle method, GIS in EIA
3. Impact analysis – air, water, soil, biodiversity, socio-economic aspects
4. Uncertainty analysis, risk assessment, cost-benefit analysis

Unit III: Environmental Management and Decision-Making

16 hours

1. Environmental Management Plan (EMP) – formulation and implementation
2. Mitigation strategies – design, alternatives, public consultation and participation
3. Strategic Environmental Assessment (SEA) – purpose and applications
4. Environmental auditing and post-project monitoring

Unit IV: Policy, Legislation, and Case Studies

16 hours

1. Policy & Legislation – EIA Notification (2006 & amendments), Environment (Protection) Act, 1986, clearance procedures in India
2. International Practices – UNEP, World Bank EIA guidelines
3. Case Studies:
 - Tehri Dam (Uttarakhand), Narmada Valley Project (Madhya Pradesh/Gujarat), Bhagliar Dam (Jammu and Kashmir– displacement, ecological controversies, socio-economic issues, resettlement
 - Kudankulam Nuclear Power Plant (Tamil Nadu) – safety, marine ecology, public resistance
 - Delhi Metro Rail Project – urban transport, air pollution reduction, socio-economic impacts
 - Vishakhapatnam Gas Leak (2020) – gaps in industrial EIA and risk assessment
4. Recent Trends – cumulative impact assessment, digital EIA, sustainability appraisal

Bibliography

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7. Kaushik, A., & Kaushik, C.P. (2019). Environmental Science and Engineering. New Age International, New Delhi.
8. Singh, J.S., Singh, S.P., & Gupta, S.R. (2006). Ecology, Environment and Resource Conservation. Anamaya Publishers, New Delhi.
9. Kulkarni, V., Ramachandra, T.V., & Subrahmanya, M.H.B. (2002). Environmental Management: An Indian Perspective. Universities Press, Hyderabad.
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