

**ENVIRONMENTAL SCIENCE**  
**VII SEMESTER**  
**(For Research with Honours courses)**

**COURSE CODE: EVSR1722M**

**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

1. Canter, L.W. (1996). Environmental Impact Assessment. McGraw Hill.
2. Glasson, J., Therivel, R., & Chadwick, A. (2012). Introduction to Environmental Impact Assessment. Routledge.
3. Petts, J. (1999). Handbook of Environmental Impact Assessment. Blackwell.
4. Noble, B.F. (2015). Introduction to Environmental Impact Assessment: A Guide to Principles and Practice. Oxford University Press.
5. Y. Anjaneyulu (2002). Environmental Impact Assessment Methodologies. BS Publications, Hyderabad.
6. Joshi, P.C., & Joshi, N. (2017). Concepts of Environmental Impact Analysis. Daya Publishing House, New Delhi.
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.
10. MoEFCC (Govt. of India). EIA Notification, 2006 and Amendments. Official Document.