

Course Code	Course Title	Credit Hours
ENS-829	Environmental Risk Assessment and Management	3 (3+0)

### Course Description

The course aims to review the forms of hazards and their associated risks, define the elements of risk assessment and describe the types of information needed for each element of risk assessment, describe the ways to risk identification, estimation of magnitude of the potential risks and illustrate different approaches of exposure assessment, explain the principles of risk management and control strategies and outline the approaches to managing the environmental emergencies.

### Course Outline

**Environmental Risk Assessment and Management:** The what's, whys and how's- a historical perspective: Risk assessment to human health from chemicals in the environment, Risk assessment to ecological systems from chemicals, from biological introductions (excluding genetically modified organisms), Evaluation of the likelihood of major accidents in industrial processes, Assessing risks to ecosystems and human health from genetically modified organisms, Retrospective assessment, eco-epidemiology and ecological monitoring, Hazard identification, dose and exposure assessment, risk quantification, Epidemiology and environmental risk assessment.

**Risk Assessment in Legislation:** Application of risk assessment in policy and legislation in developed and developing countries, Balancing risks with other considerations: The psychology of risk and uncertainty, the economics of risk, Valuing risks, Natural hazards, risk analysis and risk management.

**Risk Management:** Principles, approaches and concepts: Corporate chemical management; a risk-based approach, Environmental risk assessment in business, Risk assessment and management for water treatment and disposal, Risk assessment and management in the exploitation of the seas, Risk assessment and

management for inland waters, Environmental risk assessment in development programs, the experience of World Bank.

**Risk Communication:** A framework for sustainable product development.

### **Recommended Books**

1. Calow, P. (1998). *Handbook of Environmental Risk Assessment and Management*. Black Well Science Ltd. UK.
2. Larche, I. and Paleologos, E. K. (2001). *Environmental Risk Analysis*. McGraw-Hill NY, USA.
3. Patnaik, P. (1997). *Handbook of Environmental Analysis: Chemical Pollutants in Air, Water, Soil and Solid wastes*. CRC Press Inc., USA.
4. Tarynor, P. L. (2000). *Biosafety Management: Principles and Applications*. Virginia Polytechnic Institute Publications. USA.
5. Riviere, J. (2000). *Environmental Risk Evaluation of Polluted Soils*. Oxford and IBH Publishing Company Pvt. Ltd. India.
6. Iqbal, M., Srivastava, P. S. and Siddiqui, T. O. (2000). *Environmental Hazards: Plants and People*. CBS Publishers and Distributors, India.