

Course Type	Course Code	Name of Course	L	T	P	Credit
DE	NESD513	Restoration Ecology	3	0	0	3

Course Objective

Learn different aspects of restoration ecology and conservation techniques.

Learning Outcomes

Upon successful completion of this course, students will:

- An insight into the environmental significance of restoration ecology.
- Structure and function of land diversity in ecosystem stability.
- An understanding of restoration ecology in natural resource management.
- Students can apply fundamental knowledge of restoration ecology in addressing commitments made by industries and nodal agencies to solve problems associated with environmental degradation.

Unit No.	Topics to be covered	Lecture hours	Learning outcome
1	Introduction to restoration ecology; Evolution of restoration concepts for terrestrial and aquatic ecosystems; Ecological restoration law and policies, Concept of deforestation, reforestation and afforestation; Land use and land cover change.	6	Understanding the concept of restoration ecology in nature conservation, governance and policies.
2	Fundamentals of ecological succession; Restoration of mined-out areas, riverfronts, riverbeds, watersheds, aquifer recharge, etc.; Physical, chemical and biological methods of ecological restoration; Inventory of reference conditions.	8	Understanding the concept of ecological succession in the restoration of natural and man-made ecosystems.
3	Concept of native species in ecological restoration; Concept of invasive species in ecological restoration; Concept of diversity indices in ecological restoration; Biomass estimation of restoration sites; Carbon accounting.	6	Understanding the structure and function of native species in restoration of degraded natural ecosystems.
4	Different types of ecosystems and their restoration practices; Protected areas and their restorations steps; Wetland habitats and their restoration steps; Mining areas and their restoration steps; Grassland ecosystem and restoration steps; Methods of reforestation and afforestation, Wildlife habitats and their restoration design; Rehabilitation of salt affected soils, Case studies.	8	Understanding viability of in best restoration field techniques using various with case studies.
5	Concept of ecological engineering in the restoration of ecosystem structure and functions; Principles in ecological Engineering; Merits and demerits of ecological Engineering in restoration ecology; Case studies.	6	Understating comparative engineering techniques in restoration using various with case studies.
6	International and national principles and standards for ecological restoration; Ten golden rules for ecological reforestation; United Nations decade of ecosystem restoration; SDGs, REDD+, NDC, COPs; Financing ecosystem restoration; Cost-benefit analysis of restoration projects; Accounting processes and resource mobilization.	8	Understanding evolution of various international and national restoration and rejuvenation commitments and government policies.
Total		42	

Recommended text books:

1. Introduction To Restoration Ecology: Evelyn A. Howell, John A. Harrington, Stephen B. Glass
2. Restoration and Conservation Ecology: Govind Prasad
3. Foundations of Restoration Ecology. D.A. Falk, M.A. Palmer and J.B. Zedler

Reference books:

1. Restoration of Degraded Land: Concepts and Strategies: J.S. Singh
2. Ecological Restoration: Global Challenges, Social Aspects and Environmental Benefits