

About the course

This course offers a thorough and interdisciplinary analysis of mangrove ecosystems, which are among the most productive and ecologically significant habitats on Earth. This study examines the biology, diversity, and distribution of mangroves, emphasizing their unique adaptations that facilitate survival in saline, tidal environments. Participants will analyze the intricate relationship between mangroves, coastal hydrodynamics, and global climate regulation, highlighting their role as vital "climate vaults" that sequester significant amounts of carbon. The course highlights the socio-economic and ecological advantages of mangroves, including coastal protection, biodiversity enhancement, and livelihood support for coastal communities. Students will examine the challenges to mangrove conservation, such as deforestation, pollution, and climate change, while engaging with national and international conservation policies and sustainable management strategies.

Learning Objectives

- Understand mangrove ecology, distribution, and biodiversity.
- Describe the major species and structural features of mangrove forests in different regions.
- Align mangrove conservation to the UN Sustainable Development Goals (SDGs) for climate action, marine ecosystems, and sustainable communities
- Consider mangroves' role in blue carbon storage and global carbon sequestration.
- Explain how tides affect mangrove growth, root systems, and nutrient cycling.
- Assess how human activity affects mangrove health and carbon sequestration.
- Study how climate change affects mangrove distribution and function.
- Mangrove conservation and restoration methods should be examined.
- Include mangroves in climate and resilience strategies.

Target Audiences

This course is ideal for environmental science, marine biology, ecology, climate studies, and natural resource management students and professionals. It is suitable for policymakers, conservationists, NGOs, and anyone interested in environmental sustainability and climate resilience.

Course Duration: 12-14 hours

Course Title- Mangroves as Climate: Ecology, Hydrology, and Conservation

Module 1 – Overview on Mangrove

- 1.1 About Mangroves
- 1.2 Types of Mangroves
- 1.3 Characteristics of Mangrove Ecosystem
- 1.4 Species of Mangrove
- 1.5 Distribution of Mangroves
- 1.6 Significance of Mangroves

Module 2: Role of Mangrove in Blue Carbon and Carbon Sequestration

- 2.1 Blue Carbon
- 2.2 Carbon Sequestration
- 2.3 Estimates of Mangrove Carbon Sequestration
- 2.4 Role of Mangroves in Global Climate Mitigation
- 2.5 Mangroves' Alignment with UN Sustainable Development Goals

Module 3 – Mangroves Roots and Climate Actions

- 3.1 Mangrove Roots: Natural Architects
- 3.2 Types of Mangrove Roots
- 3.3 Rooted in Salt
- 3.5 Unique root systems of mangroves
- 3.6 Why Mangrove Roots Matter for Wildlife

Module 4 – Tidal Dynamics of Mangroves as Climate Vault

- 4.1 Impact of high tides on Mangrove roots
- 4.2 Impact of high tides on Mangrove roots
- 4.3 Tidal Influence on Blue Carbon & Carbon Sequestration in Mangroves

Module 5 – Challenges and Conservation Policies

- 5.1 Challenges to Mangrove Ecosystems
- 5.2 Consequences of the destruction of mangrove ecosystems
- 5.3 Regulatory Measures for Mangrove Protection
- 5.4 Promotional Initiative for Mangrove Conservation
- 5.5 India's Mangrove Cover – Status and Trends