Department of Sustainable Energy Engineering
Indian Institute of Technology Kanpur

Proposal for a New Course

Course Title		Sustainable Forest Management
Number		SEE 631
Credits (L-T-P [C])		3-0-0-0-9
Departments proposing the course	:	Department of Sustainable Energy Engineering
Name of the Proposer	:	Prof. Ashish Garg
Offered for		UG and PG
Status of the course	:	
Prerequisite(s) for the course	:	Having passed 10+2 with Science
Faculty members interested in teaching	:	Dr. Ankur Awadhiya, IFS
Other Departments/Programmes (of whose the students are expected to take up the course)	:	Biological Sciences and Bioengineering, Earth Sciences, Environmental Engineering, Civil Engineering

Course Objectives

Management of forests is crucial not only because they provide us with resources, and because there are several fringe-forest communities dependent on them, but also because forests are one of the few effective measures for the sequestration of atmospheric carbon, so essential for climate change mitigation. Sustainable forest management aims to maximise the benefits of forests for the society – including major and minor forest produce, food and water security, ecosystem services, and tourism avenues – but in a manner that the benefits are continuously available to us for several generations. In this course, we shall discuss sustainable management of forest bio-resources using case studies and examples from India and abroad, in an attempt to understand how and why forests are planted, managed, and harvested in a continuous cycle.

Expected Learning Outcomes

1. Conceptual and working knowledge of sustainable management of biological resources.
2. Conceptual and working knowledge of silviculture and working of forests.
3. Conceptual and working knowledge of ecosystem services emanating from forests.
4. Exemplar understanding of utilisation of sustainable management principles to meet various objectives of management.

Course outline

Week 1: Introduction to forests
1. What is a forest?
2. Benefits from forests
3. Classification of forests

Week 2: Basics of forest management
1. What is forest management?
2. How do plants grow?
3. How do forests form?

Week 3: Understanding forest soils
1. Soil and soil profile
2. Types of soils
3. Biogeochemical cycles

Week 4: Measuring trees and forests
1. Describing trees and forests
2. Measurement of tree attributes – 1
3. Measurement of tree attributes – 2

Week 5: Surveying forests
1. Basics of forest surveying
2. Use of photogrammetry and satellite data
3. Use of LiDAR

Week 6: Protecting forests
1. Threats to forests
2. Forests and fires
3. Legal provisions

Week 7: Biological diversity and summing up
1. Biodiversity in forests
2. Summing up and discussion – 1
3. Summing up and discussion – 2

Mid Sem

Week 8: Silviculture – 1
1. Principles of forest regeneration
2. Silvicultural systems
3. Clear felling system

Week 9: Silviculture – 2
1. Shelterwood system
2. Selection system
3. Irregular shelterwood system

Week 10: Sustainably deriving bioresources
1. Logging and processing
2. Calculating growing stock and forest increment
3. Computing yield and sustained yield

Week 11: Sustainable practices
1. Collecting and treating forest seeds
2. Nursery techniques to produce seedlings
3. Planting and tending operations

Week 12: Recent developments in forestry
1. Non-timber forest produce
2. Social forestry
3. Ex-situ conservation

Week 13: Conservation of wild animals
1. National Parks and Wildlife Sanctuaries
2. Summing up and discussion – 1
3. Summing up and discussion – 2

End Sem

Reference Books:

1. Forest soils by Wilde
2. Principles and practices of Silviculture by S. S. Bist
3. Awadhiya, A., Principles of Wildlife Conservation. Florida and Oxfordshire: CRC Press / Taylor & Francis
4. Selected articles / papers as referred to in the lectures

Course proposed by	Recommended/Not recommended	This course is approved/not approved
(Name of the Instructor)	Convener, DPGC (SEE)	Chairman, SPGC

SEE

Scan/SSC
06/06/24

INDIAN INSTITUTE OF TECHNOLOGY KANPUR
POSTGRADUATE OFFICE

No. A(P)/IITK/course approval/
June 5, 2024

The Convener, DPGC
Departments of CE/SEE/PHY
IIT Kanpur

I am directed to communicate the concurrence of the SPGC (2023-24) in its 9th meeting held on 28/05/2024 for the approval of new PG course proposal. After detailed discussion the following courses were approved.

Course No	Title	Credits	Instructor	SPGC /Decision
CE716	Project Management and Control	3-0-0-0-9	Dr. Chirag Kothari	Approved
CE718	Water resources systems analysis	3-0-0-0-9	Dr. Tushar Apurv	Approved
CE719	Hydrometeorology	3-0-0-0-9	Dr. Tushar Apurv	Approved
SEE631	Sustainable Forest Management	3-0-0-0-9	Dr. Ashish Garg	Approved
PHY685	Introduction To Quantum Field Theory	3-0-0-0-11	Dr. Arjun Bagchi	Approved

Joint Registrar
Academic Affairs

CC: OARS (DOAA Office) For necessary action