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Forest Ecology, Biodiversity and Management NRM 512



Autumn 2022

Course Teacher(s)

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1. General Information

Course code	:	FRM 512
Course Title	:	Forest Ecology, Biodiversity and Management
Number of credits	:	4
Course duration	:	18 weeks
Level	:	Postgraduate
Course Teacher	:	Dr. Aasif Ali Gattoo Dr. Shah Murtaza Mushtaq Dr. Akhlaq Amin Wani
Pre-requisite	:	Basic understanding of plant ecology and

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		biodiversity at undergraduate level.
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2. Course description

The course introduces the basics of forest ecology and biodiversity. It exposes the students to qualitative and quantitative analysis of forest ecosystems focused towards conservational concepts and global efforts towards conservation

3. Course objectives

This course would enable the students to understand the aspects related to forest ecosystem and its dynamics. As well it provides the knowledge on biodiversity conservation in natural forests and agro-ecosystems, policy issues, IPR, etc.

4. Course outcome

On completion of this course, the students would:

- Gain a wider understanding of ecology and phyto-diversity of forest landscapes.
- The students will enhance abilities and skills for survey, exploration and sampling strategies in forests and other green areas.
- It will enable the students to explore conservation areas and factors affecting thereof and develop understanding regarding national and global efforts towards conservation.

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5. Course structure

	UNIT 1
Week1	Introduction to forest ecology, forest population,
Week2	forest community dynamics, forest community structure and analysis,
	Practical: <ul style="list-style-type: none">• Study of forest community structure and its successional status;
Week3	forest productivity on a global scale, ecology of forest landscapes spatial heterogeneity; Hierarchy issues in ecology
	Introduction to forest recreation: Trends in outdoor recreational use of wild land and natural areas with emphasis on state and federal parks and forests.
Week4	Elements and characteristics of landscape ecology.
	Practical: <ul style="list-style-type: none">• Estimation of productivity of forest ecosystem;
	UNIT 2
Week5	Biodiversity-an overview; genetic, species and ecosystem diversity; determinants of biodiversity.
	Mid Term
Week6	Higher plant diversity, species richness and endemism.
Week7	Managing plant genetic resources: Basic science issues – genetic vulnerability and crop diversity, crop diversity-institutional responses,
	Practical: <ul style="list-style-type: none">• preservation of specimen;
Week8	in situ conservation of genetic resources, the science of collecting genetic resources, the science of managing genetic
	UNIT 3
Week9	Complementary strategies for plant biodiversity conservation. In situ conservation of wild species in nature reserves,

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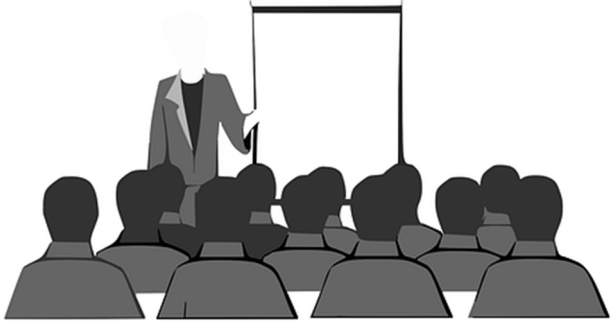

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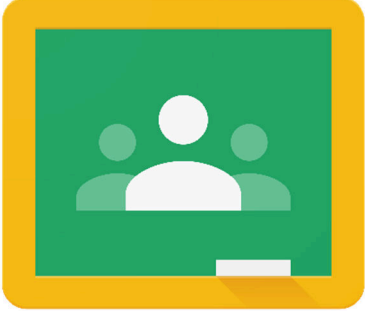



	<p>Practical:</p> <ul style="list-style-type: none"> • Methods of vegetation analysis, Measurement of biomass and productivity;
Week10	in situ conservation components, factors influencing conservation value, national plan for in situ conservation.
Week11	In situ conservation of Forest and agro-biodiversity on-farm: importance of on-farm conservation initiatives,
Week12	overview of the types of information necessary in the design of an on-farm conservation programme.
	UNIT 4
Week13	Managing plant genetic resources: policy issues (exchange of genetic resources: quarantine,
	<p>Practical:</p> <ul style="list-style-type: none"> • Quantification of litter production and decomposition;
Week14	IPR; genetic resources: assessing economic value; conflicts over ownership, management and use; national and international treaties/ legislations: CBD, IT-PGRFA, GPA, PVP and FR Act, Biodiversity Act, etc.).
	<p>Practical:</p> <ul style="list-style-type: none"> • Trip to different regions of the state to study forest vegetation, Collection.
Week15	International instruments concerning agro-biodiversity, Agenda 21, convention on biological diversity (CBD), FAO and global system of PGR,
	<p>Practical:</p> <ul style="list-style-type: none"> • Visit to national parks, wildlife sanctuaries, botanical gardens and arboreta.
Week16	the International Treaty on Plant Genetic Resources for food and agriculture (ITPGR), Global Plan of Action,
Week17	TRIPS agreement and IPR protection of life forms.
Week18	Practical Exam/Assignment submission/Presentation
	End Tem Exam

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5. Course structure

	<p style="text-align: right;">In Class Lectures</p> <p style="text-align: center;">Students will be able to understand</p> <ol style="list-style-type: none">1) Basics of forest ecology and biodiversity.2) Qualitative and quantitative analysis of forest ecosystems focused towards conservational concepts and global efforts towards conservation.
	<p style="text-align: right;">Lab/Field Exercises</p> <p style="text-align: center;">Students will be able to study</p> <ol style="list-style-type: none">1) Forest community structure and productivity of forest ecosystem;2) Preservation of specimen3) Methods of vegetation analysis, measurement of biomass and productivity;

 <p>Google Classroom</p>	<p style="text-align: right;">On line Tutorials</p> <p style="text-align: right;">Google Class Code: p4oikrn</p> <p>Students will explore and learn more about</p> <ol style="list-style-type: none"> 1) Basic concepts of forest ecology, biodiversity and management through lectures notes.
	<p style="text-align: right;">Assignments/Presentation</p> <p>Students at individual level and in groups will explore and learn more about</p> <ul style="list-style-type: none"> • Collection and preservation of specimens in specific forest areas and urban landscapes. • Exercise on phyto-diversity using biodiversity indices • Biomass and productivity studies. • Understanding the basic and modelling of geoinformatics.

6. Course Assessment

Mode of assessment	% of marks
Quiz 1	5
Mid Term (Objective and Written)	20
Practical/Assignments (Discussion)	25
Quiz 2	5
End Term (Objective and Written)	45



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Total

100

7. References

Compulsory

- Avery TE and Burkharts H. 2001. Forest Measurements. McGraw-Hill Education.
- Barnes BV, Zak DR, Denton SR and Spurr SH. 1998. Forest Ecology. Wiley.
- Jha BC, Pandey BN, Jaiswal K, Katiha PK, Pandey PN and Sharma AP. 2012. Biodiversity: Issues Threats and Conservation. Narendra Publishing House, Delhi.
- Artmann M, Breuste J, Cristian Ioja C, Qureshi S. eds "Making Green Cities - Concepts, Challenges and Practice", Springer "Cities and Nature" Series, ISBN 978-3-030-37715-1.

Recommended

- Kumar Biju. 2013. Biodiversity and Taxonomy. Narendra Publishing House, Delhi.
- Larocque GR. 2016. Ecological Forest Management Handbook (Applied Ecology and Environmental Management). Taylor & Francis.
- Mahato B, Pandey BN, Singh LB, Pandey PN and Singh RK. 2010. Text Book of Environmental Pollution. Narendra Publishing House, Delhi.
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Wood D and Lenne J. 1999. Agrobiodiversity: Characterisation, Utilization and Management. CAB International, Wallingford.

ETH Zurich, Open Access models, <https://ites-fe.ethz.ch/openaccess/>

E-Links to the course (Presentations)

Unit	E-Link to Course
Biological Diversity	https://drive.google.com/drive/folders/1HCJ-OHGsqgKJQCgyxTZYqU1KOaD80IGo
Strategies for Biodiversity Conservation	https://drive.google.com/drive/folders/1HCJ-OHGsqgKJQCgyxTZYqU1KOaD80IGo
Population Dynamics	https://drive.google.com/drive/folders/1HCJ-OHGsqgKJQCgyxTZYqU1KOaD80IGo
Forest Population Ecology	https://drive.google.com/drive/folders/1HCJ-OHGsqgKJQCgyxTZYqU1KOaD80IGo
Community	https://drive.google.com/drive/folders/1HCJ-OHGsqgKJQCgyxTZYqU1KOaD80IGo

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