National Education Policy-2020

Common Minimum Syllabus for Uttarakhand State Universities and Colleges

PROPOSED SYLLABUS OF FORESTRY

Effective from the academic session 2025-26

of

Four Years Undergraduate Programme/ HonoursProgramme/Master's in Forestry

DEPARTMENT OF FORESTRY

0EXPERT COMMITTEE

S.N.	NAME	DESIGNATION	DEPARTMENT	AFFILIATION
1.	PROF. JEET RAM	PROFESSOR AND HEAD	FORESTRY	KUMAUNUNIVERSITY, NAINITAL
2.	PROF. A. K. YADAVA	PROFESSOR AND HEAD	FORESTRY	SOBAN SINGH JEENA UNIVERSITY, ALMORA
3.	DR. H.C. JOSHI	ASSOCIATE PROFESSOR	FORESTRY	UTTARAKHAND OPEN UNIVERSITY, HALDWANI

SYLLABUS PREPARATION COMMITTEE

S.N.	NAME	DESIGNATION	DEPARTMENT	AFFILIATION
1.	PROF. JEET RAM	PROFESSOR AND HEAD	FORESTRY	KUMAUN UNIVERSITY, NAINITAL
2.	PROF. A.K. YADAVA	PROFESSOR AND HEAD	FORESTRY	SOBAN SINGH JEENA UNIVERSITY, ALMORA
3.	PROF. L.S. LODHIYAL	PROFESSOR	FORESTRY	KUMAUN UNIVERSITY, NAINITAL
4.	PROF. ASHISH TEWARI	PROFESSOR	FORESTRY	KUMAUN UNIVERSITY, NAINITAL
5.	DR. NEETA ARYA	ASSISTANT PROFESSOR	FORESTRY	KUMAUN UNIVERSITY, NAINITAL

CONTENTS

List of Papers (DSC, GE, AEC, SEC, VAC) with Semester wise Titles for 'Forestry'					
Year	**Semester**	**Course**	**Paper Title**	**Theory/ Practical**	**Credits**
Undergraduate Certificate in Forestry					
FIRST YEAR	I	DSC	Introductory Forestry	Theory/Practical	3+1
		GE	Principles and Practices of Forestry	Theory/Practical	3+1
		AEC	Indian Language	Theory	2
		SEC	Nursery Technology (University Pool)	Theory	0+2
		VAC	Environmental Education	Theory	2
	II	DSC	Forest Ecology	Theory/Practical	3+1
		GE	Participatory Forest Management (University Pool)	Theory/Practical	3+1
		AEC	Indian Language	Theory	2
		SEC	Nursery Technology (University Pool)	Theory	0+2
		VAC	Environmental Education	Theory	2
Undergraduate Diploma in Forestry					
SECOND YEAR	III	DSC	Principles of Silviculture	Theory/Practical	3+1
		DSE/ GE	Forest Biodiversity and Conservation	Theory/Practical	3+1
		AEC	Indian Language	Theory	2
		SEC	Plantation Technology/IAPC (University Pool)	Theory	0+2
		VAC	Value addition to NTFP	Theory	2
	IV	DSC	Agroforestry	Theory/Practical	3+1
		DSE/ GE	Forest Protection	Theory/Practical	3+1
		AEC	Indian Language	Theory	2
		SEC	Plantation Technology/IAPC (University Pool)	Theory	0+2

		VAC	Value addition to NTFP'S	Theory	2
Bachelor of Forestry					
THIRD YEAR	V	DSC	Forest Mensuration	Theory/Practical	3+1
		DSE/GE	Watershed Management	Theory/Practical	3+1
		SEC	Propagation of Medicinal and Aromatic Plants/IAPC (University Pool)	Theory	0+2
	VI	DSC	Forest Management and Policies	Theory/Practical	3+1
		DSE/GE	Seed Science and Technology	Theory/Practical	3+1
		SEC	Propagation of Medicinal and Aromatic Plants/IAPC (University Pool)	Theory	0+2

Bachelor of Forestry with Honours					
FOURTH YEAR	VII	DSC	Advances in Forest Ecology	Theory/Practical	3+1
		DSE 1	Advances in Silviculture and Systems	Theory/Practical	3+1
		DSE 2	Remote Sensing and GIS	Theory/Practical	3+1
		DSE 3/	Forest Pathology	Theory/Practical	3+1
		GE 1	Environmental Audit and EIA	Theory/Practical	3+1
		GE 2	Forest Resource Assessment	Theory/Practical	3+1
		DISSERTATION	Dissertation on Major OR Dissertation on Minor or Academic Project/Entrepreneurship	Theory/Practical	4+2
	VIII	DSC	Forest Utilization	Theory/Practical	3+1
		DSE 1	Forest Entomology	Theory/Practical	3+1
		DSE 2	Advance Agroforestry	Theory/Practical	3+1
		DSE 3	Environmental Management	Theory/Practical	3+1
		GE1	Tree Physiology	Theory/Practical	3+1
		GE2	Dendrology	Theory/Practical	3+1
		DISSERTATION	Dissertation on Major OR Dissertation on Minor or AcademicProject/Entrepreneurship	Theory/Practical	4+2
Master's in Forestry					
FIFTH YEAR	IX	DSC	Forest Products and Industries	Theory/Practical	3+1
		DSE 1	Energy Plantation and Biofuels	Theory/Practical	3+1
		DSE 2	Natural Resources and Management	Theory/Practical	3+1
		DSE 3	Advances in Tree Seed Technology	Theory/Practical	3+1
		GE 1	World Forestry and Tribal development	Theory/Practical	3+1
		GE2	Analytical Technique	Theory/Practical	3+1
		DISSERTATION	Dissertation on Major OR	Theory/Practical	4+2

			Dissertation on Minor or Academic Project/Entrepreneurship		
	X	DSC	Forest Economics	Theory/Practical	3+1
		DSE 1	Research Methodology	Theory/Practical	3+1
		DSE 2	Biostatistics	Theory/Practical	3+1
		DSE 3	Forest Genetics and Tree Improvement	Theory/Practical	3+1
		GE1	Climate Change and Mitigation	Theory/Practical	3+1
		GE2	Fundamentals of Soil Science	Theory/Practical	3+1
		DISSERTATION	Dissertation on Major OR Dissertation on Minor or Academic Project/Entrepreneurship	Theory/Practical	4+2

ABILITY ENHANCEMENT COURSE (AEC) PREPARED FOR THE POOL OF COURSES

	Paper Title	Theory/Practical	Credits
Ability Enhancement Course (AEC)	Indian Language	Theory	2

VALUE ADDITION COURSE (VAC) PREPARED FOR THE POOL OF COURSES

	Paper Title	Theory/ Practical	Credits
Value Addition Course (VAC)	Environmental Education	Theory	2
Value Addition Course (VAC)	Non-Timber Forest Products	Theory	2

SKILL ENHANCEMENT COURSES (SEC) PREPARED FOR THE POOL OF COURSES

	Paper Title	Theory/ Practical	Credits
Skill Enhancement Courses (SEC)	Nursery Technology (University Pool)	Practical	0+2
Skill Enhancement Courses (SEC)/IAPC	Plantation Technology (University Pool)	Practical	0+2
Skill Enhancement Courses (SEC)/IAPC	Propagation of Medicinal and Aromatic Plants (University Pool)	Practical	0+2

Abbreviations-

DSC-Discipline Specific Course; DSE-Discipline Specific Electives;

GE-Generic Electives; AEC-Ability Enhancement Course; VAC-Value Addition Course

IAPC- Internship/Apprentice/Project/Community outreach

Programme Specific Outcomes (PSOs) (Undergraduate Programme) After this programme, the learners will be able to:	
PSO 1	It will impart basic knowledge and skills of forestry among the students.
PSO 2	It will inculcate forestry knowledge and practical skills among the students for diagnosis and analysis of existing problems in the fields of forestry and environment.
PSO 3	It will be helpful to produce trained forestry graduates to fill the requirements of different sectors, i.e., private, public, NGOs, and other organizations.
PSO 4	Assessment of various forestry problems and developing methods for their solutions.
PSO 5	Students will become forestry professionals and use their knowledge in research and technology.

Programme Specific Outcomes (PSOs)-MASTER'S IN FORESTRY After this programme, the learners will be able to:	
PSO 1	Students comprehend the numerous functions of forests, how to regenerate and conserve them, and how to prevent their destruction.
PSO 2	Students at an advanced level of knowledge in specific fields of forestry to continue graduate studies or meet professionals in various roles in the public and private sectors.

Semester-I
Undergraduate Certificate in Forestry

Skill Enhancement Course (SEC)-Nursery Technology

No. of Hours-45

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

CourseTitle	Credits	Credit distribution of the Course			Eligibility criteria	Pre-requisiteofthe course(if any)
		Lecture	Tutorial	Practical/Practice		
SEC: Nursery Technology	2	0	0	2	Passed Class XII	Nil

UNDERGRADUATE CERTIFICATE IN FORESTRY		
Programme: Undergraduate Certificate in Forestry	**Year: I**	**Semester: I** **Paper: DSC**
Subject: Forestry		
Course:SEC	**CourseTitle: Nursery Technology**	
Course Outcomes: The study will learn about the different techniques of nursery raising of different forest tree species and their management.		
Credits:2		**Discipline Specific Course**
Max. Marks: As Per Univ. rules		**Min. Passing Marks: As per Univ. rules**

Unit	Topic	No. of Hours
Unit I	Introduction and Types of nursery, Nursery planning and design, layout of nursery, Soil preparation, preparation of seed bed, size of seed bed. Pits digging of planting Seed sowing: methods of sowing, time of sowing. Growing media. Seed and vegetative propagation, Water and irrigation system. Identification of important useful tree species. Seed collection and germination, plus and elite trees, seedling development.	**15**
Unit II	Nursery cultural practices: Weeding, hoeing, irrigation, fertilization etc. and controlled measures, seedlinggradiness and hardening and transplanting; Nursery and tools, Plant containers; Potting media.	**15**

Suggested Reading:

1. Nursery and Plantation Practices by V. Kumar
2. Principles and Practices of Silviculture by L. S. Khanna
3. Plantation Forestry in India by R. K. Luna
4. Plant Nursery Management by P. K. Ray

Semester-II

Undergraduate Certificate in Forestry

Skill Enhancement Course (SEC)- Nursery Technology

No. of Hours-45

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

CourseTitle	Credits	Credit distribution of the Course			Eligibility criteria	Pre-requisiteo fthe course(if any)
		Lecture	Tutorial	Practical/Practice		
SEC: Nursery Technology	2	0	0	2	Passed Class Ist semester	Nil

UNDERGRADUATE CERTIFICATE IN FORESTRY		
Programme:Undergraduate Certificate in Forestry	**Year: I**	**Semester: I** **Paper: DSC**
Subject: Forestry		
Course:SEC	**CourseTitle: Nursery Technology**	
Course Outcomes: The study will learn about the different techniques of nursery raising of different forest tree species and their management.		
Credits:2		**Discipline Specific Course**
Max. Marks: As Per Univ. rules		**Min. Passing Marks: As per Univ. rules**

Unit	Topic	No. of Hours
Unit I	Manuring (Organic compost/manure), Farm Yard Manure (FYM); Bio-fertilizers; Mycorrhiza and fertilizer application methods.	**15**
Unit II	Nursery visits, report preparation, preservation and viva-voce.	**15**

Suggested Reading:

5. Nursery and Plantation Practices by V. Kumar
6. Principles and Practices of Silviculture by L. S. Khanna
7. Plantation Forestry in India by R. K. Luna
8. Plant Nursery Management by P. K. Ray

Semester-III

Undergraduate Diploma in Forestry

Skill Enhancement Course (SEC)-Plantation Technology/ IAPC

No. of Hours-60

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

CourseTitle	Credits	Credit distribution of the Course			Eligibility criteria	Pre-requisite of the Course (if any)
		Lecture	Tutorial	Practical/Practice		
SEC: Plantation Technology/ IAPC	2	0	0	2	Passed Class Ist year	Nil

UNDERGRADUATE DIPLOMA IN FORESTRY		
Programme: Undergraduate Certificate in Forestry	**Year: I**	**Semester: I** **Paper: DSC**
Subject: Forestry		
Course: SEC	**CourseTitle: Plantation Technology**	
Course Outcomes: Students will learn the practical aspects and knowledge about raising, care, development and use of tree species in a specific site and specific objectives.		
Credits:2		**Discipline Specific Course**
Max. Marks: As Per Univ. rules		**Min. Passing Marks: As per Univ. rules**

Unit	Topic	No. of Hours
Unit I	Introduction of plantation, types of plantation, identification and selection of plantation sites, site preparation, and tree plantation techniques. Assessment of the quantity of raising the plantation. Assessment of planting material required under different planting material (seed/seedling/ETPs), planting patterns, and assessment of spacing under different planting patterns	**15**
Unit II	Plantation activities, fertilizer and soil management, weed, pest, and disease control: weed management, Integrated Pest and Disease Management.Value of plantation: ecological, social, and economic.	**15**

Suggested Readings:

1. Plantation Forestry in India by R. K. Luna
2. Nursery and Plantation Practices by V. Kumar
3. Alternative Energy Development and Management by S. A. Abbasi

Semester-IV

Undergraduate Diploma in Forestry

Skill Enhancement Course (SEC)-Plantation Technology/ IAPC

No.of Hours-60

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

CourseTitle	Credits	Credit distribution of the Course			Eligibility criteria	Pre-requisite of the Course (if any)
		Lecture	Tutorial	Practical/Practice		
SEC: Plantation Technology/ IAPC	2	0	0	2	Passed Class III semester	Nil

UNDERGRADUATE DIPLOMA IN FORESTRY		
Programme: Undergraduate Certificate in Forestry	**Year: II**	**Semester: IV** **Paper: SEC**
Subject: Forestry		
Course: SEC	**CourseTitle: Plantation Technology**	
Course Outcomes: Students will learn the practical aspects and knowledge about raising, care, development and use of tree species in a specific site and specific objectives.		
Credits:2		**Discipline Specific Course**
Max. Marks: As Per Univ. rules		**Min. Passing Marks: As per Univ. rules**

Unit	Topic	No. of Hours
Unit I	Afforestation of problematic sites- drought prone, arid, marshy, saline land, sandy soil and suitable species for plantation of these sites. Failures of plantations- reason for failure and remedial techniques. Seed stands, seed collection, storage and supply of seeds.	**15**
Unit II	Important tree species of plantation i.e. native and exotic, broad leaves: Oak, Sal, Shisham, Acacia, Eucalyptus, Popular and Bamboo. Conifers: Chir-pine, Deodra, Surai.	**15**

Suggested Readings:

4. Plantation Forestry in India by R. K. Luna
5. Nursery and Plantation Practices by V. Kumar
6. Alternative Energy Development and Management by S. A. Abbasi

Semester-V

BACHELOR OF FORESTRY

SKILL ENHANCEMENT COURSE (SEC)-Propagation of Medicinal and Aromatic Plants/ IAPC

No. of Hours-60 CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

CourseTitle	Credits	Credit distribution of the Course			Eligibility criteria	Pre-requisite of the Course (if any)
		Lecture	Tutorial	Practical/Practice		
SEC: Propagation of Medicinal and Aromatic Plants/ IAPC	**2**	**0**	**0**	**2**	**Passed Class II Year (IV semester)**	**Nil**

BACHELOR OF FORESTRY		
Programme: Undergraduate Diploma in Forestry	**Year: III**	**Semester:V Paper: SEC**
Subject: Forestry		
Course: SEC	**Course Title: Propogation of Medicinal and Aromatic Plants**	
Course Outcomes: Students will learn the practical aspects and knowledge about different medicinal and aromatic plants, their distribution, habitat, importance, and use,especially those growing in the Himalayan region.		
Credits: 4		**Generic Elective**

Max. Marks: As per Univ. rules		**Min. Passing Marks: As per Univ. rules**
Unit	**Topic**	**No. of Hours**
Unit I	Identification of medicinal and aromatic plants.Ecology and biology, propagation techniques of medicinal and aromatic plants (seed and vegetative	15

	parts), germinationcharacteristics, viability and plant percent, survival rate of selected medicinal and aromatic plants.	
Unit II	Effect of growing media. Drug descriptors for medicinal and aromatic plants, Production, storage and marketing of medicinal and aromatic plants.Important constituents of medicinal and aromatic plants, different uses and benefits of medicinal and aromatic plants	15

Suggested Readings:

1. Medicinal and Aromatic Plants by Malhotra Publ. House
2. Reviews on Indian Medicinal Plants by A. K. Gupta & M. Sharma
3. Quality Standards of Indian Medicinal Plants by A. K. Gupta, N. Tandon& M. Sharma
4. Breeding research on aromatic and medicinal plants by C. B. Johnson & C. Franz
5. Agrotechniques of Medicinal Plants by R. Sharma
6. Role of Biotechnology in Medicinal and Aromatic Plants by I. Alikhan& A. Khanum

Semester-VI

BACHELOR OF FORESTRY

SKILL ENHANCEMENT COURSE (SEC)-Propagation of Medicinal and Aromatic Plants/IAPC

No. of Hours-60

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title	Credits	Credit distribution of the Course			Eligibility criteria	Pre-requisite of the Course (if any)
		Lecture	Tutorial	Practical/Practice		
SEC: Propagation of Medicinal and Aromatic Plants/IAPC	2	0	0	2	Passed Class II Year (V semester)	Nil

BACHELOR OF FORESTRY		
Programme: Undergraduate Diploma in Forestry	**Year: III**	**Semester:VI Paper: SEC**
Subject: Forestry		
Course: SEC	**Course Title: Propogation of Medicinal and Aromatic Plants**	
Course Outcomes: Students will learn the practical aspects and knowledge about different medicinal and aromatic plants, their distribution, habitat, importance, and use, especially those growing in the Himalayan region.		
Credits: 4		**Generic Elective**

Max. Marks: As per Univ. rules		**Min. Passing Marks: As per Univ. rules**
Unit	**Topic**	**No. of Hours**
Unit I	Assessment of population in natural habitat in major medicinal and aromatic plants. Calculation of species richness of diversity of medicinal plants in different forest types. Conservation of medicinal plants and its techniques: In situ, ex- situ and biotechnological.	15

Unit II	Cultivation and propagation of medicinal and aromatic plants: *Valerianajatamasi, Viola species, Rauvolfiaserpentina, Ocimum sanctum, Phyllanthusemblica,* Terminalia bellirica, Terminalia arjuna, Terminalia chebula, *Centellaasiatica, Berberis species, Asparagus officinalis, Tinosporacordifolia,Taxusbaccata, Vincarosa, Cymbopogon spp. Cedrusdeodara, Prunusarmenica*	15

Suggested Readings:

1. Medicinal and Aromatic Plants by Malhotra Publ. House
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6. Role of Biotechnology in Medicinal and Aromatic Plants by I. Alikhan& A. Khanum