CURRICULUM OF
MASTERS' ACADEMIC PROGRAMMES

M.Sc. Environmental Science (Natural Resource Management)

Academic Session-2025 Onwards

School of Environment & Natural Resources

DOON UNIVERSITY

Dehradun-248001, Uttarakhand, India

M. Sc. Environmental Science (Natural Resource Management)

As per NEP 2020

(w.e.f. Academic Session 2010)

Updated on: April 2025)

School of Environment & Natural Resources

DOON UNIVERSITY

Dehradun-248001, Uttarakhand (INDIA)

M. Sc. Environmental Science (Natural Resource Management)

Course duration: 4 semesters

About the Programme

The Master's in Environmental Science with a specialisation in Natural Resource Management aims to provide awareness of natural resources, their mapping, management, and sustainable development, as well as a basic understanding of the significant processes of environmental change. It is designed to understand the connections and ability to communicate between disciplines.

PROGRAMME OUTCOMES (POs)

PO1. Offering a comprehensive understanding of processes and mechanisms related to conflicting interests over the use of natural resources, the program will provide valuable insights.

PO2. To foster advanced knowledge, students will delve deeply into a relevant topic within the field of natural resource management in their master's thesis.

PO3. To promote contributions to the management and sustainable use of natural resources and encourage students to work in a multidisciplinary team.

PO4. Addressing ethical dilemmas related to perceived justice in resource allocation conflicts is a key aspect of thisprogram.

PO5. To engage with various sectors, including organizations, education, and industry, the interdisciplinary master's program in Natural Resources provides a broad perspective.

Programme Specific Outcome (PSOC)

Upon completion of this programme, the student will be able to:

Academic competence: (i) Understand fundamental concepts, principles and processes underlying the field of Environmental Science, its interdisciplinary nature (ii) Demonstrate an understanding of a wide range of Environmental techniques (e.g. basic water and soil analysis, microbiological methods, spectrophotometry, GIS based analysis, Ecological data analysis, Bio- assays)

Personal and Professional Competence: (i) Carry out laboratory-oriented numerical calculations and be capable of data visualization and interpretation. related to Environmental Science (ii) Analyse environmental data (e.g. in Natural resource Management, Habitat analysis and biological databases). (iii) Formulate ideas, write scientific reports, and demonstrate effective presentation and communication skills.

Research Competence: (i) Apply environmental data analysis methodology to conduct research and demonstrate appropriate skill to seek innovative solutions to problems that emerge in various fields of Ecology and Environmental Science and interdisciplinary fields (ii) Integrate informatics and statistical skills to explore and authenticate biological data for experimental and research purposes.

Entrepreneurial and Social competence: (i) Employ skills in specific areas related to Environmental Science, such as industrial pollution, Green technology development, Ecological health, agriculture, and ensure multilevel commitment to the health and well-being of society at large. (ii) Exhibit awareness of environmental and ethical issues: emphasising academic and research ethics, scientific misconduct, intellectual property rights and issues of plagiarism

Course definitions

a) **Discipline Specific Core (DSC)**: A Discipline Specific Core course is a mandatory requirement for students within their program of study. These core credit courses are specific to a particular discipline and are graded and scheduled across the semesters with multiple exit options by NEP 2020. The relevant department will identify the DSCs outlined in the framework as essential courses for the program. For instance, to earn a single discipline-specific honours degree, such as a B.A. (Honours) in Economics, B. Com (Honours), or B.Sc. (Honours) in Physics, the core courses will be those in Economics, Commerce, and Physics, respectively.

b) **Discipline Specific Elective (DSE)**: Discipline Specific Electives (DSEs) are a collection of credit courses related to a specific discipline (for single-discipline programs) or multiple disciplines (for multidisciplinary programs), from which students select according to their field of study. There will be a range of DSEs available for students to choose from. The DSEs listed in the framework will be designated by the [2] relevant department as elective courses to be offered in a program. For example, for a B.Sc. (Honours) in Physics, the DSEs selection should be drawn from the available Physics DSEs.

c) **Generic Elective (GE)**: Generic Electives (GE) are a set of courses intended to offer students a multidisciplinary or interdisciplinary education. These electives include courses from various disciplines, excluding those from the student's primary discipline, and are available during both odd and even semesters. Students can choose from this range of courses. The GEs outlined in the framework will be designated by the relevant department as electives for the program. If a student selects DSEs outside their specific discipline, those DSEs will be considered as GEs for that student.

d) **Ability Enhancement course (AEC), Skill Enhancement Course (SEC)** and **Value Addition Course (VAC)**: These three courses will be available from a range of offerings provided by all departments in both odd and even semesters, allowing students to choose according to their interests. To pursue an Academic Project or Entrepreneurship as a Minor, a student must select a suitable combination of GE, SEC, VAC, and

Internship/Apprenticeship/Project/Community (IAPC) courses. These options will be presented in different modules as outlined in the study scheme.

(i) **AEC courses** are intended to broaden knowledge through different fields of study. These courses, which include Language and Literature, are required for all the disciplines.

(ii) **SEC courses** focus on skill development across various disciplines and aim to provide practical training to enhance students' competencies and abilities. Students can choose from a range of skill-based courses specifically designed for this purpose. Each discipline may offer its skill-based course(s), some of which are reserved for its students, while others are available to students from different disciplines.

(iii) **VAC courses** are a set of offerings from different disciplines designed to foster personality development. These courses emphasize the incorporation of ethical, cultural, and constitutional values, as well as the promotion of critical thinking, Indian knowledge systems, scientific mindset, communication skills, creative writing, presentation abilities, physical education, and teamwork in sports, etc. contributing towards the comprehensive development of students.

Academic Framework for 2-Year (4 Semesters) **M. Sc. Environmental Science (Natural Resource Management)** Programme

Table 11: Semester-wise distribution of credits.

Semester	**Minimum Credit Requirement**				**Total Credits**
	DSC	**GE/DSE**	**SEC/Project/ Dissertation**	**AEC/ VAC**	
Semester-1st	(DSC) 3x4=12	(DSE) 2x4=8	(SEC) 1x2=2	-	22
Semester-2nd	(DSC) 3x4=12	(DSE) 2x4=8	(SEC) 1x2=2	-	22
Exit option after one year with 44 credits with a PG Diploma in Environmental Science					
Semester-3rd	(DSC) 2x4=8	(DSE) 3x4=12	Internship/project (1x2=2)	0	22
Semester-4th			Dissertation (1x20=20)	(VAC) 1x2=2	22
Total	32	28	26	2	88
After two years with 88 credits, the student will be awarded the Degree of M.Sc. in Environmental Science					

Course Structure

Table 12: Semester-wise Course Framework

S. No.	**Course Code**	**Course Type**	**Name of the Course**	**L**	**T**	**P**	**Total Credits**
Semester I							

1	DSC1	EES-511	Fundamentals of Ecology and Environment	3	0	1	4
2	DSC2	EES - 517	Environmental Chemistry	3	0	1	4
3	DSC3	EES-516	Environmental Impact Assessment and Management	3	1	0	4
4	DSE	DSE1	Choose from the pool of courses – I	3	1	0	4
5	DSE	DSE2	Choose from the pool of courses – I	3	1	0	4
6	SEC	EES- 561	Statistical Applications and Modelling in Environmental Science	2	0	2	2
Total Credits 22							
Semester II							
1	DSC1	ENR- 558	Wildlife Management and Ecotourism	3	0	1	4
2	DSC2	EES - 514	Geomatics	3	0	1	4
3	DSC3	ENR - 512	Energy Resources and Their Management	3	0	1	4
4	DSE	DSE1	Choose from the pool of courses – II	3	1	0	4
5	DSE	DSE2	Choose from the pool of courses – II	3	1	0	4
6	SEC	EES- 618	Analytical Techniques and Instrumentation	2	0	2	2
Total Credits 22							
Exit option after one year with 44 credits with a PG Diploma in Environmental Science							
Semester III							
1	DSC1	EGC-566	Environmental Economics	3	0	1	4
2	DSC2	ENR- 516	Biodiversity Assessment and Conservation	3	1	0	4
3	DSE	DSE1	Choose from the pool of courses – III	3	0	1	4
4	DSE	DSE2	Choose from the pool of courses – III	3	1	0	4
5	DSE	DSE3	Choose from the pool of courses – III	3	1	0	4
6	AEC	EES -635	Internship (6 – 8 Weeks)	0	0	2	2
Total Credits 22							
Semester IV							
1	VAC	VAC	Choose from the courses offered by other/MOOC	2	0	0	2
2	SEC	EES-690	Dissertation	0	0	20	20
Total Credits 22							
After two years with 88 credits, the student will be awarded the Degree of M.Sc. in Environmental Science							

L-Lecture, T-Tutorial, P-Practical

List of Discipline-Specific Elective Papers: (4 credits each)

The Discipline Specific Electives (DSEs) are a pool of credit courses offered by the School of Environment & Natural Resources from which a student will choose to study based on his/ her interest. A student of M. Sc. in Environmental Science gets an option of choosing DSE in I, II and III semesters.

Table 13: Pool of Discipline-Specific Elective Courses (DSE-I)

S. No.	Course Code	Name of the Course
1	EES-575	Environmental Geoscience
2	EES - 518	Environmental Toxicology
3	EES - 627	Environmental Microbiology & Biotechnology
4	EGC-571	Environmental Issues, Laws, and Policies
5	ETC-530	Solid & Hazardous Waste Management

Table 14: Pool of Discipline-Specific Elective Courses (DSE-II)

S. No.	Course Code	Name of the Course
1	EES-513	Aquatic Environment
2	EES - 515	Environmental Pollution and Control
3	EGC-596	Computational Methods in Environmental Science
4	ENR-559	Disaster Management
5	ETC-530	Solid & Hazardous Waste Management

Table 15: Pool of Discipline-Specific Elective Courses (DSE-III)

S. No.	Course Code	Name of the Course
1	EGC- 576	Environmental Sociology/Environmental Sustainability
2	EES - 619	Green Technology
3	EES - 520	Atmosphere, Weather and Climate
4	EES-590	Atmospheric Modelling
5	ENR-553	Restoration Ecology
6	EES-570	Global Climate Change and Its Impacts
7	ENR-557	Himalayan Ecosystem and People
8	EES-515	Hazards, Risks Analysis and Management
9	ETC-540	Air Pollution
10	EGC-556	IPR Traditional Knowledge

In addition to the above proposed courses, students may select courses from Swayam.org as MOOCs courses up to the permissible limit.

Academic Framework for 1-Year* (2 Semesters) **M. Sc. Environmental Science (Natural Resource Management)** Programme

*[For those who have completed a 4-Year UG Programme as per UGC norms (without any back paper)]

Table 16: Semester-wise distribution of credits.

Semester	Minimum Credit Requirement				Total Credits
	DSC	GE/DSE	SEC/Project/ Dissertation	AEC/ VAC	
Semester-1st	(DSC) 2x4=8	(DSE) 3x4=12	Seminar (1x2=2)	0	22
Semester-2nd			Dissertation/Academic Project/Entrepreneurship (1x20=20)	(VAC) 1x2=2	22
Total	8	12	22	2	44
After completing the 1-Year with 44 credits, the student will be awarded the Degree of M.Sc. in Environmental Science					

Course Structure

Table 17: Semester-wise Course Framework

S. No.	Course Code	Course Type	Name of the Course	L	T	P	Total Credits
Semester I							
1	DSC1	EES-580	Fundamentals of Environmental Science	3	0	1	4
2	DSC2	EES- 618	Analytical Techniques and Instrumentation	2		2	4
3	DSE	DSE1	Choose from the pool of courses – I	3	0	1	4
4	DSE	DSE2	Choose from the pool of courses – II	3	1	0	4
5	DSE	DSE3	Choose from the pool of courses – III	3	1	0	4
6	SEC	EES -635	Internship (6 – 8 Weeks)	0	0	2	2
Total Credits 22							
Semester II							
1	VAC	VAC	Choose from the courses offered by other/MOOC	2	0	0	2
2	SEC	EES-690	Dissertation	0	0	20	20
Total Credits 22							
After one year with 44 credits, the student will be awarded the Degree of M.Sc. in Environmental Science							

L-Lecture, T-Tutorial, P-Practical

List of Discipline-Specific Elective Papers: (4 credits each) – One-year M. Sc. Environmental Science

The Discipline Specific Electives (DSEs) are a pool of credit courses offered by the School of Environment & Natural Resources from which a student will choose to study based on his/ her interest. A student of M. Sc. in Environmental Science gets an option

of choosing DSE in I semester.

Table 18: Pool of Discipline-Specific Elective Courses (DSE-I)

S. No.	Course Code	Name of the Course
1	EES-575	Environmental Geoscience
2	EES - 518	Environmental Toxicology
3	EES - 627	Environmental Microbiology & Biotechnology
4	EGC-566	Environmental Economics
5	ENR - 512	Energy Resources and Their Management
6.	EES-516	Environmental Impact Assessment and Legal Framework
7	EES - 515	Environmental Pollution and Control
8	EES - 514	Geomatics

Table 19: Pool of Discipline-Specific Elective Courses (DSE-II)

S. No.	Course Code	Name of the Course
1	EES-513	Aquatic Environment
2	EES-590	Atmospheric Modelling
3	ENR- 516	Biodiversity Assessment and Conservation
4	EES-515	Hazards, Risks Analysis and Management
5	ETC-540	Air Pollution
6	ETC-530	Solid & Hazardous Waste Management
7	ENR- 558	Wildlife Management and Ecotourism
8	EES - 520	Atmosphere, Weather and Climate

Table 20: Pool of Discipline-Specific Elective Courses (DSE-III)

S. No.	Course Code	Name of the Course
1	ENR-559	Disaster Management
2	EGC- 576	Environmental Sociology/Environmental Sustainability
3	EES - 619	Green Technology
4	EES-555	Hazards, Risk Analysis and Management
5	ENR- 558	Wildlife Management and Ecotourism
6	ETC-510	Water and Wastewater Engineering
7	EGC-556	IPR Traditional Knowledge
8	EES-625	Microbial Ecology
9	EES-570	Global climate change and its impacts
10	ETE-553	Resource recovery from waste material
11	ENR-514	Forest Ecosystem and Management
12	ENR-557	Himalayan Ecosystem and People

In addition to the above proposed courses, students may select courses from

Swayam.org as MOOCs courses up to the permissible limit.

Examination and Evaluation System

Core, General, discipline electives and skill-based courses			**Internships and dissertation**	
	Marks	**Evaluation**	**Marks**	**Evaluation**
Mid-semester exam	30	Descriptive exam**	100	Report (80%) Presentation and viva voce (20%)
End-semester exam	30/50*	Descriptive exam		
Practical	20	Performance and Evaluation		
Assignments	20	Evaluation of assignments, presentations, class attendance, quizzes, etc.		

* Course without practical hours

**** Descriptive exam question paper pattern:**

Sections	Description	Weightage
Section-A	Objective or short answer questions (word limits <50 - 100) Question standard: Easy to moderate	30%
Section-B	Medium answer questions (word limits up to 300) Question standard: Easy (20%); moderate (40%); difficult (40%)	50%
Section-C	Large answer questions (word limits up to 700) Question standard: moderate (60%); difficult (40%)	20%

Maximum period for completing an academic programme:

1-Year PG programme — Up to a maximum of 03 years

2-Year PG programme — Up to a maximum of 04 years