



M.Sc. Environmental Studies (Conservation Practice) - Coursework

The M.Sc. in Conservation Practice course comprises 80 credits in total, of which 25 are from the project semester and the remaining are from practice-oriented immersive and experiential classroom semesters. The first semester comprises interdisciplinary foundation courses, including ecology, sociology for conservation and sustainability, environmental science, environmental economics and scientific communication. The second semester comprises domain knowledge courses on biodiversity, food systems and ecosystem services and a perspective course on interdisciplinary practice. The third and final semester includes practice-oriented domain skills courses on landscape restoration, conservation technologies, decision science, approaches to conservation, climate change and conservation psychology. In addition, during the third semester, students can take a range of electives on project cycle management, adaptive learning, effective advocacy, ethnobotany, transdisciplinarity, environmental humanities and medicinal plants, based on their interests.

Semester – 1

Course: Natural History and Basic Ecology

Credit: 3

Objectives: This course is primarily designed for Master's students with no prior natural history and ecology training. This introductory full-semester core course will introduce students to basic natural history and ecological principles, emphasizing their application. While modern ecology has seen significant advancements in experimental and theoretical approaches, natural history remains an essential foundation for ecological research. It helps ecologists develop hypotheses and design experiments that are relevant to the natural world. Furthermore, many ecological questions and patterns can only be fully understood and appreciated through



detailed natural history observations. This 3-credit course deals with studies related to observation, documentation, and study of organisms and their interactions with their environment in their natural settings. Students will also learn basic ecological concepts at levels of the population, community and ecosystem: the relationship between organisms and their environment, interactions amongst organisms; patterns in the distribution of species and communities; and processes that underlie the functioning of ecosystems. The course will also draw upon case studies to illustrate the application of ecological concepts to conservation practice and sustainable use of bioresources. The course will present different perspectives and debates around topical issues such as fire management, human-wildlife conflicts, invasive species management, conservation models, etc. Policy and conservation challenges around these topical issues would also be discussed.

Course: Sociology for Conservation and Sustainability

Credits: 2

Objectives: This course trains students to use the sociological perspectives to not only locate their conservation and development thoughts and actions in wider political, economic, and cultural structures, but also those of conservation and sustainability stakeholders in general. Students get to discuss the stratified nature of traditional Indian society and its encounter with modernity.

The course imparts foundational and critical knowledge in classical and contemporary sociology. Students will be introduced to contemporary, postmodern, post-structural sociology, its power and gender engagements, including Indian sociologies of gender. Subsequently, they will be exposed to Indian sociological work on caste, class and their interfaces. Across all the modules, theorizing on conservation and environmentalism appears in relational or linked ways. The course seeks to inoculate the conservation or sustainability academic or practitioner with sociological sensibilities and sensitivities. These will also make themselves felt in the final assignment that students will undertake. The assignment fulfills the performative aspect of this course.



Course: Conservation Issues and Concerns

Credits: 2

Objectives: Conservation is an important part of the environmental debate today. It is also the prime focus of this Masters programme. This course investigates the history, definition, scope, values and ethics underpinning that term, explores its relationship with other environmental concerns, the relationship of environmentalism with other societal goals, and the challenges of effective environmental conservation in democratic societies. At the end of the course, students should be able to describe the different cultural conceptions of what is to be conserved and why, and coherently articulate the challenges to effective and ethical conservation in a democracy.

Course: Basic Maths

Credits: 1

Objectives: The goal of this course is to provide an overview of the fundamentals of mathematics needed to understand quantitative methods used in environmental, social and ecological sciences. Classes will combine lectures on mathematical concepts and practice sessions.

Course: Basic English

Credits: 1

Objectives: The course will provide the students with a holistic understanding of the English language. It aims to improve the students' speaking, reading, and writing abilities in the English language. Students will increase their awareness of the correct usage of English grammar in writing and speaking.

Course: Environmental Economics

Credits: 2

Objectives: The contemporary world is facing challenges of overexploitation and degradation of resources and the environment which is often linked to economic growth. Environmental economics helps countries and states to develop environmental policies which can help in achieving sustainable development. Through this course, students will gain a foundational understanding of environmental economics, and its real-life use and applications.



Course: Environmental Science

Credits: 2

Objectives: This course will introduce the fundamentals of environmental processes at global, regional and local scales using a biogeochemical framework. Apart from lectures on theory, the course will help students apply the concepts learned to real-world environmental problems. Students will learn by doing field, laboratory and computer exercises in environmental sciences. The theory portion of the course will focus on carbon, nitrogen and water and cycles. Concepts of stocks, fluxes, and positive and negative feed-back mechanisms will be discussed for each biogeochemical cycle at various spatial scales. These concepts will be presented in the context of major environmental challenges facing us including water resources, agriculture, pollution, soil degradation, and climate change.

The course will explore topics in sustainability science in relation to the anthropogenic transformation of environmental processes using a variety of thematic lenses: resources (water), production sectors (agricultural systems), and environmental problems (climate change and water pollution).

Course: Phil. of Science & Practice, Theory of Change

Credits: 1

Objectives: This course has been structured to allow students to appreciate the differences in cultural foundations, logic, and world views of knowledge systems that seek to understand nature, to appreciate the epistemology, and ontology of Indian knowledge systems, and to critically review the basis of theory construction employed across knowledge systems.



Semester: 2

Course: RS & GIS

Credit: 2

Objectives: This course will provide a basic introduction to concepts of landscape ecology and practical applications of Geographical Information Systems (GIS) and satellite remote sensing (RS) for environmental applications, with a special focus on the remote sensing of vegetation and land cover. The course is intended to provide students with the background information and hands-on skills necessary to successfully link remotely sensed imagery and GIS and RS applications with administrative, ecological and environmental datasets to answer research and applied questions related to ecology, conservation and sustainable development. The course will aim to provide a basic understanding of the theoretical basis for landscape processes, issues of temporal and spatial scale, data collection and analysis, as well as a broad overview of various approaches that enable interpretation of these data for understanding the drivers, processes and outcomes of ecological and environmental change in different contexts. It will equip students with basic skills in applying GIS and RS using QGIS.

Course: Introduction to Climate Change

Credit: 2

Objectives: The course provides a basic understanding of weather and climate, global and regional atmosphere-ocean phenomena such as ENSO and IOD and their impact on the Indian Monsoon, basic physics of global warming and its change due to anthropogenic activities, the impact of warming and enhanced CO₂ on land, water, vegetation, and ocean, implications of climate change on ecosystem services and biodiversity, and fundamentals of climate change adaptation and mitigation.



Course: Food Systems

Credit: 2

Objectives: The course will allow students to have understanding of the evolution of agriculture and food systems, while understanding the ecological context of agriculture, food production and its merits and demerits. They will also understand the linkages between food, water, livelihood, sustainability, industrialization and the ecological and economic footprints therefrom.

Students will develop approaches to modify current agricultural and food production practices to conserve, protect, and enhance natural resources, and also find new strategies to protect and improve rural livelihoods, equity, and social well-being.

The course will teach methodologies to improve efficiency in the use of resources crucial to sustainable agriculture, understand the market dynamics throughout the food supply chain; and learn to leverage urban environments to produce and distribute locally sourced food. Finally, it will show how to evaluate governance mechanisms to responsibly and effectively transition to sustainable food production through private and public sector initiatives and approach food systems from the perspective of UN-SDG attainment and improving human habitats while improving livelihood options and incomes.

Course: Biodiversity and Ecosystem Services + Advanced Ecology

Credit: 2

Objectives: This course will introduce students to natural history, methods to observe and record nature, various forms of biodiversity, and the processes that leads to an abundance of biodiversity. It will demonstrate how biodiversity is itself a building block for life on this planet and therefore loss and degradation of it have consequences on human well-being. The students will understand the importance of scale and how landscapes and history shape biodiversity. The course will essentially be field-based, one that would help students understand not only ways to observe nature, and measure and quantify biodiversity but also how to use collected data and information in conservation planning.



Course: Qualitative and Quantitative Research Methods

Credit: 3

Objectives: The course will introduce and provide hands on training of the essential qualitative, quantitative and participatory methods used in social sciences for applied conservation, environment and development research. Emphasis will be placed on organizing and executing research projects and combining methods in field settings.

At the end of the course, the students should be able to independently develop appropriate methodological protocols to answer questions in applied research on conservation, environment and development. They will be able to design, organize and execute field oriented academic research projects requiring a mix of disciplinary approaches and methods. And critically assess social research methods and tools used in research projects and studies. This course will consider and present statistics as an integral part of the scientific process rather than as an afterthought. It will use R statistical software for conducting statistical analyses and generating coherent outputs. Examples and applications will be drawn from both social and natural sciences.

Course: Communicating Science

Credit: 2

Objectives: This course will provide students with various tools for effective scientific communication and the process used in developing a communication plan.

Course: Research Publication and Ethics

Credit: 1

Objectives: This course is divided into two parts, the first provides students with an introduction to the philosophy of science, and the second elucidates the ethics of conducting and publishing scientific research. Beginning at an introduction to the philosophy of science, students will be introduced to the background, ethics, debates and pitfalls of publishing science. Students will also be taught a number of soft skills including learning authorship protocols, conducting and responding to peer review and developing data archival strategies. Through a series of hands-on sessions students will also learn to find appropriate journals for publishing their work, develop and maintain bibliographies, obtain research ethics clearance and conduct a plagiarism check.



Course: Interdisciplinary Perspectives and Case Studies (C3)

Credits: 2

Objectives: This core course is meant to help students understand how to carry out interdisciplinary research on the environment. It will build on the disciplinary knowledge to which students were exposed in semester 1 and focuses on the challenge of linking and integrating this knowledge to study society-environment interactions holistically.

The first part of the course will be common to PhD and Masters students: It will begin by exploring the nature of environmental problems as a special class of social problems, of the inherently value-laden nature of such problems, and the need for and challenge of doing rigorous interdisciplinary but rigorous research in this context. It then will explore the specific normative ideas that are central to the environment-development debate. Finally, it will take students through different (often competing) perspectives on the society-environment relationship.

In the second part of the course, different tracks for the PhD and the Masters students will be followed:

The MSc students will focus on understanding how interdisciplinary 'solutions' are crafted, whether for policy or for practice, focusing on what normative concerns and merging multiple causal perspectives and solution styles in what way. This they will do by choosing a particular real-world issue where some 'solution' initiative is under way (at the policy, programme or individual site level), and studying available secondary material, interviewing the proponents, talking to other stakeholders, etc. and submitting a study report at the end of the semester.



Semester - 3

Course: Impact Assessment

Credit: 2

Objectives: Understanding the tensions between environmental protection and economic development and the role of impact assessments in clarifying these, understanding the principles, processes, and participants involved in environmental impact assessment (EIA), examining these through the lens of laws, economics, and justice, analyzing and critiquing EIA reports, and contributing to designing EIA.

Course: Project Cycle Management

Credit: 1

Objectives: This course is designed to introduce students to tools and methods that will equip them with skills to write well designed project proposals required for their post-university years. It will upgrade the technical and managerial competencies required for project identification, stakeholder management, project design and the development of monitoring and evaluation systems.

Further, it will help develop skills that will provide students with wider opportunities in their careers in case they opt for non-research pathways, as well as inculcate a learning style that includes reflection, analysis, working in a team with diverse people/cultures and learning styles.

Course: Conservation Psychology

Credit: 2

Objectives: This course will introduce the psychological underpinning of the 'reciprocal relationship between humans and the rest of nature'. Exploring the possibilities of utilising the principles of psychology for promoting behaviours that help to ensure sustainability and reduce harm to the environment also comes under the scope of this course.

It will also structure the learning and doing objectives as a way of gaining familiarity with the theories and methodologies of conservation psychology, understanding the psychological dimension of the human's care for nature, and exploring the psychology-based strategies for promoting environmental pro behaviours, coexistence and conservation.



Course: Cultural Diversity and Traditional Ecological Knowledge

Credit: 2

Objectives: This course will introduce students to various perspectives, practices, policies and their relevance in development related to traditional knowledge, culture and intangible heritage with the objectives of learning about national responses to such in process, cultural and intangible heritage contributing to grass-root level conservation action and legal and policy issues related to culture and traditional knowledge.

Course: Design Thinking

Credit: 1

Objectives: An approach to learning, collaboration, and problem solving and a structured approach to identifying opportunities, gathering information, creating innovative solutions, communicating ideas, improvising concepts based on feedback, validating solutions, and implementation

Course: Field and Project Immersion

Credit: 2

List of Electives:

Sl.No	Courses	Credit
1	Water Resources (Domain Knowledge)	2
2	Approaches to Conservation (Electives)	2
3	Ecosystem Restoration (Electives)	2
4	Conservation Policy and Governance (Elec.)	2
5	Conservation Technologies (Electives)	2
6	Ethnobotany (Electives) + Tribal Health Module	2
7	Environmental Humanities (1+1)	2
8	Landscaping with Medicinal Plants and Nursery Techniques (Electives)	2
9	Biodiversity for Food and Nutrition	1
10	Wildlife Management	1
11	Carbon Assessments	1
12	NTFP	2



Semester - 4

M.Sc. Thesis/ Internship

Credit: 35

Objectives: Conservation Practice students will have the option of conducting research leading towards a thesis or interning at partner organizations. This will help students convert classroom instruction to experiential learning and develop the confidence and ability to address real-world situations by applying a diverse suite of perspectives, domain knowledge, and skills. The thesis research or internship will be conducted over a period of 5 months. Students will be assigned supervisors, either from ATREE or TDU in the 3rd semester based on mutual interests. Given the interdisciplinary nature of the program, a thesis or internship committee consisting of one another faculty will need to be formed. The supervisor will advise the student on the choice of thesis or internship options for the final semester. The student will need to draft and finalize a research or internship proposal.

The “thesis stream” will involve conducting research at ATREE’s Community-based Conservation Centres (CCCs) or TDU field sites. The thesis research can be based on topics finalized after discussions with respective supervisors. Students choosing the “internship stream” will intern with partner organizations across government, NGO, corporate and academic sectors. The internship is intended to result in mutual capacity building. Student interns will participate in an existing conservation-related initiative of the host organization, or initiate and complete a new one. Student work will be supervised by a senior member at the partner organization and one ATREE or TDU faculty member.