












M.Sc Environmental Studies (Conservation Practice)








COURSEWORK

Coursework

First Semester

Course	Credits	Course Name	Faculty
	3	Natural History and Basic Ecology	G Ravikanth, Seshadri KS, Aravind NA
	2	Fundamentals of Environmental Sciences	Priyanka Jamwal, Shrinivas Badiger, Ashish Kumar, Manan Bhan
	2	Economics	Vinay Sankar
	2	Sociology	Siddhartha Krishnan, Saloni Bhatia
	2	Conservation Issues, Ethics, and Concerns	Saloni Bhatia, Siddhartha Krishnan, Sharachchandra Lele
	2	Research and Publication Ethics	Seshadri KS, Obaiah, Siddhartha Krishnan, Sailendra Dewan, Vinay Sankar, Asmita Sengupta
	2	Communicating Science	Karthik Ram, Jaya Peter
	1	Basic Mathematics	Asmita Sengupta
	1	Basic English	Karthik Ram

Second Semester

Course	Credits	Course Name	Faculty
	2	Remote Sensing and GIS	Manan Bhan, Milind Bunyan, Dipanwita Dutta
	2	Food Systems	Gurmeet Singh
	2	Biodiversity and Ecosystem Services	T Ganesh, Aravind NA, Abdul Kareem, Ravikanth, Asmita Sengupta, Seshadri, R Ganesan
	2	Introduction to Climate Change	Shrinivas Badiger, Sachin Tiwale, Vinay Sankar, Priyanka Jamwal
	2	Water Resources	Ashish Kumar, Priyanka Jamwal, Sachin Tiwale
	3	Advance Research Methods	Siddappa Setty R, Vinay Sankar, Seshadri KS, Asmita Sengupta
	2	Practising Interdisciplinary Research on the Environment	Sharachchandra Lele, Shrinivas Badiger, Saloni Bhatia, Vinay Sankar, Sachin Tiwale, Siddhartha Krishnan



FOUNDATIONS



PERSPECTIVES



DOMAIN
SKILLS










DOMAIN
KNOWLEDGE




ELECTIVES








Third Semester

Course	Credits	Course Name	Faculty
	2	Project Cycle Management	Sarala Khaling, Shrinivas Badiger
	2	Conservation & Environment Policy	Sharachchandra Lele, Gautam Aredath, Anuja Date
	2	Conservation Psychology	VV Binoy, Abdul Kareem
	2	Impact Assessment	Gautam Aredath, Sachin PS
	2	Cultural Diversity & Traditional Knowledge	Abdul Kareem, Unni Krishnan
	1	Design Thinking	Shyam Sundar
	2	Field Immersion	

Fourth Semester

Course	Credits	Course Name	Faculty
	35	Masters Thesis or Internship	

Electives (Tentative)

Course	Credits	Course Name	Faculty
	2	Conservation Technologies	Shiv Subramanya, Shrinivas Badiger, Abhijith Kumar
	2	Human-Wildlife Interactions	Asmita Sengupta, Saloni Bhatia
	2	Ecological Restoration	Rajkamal Goswami, Abi T Vanak, Priyanka Jamwal, Anuja Malhotra
	2	Impact Assessment	Gautam Aredath
	2	Enterprise-based Conservation	Siddappa Setty, Harisha
	2	Urban Ecology, Design, and Practice for Sustainability	Soubadra Devy, Seshadri KS, Asmita Sengupta, Jaya Peter, Siddhartha Krishnan
	2	Approaches to Conservation	Siddappa Setty, Aravind NA



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ELECTIVES

FULL COURSE SYLLABUS
FIRST SEMESTER

1. *Natural History and Basic Ecology (3 credits)*

This course is designed primarily for students with no prior training in natural history and ecology. It serves as an introductory, full-semester core course that covers basic natural history and ecological principles. Despite the significant advancements in experimental and theoretical approaches within modern ecology, natural history remains a crucial foundation for ecological research. It aids ecologists in developing hypotheses and designing experiments that are relevant to the natural world. Many ecological questions and patterns can only be fully understood and appreciated through detailed natural history observations.

Faculty: G Ravikanth, Seshadri KS, Aravind N A

2. *Fundamentals of Environmental Sciences (2 credits)*

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, water and nitrogen 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, energy consumption, air and water pollution and soil degradation. Concepts related to assessing risk to human health on exposure to contaminants will also be covered.

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

Faculty: Priyanka Jamwal, Shrinivas Badiger, Ashish Kumar, Manan Bhan

3. *Economics for Environment and Development (2 credits)*

Basic principles of economics; key concepts in environmental economics; key concepts in development economics; major tenets of political economic analysis. The outcomes of this course are the evolution of economic thought; an understanding of micro-economic concepts; decision making of economic agents; Ecological economics and neoclassical economics; Critical assessment of research and debate in the application of economic theories & tools in environment & development

Faculty: Vinay Sankar

4. *Sociology (2 credits)*

This course trains students to use the sociological imagination to 1. Locate their environment and development thoughts and actions in wider political, economic and cultural structures, and 2. And similarly, those of other environmental stakeholders in general. In doing so, students get to discuss the stratified nature of traditional (Indian) society, its encounter with modernity, and how class, caste and gender locations condition experience of environmental goods and bads.

Faculty: Siddhartha Krishnan, Saloni Bhatia. Kiren Asher, Rinzi Lama

5. *Conservation Issues, Ethics, and Concerns (2 credits)*

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.

Faculty: Saloni Bhatia, Siddhartha Krishnan, Sharachchandra Lele

6. *Research and Publication Ethics (2 credits)*

This course is divided into two parts with the first intended to provide students with an introduction to the philosophy of science and the second, the ethics of conducting and publishing scientific research. Beginning with 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 several 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.

Faculty: Seshadri KS, Obaiah B, Siddhartha Krishnan, Sailendra Dewan, Vinay S, Asmita Sengupta

7. *Communicating Science (2 credits)*

To communicate your research effectively to various stakeholders – both non-academic and academic. The outcomes of this course are to understand the process of writing, write clearly and concisely, organize an essay meaningfully, understand the history and philosophy of research communication, survey relevant literature, understand the structure of a research paper, understand the process of peer-review, learn about other forms of research communication including research posters, research talks, grant proposals and grant proposals, tailor a communication strategy for different audiences, understand the varied audiences and the tools needed to communicate effectively, summarise concepts and create a pitch, practice the art of storytelling with words and visual.

Faculty: Karthik Ram, Jaya Peter

8. *Basic Mathematics (1 credit)*

The goal of this course is to provide an overview of the fundamentals of mathematics needed to understand concepts of relevance in the realm of environmental, social and ecological sciences.

Faculty: Asmita Sengupta

9. *Basic English (1 credit)*

To learn the basics of English grammar and style while learning how to apply these skills to critical reading and writing in the context of conservation and science.

Faculty: Karthik Ram

FULL COURSE SYLLABUS
SECOND SEMESTER

1. *Remote Sensing and Geographic Information System (GIS) of the Environment (2 credits)*

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. Students will gain a basic understanding of the theoretical basis for temporal and spatial scale issues, data collection and analysis, and an overview of the approaches used to interpret these data for understanding the drivers, processes and outcomes of ecological and environmental change in different contexts.

Faculty: Manan Bhan, Milind Bunyan, Dipanwita Dutta

2. *Food Systems (2 credits)*

This course will present some of the key conservation & sustainability challenges arising from food and the societal & technological solutions being pursued to address them.

The course will begin with an holistic exploration of what food means to humans and how this has evolved in context of our biological & cultural evolution. It will delve into population level calculations to understand the **basic mass & energy challenges** related to food. The sources of food – foraged versus farmed, vegan versus animal, local versus global, whole foods versus supplements - will be discussed and **technology landscape** to address these tensions will be presented. The importance of local ecosystem resources and associated traditional knowledge in Food System Transformations will be discussed. Writing actions for food system transformations will form a key part of the course. The students will design a 2050 food plate in line with the actions and cook it.

Faculty: Gurmeet Singh

3. *Biodiversity and Ecosystem Services (BES) (2 credits)*

This course will expose students to the importance of ecology in the larger conservation context. It will show how ecology, ecological processes and related ecosystem services help us address conservation issues for the well-being of the planet. The students will be presented with several case studies of conservation programs and the importance of ecological studies in shaping them.

The course will essentially be taught both in class and in the field for students to appreciate and understand how nature functions and how to use such information in conservation planning.

Faculty: T Ganesh, Aravind NA, Abdul Kareem, Ravikanth, Asmita Sengupta, Seshadri KS, R Ganesan

4. *Introduction to Climate Change (2 credits)*

Basic understanding of weather and climate, Climate of India. Global and regional atmosphere-ocean phenomena such as ENSO and IOD and its impact on Indian Monsoon. Basic physics of global warming and its change due to anthropogenic activities. Impact of warming and enhanced CO₂ on land, water, vegetation and ocean. Implications of climate change on ecosystem services and biodiversity. Fundamentals of climate change adaptation and mitigation.

Faculty: Shrinivas Badiger, Sachin Tiwale, Vinay Sankar, Priyanka Jamwal

5. *Water Resources (2 credits)*

This course is designed to equip students with the knowledge to understand surface and groundwater dynamics, addressing both water quantity and quality, learning to understand human influences on the hydrological system and apply tools, such as modeling, for the proper integration of hydrological knowledge and analysis in water resources planning and management.

Faculty: Ashish Kumar, Priyanka Jamwal, Sachin Tiwale

6. *Advanced Research Methods (3 credits)*

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, 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. The course will offer an overview of the fundamentals of statistics and their applications in addressing research questions. It will further provide hands-on training in using the R statistical environment.

Faculty: Siddappa Setty R, Vinay Sankar, Seshadri KS, Asmita Sengupta, Eapsa Berry, Sailendra Dewan

7. *Practising Interdisciplinary Research on the Environment (2 credits)*

This core course 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 Master 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. We will briefly review the normative concerns that are central to the environment-development debate (already covered in CIEC). Finally, and most importantly, it will take students through different (often competing) perspectives on the society-environment relationship. We will end this part with a discussion of the different ways in which frameworks can be translated onto the ground for research and for action. 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 learning will be through 4 case studies of how activists or practitioners or policy advocates have tried to address real world environmental problems. We will try to bring in guest speakers who have hands-on experience in such matters. At the end of this course, MSc student will have learnt how to analyse environmental problems holistically, using different normative and analytical framings, and how to identify approaches to solving these problems.

Faculty: Sharachchandra Lele, Shrinivas Badiger, Saloni Bhatia, Vinay Sankar, Sachin Tiwale, Siddhartha Krishnan

FULL COURSE SYLLABUS
THIRD SEMESTER

1. *Project Cycle Management (2 credits)*

This course introduces students to tools and methods that will equip them with skills to write well-designed project proposals required for their post-university years and to upgrade the technical and managerial competencies required for project identification, stakeholder management, project design, and the development of monitoring and evaluation systems. It develops skills that will give students wider career opportunities in case they opt for non-research pathways and to inculcate a learning style that includes reflection, analysis, and working in a team with diverse people/cultures and learning styles.

Faculty: Sarala Khaling, Shrinivas Badiger

2. *Conservation & Environment Policy (2 credits)*

This course will introduce key theoretical concepts: why environmental policy/governance is necessary (nature of the resource, nature of societal decision-making) and what its instruments can be (legal, fiscal and administrative), and then will use examples from various sectors—with a special focus on biodiversity and forests—to understand how these instruments are deployed and how they perform in India. We will also discuss how other state and non-state actors, such as the judiciary and social movements, have shaped environmental policy in India.

Faculty: Sharachchandra Lele, Gautam Aredath, Anuja Date

3. *Conservation Psychology (2 credits)*

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.

Faculty: VV Binoy, Abdul Kareem, Prantik Das

4. *Impact Assessment (2 credits)*

Environmental impact assessment (EIA) refers to a tool for decision-making, a legislative instrument and a formalised environmental management process. It provides for due-diligence relating to environmental impacts of developmental activities, aiding decision-making on the suitability of development projects and the mitigation of its adverse effects. The objective of this course is to provide students with a working knowledge of the conceptual, regulatory and technical aspects of EIA, particularly as it is practised in India.

Faculty: Gautam Aredath, Sachin PS

5. *Cultural Diversity & Traditional Knowledge (2 credits)*

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 following objectives of introducing students to traditional knowledge and related concepts/ideas and learning about international and national responses to TK. Also to study cultural and intangible heritage contributing to grass-root level conservation action and legal and policy issues related to culture and traditional knowledge.

Faculty: Abdul Kareem, Unni Krishnan

6. *Design Thinking (1 credit)*

An approach to learning, collaboration, & problem-solving. Structured approach to identify opportunities, gathering information, resolutions, creating innovative solutions, communicating the ideas, improvising the concepts based on feedback, validating the solutions & implementation.

Faculty: Shyam Sundar

FULL COURSE SYLLABUS
FOURTH SEMESTER

In the final semester, students have the option to undertake a Master's Thesis or an Internship, both carrying 35 credits. The Master's Thesis involves independent research on a chosen topic under faculty supervision, allowing students to develop critical thinking and analytical skills. Alternatively, the Internship provides hands-on experience with organizations working in conservation, sustainability, or environmental management. This semester is designed to equip students with research expertise or practical exposure, preparing them for careers in academia, policy, or the environmental sector.

FULL COURSE SYLLABUS
ELECTIVES
(TENTATIVE)

1. *Conservation Technologies (2 credits)*

Technology has made the conservation of natural resources easier. From smartphones to satellites, information is now collected and processed in unprecedented quantities and at lower costs. In this course students will learn about the technologies that are being used in natural resource conservation, debate and discuss the ethics of deploying these technologies and explore the frontiers of the field. Students will be given hands-on experience in the use of two open-source platforms that are proven to democratize data collection and improve scientific rigour.

Faculty: Shiv Subramanya, Shrinivas Badiger, Abhijith Kumar

2. *Human-wildlife interactions in a rapidly changing world (2 credits)*

The course will introduce students to human-wildlife interactions (HWI) in its many forms and the various facets thereof. Drawing from the natural and the social sciences – both in terms of theory and practice, and through case studies and debates, the course will examine how human-wildlife interactions are shaped across different cultures, contexts and intersectionalities. It will enable students to assess the implications of different kinds of interactions for human lives, animal lives and the ecosystems that we are a part of.

Faculty: Asmita Sengupta, Saloni Bhatia

3. *Ecological Restoration (2 credits)*

This course provides a comprehensive understanding of ecosystem restoration, from theoretical knowledge to the practical dimensions. Students will explore restoration ecology principles, methodologies, and case studies, including field visit to two restoration project sites.

Faculty: Rajkamal Goswami, Abi T Vanak, Priyanka Jamwal, Anuja Malhotra

4. *Enterprise-based conservation, ecology and socio-economics (NTFPs, invasive species and Agroforestry) (2 credits)*

Non-timber forest products (NTFPs) play an important role in maintaining biodiversity and species richness across biodiversity hotspots of tropical forests. A significant number of species are being harvested for fruits, leaves, flowers, barks etc. Understanding safe harvest techniques and monitoring would contribute to the livelihood and conservation of biodiversity.

The course will focus on the Enterprise based conservation models, ecological, social and economic aspects of NTFPs, invasive species, agroforestry in Western Ghats and Eastern Himalayas. Course will give an idea of how NTFP studies would contribute and strengthen the biodiversity conservation in the context of forest landscape. Speak about invasive species, related impacts and opportunities and other enterprise based conservation models.

The course will consist of following three components: 1) History of NTFPs and invasives 2) Livelihood and conservation linkage with NTFPs, invasives and other forest based enterprises. 3) Enterprise based conservation models 4) Current status of NTFP, invasive species like Lantana and policy implications.

Faculty: Siddappa Setty, Harisha

5. ***Urban Ecology, Design, and Practice for Sustainability (2 credits)***

This course aims to provide a comprehensive exploration of how ecological and social sciences can be integrated into sustainable urban planning and design.

Faculty: Soubadra Devy, Seshadri KS, Asmita Sengupta, Jaya Peter, Siddhartha Krishnan

6. ***Approaches to Conservation (2 credits)***

The course aims to provide insights into practical learning in the context of conservation. It will help them design experiments and learn from them and assess impact.

Faculty: Siddappa Setty, Aravind N



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