Multidisciplinary Course from the department for pool of the Courses in the University

(These courses are to be offered to students of different discipline/Subject)

Semester 1

Course Code	Course Title	Course ID	L	T	P	L	T	P	Credits	MARKS				
			(Hrs)			Credits				TI	TE	PI	PE	Total
MDC-01	Pollution and Climate Change	261/EVS/MD101	03	00	00	03	00	00	03	25	50	00	00	**75**

Semester 2

Course Code	Course Title	Course ID	L	T	P	L	T	P	Credits	MARKS				
			(Hrs)			Credits				TI	TE	PI	PE	Total
MDC-02	Natural Resources Management	261/EVS/MD202	03	00	00	03	00	00	03	25	50	00	00	**75**

Semester 3

Course Code	Course Title	Course ID	L	T	P	L	T	P	Credits	MARKS				
			(Hrs)			Credits				TI	TE	PI	PE	Total
MDC-03	Natural Hazards and Disaster Management	261/EVS/MD303	03	00	00	03	00	00	03	25	50	00	00	**75**



M.Sc. ENVIRONMENTAL SCIENCE – SEMESTER- I
SUBJECT NAME: POLLUTION AND CLIMATE CHANGE
Course code: MDC-01
Course ID: 261/EVS/MD101

NO. OF CREDITS: 3

L	T	P
3	0	0

Exam Time : 3 hrs

TI	:	25
TE	:	50
Total	:	75

Note:

1. Seven questions will be set in all.
2. Question no. 1 which will be short answer type (20 marks), covering the entire syllabus will be compulsory.
3. The remaining six questions will be set unit wise selecting two questions from each unit.
4. The candidates will be required to attempt question no.1 and three four more questions.

COURSE OUTCOMES:

At the completion of this course, the learner will be able to:

CO1. Understand the complex environmental issues, sources and fate of different environmental pollutants along with their effects on environment.

CO2. Learn the standard methods of sampling, analysis and standards set up for different environmental pollutants

CO3. Understand the concept of global climate change, its causes, impacts, adaptation and mitigation strategies

CO4. Learn the role of international and national organizations in mitigating climate change

CO5. Predict the environmental changes and provide simple, technological and socially acceptable solutions

CO6. Understand the tools to study climate change and importance of carbon trading

UNIT–I: AIR AND NOISE POLLUTION

Sources, classification and major properties of air pollutants; fate and effects of air pollution on human health and materials; major pollutants: SOx, NOx, CO, ozone, hydrocarbons and particulate matter; basic air pollution monitoring and air quality standards.

Noise pollution: sources, effects and basic monitoring using sound level meter.

UNIT–II: WATER AND SOIL POLLUTION

Sources and characteristics of domestic, industrial and agricultural wastes; effects of water pollution; thermal and marine pollution; water quality standards.

Soil pollution: sources and major pollutants including fertilizers, pesticides, heavy metals and industrial wastes; effects and basic remedial measures.

UNIT–III: GLOBAL CLIMATE CHANGE AND MITIGATION

Greenhouse effect, global warming, greenhouse gases, trends and radiative forcing; CO_2 fertilization; impacts of climate change on glaciers, sea level, extreme weather, ecosystems, human health and coral reefs.

Climate change mitigation: biological and geological carbon sequestration; role of forests in carbon storage; Kyoto Protocol and carbon trading; IPCC and major global climate programmes; Indian initiatives for climate change mitigation.

SUGGESTED READING

- Botkin, D.B. and E.A. Keller (2004). Environment Science: Earth as a Living Planet, John Wiley & Sons Inc., New York.
- Miller Jr., G.T. (1997). Environmental Science: Working With the Earth. Wadsworth Publishing Company, Belmont, California
- Philander, S.G. (ed.) (2008). Encyclopedia of global warming and climate change. 2nd edition, SAGE Publications, Inc., California.
- Singh, J.S., Singh, S.P. and Gupta, S.R. (2015). Ecology, Environment and Resource Conservation, S. Chand Publishing, New Delhi.
- Steffen, W., A. Sanderson, P. D. Tyson, J. Jager, P. M. Matson, B. Moore, III, F. Oldfield, K. Richardson,
- H. J. Schnellnhuber, B. L. Turner, II, and R. J. Wasson. (2004). Global change and the Earth system: a
- Planet under Pressure. Springer-Verlag, New York, New York, USA..

TEACHING-LEARNING PROCESS

- Lectures: Supported by black board teaching, power point presentations, related videos and demonstrations.
- Assignments and exercises
- Test: Knowledge of the students is tested through surprise tests, quiz, sessional tests and seminars.

MODE OF TRANSACTION:

Lecture, Demonstration, PowerPoint presentation, E-tutoring, Discussion, Assignments, Case study

LMS/ICT TOOLS: Digital Classrooms, DLMS, ZOOM, G-Suite, MS Power-Point, Online Resources.



M.Sc. ENVIRONMENTAL SCIENCE – SEMESTER- II
SUBJECT NAME: NATURAL RESOURCES MANAGEMENT
Course code: MDC-02
Course ID: 261/EVS/MD202

NO. OF CREDITS: 3 **Exam Time : 3 hrs**

L	T	P			
3	0	0	TI	:	25
			TE	:	50
			Total	:	75

Note:

1. Seven questions will be set in all.
2. Question no. 1 which will be short answer type (20 marks), covering the entire syllabus will be compulsory.
3. The remaining six questions will be set unit wise selecting two questions from each unit.
4. The candidates will be required to attempt question no.1 and three four more questions.

COURSE OUTCOMES:

At the completion of this course, the learner will be able to:

CO1: Understand the fundamental principles of various natural resources

CO2: Illustrate the factors affecting and consequence of resource degradation.

CO3: Appraise the integrative approach to suggest sustainable solutions to the resource degradation.

CO4: Able to effectively apply various steps for conservation and management of natural resources.

UNIT–I: NATURAL AND FOREST RESOURCES

Natural resources: concept and classification; resource degradation, conservation and environmental impacts of resource depletion.

Forest resources: forest cover, classification and major forest types in India; importance and values of forests; use and over-exploitation; deforestation, causes and effects; forestry programmes: social forestry and urban forestry.

UNIT–II: WATER, MARINE, LAND AND MINERAL RESOURCES

Water resources: surface and groundwater problems; waterlogging and salinity; water conservation and management: rainwater harvesting, watershed management and river action plans.

Marine resources: introduction and importance; deep-sea mineral resources, exploration prospects and environmental challenges; sustainable deep-sea mining.

Land resources: land degradation and loss of soil fertility; salinization and waterlogging; soil conservation: wasteland reclamation, organic farming and green manuring; wetlands: definition, types, functions, ecological importance and conservation.

Mineral resources: mineral resources of India; use, exploration and extraction; environmental impacts of mineral extraction.

UNIT–III: BIORESOURCES AND BIODIVERSITY CONSERVATION

Bioresources: definition, types and significance of biodiversity; values and threats; biodiversity conservation strategies; bioprospecting and biopiracy; REDD+; major conventions and protocols; wildlife resources and their conservation measures.

SUGGESTED READINGS

- Anderson, D. A. (2013). Environmental economics and natural resource management. Routledge.
- Beckman, D. (2012). Marine environmental biology and conservation. Jones & Bartlett Publishers.
- Grigg, N. S. (2009). Water resources management: principles, regulations, and cases (No. 631.7 G72). New York: McGraw-Hill.
- Kudrow, N. J. (2009). Conservation of Natural Resources. Nova Science Publishers, Incorporated.
- Kumar, H. D. (2001). Forest Resources: Conservation and Management. Affiliated East- West Press.
- Lynch, D. R. (2009). Sustainable natural resource management: For scientists and engineers. Cambridge University Press.
- Peacock, K. W. (2008). Natural resources and sustainable development. Infobase Publishing.
- Primack, R. B. (2002). Essentials of conservation biology. 5th ed. Sunderland: Sinauer Associates
- Sampson, R. N. (2010). Natural resources for the 21st century. Island Press.
- Singh, G., & Ahuja, V. (1992). Land resource management: a case study of Goa. Land resource management: a case study of Goa.

SUGGESTED WEBSITE:

- http://envis.nic.in/ENVIS_html/ENVISSubject/subject.html
- https://www.iucn.org/
- https://www.cbd.int/
- https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=14
- http://moef.gov.in/en/#

MODE OF TRANSACTION:

Lecture, Demonstration, PowerPoint presentation, E-tutoring, Discussion, Assignments, Case study

LMS/ICT TOOLS: Digital Classrooms, DLMS, ZOOM, G-Suite, MS Power-Point, Online Resources

M.Sc. ENVIRONMENTAL SCIENCE – SEMESTER- III
SUBJECT NAME: NATURAL HAZARDS AND DISASTER MANAGEMENT
Course code: MDC-3
Course ID: 261/EVS/MD303

NO. OF CREDITS: 3

L	T	P
3	0	0

Exam Time : 3 hrs

TI	:	25
TE	:	50
Total	:	75

Note:

1. Seven questions will be set in all.
2. Question no. 1 which will be short answer type (20 marks), covering the entire syllabus will be compulsory.
3. The remaining six questions will be set unit wise selecting two questions from each unit.
4. The candidates will be required to attempt question no.1 and three more questions.

COURSE OUTCOMES:

On completion of the course, the students will be able to:

CO1: Describe hazard, emergency, disaster, vulnerability, disaster management and risk,

CO2: Gain insight into different types of disasters/hazards, their implication on environment and to identify the main hazards to which our region is, or may be, vulnerable.

CO3: Differentiate, assess and apply the theoretical knowledge of disaster and emergency management activities and risk assessment to reduce the effects of disasters on vulnerable groups.

CO4: Critically analyze the influence of new emergent technologies on the disaster management.

UNIT–I: INTRODUCTION TO NATURAL AND MANMADE DISASTERS

Introduction to natural and manmade disasters; floods, flood hazards, urban flooding, drought and landslides; coastal hazards: tropical cyclones, coastal erosion and sea-level changes; earthquakes and seismic waves; earthquake-resistant buildings; tsunamis, volcanoes, wildfires, oil spills, and urban hazards and disasters.

UNIT–II: DISASTER RISK ASSESSMENT AND MANAGEMENT

Pre-disaster management activities; hazard and vulnerability analysis; capability assessment; emergency and contingency planning; post-disaster management; development planning and types of plans; MBO and SWOT analysis; principles and practices of disaster relief and recovery; relief and rehabilitation; local administration and disaster risk reduction.

UNIT–III: GEOINFORMATICS, LEGISLATIONS AND POLICIES FOR DISASTER MANAGEMENT

Role of GPS, GIS and Remote Sensing in disaster management; applications in landslides, volcanoes, tsunamis, cyclones, urban and forest fires; hazard monitoring, tracking and modelling; decision-making and early warning systems; Indian space programme and satellites for disaster management; India Disaster Resource Network; organization and structure for emergency management; disaster management policies and legislations; Disaster Management Act, 2005 and amendments; National Green Tribunal; Environment Protection Act, 1986; Explosive Substances Act, 1908; Atomic Energy Act, 1962; case studies.

SUGGESTED READINGS

- William H. D and Bruce R. M., Geology and Engineering, WCB Publishers, Iowa, 1986.
- Sushmitha Bhaskar and R. Bhaskar, Natural Disasters, Unicorn Books, 2011.
- Bell, F.G.2003, Geological Hazards, Their Assessment Avoidance and Mitigation, CRC Press
- Smith, K. 2003, Environmental Hazards: Assessing Risk and Reducing Disasters. Routledge.
- John M. Wallace and Peter V. Hobbs, Atmospheric Science: An Introductory Survey, Academic Press, New York, 1977.
- Barbar W. Murk et. al., Environmental Geology, John Wiley & Sons, New York, 1996.
- Bohle, H. G., Downing, T. E. and Watts, M. J. Climate change and Social vulnerability: the sociology and geography of food insecurity, Global Environmental Change. No.4, pp. 37-48.
- Collins Larry R. and Schneid Thomas D., Disaster Management and Preparedness, Taylor and Francis 2000.
- Goel S.L. and Kumar Ram, Disaster Management, Deep and Deep Publications, 2001.
- Kukal, S. S., Kingra, P. K. (2019). Introduction to Environmental and Disaster Management, Kalyani Publishers.
- Parasuraman S., India Disasters Report: Towards a Policy Initiatives, Oxford University Press, 2004.

SUGGESTED WEB SOURCE:

- https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=14
- https://nptel.ac.in/courses/105/104/105104183/

MODE OF TRANSACTION:

Lecture, demonstration, E-tutoring, discussion, assignments, case study, power point;

Value Added Course from the department for pool of the Courses in the University

(All the departments will offer value added course for the students of same or different departments)

Semester 1

Course Code	Course Title	Course ID	L (Hrs)	T (Hrs)	P (Hrs)	L Credits	T Credits	P Credits	Credits	MARKS TI	MARKS TE	MARKS PI	MARKS PE	MARKS Total
VAC -1	Environmental Sciences: Theory into Practice	261/EVS/VA101	02	00	00	02	00	00	02	15	35	00	00	50

Semester 3

Course Code	Course Title	Course ID	L (Hrs)	T (Hrs)	P (Hrs)	L Credits	T Credits	P Credits	Credits	MARKS TI	MARKS TE	MARKS PI	MARKS PE	MARKS Total
VAC -2	Energy Resources	261/EVS/VA302	02	00	00	02	00	00	02	15	35	00	00	50

M.Sc. ENVIRONMENTAL SCIENCE – SEMESTER- I
SUBJECT NAME: ENVIRONMENTAL SCIENCES: THEORY INTO PRACTICE
Course code: VAC-01
Course ID: 261/EVS/VA101
NO. OF CREDITS: 2 (Exam Time : 2 hrs)

L	T	P			
2	0	0	TI	:	15
			TE	:	35
			Total	:	50

Note:

1. Five questions will be set in all.
2. Question no. 1 which will be short answer type (15 marks), covering the entire syllabus will be compulsory. The remaining four questions will be set unit wise selecting two questions from each unit.
3. The candidates will be required to attempt question no.1and two more questions.

COURSE OUTCOMES:

On successful completion of this course, the students will be able to:

CO1. Develop foundation on principles of Environmental Science and concept of structure and function of different compartments of the Environment.

CO2. Gain scientific perspective of the issues confronting our present-day environment

CO3. Enable to analyze the national and global environmental issues relating to atmosphere, water, soil and land use, biodiversity, and natural resources (global warming, climate change, mineral extraction and energy resources, environmental impact assessment and environmental audit).

UNIT–I: ENVIRONMENT, NATURAL RESOURCES, ECOSYSTEMS, BIODIVERSITY AND ENVIRONMENTAL POLLUTION

Introduction, scope and importance of environmental studies; components of environment; renewable and non-renewable natural resources; conservation and sustainable development.

Ecosystem: concept, structure and functions; producers, consumers and decomposers; energy flow, food chains and food webs; major terrestrial and aquatic ecosystems.

Biodiversity: concept and types; values and importance; biodiversity hotspots; major threats; in-situ and ex-situ conservation.

Environmental pollution: sources, types, effects and control measures; air, water, soil and noise pollution; solid waste management.

UNIT–II: GLOBAL ISSUES AND DISASTERS, ENVIRONMENT, SOCIETY AND SUSTAINABLE DEVELOPMENT

Global environmental issues: greenhouse effect, global warming, ozone layer depletion and climate change.

Disaster management: basic concepts and classification of natural disasters; major disasters such as floods, earthquakes, cyclones and landslides; preparedness and mitigation.

Environment and society: population growth, urbanization and environmental health; environmental awareness and public participation; community-based conservation.

Sustainable practices: reduce, reuse and recycle; rainwater harvesting; watershed management; sustainable use of natural resources.

Environmental governance: basic provisions of major environmental laws; environmental ethics and human responsibility towards the environment.

SUGGESTED READINGS:

- Agarwal, K.C. (2001). Environmental Biology. Nidhi Publishers, Bikaner.
- Bharucha, E. (2003). The Biodiversity of India. Mapin Publishing, Ahmedabad.
- Centre for Science and Environment. Down to Earth.
- Cunningham, W.P. et al. (2001). Environmental Encyclopedia. Jaico Publishing House, Mumbai.
- Saxena, H.M. Environmental Geography. Rawat Publications, Jaipur.
- Sharma, P.D. Ecology and Environment. Rastogi Publications, Meerut.
- Singh, S. Environmental Geography. New Delhi.
- World Commission on Environment and Development (1987). Our Common Future. Oxford University Press.

M.Sc. ENVIRONMENTAL SCIENCE – SEMESTER- III
SUBJECT NAME: ENERGY RESOURCES
Course code: VAC-2
Course ID: 261/EVS/VA302
NO. OF CREDITS: 2 **(Exam Time : 2 hrs)**

L	T	P			
2	0	0	TI	:	15
			TE	:	35
			Total	:	50

Note:

1. Five questions will be set in all.
2. Question no. 1 which will be short answer type (15 marks), covering the entire syllabus will be compulsory. The remaining four questions will be set unit wise selecting two questions from each unit.
3. The candidates will be required to attempt question no.1and two more questions

COURSE OUTCOMES:

On successful completion of this course, the students will be able to:

CO.1 Awareness among students about non-conventional sources of energy technologies and provide adequate inputs on a variety of issues.

CO.2 Knowledge about all renewable energy sources like solar thermal power, power from wind, biomass power and fuel cell and relevant technologies.

CO.3 Ability to plan and perform a short scientific study and present the results in writing and orally.

UNIT–I: SOLAR AND WIND ENERGY

Solar Energy: Sun as a source of energy; availability and utilization of solar energy; solar thermal, photovoltaic and photosynthetic conversion; applications and scope.

Wind Energy: Wind as an energy resource; basic principles of wind energy conversion; types of wind turbines; HAWT and VAWT; applications and scope.

UNIT–II: BIOMASS ENERGY ; FUEL CELLS

Biomass: origin, resources, classification and characteristics; biomass as a renewable energy source.

Biomass Conversion: combustion, pyrolysis, gasification, liquefaction and biogas production; applications and advantages of biomass energy.

Fuel Cells: basic principle and working; major types of fuel cells; components, electrodes and electrolytes; energy conversion efficiency; applications and advantages.

SUGGESTED READINGS

- Bridgwater, A.V. Thermochemical Processing of Biomass.
- Freris, L.L. Wind Energy Conversion Systems. Prentice Hall.
- Hall, D.O. & Overend, R.P. Biomass Renewable Energy. John Wiley & Sons.
- Johnson, G.L. Wind Energy Systems. Prentice Hall.
- Manwell, J.F., McGowan, J.G. & Rogers, A.L. Wind Energy Explained. John Wiley & Sons.



Skill Enhancement Course from the department for pool of the Courses in the University

(These courses are offered by each department for students of other departments/same department and is designed to provide value-based and/or skill-based knowledge and should contain both theory and lab/hands-on/training/field work.)

Semester 2

Course Code	Course Title	Course ID	L (Hrs)	T (Hrs)	P (Hrs)	L Credits	T Credits	P Credits	Credits	MARKS TI	MARKS TE	MARKS PI	MARKS PE	MARKS Total
SEC-1	Basics of Remote Sensing and GIS	261/EVS/SE201	02	00	00	02	00	00	02	15	35	00	00	50

Semester 3

Course Code	Course Title	Course ID	L (Hrs)	T (Hrs)	P (Hrs)	L Credits	T Credits	P Credits	Credits	MARKS TI	MARKS TE	MARKS PI	MARKS PE	MARKS Total
SEC-2	Global Environmental Issues	261/EVS/SE302	02	00	00	02	00	00	02	15	35	00	00	50



M.Sc. ENVIRONMENTAL SCIENCE – SEMESTER- II
SUBJECT NAME: BASICS OF REMOTE SENSING AND GIS
Course code: SEC-1
Course ID: 261/EVS/SE201

NO. OF CREDITS: 2 (Exam Time : 2 hrs)

L	T	P			
2	0	0	TI	:	15
			TE	:	35
			Total	:	50

Note: 1. Five questions will be set in all.
2. Question no. 1, which will be short answer type (15 marks), covering the entire syllabus, will be compulsory. The remaining four questions will be set unit wise selecting two questions from each unit.
The candidates will be required to attempt question no.1and two more questions.

COURSE OUTCOMES:

At the completion of this course, the learner will be able to:

CO.1 Understand the concepts of Photogrametry and compute the heights of objects**.**

CO.2 Understand the principles of aerial and satellite remote sensing, comprehend the energy interactions with earth surface features, spectral properties of water bodies.

CO.3 Understand the basic concept of GIS and its applications, know different types of data representation in GIS**.**

CO.4 Illustrate spatial and non-spatial data features in GIS and understand the map projections and coordinates systems

CO.5 Apply knowledge of GIS and understand the integration of Remote Sensing and GIS

UNIT-I: BASICS OF REMOTE SENSING

Definition, Introduction and scope of remote sensing. Electromagnetic radiation, Atmosphere window, Platforms, Sensors and type of scanning systems; Resolution in Remote Sensing; Digital image and image structure, Image classification: Elements of visual image interpretation.

Aerial photography: vantage point, cameras, filters, and types of films; Photogrammetry - Introduction, Stereoscopic vision, Projection types.

Remote sensing application in Forestry, Ecology and environment, Land use, Agriculture, soils and geology, Disaster management.

UNIT-II: BASICS OF GIS AND GPS

Geographic Information System (GIS): Definition and concept of GIS; Components of GIS; Hardware and software requirement for GIS; Spatial Data Models -Raster and Vector data; Conceptual model of spatial & non-spatial information, GIS technology and its uses in environmental science.

Global Positioning System (GPS); Introduction and fundamental concepts.

REFERENCE BOOKS:

1. Barrett EC, Curtis LF. Introduction to environmental remote sensing. Routledge; 2013 May 13.
2. Ray SS. Basics of remote sensing. Remote Sensing Image Analysis: Including the Spatial Domain. 2013:1-5.
3. Lillesand T, Kiefer RW, Chipman J. Remote sensing and image interpretation. John Wiley & Sons; 2015 Feb 18.
4. Chandra AM, Ghosh SK. Remote sensing and geographical information system. Alpha Science Int'l Ltd.; 2006.
5. Jensen JR. Remote sensing of the environment: An earth resource perspective 2/e. Pearson Education India; 2009.



M.Sc. ENVIRONMENTAL SCIENCE – SEMESTER- III
SUBJECT NAME: GLOBAL ENVIRONMENTAL ISSUES
Course code: SEC- 2
Course ID: 261/EVS/SE 302

NO. OF CREDITS: 2 (Exam Time : 2 hrs)

L	T	P			
2	0	0	TI	:	15
			TE	:	35
			Total	:	50

Note: 1. Five questions will be set in all.
2. Question no. 1 which will be short answer type (15 marks), covering the entire syllabus will be compulsory. The remaining four questions will be set unit wise selecting two questions from each unit.
The candidates will be required to attempt question no.1 and two more questions.

Course Outcomes:

CO1: Develop perspective on important environmental issues that have become a matter of global policy making, international negotiations and trade disputes.

CO2: Develop critical thinking**.**

UNIT I: CLIMATE CHANGE AND GLOBAL ENVIRONMENTAL GOVERNANCE

Key concerns in the climate change debate; Scientific and political dimensions of climate change; Impacts of climate change on natural resources and food security; Greenhouse gas emissions and techno-economic mitigation measures.

Business– Environment debate; Globalization and sustainable development; Ozone depletion and environmental change; Environmental management norms and certification; International environmental management systems.

International Climate and Environmental Agreements: Kyoto Protocol (1997); Clean Development Mechanism (CDM); Paris Agreement (2016)

UNIT–II: ENVIRONMENTAL SECURITY AND HAZARDOUS WASTES

War, Conflict, and Environmental Degradation: Concept of environmental security; Environmental consequences of nuclear war (Nuclear Winter); Impacts of chemical and biological warfare; Environmental effects of nuclear weapon testing; Destruction of nuclear power plants and chemical industries; Environmental impacts of oil well fires and use of incendiary weapons.

Hazardous and Toxic Wastes: Global Perspectives: Transboundary movement of hazardous wastes; Regional and international frameworks regulating waste trade; Environmental and health impacts of toxic wastes: Asbestos, Lead and mercury, PVCs, Electronic waste (e-waste); Role of environmental policies and activism in waste regulation.

Reference Books:

1. Kemp, D.D. 1990. Global Environmental issues: A climatologized approach, Taylor and Francis, London.
2. Makofske, W.J. and Karlin, E.F. 1995. Technology and Global Environmental issues, Addison Wesley, Longman, Toronto.
3. Smith, P. and Warr, K. 1991. Global Environmental issues, Hodder and Stoughton, London. Susskind, L. et. al. (eds). 2002. Trans-boundary Environmental Negotiation: New Approaches to Global Cooperation.
4. Toman,M. (ed). 2002. Climate change, Economics and Policy, Cambridge University Press.



SCHEME A2: M.Sc. ENVIRONMENTAL SCIENCE (w.e.f. Academic Session 2026-27)

Scheme: Semester 4th

Course Code	Course Title	Course ID	L	T	P	L	T	P	Total Credits	MARKS				
			(Hrs)			Credits				TI	TE	PI	PE	Total
Ability Enhancement Course(s)														
AEC-03	Manuscript Writing**/ Pool	261/EVS/AE403	02	00	00	02	00	00	02	15	35	00	00	**50**
Dissertation/Project Work														
Dissertation	Industrial Training/Research Project/ Dissertation	261/EVS/Dissertation401	0	0	40	0	0	20	20	00	00	100	400	**500**
Total Credits									**22**					**550**

M.Sc. ENVIRONMENTAL SCIENCE – SEMESTER- IV
SUBJECT NAME: MANUSCRIPT WRITING (CREDITS: 2)
Course code: AEC-A03
Course ID: 261/EVS/AE403 (Exam Time : 2 hrs)

L	T	P		
2	0	0	TI :	15
			TE :	35
			Total :	50

Note:

1. Five questions will be set in all.
2. Question no. 1 which will be short answer type (15 marks), covering the entire syllabus will be compulsory. The remaining four questions will be set unit wise selecting two questions from each unit.
3. The candidates will be required to attempt question no.1and two more questions.

COURSE OUTCOMES:

At the completion of this course, the learner will be able to:

- CO1: Understand the fundamental principles and components of manuscript writing.
- CO2: Develop knowledge of the stages and processes involved in effective writing.
- CO3: Apply appropriate techniques and strategies for manuscript preparation.
- CO4: Demonstrate proper use of citation and referencing methods in academic writing.

Unit I: Fundamentals of Manuscript Writing

Manuscript Writing: Definition, purpose, and significance in academic and research contexts.

Types of Manuscripts: Original research articles, case studies, review articles, reflective essays, and brief reports.

Writing Process: Pre-writing, drafting, revising, editing, and proofreading.

Ethical Considerations: Academic integrity, plagiarism, proper citation practices, and avoiding misconduct in writing.

Unit II: Writing Techniques and Final Presentation

Principles of Effective Writing: Clarity, coherence, conciseness, and precision.

Writing Techniques: Developing thesis statements, structuring arguments, and use of evidence.

Revision and Editing: Techniques for improving organization, clarity, and logical flow.

Proofreading: Common proofreading symbols and error correction.

Drafting and Revising: Outlining, drafting, and refining manuscripts.

Final Manuscript Preparation: Formatting, preparing final drafts, and effective presentation of key arguments.

SUGGESTED SOURCES:

- Belcher, W. L. Writing Your Journal Article in 12 Weeks. University of Chicago Press.
- Day, R. A., & Gastel, B. How to Write and Publish a Scientific Paper. Cambridge University Press.
- James D. Lester, Writing Research Papers: A Complete Guide. Pearson, 2015.
- MLA Handbook for Writers of Research Papers by The Modern Language Association of America.
- Silvia, P. J. How to Write a Lot: A Practical Guide to Productive Academic Writing. APA.
- Sword, H. Stylish Academic Writing. Harvard University Press.
- Turabian, K. L. A Manual for Writers of Research Papers, Theses, and Dissertations. University of Chicago Press.
- Wayne C. Booth et. al. The Craft of Research. University of Chicago Press.
- William Strunk Jr. and E.B. White. The Elements of Style. Independently Published, 2019.

