MADHYANCHAL PROFESSIONAL UNIVERSITY

SCHEME FOR M.Phill

SEMESTER -1

Subject Name -Environmental Science

S.NO	NAME OF THE PAPER	PAPER CODE	THEORY		TOTAL MARKS	HOURS PER WEEK		TOTAL CREDIT
			END SEM	INTERNAL		L	T	
1	Research methodology	MPEVS101	60	40	100	3	1	4
2	Environmental Study	MPEVS102	60	40	100	3	1	4
3	Social Issues and the Environment	MPEVS103	60	40	100	3	1	4
4	Biodiversity and conservation	MPEVS104	60	40	100	3	1	4
5	Reviews of literature	MPEVS105	60	40	100	3	1	4
	TOTAL	MARKS	300	200	500			

INTERNAL- ARTICLE/PAPER/ CLASS ROOM TEACHING/FIELD VISIT /SEMINAR/CONFERENC

SCHEME FOR M.Phill

SEMESTER -2

Subject Name -Environmental Science

S.NO	NAME OF THE PAPER	PAPER CODE	THEORY		TOTAL MARKS	HOURS PER WEEK		TOTAL CREDIT
			END SEM	INTERNAL		L	T	
1	**Wild life studies**	**MPEVS201**	60	40	100	3	1	4
2	**Environment and health**	**MPEVS202**	60	40	100	3	1	4
3	**Industrial pollution**	**MPEVS203**	60	40	100	3	1	4
4	**Environmental management**	**MPEVS204**	60	40	100	3	1	4
5	Dissertation	**MPEVS205**	60	40	100	3	1	4
	TOTAL	**MARKS**	**300**	**200**	**500**			

INTERNAL- ARTICLE/PAPER/ CLASS ROOM TEACHING/FIELD VISIT /SEMINAR/CONFERENC

SEM.-1

Paper -1

Subject code-MPEVS101

Research methodology

Unit – 1) - Introduction to Research:

Meaning, Types, Process, Importance of research, Meaning of Research Problems, Sources of research problem, selection & formulation of research problems, Research application in decision making.

Unit – 2) – Review ,Report writing & hypothesis formulation:

An Introduction to literature review and referencing, formulation of research hypothesis, meaning of research design, features of good research design, types of research design. Types of research report, styles of reporting, steps in drafting research report, writing of research proposal, bibliography

Unit – 3) – Quantitative Methods for problem solving:

An introduction to statistical modeling and analysis, spectral analysis and its applications, Multivariate method of correlation & regression, ANOVA, Sampling & Test of significance.Tables and graphs of frequency, data of one variable and two variable, Relation between frequency distributions and other graphs, Preparing data for analysis.

Unit – 4 -Computer Skill- Brief history of computers, generation of computers, application of computers in research. Introduction of hardware & software of computers, operating systems and types of operating systems. – Data processing tools & techniques, Security issue of computers, use of later.

Unit – 5) – Report Writing: Use of MATLAB analysis, SPSS, GRETL in research .Introduction to evolutionary algorithms, fundamental of genetic algorithm, simulated annealing, neural network based optimization, optimization of fuzzy system. Use of excel for simple statistical calculations of central tendency, S.D. correlation, Regression, Preparation of graphics & diagrams, Factors analysis.

Reference books.

- Research methodology by Dr. C.R. Kothari
- Statistical methods by S.P. Gupta.
- Research Methodology by Deepak Chawala
- Basic Computer Engineering By Amit Kumar Mishra
- Fundamental of Computer By Anita Goel
- Fundamental of Computer By Pradeep K. Sinha
- Fundamental of Computer By E-Balagurusamy
- Introduction to Computer By V. Rajaraman
- MATLAB and its Applications in Engineering By Raj Kumar Bansal Ashok Kumar Goel Manoj Kumar Sharma

Paper -2

Subject code-MPEVS102
Environmental Study

Unit 1: Introduction: Multidisciplinary nature of environmental studies Definition, scope and importance need for public awareness.

Unit 2: **Natural Resources**: Renewable and non-renewable resources: Natural resources and associated problems. Forest resources, Water resources, Mineral resources. Food resources, Energy resources, Land resources, Role of an individual in conservation of natural resources, equitable use of resources for sustainable lifestyles.

Unit 3: **Ecosystems**: Concept of an ecosystem. Structure and function of an ecosystem. • Producers, consumers and decomposers, Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystem: - a. Forest ecosystem, Grassland ecosystem, Desert ecosystem d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit 4: **Biodiversity and its conservation**: Introduction – Definition: genetic, species and ecosystem diversity. Biogeographically classification of India • Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values • Biodiversity at global, National and local levels. , Inida as a mega-diversity nation.

Unit 5 : **Environmental Pollution** :Definition ,Cause, effects and control measures of :- a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards , Solid waste Management : Causes, effects and control measures of urban and industrial wastes, Role of an individual in prevention of pollution., Pollution case studies,Diaster management: floods, earthquake, cyclone and landslides.

References:

1. Global Biodiversity Assesment , V.H.Heywood & Watson , R.T.,
2. Environmental Hydrology by Andy. D. Ward and William J.Elliot, Lewis
3. Environmental Geography,.Valdia ,K..S(1987)
4. Physical Geography - S. Strahler ,John Wiley & Sons.
5. Singh, Samar, 1986. conserving India's Natural Heritage. Natraj Publisher, Dehradun.
6. Cox, C.B., Healey, I.N. and Moore, P.D. 1976. Biogeography 2nd Edition, Blackwell,

Oxford.
7. Earth Science - Turbuck E. J.
8. Hunter, Malcolm L. Jr. 1990. Wildlife, forests and Forestry : Principles of Managing Forests for Biodiversity, Englewood Cliffs. N. J., Prentice Hall.
9. INDP 1992. Global Biodiversity Strategy, Washington, DC, World Resource Institute

Paper -3

Subject code-MPEVS103
Social Issues and the Environment

Unit 1- .Social Issues and the Environment • From Unsustainable to Sustainable development • Urban problems related to energy • Water conservation, rain water harvesting, watershed management • Resettlement and rahabilitation of people; its problems and concerns. Case Studies • Environmental ethics : Issues and possible solutions. • Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. • Wasteland reclamation. • Consumerism and waste products. • Environment Protection Act. • Air (Prevention and Control of Pollution) Act. • Water (Prevention and control of Pollution) Act • Wildlife Protection Act • Forest Conservation Act • Issues involved in enforcement of environmental legislation. • Public awareness.

Unit 2- Human Population and the Environment • Population growth, variation among nations. • Population explosion – Family Welfare Programme. VII • Environment and human health. • Human Rights. • Value Education. • HIV/AIDS. • Women and Child Welfare. • Role of Information Technology in Environment and human health. • Case Studies.
Unit3 - Social and ethical issues: Demonstrate understanding of contemporary social and ethical issues Environmental science is by definition interdisciplinary and the text and lectures discuss economic, social, and ethic ramifications of environmental problems and their solution.

Unit 4 : Field work • Visit to a local area to document environmental assetsriver/forest/grassland/hill/mountain • Visit to a local polluted site-Urban/Rural/Industrial/Agricultural • Study of common plants, insects, birds. • Study of simple ecosystems-pond, river, hill slopes, etc.

Unit 5: Participate in democratic society as informed and civically engaged citizens The text and lectures discuss the importance of informed and engaged citizens for both recognizing and addressing the many environmental issues we all face.
References :

1. Global Biodiversity Assesment , V.H.Heywood & Watson , R.T.,
2. Environmental Hydrology by Andy. D. Ward and William J.Elliot, Lewis
3. Environmental Geography,.Valdia ,K..S(1987)
4. Physical Geography - S. Strahler ,John Wiley & Sons.
5. Singh, Samar, 1986. conserving India's Natural Heritage. Natraj Publisher, Dehradun.

6. Cox, C.B., Healey, I.N. and Moore, P.D. 1976. Biogeography 2nd Edition, Blackwell, Oxford.
7. Earth Science - Turbuck E. J.
8. Hunter, Malcolm L. Jr. 1990. Wildlife, forests and Forestry : Principles of Managing Forests for Biodiversity, Englewood Cliffs. N. J., Prentice Hall.

Paper -4
Subject code-MPEVS104
BIODIVERSITY AND CONSERVATION

UNIT 1. Introduction to Biodiversity: Need to ensure biodiversity of our planet, Biodiversity in Global and regional contest importance of biodiversity for sustainable development. Regional features of biodiversity in India. Causes of deterioration of biodiversity in India, Conservation Programme for maintenance of biodiversity of India.

UNIT 2. **Climate Geographic conditions and life :** Climatic conditions and distribution of plants and animals. – Geographical features and distribution of flora and fauna. Decreasing animal and plant diversity causes of decreasing and vanishing rate of flora and fauna at global and Nation level. Influence of global climatic changes, on biodiversity.

UNIT 3. **Forests and Zoogeographical regions of world :** Biomes, Tundra, Tropical savanna, grass land, Tropical rain forest, desert semi-desert, coniferous forest, chaparral, Temperate – deciduous and deciduous biomes. **:** Some special features of biodiversity of third world. Deterioration of biodiversity or third world. Management of biodiversity of third world.

UNIT 4. **Impact of human development on biodiversity :**Developmental activities and loss of biodiversity. Impact of pollution on biodiversity.Natural and Man made factors influencing biodiversity. Some special features of biodiversity of third world. Deterioration of biodiversity or third world. Management of biodiversity of third world.

5. **Biodiversity presentation and conservation:** Sustainable use of diversity in human development. Population, sustainable development and preservation of biodiversity. Land scape for regional diversity. Biosphere reserve, National parks, Zoos and Wildlife. Wild life refugees, gene bank and conservation of animal and plant life.

References :

1. Global Biodiversity Assesment , V.H.Heywood & Watson , R.T.,
2. Environmental Hydrology by Andy. D. Ward and William J.Elliot, Lewis
3. Environmental Geography,.Valdia ,K..S(1987)
4. Physical Geography - S. Strahler ,John Wiley & Sons.
5. Singh, Samar, 1986. conserving India's Natural Heritage. Natraj Publisher, Dehradun.
6. Cox, C.B., Healey, I.N. and Moore, P.D. 1976. Biogeography 2nd Edition, Blackwell,

Oxford.
7. Earth Science - Turbuck E. J.
8. Hunter, Malcolm L. Jr. 1990. Wildlife, forests and Forestry : Principles of Managing Forests for Biodiversity, Englewood Cliffs. N. J., Prentice Hall.
9. INDP 1992. Global Biodiversity Strategy, Washington, DC, World Resource Institute.
10. WCMC 1992. Global biodiversity : Status of the Earth;s Living Resources, Chapma

Paper -5

Subject code-MPEVS105

Literature review

A **literature review** or **narrative review** is a type of review article. A literature review is a scholarly paper, which includes the current knowledge including substantive findings, as well as theoretical and methodological contributions to a particular topic. Literature reviews are secondary sources, and do not report new or original experimental work. Most often associated with academic-oriented literature, such reviews are found in academic journals, and are not to be confused with book reviews that may also appear in the same publication. Literature reviews are a basis for research in nearly every academic field. A narrow-scope literature review may be included as part of a peer-reviewed journal article presenting new research, serving to situate the current study within the body of the relevant literature and to provide context for the reader. In such a case, the review usually precedes the methodology and results sections of the work.

SEMESTER -2

Paper -1

Subject code-MPEVS201

WILD LIFE STUDIES

UNIT 1. Wild life studies: Global status, significance and scope with particular reference to India. Global distribution, Indian wild fauna, Wildlife by products and trade, Ethical value, Scientific value, medicinal value, game and recreation value, ecological value, wild life as natural resource in India.

UNIT 2. Wild life extinction: Natural endangered species, cause of extinction, causes of accelerating rate of extinction. Species endangered due to human induced environmental change. Vulnerable species, threatened species, greatly endangered species, extended species from India.

UNIT 3. Wild life conservation: Historical background, Need of conservation projects in India. Global and National Zoos, National parks, Dangerous animals and man, Human reactions to danger our animal conservation.

UNIT 4.Wild life Management: Biological and ecological basis of wild life management, Principles of wild life management. Comparative studies on global and national wild life management, Management of game species, aquatic animals, reptiles and big mammals. Zoo management.

UNIT 5. Wild life and Tourism : Role of wild life in tourism, Global and Indian status of wild life in relation to tourism, Impact of Tourism on protected wild life. Ecological impact of wild land. National and International, Government and Non Government organizations of conservation and management of wild life. Constitutional provisions, National and International laws, Effectiveness of wild life protection act – 1992.

References :

1. Global Biodiversity Assesment , V.H.Heywood & Watson , R.T.
2. Singh, Samar, 1986. conserving India's Natural Heritage. Natraj Publisher, Dehradun.
3. Hunter, Malcolm L. Jr. 1990. Wildlife, forests and Forestry : Principles of Managing Forests for Biodiversity, Englewood Cliffs. N. J., Prentice Hall.
4. INDP 1992. Global Biodiversity Strategy, Washington, DC, World Resource Institute.
5. WCMC 1992. Global biodiversity : Status of the Earth;s Living Resources, Chapman and Hall.

Paper -2

Subject code-MPEVS202

ENVIRONMENT AND HEALTH

UNIT 1.: **Concept of Environment and Health.** Geographic approach**,**Ecological approach Biological approach,Clinical approach.

UNIT 2. Natural calamities and disease epidemiology. Earth atmosphere system and global health changes.Exogenous – endogences and anthropogonic.Disease epidemology in environmental hazards.Disaster management in relation to human health and survival.

UNIT 3: . **Environmental health hazards.** Health hazards of the Physical Environment. Health hazards of the Chemical Environment**.**Health hazards of the Biological Environment.Health hazards of the Human Environment.

UNIT 4 : **Environmental health assessment, monitoring and protection :**Health surveillance by medical examination.Monitoring exposure levels of toxic agents.Risk assessment and safety and occupational epidemiology.Health protection programme. Health services and administration. Integrated health care.

UNIT 5.Improvement in environment health conditions : A community base approach. Urbanization environmental health and related problems. Statutory provisions on environmental health and safety.Needs and priorities of improvement of environmental health.

References:

1. Environmental Geology, K. Valdia, Tata McGraw Hill Publishing House.
2. Lal D.S., Climatology, Parag Pustak Bhavan, Allahabad.
3. Moeller, Dave, W. 1992. Environmental Health. Cambridge, Mass : Harvard University Press.
4. Kathryn Hilgenkamp Environmental Health: Ecological Perspectives , Jones And
Bartlett Publishers (Sep 2005).
5. K. Park., Preventive and Social Medicine, Banarsidas Bhanot Publishers, Jabalpur.
6. May J.M., The Ecology of Human Disease, M. D. Publications, New York.

Paper -3
Subject code-MPEVS203
INDUSTRIAL POLLUTION

UNIT 1. **Present status of industrial pollution in India:** Nature of general neglect of safety measures and its ecological ill effects, Size and issues of the problem, Economics of pollution measures, legal provisions for industrial pollution control, land, river and air pollution in major industrial cities in India, Health and occupational hazards.

UNIT 2. Chemical analysis of Pollutants : Sampling of air, water and soil, analysis of gas, water and soil by using national and international standard recommended methods, detailed study of particulate matters, biological and biochemical techniques.

UNIT 3.Industrial wastewater treatment : Extension of aerobic and anaerobic methods to industrial effluents, recovery of pollutants by various physico-chemical methods like precipitation, solvent extraction,chemical conversion and biodegradable or less hazardous products, economics, ultimate use of pollutants, process plant designs.**Treatment of industrial gaseous discharges :**Process plant designs for gas and vapor treatments recovery economics.

UNIT 4 Pollution control in heavy industries :

Nature and composition of effluents, treatment methods presently applied, development of process for bringing down the pollutant levels to allowed levels and zero level, Recovery and recycle economics, Process plant designs in (a) fertilizer industry, (b) Petroleum refineries and petrochemical industries, (c) sugar and byproduct industries, (d) textile industries, (e) ferrous and non ferrous metallurgy, (f) Paper and pulp industries, (g) electroplating and metal finishing (h) production of heavy chemicals and (i) tanning industry.

UNIT 5 Strategies for developing pollution free industrial process : Need for developing alternative safe technologies, chemical methods involving elimination of highly corrosive and toxic reagents like H2SO4, Cl2 etc. Use of functional polymers, their synthesis and application in development of safe industrial processes, Use of less hazardous pathways for synthesis, Elimination of objection chemicals residues like pentachlorophenol, pesticide residues, microorganismsforming export quality consumer goods.

References :

1. Mahajan S. P. : Pollution control In Process Industries Tata Mc Graw-Hill pb. 1991.
2. Metcaff and Eddy : Waste water Engineering : Treatment, Disposal and Reuse, Tata McGraw Hill, 1999
3. Eekenfelder Jr. W. W.: Principles of water Quality Management EBI Boston, 1980.
4. Environmental Pollution Control, C.S. Rao, Wiley Eastern Ltd.,1993
5. Air Pollution Control and Engineering, De Nevers, Mc Graw Hills, 1993
6. Fundamentals of Environmental Pollution, Krishnan Khannan S.Chand & Company Ltd.,1994

Paper -4
Subject code-MPEVS204
ENVIRONMENTAL MANAGEMENT

UNIT 1. Our Environment and Problems:

- Environment man and Settlements.
- Environment and Development.
- Issues and challenges of environment..
- Natural resources : Scarcity and non-renewability.

UNIT 2.Environmental management strategies:

- Need of management.
- Management of ecosystem.
- Management of natural resources.
- Pollution management and clean environment.
- Assessment of waste-land, land use management.
- Risk assessment and management of environmental hazards.
- Surface water management and natural farming.
- Energy crisis and its management.

UNIT 3. Environment Conservation :

- Ecological basis of nature conservation.
- Conservation of natural resources.
- Alternative energy sources, Non-conventional energy sources and
- energy conservation, National park, Marine park, Eco-park, Sanctuaries
- Zoo management, conservation of biodiversity and gene bank.

UNIT 4 . Environmental management and legislation :

- Global and National environmental policy.
- Environmental laws and acts.
- Global legislation and environmental management.
- Some case studies of environmental conservation and management.

UNIT 5. Environment and Problems:

- Urbanization and related environmental problems.
- Deterioration of biodiversity.
- Environmental hazards and toxicity.
- Pollution and its management.
- Population explosion and man made global effects.
- Socio - economic environmental problems.

References :

1. Environmental Law and Policy of India ,Diwan,S. and Rosencranz, A, 2001, Oxford University Press.
2. Environmental Policy in India, Shekhar Singh, IIPA, New Delhi
3. Declaration of :The Stockholm Conference,Rio, Rio+5 and Rio +10
4. Our Common Future,WECD,1991
5. Universal Environment and Pollution Law Manual , S.K.Mohanty,1998
6. Legal Aspects of Environmental Pollution and Management , S.M.Ali,1992.
7. Environmental Protection and Laws, Jadhav and Bhosale, V.M. Himalaya publishing House.
8. Environmental Impact Assessment, Canter, L.W., 1977, McGraw Hills New York.
9. Environmental Impact Assessment, Peter Wathern ,Unwin Hywin, London.
10. Pallister, Environmental Management: A Core Text For O Level And IGCSE - Teacher's Guide (OXFORD UNIVERSITY PRESS).
11. Sivakumar, M.V.K. , Chaudhary, R.N. Environmental Management: Engineering The Water-Environment And Geo-Environment , Elsevier Science (1998).
12. Bala Krishnamoorthy, Environmental Management, Prentice-hall of India Pvt. Ltd., 1st Edition.
13. Eekenfelder Jr. W. W. : Principles of water Quality Management EBI Boston, 1980.
14. Barrow C. J. Environmental Management For Sustainable Development, Routledge Publishers, 2nd Edition.

Paper -5
Subject code-MPEVS205
Dissertation

Students individually will carry out a detail study on a topic and implement a related system. The study must include literature survey, methodology and proposed work, experimental details and results, modifications to be included and future directions, applications etc. A report is to be prepared and submitted under the guidance of a supervisor. The report should contain design, implementation and experimental details. The topics involved in the work should be related to the courses undertaken by the student till this portion of progression under the programme and have contemporary relevance. It can involve research and development oriented works and be carried out with an eye on the needs of the industry. The work must be defended through a presentation in front of a panel constituted by selected experts. The quality of the work should be reflected by at least one publication in conference proceedings/ journals etc.