



MASTER OF PHILOSOPHY IN ENVIRONMENTAL SCIENCE SESSION 2013-14

CURRICULUM

S. No	Code	Papers	Max. Marks	Ex. Hrs.
1	MPES 101	Research Methodology	100	3
2	MPES 102	Current Issues in the Environment & Pollution Control	100	3
3	MPES103	Specialization on dissertation topic on dissertation topic	100	3
4	MPES104	Dissertation	100	-

RESEARCH METHODOLOGY THEORY AND TECHNIQUES MPES 101

UNIT – I

Research: Definition – Importance and Meaning of research – Characteristics of research – Types of Research – Steps in research – Identification, Selection and formulation of research problem – Research questions – Research design – Formulation of HypoDissertation – Review of Literature.

UNIT – II

Sampling techniques: Sampling theory – types of sampling – Steps in sampling – Sampling and Non-sampling error – Sample size – Advantages and limitations of sampling.
Collection of Data : Primary Data – Meaning – Data Collection methods – Secondary data – Meaning – Relevances, limitations and cautions.

UNIT – III

Statistics in Research: Measure of Central tendency – Dispersion – Skewness and Kurtosis in research. HypoDissertation – Fundamentals of HypoDissertation testing – Standard Error – Point and Interval estimates – Important Non-Parametric tests : Sign, Run, Kruskal – Wallis tests and Mann-Whitney test.

UNIT – IV



Para metric tests: Testing of significance – mean, Proportion, Variance and Correlation – testing for Significance of difference between means, proportions, variances and correlation coefficient. Chi-square tests – ANOVA – One-way and Two-way

UNIT – V

Research Report: Types of reports – contents – styles of reporting – Steps in drafting reports – Editing the final draft – Evaluating the final draft.

Reference Books:

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| 1. Statistical Methods | S.P. Gupta |
| 2. Research Methodology Methods and Techniques | C.R. Kothari |
| 3. Statistics (Theory and Practice) | B.N. Gupta |
| 4. Research Methodology Methods and Statistical Techniques | Santosh Gupta |

CURRENT ISSUES IN THE ENVIRONMENT & POLLUTION CONTROL

MPES 102

UNIT – I

Fundamentals of environmental science: Definition – Principles & Scope of Environmental Science. Earth – Man & Environment – Ecosystems – pathways in Ecosystems. Physico – Chemical & Biological factors in the environment, Structure & composition of atmosphere – hydrosphere, lithosphere & biosphere, Natural resources – conservation – sustainable development,

UNIT – II

Environmental chemistry: Chemical composition of air: Classification of elements, chemical speciation. Chemical processes for formation of inorganic and organic particulate matter, Thermochemical & photochemical reactions in the atmosphere, Oxygen & ozone depletion, photochemical smog. Water chemistry: chemistry of water, concept of DO, BOD, COD, Sedimentation, coagulation, filtration, Redox potential. Toxic chemicals in the environment air & H₂O: Pesticides in H₂O, Biochemical aspects of Arsenic, cadmium, Mercury, carbonmonoxide, O₃, carcinogens in the air

UNIT – III



Environmental biology: Definition, Principles & Scope of ecology, Evolution, origin of life & Speciation, Ecosystems: Structure & functions, abiotic & Biotic components, Energy flow, food chains, food web & Ecological pyramid, Common flora & fauna in India: (i) Aquatic: Phytoplankton, Zooplankton & Macrophytes. (ii) Terrestrial: Forests. Endangered & Threatened species,

UNIT – IV

Environmental pollution & control: Air: Natural & anthropogenic sources of pollution, primary & Secondary pollutants, Effects of pollutants on human beings, plants, animals, materials & on climate, Methods of monitoring & control of air pollution. **Water:** Types, sources of H₂O pollution, physico-chemical & bacteriological sampling & analysis of H₂O quality, water borne diseases, Waste water treatment & recycling. **Noise:** Sources of noise pollution, Measurement of noise & indices, Noise exposure levels & standards, Noise control & abatement measures, Impact of noise on human health. **Marine:** Sources of marine pollution & control, Radioactive & Thermal Pollution

UNIT – V

Environmental management, laws & policies: Sources & generation of solid wastes, Different methods of disposal & management of solid wastes (Hospital wastes & Hazardous wastes), Environmental Policy Resolution, Legislation, Wildlife protection Act, 1972 amended in 1991, Forest conservation Act, 1980, Air (Prevention & control of pollution) Act, 1981. The water (Prevention & control of pollution) Act 1974.

UNIT – VI

Current issues & problems in environment: Environmental education & Awareness. Global Environmental Problems – Ozone depletion, global warming & climatic change. Rain water Harvesting. Waste Lands & their reclamation, Epidemiological issues (Goitre, Fluorosis, Arsenic), Bio-diversity conservation & Agenda-21

Reference Books:

1. Sharma, P.D. Ecology & Environment – Meerut: Rastogi Publications, Meerut, 1990.
2. Manivasakam, "Environmental Pollution", New Delhi, Natural Book Trust of India, 1984.
3. Dara. S.S. - Text Book of Environmental chemistry & Pollution control. S.Chand & Company.
4. Sharma. B.K. – Environmental Chemistry, Goel Publishing House
5. Biswarup Mukerjee -- Environmental Biology.