

Syllabus for Environmental Science Master's

Section 1: Subject Knowledge

Please Note: A Total of 40 Questions will be asked, combining the following topics, with the difficulty level commensurate to a Master's Candidate.

Unit I: Fundamentals of Environmental Science

the principles of ecology, environmental systems, and the interrelationships between living organisms and their physical environment, environmental pollution, climate change, sustainable development, and conservation strategies.

Unit II: Environmental Chemistry

composition and properties of environmental media (air, water, and soil), sources and behavior of pollutants, including heavy metals, pesticides, and organic compounds, the role of chemistry in biogeochemical cycles, and the effects of pollutants on ecosystems and human health.

Unit III: Environmental Biology

Scope and significance of environmental biotechnology, Current challenges in environmental sustainability, Environmental problems and biotechnological interventions, Biological treatment processes, Activated sludge process, trickling filters, and biofilm systems, and Wastewater treatment.

Unit IV: Environmental Geoscience

interactions between geology, hydrology, atmosphere, and biology, Soil formation, erosion, and sedimentation processes, Human activities on natural systems, geochemical cycles, water resources, environmental hazards, and the principles of sustainable land use.

Unit V: Energy and Environment

fundamentals of various energy sources—renewable and non-renewable and their environmental impacts, energy conversion technologies, energy efficiency, and conservation strategies, emphasizing the importance of sustainable energy practices.

Unit VI: Environmental pollution and control

types of pollutants (air, water, soil, and noise), their chemical and biological impacts on ecosystems and human health, and the regulatory frameworks governing environmental protection, pollution monitoring techniques, risk assessment, and the principles of sustainable development.

Unit VII: Solid and Hazardous Waste Management

Solid waste, including definitions, sources, and classifications, waste generation, collection, transportation, and disposal methods, Importance of waste minimization and recycling, incineration, landfilling, and bioremediation, along with the environmental impacts of improper waste disposal.

Unit VIII: Environmental Assessment, Management, and Legislation

principles and practices of assessing environmental impacts, managing natural resources sustainably, and understanding the legislative frameworks that govern environmental protection, methodologies, including Environmental Impact Assessments (EIA) and Strategic Environmental Assessments (SEA).

Unit IX: Statistical Approaches and Modelling in Environmental Sciences

Descriptive statistics, inferential statistics for hypothesis testing, regression analysis for modeling relationships between variables, statistical techniques such as multivariate analysis, spatial statistics, and time series analysis, experimental design, sampling methods, Statistical models.

Unit X: Contemporary Environmental Issues

Air, water, and soil and its effects on health and ecosystems, sustainable resource management, Renewable energy, impacts of environmental degradation on marginalized communities, and the implications of policy and regulation on environmental protection, Paris Agreement, Grassroots movements.

Section 2: Fundamental Skills

Please Note: A Total of 24 Questions will be asked, combining the following topics, with the difficulty level commensurate to a Master's Candidate.

Unit I: Data Analysis

Unit II: Math and Statistics

Unit III: Lab skills

Unit IV: Reading and Writing

Section 3: Specific Skill Proficiency

This section has more than 30 skills. You can select the ones you are proficient in from the enrollment form. You can choose a maximum of 4 skills. Each skill contains 10 questions.