SCHOOL OF BASIC SCIENCES

Syllabus for Ph.D. Entrance Examination in Environmental Sciences

Environmental Chemistry and Ecotoxicology:
Atmospheric chemistry, Chemistry of water, Chemistry of toxicants, Concept of ecotoxicology,
Routes and kinetics of toxicant uptake, Biological indicators of toxicants

Basics of Earth Sciences and Climatology:
Interior of Earth, Geomorphological processes, Geomorphological systems, Climatology: basics and temperature distribution, atmospheric pressure and wind systems, climatic classification and weather forecasting, major climates of the world, applied climatology

Concepts of Ecology and Ecosystem:
Introduction to ecology and ecosystem, Biogeochemical cycle and productivity, Principles of limiting factors, Biotic community-Principles and concepts, Population characteristics and dynamics, Population regulation structure and interaction

Remote Sensing and GIS:
Introduction to remote sensing and RS systems, Aerial photography and photogrammetry, Microwave and thermal remote sensing, Image interpretation, Geographical information system (GIS) and global positioning system (GPS)

Aquatic Environment:
Aquatic environment: basics, lentic environment- lakes and wetlands, lotic environment-streams and rivers, groundwater hydrology, estuarine and marine environment

Environmental Impact Assessment and Management:
Basic concepts of environmental impact assessment, prediction and assessment of impacts on water environment, air environment, noise environment, socio-economic and cultural environment, biological environment, life cycle assessment, eco labelling, environmental auditing, sustainable development, environmental education, ecotourism, land use planning, watershed management, rainwater harvesting, wasteland reclamation.

Environmental Pollution:
Air pollution, noise pollution, terrestrial pollution, water pollution, environmental pollution control technologies.

Environmental Microbiology and Contaminant Remediation:
Microbial environment, food microbiology, industrial microbiology, Bioremediation-overview and processes involved, bioremediation technologies, phytotechnologies for contaminant remediation

Climate Change: Science and Policies:
Understanding climate change, climate change: vulnerabilities and impacts, limiting climate change: adaptation and mitigation, policy framework on climate change, climate change and India's concerns

Natural Resources: Conservation and Management:
Forest resources, soil and minerals, wildlife and wildlife habitats, status and distribution of wildlife in India, natural resources conservation strategies and management.

Environmental Law:

Introduction to environmental laws, pollution abatement and law, environment protection and law, laws pertaining to natural resource conservation, environmental protection rules and judicial activism,

Environmental Biotechnology:

Role of environmental biotechnology for pollution control, wastewater treatment systems, biofuels, bio-insecticides, biotechnology for re-forestation, biotechniques for air pollution abatement, biofertilizers, vermitechnology, bioplastics.

Disaster Management:

Disaster: introduction, disaster management cycle, man-made disasters, biological disasters, chemical disasters, nuclear disasters, desertification, natural disasters (earthquake, volcanic eruptions, landslides, snow avalanches, cyclones, floods, drought, heat and cold waves, tsunami). disaster response, risk and vulnerability assessment, disaster preparedness, disaster mitigation, recovery.

Environmental Health Hazards & Sanitation:

Environment and health, determinants of health, health education and health situation in India, disease transmission, environmental hazards with reference to occupational hazards, communicable diseases (diarrhoea and dysentery, cholera, typhoid, tuberculosis, nosocomial infections, zoonotic infections).