University of Mysore
Ph.D Entrance Examination Syllabus
ENVIRONMENTAL SCIENCE

Unit – 1 Environmental Chemistry : Air pollution, sources of air pollutants, CFC's photochemical smog, effect of air pollution on vegetation, animals and human beings, Air pollution control measures carcinogens in the air. Global warming, Green house effect, Ozone depletion and its impact, acid rain. Water pollution – sources, heavy metal pollution noise pollutions, effect of noise pollution, prevention and control of noise pollution. Principles and applications of UV-Visible spectroscopy AAS, FES, IR, Nephelomchy, Polargrphy, GC and HPLC.

Unit – 2 Environmental Earth Science : Interior of earth; Earth systems and its interaction. Earth's Materials – Minerals and their definition, Definition of resources and reserve. Earthquakes: causes, intensity and magnitude of earthquakes; geographic distribution of earthquake zones, volcanism: nature, extent and causes of volcanism, geographic distribution of volcanoes. The hydrological cycle, and its balance. Factors influencing the surface water and characteristics of stream flow, sub-surface water.

Unit – 3 Environmental Microbiology : Classification, microbes as bioindicators of pollution, role of microorganisms in environmental pollution and management, microbes of extreme environment. Bioaccumulation and Biomagnification. Advanced techniques in detection of microbes in air, water and soil.

Unit – 4 Environmental Biotechnology – Role of biotechnology in energy production, role of environmental biotechnology in field of prevention, deduction and monitoring and genetic engineering. Application of biotechnology to environmental problems. Biosensors – Types of biosensors. Applications of biosensors. – Composting – types of composting. GMO's Bioremediation, Applications, biofilters, microchips

Unit – 5 Solid waste Management – Sources, characteristics, classification, collection, storage, segregation, transportation and disposal methods – sanitary land filling, waste prevention and recycling, commonly recycling material and processes, recovery of biological conversion products, biogasification, energy recovery, energy and hazardous waste management classification of hazardous waste, characteristics listing criteria, hazardous waste management, hazardous waste management in India, municipals solid waster management roles 2000, biomedical waste management and handling rules 1998, pyrolysis, incineration. Hospital waste – characteristics and Management

Unit – 6 Occupational Health Hazards : Occupational Environment, Physical, Chemical, Biological agent. Occupational Hazards – physical hazards, chemical hazards, Biological hazards. Occupational diseases-Pneumoconiosis-silicosis, Anthracosis, Byssinosis, Bagassosis, Asbestosis, Farmers lung, Lead poisoning, Occupational cancer, Occupational Dermatitis, Radiation hazards.

Unit – 7 Environmental Biology – Ecosystem, Homeostasis, energy flow in a lake ecosystem, Lindemen model – climatic factors, influence of light on morphology and physiology of plants, characteristics of heliophytes and sciophytes, effect of low and high temperature on plants, mechanical and physiological effects of wind, characteristics of populations, biological interaction.

Unit – 8 Remote Sensing GIS and Disaster Management : Principle of Remote Sensing and its applications to Environment, types of sensors spectral reflectance and their characteristics, products used in Remote sensing, GIS and their use for environmental monitoring.

Environmental Disaster – Types of Hazards, Hazard mitigation. Earthquake, volcanic, seismic Hazards – nature of destruction, ground subsidence, protection of earthquake and volcanic hazards, Landslides and mudflows floods and flood management, nature and frequency of flooding, man made disaster and Hazards.

Unit – 9 Biodiversity : Genetic diversity, Species diversity and ecosystem diversity, alpha, beta, and gamma diversity, endemism, significance of the endemism, Hot spots of Biodiversity, Red data book and IUCN categories, endangered species, vulnerable species. Rare species. Ecological consequences of reduction in biodiversity. Deforestation and its impact.
Causes for depletion of biodiversity in India, Sacred grooves. Biosphere Reserves – A new concept of conservation – objectives and management, *In situ* and *ex situ* conservation.

Unit – 10 EIA and Environmental Laws : Framework of Environmental Impact assessment (EIA), simple methods of identification of impacts, matrices network, checklists. Methods of impact analysis, public participation in Environmental decision making, EIA in project planning.

Legal control of Environmental pollution in India with special reference to :

i. The Wildlife protection Act – 1972
ii. The Water prevention and control of pollution Act, 1974.
iii The Forest Conservation Act, 1980.
iii. The Air prevention and control of pollution Act, 1981.
iv. The Environment protection Act. 1986.
viii. Hazardous waste management rules-1989
ix Biological Diversity Act of India, 2002