Syllabus of M.Sc. Environmental Sciences

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Section A

Earth Sciences: Structure and composition of Environment- Atmosphere, Hydrosphere and Lithosphere, Earth Processes, Mineral and Power Resources in India, Biogeochemical Cycles, Meteorology, Climate Change, Origin and evolution of earth, Mineral and Power Resources in India.

Section B

Physical and Chemical Sciences: Fundamentals, Atmospheric Chemistry, Water Chemistry, Geochemistry, Green Chemistry, Water-Physics characterstics, buffering capacity, Essential and trace elements in living systems, Bio-molecules-chemical components of cell, Bio-geochemical cycles-carbon, nitrogen and phosphorus, Hydrological cycle and global water balance, Toxicity of Heavy metals.

Section C :

Life Sciences
Origin of life: Theories of evolution, genetic drift, speciation , cell organelles, cell division, modes of reproduction, principles of inheritance, epistasis, mutations, chromosomal aberrations, extra-chromosomal inheritance.

Genetic Material: DNA structure and replication, transcription and translation, chromosome structure, protein structure, mutability and repair of DNA, reverse genetics.
Photosynthesis, Plant growth hormones, Dormancy and seed germination, Respiration.

Plant and Animal Systematics: Bryophytes, Tracheophytes, Gymnosperms, Angiosperms. Membrane structure and Ion transport, ATPase- structure and function, Photosynthesis, Photoperiodism, Vernalization, RUBISCO.

Animal systematic, physiology and diseases: Cnidaria, Echinodermata, Chordata, Protostomia; Anatomy and physiology of humans; major classes of bacterial and viral pathogens, Apoptosisand cancer, inherited diseases, animal cell culture.

Eclology and Environment: Biosphere, Organizational level of biosphere, Ecosystem: Structure and Types, Food Chain and Energy Flow, Population and community Ecology, Biodiversity andits Conservation.
Microbiology and Biotechnology: Principles of Microbiology, Microbiology of Air, Water, Soil, Sewage, Recombinant DNA technology, principles of gene cloning, transposition, applications of biotechnology in medicine, industry, agriculture and environment.

Natural resources and Management: Natural Resources-Forest, Water, Minerals Marine, Energy (Renewable and Nonrenewable)- Sources, Threats, Conservation and Management.
Global Environmental issues: Ozone depletion and Global warming, Acid rain and Smog, Sustainable Development.

Environmental Pollution: Air, Water, Soil, Noise Pollution- Sources, Causes, Effects, Consequences.
Waste Management: Solid waste- Disposal, Management; Waste of energy conservation.
Instrumentation: Principles and applications of microscopy, spectrophotometer, centrifugation, radioisotope techniques, electrophoresis and chromatographic separation techniques, Blotting and hybridization techniques.

Under Graduate Engineering Entry level qualification: 10+2 level

SN	Major Disciplines	Mandatory courses At 10+2 Level	Other relevant course(s) for This discipline
1	Civil Engineering	Phy, Chem, Maths	NA
2	Computer Science & Engineering / Computer Science &Engineering (Artificial Intelligence & Machine Learning) / Computer Science & Engineering(Artificial Intelligence & Data Science)	Phy, Maths	#For remaining single course, select any courses out of 14
3	Electrical Engineering/Electrical & Electronics Engineering / Electronics and communication Engineering	Phy, Maths	#For remaining single course, select any courses out of 14
4	Mechanical Engineering	Phy, Chem, Maths	NA
5	Architecture	As per Norms of Council of Architecture (CoA)	