Curriculum for Entry Test

M. Phil & PhD Environmental Sciences

The tentative curriculum for the M.Phil. Environmental Sciences entry test includes, but not limited to the following areas and topics of environmental sciences.

1. Introduction to Environmental Science

Basic principles: about ecology; its nature, history, scope and the contribution to society. Environmental aspects: physico- chemical, biological, socio-economic, socio-cultural, moral and ethical, and philosophical thinking. Environmental problems: local, regional and global level. Environmental challenges: Sustainability of resources for development: efficiency of energy and water resources, current and future trends in growth and resultant environmental pollution, poverty and resource depletion, development in industry, agriculture and urbanization; and other related topics.

2. Environmental Chemistry

Concept and scope of environmental chemistry. Chemical reactions, kinetics and mechanism concerning to organic and inorganic pollutants. Fundamentals of aquatic, atmospheric and soil chemistry. Acid rain & Greenhouse

effect, its causes and impacts. Ozone depletion, its causes and effects. Environmental impact of various industries; and other related topics.

3. Fundamentals of Ecology

Introduction and branches of ecology. Levels of ecological organization: species, population, community and ecosystem. Abiotic and biotic factors. Concepts of limiting factors, habitat and niche. Populations: distribution and abundance, population dynamics and distribution limits. Community: organization and various concepts, community dynamics. Ecosystem: structure and function, energy flow and material cycling within ecosystem and carrying capacity. Biomes of the world. Ecological production: primary and secondary productivity, productivity of different ecosystems; and other related topics.

4. Analytical Techniques in Environmental Science

Quality assurance in an Environmental Science laboratory. Purposes and designs of environmental sampling. Sample collection and preservation methods. Standard solutions and standard curves. Instrumentations: procedure for

Conductivitymetry, pH metery, Titrimetery, Gravimetery, Spectroscopy and Chromatography. Analysis of water, wastewater and soil/solid waste samples; and other related topics.

5. Environmental Impact Assessment

Introduction: principles, concepts and purposes of IEE and EIA and its significance for the society. Cost and benefits of EIA. Main stages in EIA process. Public consultation and participation in EIA process. Methods and techniques for impact prediction and evaluation. EIA review and post project analysis. EIA process management. EIA Regulations and guidelines in Pakistan; and other related topics.

6. Solid Waste Management

Introduction to solid waste management; Solid waste characterization: Sources, quantities, quality; Waste collection and transport; Treatment technologies: Composting: Types and methods, environmental requirements, incineration, reuse and recycling; Recent technologies used for solid waste management; and other related topics.

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7. Air and Noise Pollution

Air Pollution Essentials; The Risks of Air Pollution; Measurement and Monitoring of Air Pollution; The methodology of Air Pollution; The Regulatory Control of Air Pollution; The Engineering Control of Air Pollution; Introduction to Noise Pollution; Basic concepts of sound and noise; Noise and its effects; approaches to noise problems; Planning to control noise pollution; and other related topics.