



**University of Management and Technology, Lahore**  
**School of Science**  
**Department of Chemistry**  
**Certificate / Short /Diploma Course**

**Course Title:** Environmental Sustainability

By Dr. Sohail Nadeem

**Introduction:** Environmental sustainability is a complex and multifaceted concept that encompasses a range of interconnected issues related to the health and well-being of our planet. One of the key measures of environmental sustainability is the ecological and carbon footprint of human activity. The ecological footprint is a measure of the impact of human activity on natural resources, while the carbon footprint measures the amount of greenhouse gases emitted by human activity. Both footprints are important indicators of the sustainability of human activity and the need for action to reduce our impact on the environment.

Primary sustainability issues also include the global ecosystem, which is made up of a complex network of interconnected systems and processes that support life on Earth. This ecosystem is threatened by a range of issues, including climate change, deforestation, pollution, and loss of biodiversity. In addition to these broader sustainability issues, there are also specific concerns related to organic and inorganic pollutants, particulate matter and smog, indoor pollution and toxic gases, acid rain and its consequences, global warming, and air and water pollution. Addressing these issues requires a coordinated global effort and a commitment to sustainable practices at all levels of society.

**Objectives:**

- To learn ways in which natural resources are used to produce what they consume, such as the food they eat, the water they drink, and the energy they use.
- To understand ways in which lifestyle and well-being are interconnected with those of diverse producers and consumers around the world, including impoverished communities.
- To gain Sustainability knowledge and skills.
- To learn core concepts of ecology and develop skills relevant to their chosen field to provide a basis for environmental sustainability.
- To learn to think holistically about sustainability using perspectives across multiple disciplines.
- To understand relationships between global environmental and economic trends and their impact on diverse cultures and communities.
- To develop an integrated vision for sustainability that embraces their personal lives, professions, local communities, and the world at large.

**Learning Outcomes:**

- Demonstrate an understanding of comprehensive systemic analysis across both physical and behavioral dimensions involving society and the environment.



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- Participants demonstrate an understanding of how the health of these systems determines the sustainability of natural and human communities at local, regional, national, and global levels
- Define sustainability and assess the ways that sustainability topics are approached by a diversity of academic disciplines.
- Apply critical thinking skills to provide sustainable solutions and build resilient communities.
- Articulate a comprehensive worldview that integrates diverse approaches to sustainability.
- Learn how to solve large-scale problems using a multitude of tools and approaches.
- Understand the basic sustainability concepts of homeostasis, carrying capacity, cradle-to-grave recycling, evolutionary processes, inter-generational debt, socio-political adaptation, climate change, ecosystem services, and environmental justice—and understand the relationships between them.

**Duration:**

Four weeks two days a week. Wednesday-Friday 5 pm to 7 pm

**Eligibility/Registration Criteria:**

14 Years of Science Education

**Course Outline:**

Week No.	Session No.	Title	Course Outline
<b>Week 1</b>	<b>Session 1</b>	Introduction	One-to-one introduction Course Introduction, Teaching & Assessment Methodology Distribution of Course Outlines Discussion on Course Outline Setting up of Norms Dividing the class in 4 to 5 Study Groups which will remain till the completion of the course Introduction to Environmental Sustainability
	<b>Session 2</b>	Ecological and Carbon Footprint	Background Measuring carbon footprints Reducing carbon footprints Kyoto Protocol, carbon offsetting, and certificates Mandatory market mechanisms Solutions
<b>Week 2</b>	<b>Session 3</b>	Primary Sustainability Issues and Global Sustainability Initiatives	Education for Sustainability Education and research Symposium and workshop Competition Climate.



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			Community Development. Food. Human Health & Wellbeing. Natural Resource Management Air, Land, Water and Waste
	<b>Session 4</b>	The Global Ecosystem and Socio-Economic Issues	The Terrestrial Biomes The Tropics Arid and Semi-Arid Lands Aquatic Biomes Continental Shelf Systems Biotic Adaptations - Basic Ecological Mechanisms Human Adaptations - Cultural Ecology Impact of Global Climate Change on Biomes Direct impact Indirect impact Induced impact Supply chain
<b>Week 3</b>	<b>Session 5</b>	Organic/Inorganic pollutants, Particulate Matter and Smog	Types of pollutants Categories of pollution sources Contaminants and their sources Measurement Control Composition Size distribution of particulates Deposition processes Controlling technologies Climate effects Etymology and causes of smog Types of smog Health effects
	<b>Session 6</b>	Indoor, Air and Water Pollution and Toxic Gasses	Types and Sources Composition Health effects Radon Exposure Reduction efforts Regulations Types of air pollutants Types of water pollutants Sources of pollution Treatment technique
<b>Week 4</b>	<b>Session 7</b>	Acid Rain, Global Warming and its Consequences	Natural phenomenon Anthropogenic activities Chemical processes Effects Green House Effect Climate Change Ozone depletion Causes Solutions



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	<b>Session 8</b>	Sampling and Analysis of pollutants	Components of sampling Sampling parameters Sampling methods Analysis techniques for different compartments
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**Evaluation Criteria:**

Class Participation/Attendance:	10%
Quizzes:	20%
Assignments:	20%
Final/Project:	50%