Code	Subject Title	Cr. Hrs	Semester
BOT-401	**Air Pollution, its Impacts and Control**	**3**	**VII**
Year	Discipline		
4	**BOTANY**		

Syllabus Outline: Nature of Atmosphere, Air Pollution causing Factors and Measurements for their Remedies.

Course Outline:

Atmosphere Introduction: Nature and Scope.

Chemistry of Troposphere and Stratosphere, Primary Pollutants, Troposphere Ozone and its Impacts, Stratospheric Ozone and its Destruction, Atmospheric Aerosols; Origin, Types, Functions and Impacts, Acid Rain and its Adverse Effects.

Trace Gases and Global Warming, The Greenhouse Theory, The Culprit Gases and their Warming Potential, Estimates of Greenhouse Impacts.

Air Quality in Urban Atmosphere; Introduction. Exhaust Emissions from Motor Vehicles, Waste Heat, Primary and Photochemical Pollutants, Urban Pollution Rankings in Pakistan and other Countries, Catalyst System for Emission Control from Motor Vehicles, Organ Metallic Compounds in the Environment, (Organ Lead and Organ Mercury). The Health Effects of Environmental Pollutants, Effects on Inert Materials and General Adverse Effects.

Radiation and Nuclear Explosion: Background Information, Radiation Impact at Ecosystem Level and Comparative Sensitivity of Organisms, Fate of Radionuclides and Fall Out Problem, Disposal of Radioactive Wastes, the Lessons of Chernobyl, Nuclear Winter, Environmental Consequences of Nuclear War, Uncertainties and Recent Developments.

Control of Air Pollution; Air Quality Standards, International Air Quality Programmes, Control of Atmospheric Pollution at Source.

Module Aims: The objective of this course is to develop skills in formulating and solving problems arising from Emerging Technologies for the Energy and Industrial Waste. The course

is designed to know the Effects of Air Pollution as motivation for control of Anthropogenic Omissions to the Atmosphere.

Learning Strategies:

1. Lectures
2. Group Discussion
3. Laboratory work
4. Seminar/ Workshop

Learning Outcome: To make the student capable to design a System Component and Process for Controlling Pollution/Environmental Hazards. On completion of the course, the students are able to discuss and explain Fundamental reasons of Air Pollution, to create awareness on Pollution generated at different stage of Industries Outcome Procession.

Assessment Strategies:

1. Lecture Based Examination (Objective and Subjective)
2. Assignments
3. Class discussion
4. Quiz
5. Tests

Books Recommended:

1. **Bridgeman, H.A (2009).** *Global Air Pollution.* Belhaven Press, London.
2. **Southwick, C.H. (2007).** *Global Ecology.* Sinauer Associates, Inc. Sunderland, Massachusetts.
3. **Crawley, M.J. (2007).** *Plant Ecology* (3rd Ed.). Blackwell Science Ltd. (U.K).
4. **National Research Council, USA, (2007).** Committee on Medical and Biological Effects of Environmental Pollutants; Ozone and other Photochemical Oxidants. National Academy of Sciences, Washington, D.C.
5. **Schneider, S.H. (2005).** *Global Warming.* Sierra Club Books. San Francisco.
