Mississippi Valley State University
Natural Sciences and Environmental Health
Course Syllabus

Course: EH 340, Air Pollution
Instructor: Dr. Swatantra Kethireddy (a.k.a.: Dr. Reddy)
Class hours: MWF, 11:00 – 11:50am
Office hours: MWF, 2:00-2:50pm
T, 10:00-10:50, 11:00-11:50
R, 10:00-10:50, 11:00-11:50
Location: Science & Technology building, Room 2202
Phone: (662)-254-3394
Email: swatantra.kethireddy@mvsu.edu
Credit Hours: 3

Textbook: Introduction to air pollution science – A public health perspective, by Robert F. Phalen and Robert N. Phalen.

Description: The course is designed for students to understand the science of air pollution, its effects on human health and environment. Important basic principles and current issues are covered to provide the knowledge required in field. Students will learn about the sampling and analysis techniques, air regulations and acts. Concepts of air pollution exposure and effects on human health, toxicological studies and epidemiology of air pollution are also introduced. The traditional topics relating to the emission, transport, sampling, analysis, and control of air pollutants are covered, along with toxicology, epidemiology, risk assessment, and ethics.

Course objectives: Air pollution (EH 340) is an undergraduate course.

1) Provide an overview of the fundamental concepts of air pollution.
2) Discuss the current air pollution issues faced by humans and other species (e.g., climate change).
3) Understand the air quality issues on a global scale from historical perspective to modern issues.
4) Demonstrate the changing air quality and its effects on population health and the planet.

Class work and timeline: Tentative Schedule
Week 1
August 20: Class introduction, instructor and students meet and interact, course orientation and assignment for students.
August 22: Welcome message, and course introduction, **CHAPTER 1 – INTRODUCTION TO AIR POLLUTION**.
August 24: History, and the great air pollution disasters. Modern air pollution issues, Risks vs Benefits associated with air pollutant producing activities. Agencies involved in air pollution assessment and control, the scope of modern air pollution science.

Week 2
August 27: **CHAPTER 2 – SOURCES AND EMISSIONS OF AIR POLLUTANTS**.
Introduction, measurement basics, unpolluted vs polluted air.
August 29: ***Quiz 1 (chapter 1)***, air pollutant sources and their emissions.
September 2: pollutant transport.

Week 3
September 3: **Labor Day – No classes**
September 5**: CHAPTER 3 – IMPORTANT PROPERTIES OF AIR POLLUTANTS**
Introduction, and particle basics.
September 7: ***Quiz 2 (chapter 2)***, Particle morphology and toxicity, gases and vapors.

Week 4
September 10: Important photochemical and other reactions, primary and secondary air pollutants, uncertainties related to public health issues.
September 12: **CHAPTER 4 – SAMPLING AND ANALYSIS FOR HEALTH ASSESSMENTS**
Introduction, Quality assurance and statistical considerations, the human as an air sampler.
September 14: Particle sampling, particle analysis.

Week 5
September 17: Gas sampling, gas analysis.
September 19: **Test 1** ***(Chapter 3 and 4),***
September 21: **CHAPTER 5 – VISIBILITY, CLIMATE, AND THE OZONE LAYER**
Basic concepts – visibility, climate.

Week 6
September 24: Visibility and air pollution, climate and air pollution, stratospheric ozone.
September 26: **CHAPTER 6 – REGULATION AND ABATEMENT OF AIR POLLUTANTS**
Introduction – The justification for regulation and abatement of air pollutants, the complications, Strategic vs. tactical air quality regulations, compliance strategies, Regulatory agencies.
September 28: Air pollution regulations and quality standards; Trends, benefits, and trade offs

Week 7
October 1: Control of particulate and gaseous emissions; Case studies – coal fired power plant, automobiles and trucks.
October 2: Mid term exam preparation, Questions and discussion
October 1-5: Mid term exam (Chapters 1 – 5)

Week 8
October 8: **CHAPTER 7 – HUMAN EXPOSURES TO AIR POLLUTANTS**
Introduction
October 10: Respiratory tract compartments for inhalation considerations, pollutant deposition in the body, fates of air pollutants in the body.
October 12: Population variability, Exposure in the workplace – Exposure characteristics, Inhaled dose vs. exposure dose, exposure control methods used to protect workers.

Week 9
October 15: **CHAPTER 8 – EFFECTS ON HUMAN HEALTH**
Introduction to air pollution and health; key concepts – definition, measures, and determinants of human health, dose – response concepts and complications, acute vs. chronic exposures and effects.
October 17: Sources of health data, health effects of selected air pollutants.

October 19: Susceptible populations, sources of information on health effects of air pollutants.

Week 10
October 22: ***Quiz 3 (Chapter 6 and 7)***
October 24: **CHAPTER 9 – TOXICOLOGY STUDIES**
Introduction, definition, scope, and tools. Introduction to air pollution toxicology. In vitro studies and mechanisms of toxicity, Animal studies, Human clinical studies.
October 26: In vitro studies and mechanisms of toxicity.

Week 11
October 29: Animal studies, Human clinical studies.
October 31: Exposure methods, unsolved problems in air pollution toxicology.
November 2: ***Test 2 (Chapter 8 and 9)***
Week 12
November 5: **CHAPTER 10 - EPIDEMIOLOGY AND AIR POLLUTION**
Introduction – what is epidemiology and why is it important?
November 7: Important concepts in epidemiology
November 9: Types of epidemiological studies

Week 13
November 12: Air pollution epidemiology
November 14: Potentially susceptible sub populations
November 16: **CHAPTER 11 – RISK ASSESSMENT**
Introduction, what is risk? Air pollution risk assessment.

Week 14
November 19 – 23: Thanksgiving break

Week 15
November 26: Hazard identification, Hazard assessment. Exposure assessments, risk characterization, risk communication.
November 28: December 2: Final exam preparation (Reading days)
December 1: Final exam preparation (Reading days)
Week 16
December 3 – 7: Final Examination

Criteria for grading	% of final grade
Quizzes	15
Midterm examination	25
Final examination	40
Class attendance	10
Project report or review	10

Grading scale

90 – 100%	A
80 – 89%	B

70 – 79% C
60 – 69% D
Below 60% F

Class attendance: (See class attendance policy from the Mississippi Valley State University catalog). Students at Mississippi Valley State must fully commit themselves to their program of study. One hundred percent (100%) punctual class attendance is expected of all students in all scheduled classes and activities. Instructor keeps daily attendance records and copy of excused and unexcused absence. Students must understand that EVEN WITH AN OFFCIAL EXCUSE OF ABSENCE, THEY ARE RESPONSIBLE FOR THE WORK REQUIRED DURING THEIR ABSENCE.

Academic integrity
Full responsibility is placed on the students from the content and integrity of all academic work submitted in the form of quizzes and examinations. Copying another person's work or portions of it is a violation of academic integrity and will be handled according to Mississippi Valley State University policy.

Make-up policy
No makeup tests will be given except in cases of an immediate family member's death or personal illness in which the proper documentation must be presented to the instructor. A valid excuse slip should be submitted upon return to class. Makeup tests and quizzes must be taken no later than the second class meeting after the test date or during the same week when test or quizzes are given. If tests are not taken within the allotted time frame, the grade will be ZERO and there will be NO EXCEPTION.

Cell Phones All cell phones must be turned off or switched to vibration mode before entering the class to avoid interrupting instructor and fellow students. Penalty will be assessed if students fail to comply. Cell phones cannot be used during quizzes or exams.

Service for students with disabilities (SSD)
Mississippi Valley State University is committed to providing reasonable accommodations for students with a documented disability. If you feel you are eligible to receive accommodations for a covered disability (mental, physical, psychiatric, learning, vision, hearing, etc.) and would like to request it for this course, you must be registered with the Services for Students with Disabilities (SSD) program administered by University College. It is recommended that you visit the Disabilities office located inside the EMAP Computer Lab in the Technical Education (IT) building to register for the program at the beginning of each semester. For more information or to schedule an appointment, please contact Mr. Billy Benson, Jr. via phone or email at 662-254-3005 or billy.benson@mvsu.edu.

NOTE: Violation of academic integrity will be handled according to the Mississippi Valley State University policy.

*******This document doesn't constitute a contract with the university, it contains guidelines. Please be advised that the contents of this course syllabus are subject to change at the discretion of the instructor.***