SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE MARIE, ON

COURSE OUTLINE

Course Title: Atmospheric Pollutants

Code No.: ENV 300-3   **Semester**: IV

Program: Environmental Engineering
          Water Resources Engineering

Author: Lory Vanderzwet

Date: April 1998   **Previous Outline Date**: March 1996

Approved: _L. DeRosario_   _April 20/98_
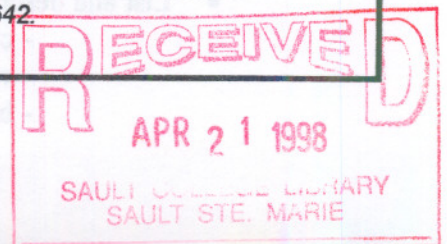   **Dean**   **Date**

Total Credits: 3   **Prerequisite(s)**: CHM 104
Length of Course: 16 wks   **Total Credit Hours**: 48

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I.   **COURSE DESCRIPTION:**

      **This course deals with the nature and effects of atmospheric pollutants and their
      control. An overview of pollutant types, effects and causes will be presented as well
      as current methods of control, monitoring and dispersion modelling.**

II.   **LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**
      (Generic Skills Learning Outcomes placement on the course outline will be determined
      and communicated at a later date.)

Upon successful completion of this course the student will demonstrate the ability to:

1)   Identify the causes and effects of common atmospheric pollutants

      Potential Elements of the Performance:

      - Describe the origins of atmospheric pollution
      - Present past air pollution episodes
      - Explain the specific causes of atmospheric pollution
      - Explain the specific effects of atmospheric pollution
      - List the types of substances that pollute the air
      - Classify pollutants based on chemical and physical make up

2)   Describe the effects of meteorological factors on atmospheric pollutants

      Potential Elements of the Performance:

      - Describe basic atmospheric properties
      - Explain wind patterns and atmospheric stability
      - Explain how atmospheric pollutants are dispersed
      - Complete atmospheric pollution dispersion calculations
      - Interpret wind and pollution roses

3)   List and describe the current control devices used in industry.

      Potential Elements of the Performance:

      - List and describe the operation of the following pollution control devices:
              - cyclones
              - wet scrubbers
              - baghouse filters

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE (Continued)

- electrostatic precipitators
- adsorption devices
- catalytic converters
- List and describe the devices used for odour control
- List and describe the devices used for noise control

4) Describe the air sampling/monitoring instruments and their use in determining the Air Quality Index (AQI)

Potential Elements of the Performance:

- List the atmospheric pollutants considered in the AQI
- Explain how the AQI works
- Describe the instruments used to determine the air borne concentration of particulate matter
- Describe the instruments used to determine the concentration of air borne gaseous matter
- Complete calculations to convert raw data from these instruments to concentrations in appropriate units
- Describe sampling and monitoring objectives

5) Discuss current legislation for atmospheric pollutants

Potential Elements of the Performance:

- List specific legislation (federal & provincial) relevant for the control of atmosperic pollutants
- Briefly explain the objectives of this legislation
- Discuss the inadequacies of current legislation

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III.   TOPICS:

1)   Causes and effects of atmospheric pollutants
2)   Particulate and gaseous pollutants
3)   Meteorological factors and dispersion modelling
4)   Air pollution control equipment and application
5)   Air monitoring systems and determination of air quality index
6)   Air pollution case studies: greenhouse effect, acid rain, ozone depletion, noise pollution

IV.   REQUIRED RESOURCES/TEXTS/MATERIALS:

Atmospheric Pollutants Study Guide, 1996, Sault College
Environmental Engineering, Peavy/Rowe/Tchobanoglous, McGraw-Hill (optional)

V.   EVALUATION PROCESS/GRADING SYSTEM

Students will be evaluated on three tests and a minimum of three assignments. One of these assignments will be a group project worth 10%.

Three term tests - 25% each -   **75%**
Assignments   **25%**

All assignments must be submitted to pass the course. Marks are cumulative and a 60% is considered a pass.

      A+ = 90 - 100%
      A = 80 - 89%
      B = 70 - 79%
      C = 60 - 69%
      R = less than 60% (REPEAT)

VI.   SPECIAL NOTES:

-   Special Needs
    If you are a student with special needs (eg. physical limitations, visual impairments, hearing impairments, learning disabilities), you are encouraged to discuss required accommodations with the instructor and/or contact the Special Needs Office, Room E1204, Ext. 493, 717, 491 so that support services can be arranged for you.

- Retention of Course Outlines
  It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other post-secondary institutions.

- Substitute Course Information is available at the Registrar's Office.

VII.   PRIOR LEARNING ASSESSMENT

Students who wish to apply for advanced credit in the course should consult the instructor.

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