

IH&S 725

Spring 2020

Lecture: Tuesday - 4:00 - 6:50; Room 105 MRB

Lecture Coordinator: Dr. Warren R. Myers Ph.D., C.I.H. [Retired].

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Office Hours: 10 AM – 12PM Mon. & Tue

Lab: Tuesday - 7:00 - 10:00; Room: Arranged

Lab Coordinator: Brandon Takacs

Suggested reference readings on reserve

- 1) Fundamentals of Industrial Hygiene, 6th Edition (2012). National Safety Council.
- 2) Air Sampling Instruments for Evaluation of Atmospheric Contaminants, 9th edition (2001). Edited by the Air Sampling Instruments Committee of the Am. Conf. of Governmental Ind. Hyg.
- 3) Available online: NIOSH Manual of Analytical Methods
(<https://www.cdc.gov/niosh/nmam/chemicals.html>)

Philosophy of the Course:

The philosophy of the course is to teach and expose students to the basic aspects of developing and conducting exposure assessments and to impress upon them their responsibility as health and safety professionals to be able to assemble information and data from the scientific literature and to evaluate that information and data to make professionally and scientifically sound decisions about the potential of or actual exposure to a worker or group of workers.

Objectives of the Course:

1. Introduce students to the elements of developing, planning and conducting an exposure assessment and developing a sound, reasoned sampling strategy.
2. Introduce students to the basic techniques they need to professionally and scientifically evaluate and analyze exposure information and data, including statistically based decision making.
3. Provide students a real-world experience of working with labor, management, and analytical laboratories to conduct an exposure assessment.
4. Give students the opportunity to setup and use spreadsheet capabilities to manage, sort, and evaluate large volumes of exposure data.
5. Guide students through the process of critically evaluating exposure assessment related material published in the professional and scientific literature.

Student Learning Outcomes for the Course:

Students completing IH&S 725 will have acquired ability to:

1. Develop and implement an exposure assessment strategy, in a real-world exposure situation, suitable to make a sound, reasoned decision about the exposure that was assessed (Program Outcome 1, 5, 6 & 8);
2. Identify and evaluate variables that effect the selection of appropriate sampling instrumentation and analytical methodology to assess exposure (Program Outcome 1);
3. Determine minimum sampling volumes, reduce impactor data and do lognormal probability calculations and plots (Program Outcome 1 & 2);
4. Calculate statistical parameters of an exposure estimate to make statistically based decisions (Program Outcome 1 & 2);
5. Critically review the scientific and professional literature on exposure assessment (Program Outcome 1 & 3);
6. Use spreadsheets to store, evaluate and analyze exposure data (Program Outcome 1 & 4); and
7. Prepare a presentation of their exposure assessment using presentation software (Program outcome 1 & 8).

Method of Instruction:

IH&S 725 includes both a lecture and laboratory experience. The laboratory incorporates a field experience conducted under the mentorship of the plant occupational safety and health professional and the course coordinator, both of which will generally hold the C.I.H., C.S.P, or other professional certification. The lecture experience incorporates three hours of lecture each week of the semester. The laboratory experience incorporates three hours of laboratory each week of the semester which is used for several laboratory demonstration/activities and the field experience.

NOTE:

- 1. Depending on weather and my travel, lecture schedules may need to be revised.**
- 2. You are expected to have access to a computer with spreadsheet software and will need a basic knowledge of spreadsheets and formula writing in a spreadsheet.**
- 3. You are expected to have access to a computer with presentation software and be able to prepare a presentation using such software.**
- 4. If you do not have spreadsheet or presentation software skills, you will be expected to acquire them to a level enough to complete the class assignments.**

Lecture Schedule:

- 1/14 Introduction and course projects; Air sampling project discussion; Review of IH calculations and Gas Laws; FIH-15
- 1/21 The Exposure Assessment Process: FIH-15; ASI-1
- 1/28 Strategies for Exposure Assessment: ASI-2
- 2/4 Aerosol; ASI-5&13 and Gas and Vapor Sampling: FIH-16&17; ASI-16,17, &18
- 2/11 1st exam
Aerosol and Gas and Vapor Sampling continued: FIH-16&17
- 2/18 & 25
Developing the Assessment Strategy: ASI-1,2, &10
 1. Selection of instrumentation and analytical method
 2. Accuracy and precision and sources of sampling errors
 3. Minimum sample volumes
 4. Introduction of a sampling database and the spreadsheet project
- 3/3 Developing the Assessment Strategy
 1. Sample representativeness and quality
 2. Preparation of known concentrations
- 3/10 2nd Exam
Introduction of the exposure database project
- 3/17 Spring Break
- 3/24 & 3/31
Developing the Assessment Strategy - Sample data reduction and interpretation
lognormal distributions, standard normal distributions
 1. geometric means and geometric standard deviations
 - a. determined by calculation
 - b. determined by plotting
- 4/7 3rd exam
Impactor data analysis: ASI-14
- 4/14 & 4/21
Confidence limits, tolerance limits, exposure fractions, compliance decisions
- 4/28 Article Reviews & Exposure Analysis Presentations
- 5/6 Final exam 8 - 10 am

Grade Allocation:

- Exams -----30%
- Final -----15%
- Homework & quizzes -----20%
- Exposure Database Report -----10%

Article Review-----	5%
Sampling Project	
Final Report-----	15%
Presentation-----	5%

Grade Scale:

- A = 90 – 100 %
- B = 80 – 89 %
- C = 70 – 79 %
- D = 60 – 69 %
- F = < 60 %

Academic Integrity Statement:

The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, instructors will enforce rigorous standards of academic integrity in all aspects and assignments of their courses. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the West Virginia University Academic Standards Policy (<http://catalog.wvu.edu/graduate/>). Should you have any questions about possibly improper research citations or references, or any other activity that may be interpreted as an attempt at academic dishonesty, please see your instructor before the assignment is due to discuss the matter.

Academic Standards Policy including Academic Dishonesty:

The WVU Catalog contains the full Academic Standards Policy. Resources for Faculty and Students for Reporting and Appealing Violations of Academic Standards are available at the following link. (<https://provost.wvu.edu/governance/academic-standards-resources>)

Anyone found cheating on an exam, assignment, labs or copying electronic data or programs etc. will be given a 0 on that activity and a formal report will be made to the department Chairperson. Working together on assignments is encouraged; however, each student must turn in their own work.

Social Justice Statement:

West Virginia University is committed to social justice. I concur with that commitment and expect to foster a nurturing learning environment based upon open communication, mutual respect, and non-discrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color or national origin. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration.

If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangements with Disability Services (293-6700).