



SCHOOL OF PUBLIC HEALTH  
UNIVERSITY OF MINNESOTA

**PUBH 6175**  
**Industrial Hygiene Measurements Laboratory**  
**Spring Semester 2006**

**SYLLABUS**

**Summary**

One of the primary roles of an industrial hygienist is to evaluate the exposures of workers to potentially hazardous chemical, physical, and biological agents. This evaluation will often require measurements of the quantities of these hazardous agents present in the workplace, particularly in the air the workers breathe. This course will consist of short lectures and demonstrations followed by laboratory exercises to help students learn about a broad array of sampling instruments and procedures and data analysis techniques. It will emphasize the practical application of industrial hygiene concepts and methods. The course will include a project in which the students will conduct a sampling study, make oral and poster presentations of their findings, and write a short guideline on how workers should perform the task being sampled to minimize the relevant exposures.

**Course Information**

Wednesdays, 12:20 – 4:25 PM

Boynton Health Service, Industrial Hygiene Laboratory, Room S55 (Sub-basement)

2 credits

**Instructor Information**

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## **Course Materials**

Laboratory instructions and assignments required for laboratory sessions will be posted on the course's WebCT Vista page through <http://webct.umn.edu>. Supplemental readings may be specified; some may be from Dr. Ramachandran's book *Occupational Exposure Assessment for Air Contaminants* (ISBN 1-56670-609-2) and others from web resources or set aside in the Bio-Medical Library. Books on reserve in the library include a useful text summarizing many industrial hygiene sampling devices entitled *Air Sampling Instruments for Evaluation of Atmospheric Contaminants, 9<sup>th</sup> Edition* (ISBN 1-882417-39-9) published by ACGIH in 2001 and *The Occupational Environment – Its Evaluation and Control* (ISBN 0-932627-82-X) edited by S.R. DiNardi and published by AIHA in 1997.

## **Course Objectives**

By the end of the course, students should be able to:

- select appropriate sampling methods and equipment to evaluate the potential risks of workplace exposures
- utilize common sampling and analytical methods to evaluate workplace exposure to a variety of occupational health hazards
- use concepts, vocabulary, and calculations relevant to industrial hygiene measurements
- perform measurements, evaluations, and analyses based on the understanding of the scientific principles underlying industrial hygiene
- work individually or in small groups to solve complex industrial hygiene sampling problems
- communicate and present data and experimental results
- describe common difficulties associated with measuring workplace hazards

## **Course Grading**

The course will include 8 laboratory exercises. Three of the lab assignments will span two sessions, meaning that a total of 11 sessions will be spent performing lab exercises. Students are expected to turn in a laboratory report for each of the 8 exercises describing their methods, reporting data and results, and discussing questions posed in the assignments. Reports will be due within two weeks of the conclusion of the in-class portion of the assignment. The reports will be graded on a 100-point scale. Grades will be reduced by 5 points for each weekday that the assignment is late. The course will not have any exams.

A small exposure evaluation study will be carried out by each student at the Regis Center for Art on the University of Minnesota's West Bank Campus. Mike Austin, an industrial hygienist in the university's Department of Environmental Health and Safety and an adjunct faculty member, will help to set up these projects. Students are required to carry out the measurements and data analysis required for the study. The products of this work will include a poster shown during the final class session and an oral presentation of the information shown in the poster. The poster and oral presentation should include the aims of the study, the methods used, the results, and a discussion of implications. In addition, students will be required to write a 1-2 page guideline describing how the task being evaluated should be performed to minimize exposure to the hazard or hazards of interest

The neatness of all work will be taken into consideration during grading; reports that are easy to read help the instructors follow the students' reasoning more easily. Partial credit will be awarded wherever possible, so reasoning and calculations leading to an answer should be provided when appropriate.

The breakdown of grading for the course is:

Laboratory reports	72 %
Project poster	12 %
Project oral presentation	6 %
Project written guideline	10 %

Final grades will be assigned on an A/F basis as follows:

A	(93-100 %)	Outstanding achievement relative to course expectations
A–	(90-93 %)	
B+	(87-90 %)	
B	(83-87 %)	Achievement above minimum course expectations
B–	(80-83 %)	
C+	(77-80 %)	
C	(73-77 %)	Achievement meeting the minimum course expectations
C–	(70-73 %)	
D+	(67-70 %)	
D	(60-67 %)	Achievement below minimum expectations, but sufficient for credit
F	(< 60 %)	No credit awarded

### **Content of Laboratory Reports**

Reports should be produced electronically. The report must be no longer than 8 pages. A shorter report is fine if it covers all requirements!!

1. Title, name, and date.
2. A Background section providing the purpose of the experiment, principles and theory, and calculation formulae (1 page or less).
3. Methods section including a short discussion of the instruments and devices used, a diagram of the experimental set-up, and description of the experimental procedure (2 pages or less).
4. Results & Discussions sections with data in tabular form; figures; qualitative and, wherever possible, quantitative analyses of errors and variability; and answers to questions posed in the laboratory assignment (no more than 5 pages).
5. Conclusions (less than ½ page).

### **What the Instructors Expect from Students**

- Students are expected to attend all classes and to arrive on time.
- Students will comply with all laboratory health and safety requirements.

- Students should review laboratory instructions and assignments prior to class.
- Students will download handouts and laboratory instructions and assignments from the course's WebCT Vista page at <http://webct.umn.edu>
- Students should bring a calculator to all classes.
- Students are responsible for asking questions and/or letting instructors know when they do not understand lectures, laboratory instructions, or course materials.
- Although students will work together to produce data in the laboratory and may discuss data analysis procedures required for laboratory reports, each student's report is expected to reflect primarily individual analyses and consideration of the data.
- Laboratory reports must be written using word processing and graphics software.
- Students may discuss their projects with one another and others, but they must show their own work in their project reports and presentations.
- Students are encouraged to provide constructive feedback to the instructors when they are dissatisfied with the course content or teaching methods.

### **What Students Should Expect from the Instructors**

- The instructors will be enthusiastic about the class and the subject matter.
- The instructors will begin and conclude sessions on time.
- The instructors will state objectives for each session.
- The instructors will answer all questions posed during class by students. Whenever possible, questions will be answered immediately. Otherwise they will be answered during the next session.
- The instructors will ensure that all discussions in class are conducted in a professional and collegial manner.
- The instructors will create assignments with clear expectations.
- The instructors will provide detailed explanation regarding the use of equipment and methods in the experimental exercise to be performed.
- The instructors will prepare the laboratory equipment and experimental set-up prior to class.
- The instructors will grade and return assignments within one week of submission.
- The instructors will provide feedback on assignments that identifies both strengths and weaknesses in student work with constructive suggestions for improvement.
- The instructors will make themselves available outside of class to discuss any aspect of the course with students.

### **Additional Information**

Every class is influenced by the fact that participants bring diverse values, experiences, and abilities into the classroom. All participants will be expected to listen to those with differing views, disagreeing with the views while remaining respectful of the individuals who hold them. Students should feel free to question the instructors and each other collegially at any time.

School of Public Health students may withdraw from a course through the second week of the semester without permission. No "W" will appear on the transcript. After the second week students are required to do the following:

- The student must contact and notify their advisor and course instructor informing them of the decision to withdraw from the course.
- The student must send an e-mail to the SPH Student Services Center (SSC). The email must provide the student name, ID#, course number, section number, semester and year with instructions to withdraw the student from the course, and acknowledgement that the instructor and advisor have been contacted.
- The advisor and instructor must email the SSC acknowledging the student is canceling the course. All parties must be notified of the student's intent.
- The SSC will complete the process by withdrawing the student from the course after receiving all emails (student, advisor, and instructor). A "W" will be placed and remain on the student transcript for the course.

After discussion with their advisor and notification to the instructor, students may withdraw up until the eighth week of the semester. There is no appeal process.

An incomplete grade is permitted only in cases of extraordinary circumstances and following consultation with the instructor. In such cases an "I" grade will require a specific written agreement between the instructor and student specifying the time and manner in which the student will complete the course requirements. Extension for completion of the work will not exceed one year.

Students are responsible for knowing the University of Minnesota Board of Regents' policy on student conduct and scholastic dishonesty:

<http://www.umn.edu/regents/policies/academic/StudentConductCode.html>. Scholastic dishonesty as defined in the policy and will be reported to the Office of Student Judicial Affairs: <http://www.sja.umn.edu/> and will result in a grade of "F" or "N" for the entire course. Plagiarism is an important element of this policy. It is defined as the presentation of another's writing or ideas as your own. Serious, intentional plagiarism will result in a grade of "F" or "N" for the entire course. For more information on this policy and for a helpful discussion of preventing plagiarism, please consult University policies and procedures regarding academic integrity: <http://writing.umn.edu/tww/plagiarism/index.htm#resources>. Students are urged to be careful that they properly attribute and cite others' work in their own writing. For guidelines for correctly citing sources, go to <http://tutorial.lib.umn.edu/> and click on "Citing Sources". In addition, original work is expected in this course. It is unacceptable to hand in assignments for this course for which you receive credit in another course unless by prior agreement with the instructor. Building on a line of work begun in another course or leading to a thesis, dissertation, or final project is acceptable. If you have any questions, consult the instructor.

Any student with a documented disability (e.g., physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the instructor and Disability Services at the beginning of the semester. All discussions will remain confidential. For further information contact the University of Minnesota Disability Services website at <http://ds.umn.edu/> or call 612/626-1333 (V/TTY)