

Industrial Hygiene Spring 2019

IH&S 725 – Industrial Hygiene Sampling and Analysis

Instructor: Xinjian “Kevin” He, Ph.D.
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Time: 4:00-6:20pm, Tuesday
Classroom: MRB – Room 107
Office Hours: 10:00-12:00pm, Tuesday
Prerequisites: IENG 561 or OEHS 620, and STAT 511, or Consent of Instructor

Reference materials for the class:

Fundamentals of Industrial Hygiene, 6th Edition (2012). National Safety Council. ISBN: 978-0879123123.

Industrial Hygiene Evaluation Methods, 2nd Edition (2004). Edited by M.S. Bisesi and J. P. Kohn; Published by CRC Press. ISBN: 978-1566705950.

NIOSH Manual of Analytical Methods 5th Edition.
(<https://www.cdc.gov/niosh/nmam/chemicals.html>)

Syllabus

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).

Methods of Instruction:

IH&S 725 includes both a lecture and laboratory/field 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 incorporate three hours of lecture each week of the semester. The laboratory experience incorporates two hours of laboratory each week of the semester which is used for the field experience.

Notes:

Depending on the availability of laboratories guest lecturers, lecture schedules may need to be revised.

You are expected to have access to a computer with spreadsheet software and will need a basic knowledge of spreadsheets.

You are expected to have access to a computer with presentation software and be able to prepare a presentation using such software.

Course Schedule:

Date	Lecture	Class Topics
Jan. 8	Lecture 1	Course Overview; Review of IH calculations and Gas Laws
Jan. 15	Lecture 2	Analytical Methods; Exposure Assessment Strategy <i>/ Overview on Field Sampling Project</i>
Jan. 22	Lecture 3	Aerosol Sampling
Jan. 29	Lecture 4	Gas and Vapor Sampling
Feb. 5	Lecture 5	Sample Quality Assurance
Feb.12	Lecture 6	Intro to Sampling Statistics
Feb. 19	Lecture 7	Descriptive Statistics – Part I
Feb. 26		Midterm Exam
Mar. 5	Lecture 8	Occupational Exposure Models / Control Banding
Mar. 12		Spring Break – No Class
Mar. 19	Lecture 9	Descriptive Statistics – Part II
Mar. 26	Lecture 10	Compliance Statistics
Apr. 2	Lecture 11	<i>Individual Presentation on Research Article Review</i>
Apr. 9	Lecture 12	Respiratory Protection
Apr. 16	Lecture 13	<i>Field Sampling Project Presentation</i>
Apr. 23		Final Exam (Sampling Project Report Due)

Grade Allocation

Attendance/ Homework:	15%
Research Article Presentation:	5%
Midterm Exam:	30%
Final Exam:	30%
Field Sampling Project:	20%

Total: **100%**

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

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/undergraduate/coursecredittermsclassification) (<http://catalog.wvu.edu/undergraduate/coursecredittermsclassification>). 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](#)

Adverse Weather Statement

In the event of inclement or threatening weather, everyone should use his or her best judgment regarding travel to and from campus. Safety should be the main concern. If you cannot get to class because of adverse weather conditions, you should contact your instructor as soon as possible. Similarly, if your instructor(s) are unable to reach the class location, they will notify you of any cancellation or change as soon as possible, using agreed upon methods to prevent students from embarking on any unnecessary travel. If you cannot get to class because of weather conditions, instructors will make allowances relative

to required attendance policies, as well as any scheduled tests, quizzes, or other assessments. [adopted 9-8-2014]

Attendance Policy

The WVU Catalog contains the full [Attendance Policy](#).

Campus Safety Statement

The WVU Police are committed to creating and maintaining a safe learning environment for all students, faculty, and staff. Part of this mission includes educating the campus community on how to respond to potential campus threats, such as the threat of an active shooter on campus or other suspicious behaviors. Fortunately, WVU Police offer training - both online and in-person - on how to handle a variety of campus safety scenarios. All students are encouraged to visit the [WVU Police](https://police.wvu.edu/) webpage, in particular the content under the [Active Shooter](https://police.wvu.edu/training) training program. Students are also encouraged to report any suspicious behaviors on campus using the [Report a Threat](https://police.wvu.edu/emergency-management/threat-assessment) portion of the webpage. Additional materials on campus safety prepared by WVU Police, including special safety tips and training, will also be provided on our eCampus page. [adopted 10-2-17]

Inclusivity Statement

The West Virginia University community is committed to creating and fostering a positive learning and working environment based on open communication, mutual respect, and inclusion.

If you are a person with a disability and anticipate needing any type of accommodation in order to participate in your classes, please advise your instructors and make appropriate arrangements with [the Office of Accessibility Services](https://accessibilityservices.wvu.edu/).

More information is available at the [Division of Diversity, Equity, and Inclusion](https://diversity.wvu.edu/) as well. [adopted 2-11-2013]

Incomplete Policy

The WVU Catalog contains the full [Incomplete Policy](#).

Sale of Course Material Statement

All course materials, including lectures, class notes, quizzes, exams, handouts, presentations, and other course materials provided to students for their courses are protected intellectual property. As such, the unauthorized purchase or sale of these materials may result in disciplinary sanctions under the [Student Conduct Code](https://studentconduct.wvu.edu/policies-and-procedures). [adopted 5-11-2015]

Sexual Misconduct Statement

West Virginia University does not tolerate sexual misconduct, including harassment, stalking, sexual assault, sexual exploitation, or relationship violence [[BOG Rule 1.6](#)]. It is important for you to know that there are resources available if you or someone you know needs assistance. You may speak to a member of university administration, faculty, or staff; keep in mind that they have an obligation to report the incident to the [Title IX Coordinator](https://titleix.wvu.edu/staff). (<https://titleix.wvu.edu/staff>)

If you want to speak to someone who is permitted to keep your disclosure confidential, please seek assistance from the [Carruth Center](#), **304-293-9355** or **304-293-4431** (24-hour hotline), and locally within the community at the [Rape and Domestic Violence Information Center](#) (RDVIC), **304- 292-5100** or **304-292-4431** (24-hour hotline).

For students at WVU-Beckley, contact the [Women's Resource Center](#) at 304-255-1585 (toll free at 1-888-825-7836) or [REACH](#) at 304-340-3676. For students at WVU-Keyser, contact the WVU-Keyser [Psychological Services Office](#) at 304-788-6976, and locally in Keyser, the [Family Crisis Center](#), 304-788-6061 or 1-800-698-1240 (24-hour hotline).

For more information, please consult [WVU's Title IX Office](https://titleix.wvu.edu/confidential-resources) (<https://titleix.wvu.edu/confidential-resources>).

Student Evaluation of Instruction Statement

Effective teaching is a primary mission of West Virginia University. Student evaluation of instruction provides the university and the instructor with feedback about your experiences in the course for review and course improvement. Your participation in the evaluation of course instruction is both strongly encouraged and highly valued. Results are strictly confidential, anonymous, and not available to the instructor until after final grades are released by Admissions and Records. Information about how you can complete this evaluation will be provided by your instructor. [adopted 4-14-2008]