

COURSE SYLLABUS

OEH 6752 OCCUPATIONAL HAZARDS CONTROL

Semester:	Spring 2017
Credit hours:	2 credits
Class Hours:	Friday, 2-4 pm (9 am-1 pm for lab days)
Class Location:	CHB 437
Instructors:	Jun Wang, Ph.D.
Office:	CHB 425
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Email:	Jun-Wang@ouhsc.edu
Office Hours:	Tuesday, 2-4 pm

Course Description

The course will introduce students to the fundamental principles of ventilation and other engineering technologies to control occupational hazards (mostly gas/vapor and aerosol, but also heat stress and noise). Basic chemical and physical sciences will be covered in the course. The course prepares students to have an in-depth knowledge of selecting, designing, operating, and diagnosing industrial exhaust ventilation systems (general dilution ventilation, single-branch, and multi-branch exhaust ventilation). The course will also discuss worker protection strategies, management issues, and implementation skills.

Prerequisites

OEH 5723 Fundamentals of IH/EHS (Special enrollment permission can be requested from Dr. Wang.)

MPH students who do not possess strong quantitative background and wish to take this course as an elective must consult with Dr. Wang.

Course Learning Objectives

Upon completion of the course, students should be able to:

1. Describe the functions and appropriate industrial applications of general and local exhaust ventilation systems.
2. Perform calculations related to contaminant generation, buildup, and decay in a ventilated space.
3. Understand the principles and get familiar with devices to measure air flow such as anemometer and manometer.
4. Design single-branch and multi-branch industrial local exhaust ventilation systems.
5. Evaluate the performance of dilution and local exhaust ventilation systems.
6. Identify elements of good and bad industrial ventilation system design and the solutions to fix them.
7. Select personal protective equipment appropriate to specific occupational exposure scenarios.

Conduct of the Course

The course consists of lectures and laboratories, quizzes and homework, and exams. All lectures and handouts will be posted on D2L. Hard copies of handouts will be provided in class. A calculator is required for the lectures and exams. Students are encouraged to bring in their laptop (but no gaming or Facebook). Food and drinks are allowed since this class happens during lunch time.

A simple pre-class quiz is required for most but not all lectures, to ensure you reviewed the course materials prior to the class. The questions will cover materials in the textbook chapters. The quiz is due at noon before the class starts. No quiz will be dropped under any circumstance.

Homework will be posted online after every class, and is due by the next class. Homework is designed as individual homework, however moderate discussion is acceptable. The fully understanding about homework question is essential for the exams. Homework needs to be turned in as unbound hard copy.

Exams will be conducted in class, open book, with formula sheets provided. Each exam will have both multiple choice and calculation questions. Most calculations will test mastery of the principles learned from the course. The questions will be similar but not identical to the homework problems, so practicing with homework questions are encouraged. Emphasis of each exam is not cumulative, although understanding about the already-covered materials are always necessary. Some exams have bonus questions, but your score will not exceed the total (15 points). Make-up exams will be given only in extraordinary circumstances. If you expect to miss exam(s), please discuss with Dr. Wang ahead of time.

Lab I, II, and III will be a part of the OEH 5743 class. The students who are not currently enrolled in OEH 5743 need to make them available during the time slots of the labs (9 am-1 pm). Student who is currently taking, or already took OEH 5743 or equivalent class can get a waiver to attend the lab from Dr. Wang.

Method of Evaluation and Grading

Grades will be based on the following:

1. Exams: 45%. (15 points per each exam)
2. Quizzes: 10% (1 point per each quiz)
3. Lab attendance: 15% (5 points per each lab)
4. Homework assignments: 30% (3 points per each homework)

Letter grades will be assigned as follows:

A: >89.5%; B: 80~89.5%; C: 70~79.5%; D: 60~69.5%; F: <60%.

Students can track their grade and performance through the semester on D2L. No extra credits, no curve or bump up the borderline grades, every student will get the same treatment.

Course Materials

Required Textbook:

Ventilation for control of the work environment, 2nd Edition

by William A. **Burgess**, Michael J. **Ellenbecker**, Robert D. **Treitman** (will be referred as **BET** in this course)

ISBN-13: 978-0471095323 ISBN-10: 047109532X

Optional Readings:

Handbook of ventilation for contaminant control, 3rd Edition

by Henry J. **McDermott** (will be referred as **McD** in this course)

ISBN-13: 978-1882417384 ISBN-10: 1882417380

Industrial Ventilation: a manual of recommended practice for design, 26~28th Edition

by ACGIH (will be referred as **Manual** in this course)

ISBN-13: 978-1607260134 ISBN-10: 1607260131

Some handouts based on **McD** and **Manual** will be provided on D2L. However, if you seriously consider becoming an industrial hygienist, think about purchasing the **Manual** and do not forget to ask for ACGIH student discount.

Course Outline

Date*	Topics	Lecturer	QZ (10%)	HW (30%)	BET Chapter
1/20	Course overview Math & physics review	JW	-	1	-
1/27	General exhaust ventilation	JW	1	2	4
2/3 (9a-1p)	LAB I: Buildup and decay (5%)	EF	-	-	Handouts
2/3	Principle of airflow & measurement	JW	2	3	2,3
2/10	Local exhaust ventilation hood design	JW	3	4	5
2/17	Exam I (15%)				
2/24	System design: single-branch	JW	4	5	8
3/3	System design: single- & multi-branch	JW	5	6	8,9
3/10	System design: multi-branch	JW	6	7	9
Spring break week – no class					
3/24 (9a-1p)	LAB II: Airflow measurement and ventilation (5%)	EF	-	-	Handouts
3/24	System design: Fan types, selections, and laws	JW	7	8	10
3/31	Exam II (15%)				
4/7	Specialty hood and air cleaner Replacement air and re-entry prevention, air cleaner	JW	8 9	9**	6,7 11, 12, 15
4/14	Troubleshooting; ventilation economics	JW	10	9**	13, 14 Handouts
4/21	Heat stress & control	JW	-	10	-
4/28	Personal protection equipment Control banding	JW	-	-	Handouts
5/5 (9a-1p)	Lab III: PPE fitting test (5%)	EF	-	-	Handouts
5/5	Reading day, no class				
5/12	Exam III (15%)				

* JW : Dr. Jun Wang; EF: Dr. Evan Floyd (instructor of OEH 5734)

** HW9 will cover both lectures.

Course Policy Statements

This syllabus is intended as a guide for this course. Dates, assignments, and evaluation are subject to revision by the instructor. Any such revisions will be announced in advance.

Copyright. This syllabus and all related course material are protected under US Copyright Law and may not be further disseminated in any form or format without the prior explicit written consent of the faculty member. Failure to comply with this provision may subject the student to disciplinary action and/or state or federal action.

Student Professional Behavior in an Academic Program. Ethical and professional behaviors are considered a core competency in an academic program and, thus are key factors in good academic standing. Upon acceptance of an offer of admission, the student commits to comply with all professional conduct regulations established by the University, respective college, and program. The complete University policy is at www.ouhsc.edu/provost/documents/FacultyHandbookOUHSC.pdf

Academic Misconduct Code. The code describes academic misconduct as acts intended to improperly affect the evaluation of a student's academic performance or achievement and includes but is not limited to acts such as cheating, plagiarism, fabrication, fraud, destruction, bribery or intimidation, assisting others in any act proscribed by this Code, or attempting to engage in such acts. The policy and procedures related to academic misconduct are detailed in the Academic Misconduct Code found in Appendix C of the Faculty Handbook at www.ouhsc.edu/provost/documents/FacultyHandbookOUHSC.pdf

Academic Appeals. This policy outlines the procedure to request a hearing for appeals related to evaluation in a course, thesis or dissertation defense, general or comprehensive exam. It also outlines the appeal process for a suspension or dismissal or under the Student Professional Behavior in an Academic Program Policy, and the appeal of decisions resulting in dismissal, expulsion, or suspension from a program. The sole basis for an academic appeal is an alleged prejudiced or capricious evaluation or decision. Policy and procedure details are in Appendix C of the Faculty Handbook at www.ouhsc.edu/provost/documents/FacultyHandbookOUHSC.pdf

Accommodation on the Basis of Disability. The University of Oklahoma is committed to the goal of achieving equal educational opportunity and full participation for students with disabilities. Accommodations on the basis of disability are available by contacting the Disability Resource Center (DRC) by email at drc@ou.edu. or by calling (405) 325-3852 or Voice or (405) 325-4173/TDD. Information on policies and registration with the Disability Resource Center may be found on the DRC website at: www.ou.edu/drc. Students requesting accommodations related to work in a course must contact the DRC as soon as possible; accommodations are not made retroactively.

Sexual Misconduct. For concerns regarding gender-based discrimination, sexual harassment, sexual misconduct, stalking, or intimate partner violence, the University

offers a variety of resources, including Advocates-On-Call 24/7, counseling services, mutual “No Contact orders,” scheduling adjustments, and disciplinary sanctions against the perpetrator. Please contact the Sexual Misconduct Office at (405) 325-2215 (8AM-5PM) or the Sexual Assault Response Team at (405) 605-0013 (24/7).

Adjustment for Pregnancy/Childbirth Related Issues. Students needing modifications or adjustments to course requirements because of documented pregnancy-related or childbirth-related issues should contact the college’s Assistant/Associate Dean for Student Affairs (or academic advisor) as soon as possible to discuss. Generally, modifications will be made where medically necessary and similar in scope to accommodations based on temporary disability. See www.ou.edu/content/eoo/pregnancyfaqs.html for commonly asked questions.

Course Drop/University Withdrawal. The student is responsible to submit required University paperwork before the deadlines shown in the Academic Calendar online at <http://ouhsc.edu/admissions>. Missed homework and examination grades will be entered as a grade of zero if a student fails to formally drop the course or withdraw from the University.

HIPAA Compliance. The University of Oklahoma complies with all federal and state laws related to the confidentiality of patient medical information, including the Privacy and Security Regulations issued pursuant to the Health Insurance Portability and Accountability Act (HIPAA). Students are required to comply with these laws and related University policies and procedures, including the HIPAA Privacy and Security policies (<http://ouhsc.edu/hipaa/policies.asp> and <https://www.ouhsc.edu/compliance/hipaa-security-policy/default.asp>). Students are required to complete the University’s mandatory annual HIPAA training (<http://ouhsc.edu/hipaa/>) and must also comply with the related policies and procedures of their departments and any facilities in which they rotate.

Responsible Conduct of Research. Students, as members of the University community, have the responsibility to ensure that integrity and ethical standards in any activity with which they are associated directly or any activity of which there is sufficient knowledge to determine its appropriateness. Students are governed by the Policy on Ethics in Research (Faculty Handbook Section 3.25) at <http://www.ouhsc.edu/provost/documents/FacultyHandbookOUHSC.pdf>.

Information for students regarding the ABET outcomes

In addition, the course will cover the following ABET outcomes for M.S. in industrial hygiene/Environmental Health Sciences outcomes:

ID	Outcomes	Primary/ Reinforce
IHGen A	Apply knowledge of mathematics, science, and applied sciences.	R
IHGen C	Formulate or design a system, process, or program to meet desired needs.	P
IHGen E	Identify and solve applied science problems.	P
IHSpec B	Describe qualitative and quantitative aspects of generation of agents, factors, and stressors.	R
IHSpec F	Recommend and evaluate engineering, administrative, and personal protective equipment controls and/or other interventions to reduce or eliminate hazards.	P
IHSpec G	Understand applicable business and managerial practices, based in part on field experience.	R
IHSpec H	Interpret and apply applicable occupational and environmental regulations.	R
IHSpec J	Attain recognized professional certification.	R - Rubric: Engineering controls, non- Engineering Controls