
EIH 8035 / MECH 6050 Ventilation for Safety and Health

Meeting Days/Times: Wednesday 4 – 5 pm

Meeting Location: Kettering G-17

Prerequisites: None

Instructor: Jun Wang, PhD, CIH, CSP, CHMM, PE

Instructor Title: Associate Professor

Email: jun.wang@uc.edu

Phone: (513)558-4301

Office Location: Kettering 331

Office Hours: By appointment only

Communication Policy: Dr. Wang can be reached through email or Canvas messages. Responses will be given within 48 hours during weekdays, and will be delayed during weekends, holidays, or towards the end of semester.

NIOSH Instructors:

Barbara M. Alexander, Ph.D., PE, CIH

Chris Barnes, MS

Kevin H. Dunn, Sc.D., CIH

Alberto Garcia, MS

Duane Hammond, MS, PE

Kenneth R. Mead Ph.D., PE

Dylan T. Neu, BSB, ME

Chaolong Qi, Ph.D, PE

Jennifer Topmiller, MS

Course Materials

Required Textbook

Handbook of Ventilation for Contaminant Control, 3rd Edition, Henry J. McDermott. Published by American Conference of Governmental Industrial Hygienists.

Optional Reading Materials

OSHA Technical Manual: Section III

- Chapter 2 Indoor Air Quality Investigation: http://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_2.html
- Chapter 3 Ventilation Investigation: http://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_3.html;
- Chapter 4 Heat Stress: http://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_4.html

Industrial Ventilation: A Manual of Recommended Practice, 24th Edition, or newer, Published by: American Conference of Governmental Industrial Hygienists

HVAC Simplified Steve Kavanaugh, Published by American Society of Refrigeration, Heating, and Air Conditioning Engineers, www.ashrae.org

Hemeon's Plant and Process Ventilation, 3rd Edition, www.acgih.org

Course Description

This course introduces industrial ventilation as related to the needs of industrial hygienists, including principles of airflow, natural ventilation, dilution ventilation, fans, collectors, testing instruments, and construction guidelines for local exhaust systems and design of industrial ventilation systems.

Course Learning Outcomes

At the conclusion of the course you should be able to apply the knowledge of mathematics, science and engineering to identify and apply ventilation as a control for safety and health hazards. Application of this knowledge will be framed within the context of regulatory agencies such as the Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA) as well as standards organizations like the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) the American National Standards Institute (ANSI).

Upon successful completion of this course, the learner will be able to:	How is this outcome assessed?
1. Understand the fundamental principles of general ventilation, airflow, and duct design.	Homework and mid-term
2. Understand and apply fundamental principles of local exhaust ventilation, filtration and other air-cleaning devices.	Homework and mid-term
3. Evaluate general ventilation and local exhaust ventilation systems for ability to protect personnel from contaminants.	Final and semester project
4. Synthesize course knowledge to outline requirements for ventilation systems to protect personnel from airborne contaminants.	Final and semester project.

Course Format

The course will be offered as hybrid course (75% online / 25% in-person) for Spring 2022, with lectures delivered online through Zoom, and exams administered in-person. This course has the Canvas Learning Management System to provide student-centered online learning that will enhance the teaching and learning process. Canvas will be used to deliver lectures, assignments, exams, and participate in discussions. Please get yourself familiar with Canvas (<https://uc.instructure.com/>). All lecture materials will be uploaded to Canvas prior to the class and it is the student's responsibility to download the materials for notetaking and reference. If you are not familiar with these tools, please visit [Canvas Student Guides](#).

Each student will be assigned (or choose) a ventilation project related to occupational safety and health, with applying knowledge acquired from the class. A final presentation will be delivered at the end of the semester.

Course Assignments and Grading Policy

Course Grade: Course grades will be based on your performance on the following:

Point Allocation

<i>Assignments (4)</i>	<i>75 points each</i>
<i>Exams (2)</i>	<i>200 points each</i>
<i>Project Presentation</i>	<i>250 points</i>
<i>Participation (incl. attendance)</i>	<i>50 points</i>
<i>Total Points Available</i>	<i>1000 points</i>

Grading Scale

<u>Overall Percentage / Points</u>	<u>Letter Grade</u>
92% and above	A
87-91%	A-
82-86%	B+
77-81%	B
72-76%	B-
67-71%	C+
62-66%	C
Below 61%	F

No curving, bump up, or bonus credits will be given. Students are encouraged to track their grades through Canvas.

Academic Integrity

Academic misconduct or dishonesty is defined in the University of Cincinnati Student Code of Conduct. Academic misconduct includes, but is not limited to: acts of cheating, plagiarism, falsification, and misappropriation of credit. The Student Code of Conduct defines behavior expected of all University of Cincinnati students. It is each student's responsibility to know and comply with the University's Student Code of Conduct. Disciplinary procedures are explained in a step-by-step manner, and the procedures for appeal of decisions are stated. (see: [UC's Student Code of Conduct](#))

Plagiarism is defined as:

- Submitting another's published or unpublished work in whole, in part, or in paraphrase, as one's own without fully and properly crediting the author with footnotes, quotation marks, citations, or bibliographic reference.
- Submitting as one's own original work, material obtained from an individual, agency, or the internet without reference to the person, agency or webpage as the source of the material.
- Submitting as one's own original work material that has been produced through unacknowledged collaboration with others without release in writing from collaborators.
- Submitting one's own previously written or oral work without modification and instructor permission.

Plagiarism will not be tolerated and according to the Student Code of Conduct may result in the following consequences:

- Formal report of academic misconduct.
- Reduced or failing grade on the exercise.
- Reduced or failing grade for the course.
- Recommendation to the College Hearing Panel/Dean/Provost for probation, suspension, or dismissal.

Plagiarism Check:

In this course, we will use Turnitin within Canvas for some or all assignments.

Turnitin is a plagiarism detection tool that checks the originality of your work against the expansive Turnitin database, as well as [AI detection](#). After submitting your written assignment, Turnitin will create an originality report identifying whether parts of your work match or are similar to other sources. Turnitin is a great way to prevent, as well as detect plagiarism within student writing. The work submitted to Turnitin will be added to the Turnitin database to be used solely for the purpose of checking future submitted work for originality.

Use of Artificial Intelligence (AI):

Turnitin also measures the use of AI and GPT bot software programs. **You MAY NOT utilize AI or GPT bots to complete assignments for this course.**

Missed and/or late examinations:

The instructor reserves the right to make decisions about extenuating circumstances for missed deadlines on a case-by-case basis. LATE ASSIGNMENTS MAY RESULT IN ONE LETTER GRADE EACH DAY IT IS LATE!

Classroom Procedures/Policies

Communication

The instructor will communicate with students via e-mail and CANVAS. Students are expected to check CANVAS regularly for current copies of the syllabus, announcements, assignments, readings, and posted grades. The instructor will check e-mail daily during the work week (Monday-Friday) for communication with students and will try to respond, if needed, within 24 hours (except when out of the office due to illness or academic business). Unless otherwise notified, e-mail will be sent the student's university e-mail address.

Attendance Policy

Attendance at class sessions and participation in class activities are a critical aspect of this course. Students are expected to attend class regularly. Missing more than two sessions without a valid excuse (e.g., documented medical reason), may lower the course grade. The instructor reserves the right to make decisions about extenuating circumstances for missing classes on a case-by-case basis.

Classroom Etiquette

It is expected that everyone will respect the rights of others and help provide a good learning environment. Cell phones must be turned off or "on silent" before class, food should not be consumed, and the bringing of children or other visitors is only permitted with instructor's approval. Appropriate e-mail etiquette should also be observed.

Class Cancellation and Weather Policy

This course will follow the University of Cincinnati Weather Policy: In-person courses will not meet if the University is closed. If opening of the UC Uptown campus is DELAYED, courses that are scheduled to start prior to the new opening time are CANCELLED. If UC closes early, classes scheduled to start after the closing time are CANCELLED. Watch local news outlets, University website, texts from University

Ohio's Testing Your Faith Act

Ohio law and the University's Student Religious Accommodations for Courses Policy 1.3.7 permits a student, upon request, to be absent for reasons of faith or religious or spiritual belief system or participate in organized activities conducted under the auspices of a religious denomination, church, or other religious or spiritual organization and/or to receive alternative accommodations with regard to examinations and other course requirements due to an absence permitted for the above-described reasons. Not later than fourteen days after the first day of instruction in the course, a student should provide the instructor with written notice of the specific dates for which the student requests alternative accommodations. For additional information about this policy, please contact the Executive Director of the Office of Equal Opportunity and Access at (513) 556-5503 or oeohelp@UCMAIL.UC.EDU.

Pass/Fail, Audit, and Withdrawal Policy: See MPH and UC Policies

Students are not permitted to change their mode of grade from traditional to Pass/Fail. Audits must be approved by the Instructor. Students who wish to withdrawal from this course are responsible for meeting the registrar deadlines.

[UC Registrar Fall 2023 Dates and Deadlines](#)

Course Calendar

Dates	Topic(s):	Textbook Chapters	Assignments	Instructor(s)
1/10	Introduction to ventilation			Wang
1/17	Determining needs for ventilation General principles of ventilation and airflow	1,2		Topmiller
1/24	Principles of hood design	3	Assignment 1 Due 1/31	Dunn
1/31	Principles of duct design	5		Dunn
2/7	Fan fundamentals and selection	9		Qi
2/14	Scrubbers, ESPs, Filtration and other air cleaning devices	7	Assignment 2 Due 2/21	Qi
2/21	Local Exhaust Ventilation I	3		Barnes Mead
2/28	Exam 1 (in class)			
3/6	Local Exhaust Ventilation II		Assignment 3 Due 3/20	Barnes Mead
3/13	Spring break, no class			
3/20	General Ventilation and recirculated air systems I	7		Garcia
3/27	Instrumentation and Ventilation Evaluation	9		Hammond
4/3	Instrumentation and Ventilation Evaluation Practicum			Hammond Garcia
4/10	General Ventilation and recirculated air systems II	8	Assignment 4 Due 4/17	Neu
4/17	Final project (in class)			
4/24	Exam 2 (in class)			

Student Resources and Academic Support

Students are expected to review and follow the [UC Faculty Senate policies](#) and [Campus Life](#) resources on the following topics:

[Accessibility Resources](#)

The University of Cincinnati is committed to providing full and equal access to students, employees and visitors with disabilities. The University is actively engaged in improving the accessibility of our community, in the classroom, in the workplace, on campus, and online. If you have a disability (e.g., visual impairment, hearing impairment, physical impairment, communication disorder, and/or specific learning disability, etc.) which may influence your performance in this course, you must meet with the Accessibility Resources Office to arrange for reasonable accommodations to ensure an equitable opportunity to meet all the requirements of this course. If you require accommodations due to disability, please contact Accessibility Resources at 513-556-6823, Campus Location: [Commons Edge North](#).

[Graduate Students' Guide to Library Resources and Services](#): resources, tools, and services provided to graduate students by the University of Cincinnati Libraries.

[Learning Commons](#): provides many FREE services and programs available to all students.

[Academic Writing Center](#) is available for one on one appointments, workshops and tutoring.

[Equity, Inclusion, & Community Impact](#)

The Division of Equity, Inclusion & Community Impact works to bring out the best in our students, faculty and staff by valuing their unique backgrounds, experiences and perspectives. The Division of Equity, Inclusion & Community Impact addresses issues of discrimination, harassment, sexual misconduct and retaliation so members of our community can work, learn, grow and thrive in a safe and supportive environment.

[Notice of Non-Discrimination](#)

The University of Cincinnati is committed to building a welcoming and inclusive environment where discrimination, harassment, and retaliation is not tolerated.

Safety, Health & Wellness

[UC Police & Public Safety](#)

(513) 556-1111 (non-emergency)

UC's Public Safety Department work hand-in-hand with members of the Cincinnati Police Department and other community partners to prevent crime and provide vital safety services and resources. The UC Police have a dedicated victim support team available for sexual assault survivors. Making a police report and ensuring that evidence is collected is important to preserve the option of prosecution, but it does not mean you have to prosecute.

[Virtual Wellness Resources](#)

During these uncertain times, the Student Wellness Center wants to make sure you have the resources to maintain your health and wellness. This is a collection of virtual resources, apps, websites, podcasts, articles and more.

[Counseling and Psychological Services](#)

University of Cincinnati Counseling and Psychological Services (CAPS) is committed to embracing and celebrating diversity that works towards the ***inclusivity and belongingness for all*** in our campus community. The CAPS main office is located at 225 Calhoun St. Suite 200 (next door to Target).

[Crisis Emergent Services](#)

CAPS offers 24/7 phone crisis access to students who are in need of immediate support through telephone consultations or after hours crisis support. These services are accessible by calling **513-556-0648** and selecting the appropriate options.

Dean of Students Resources

[BCP and Resource Center \(Bearcats Pantry\)](#)

The UC Bearcats Pantry (BCP) and Resource Center provides free food, hygiene items, cleaning supplies, and professional clothing to students of all backgrounds with food and other insecurities. The pantry also provides meal vouchers that can be used at campus dining halls and To-Go Bags that can be conveniently picked up at locations across campus.