Western University
Department of Mechanical & Materials Engineering

MME 4460B - Heating, Ventilating and Air Conditioning II

COURSE OUTLINE – 2025-2026

CALENDAR DESCRIPTION:

Design of air distribution components and systems; fan/pump laws; air quality and ventilation; hot water heating systems; steam heating systems; cooling equipment; heat generation and transfer equipment; building automation controls; operations and maintenance.

COURSE INFORMATION:

Instructor: M. Walid Altahan

Email: waltahan@uwo.ca

Lectures/tutorials/labs: See Draft My Schedule

CONSULTATION HOURS:

Mondays: 11:30 - 12:30

PREREQUISITES:

MME 4483a/b
Unless you have either the requisite for this course or written special permission from your Dean to enroll in it, you will be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

ACCREDITATION UNITS:

Engineering Science = 50%; Engineering Design = 50%

TOPICS:

1. Hydronic system, pumps and piping design (water and steam) for heating or cooling applications
2. Boiler selection and expansion tank
3. Air Distribution System Design
4. Fan selection and furnace sizing and selection
5. Cooling and Refrigeration cycles and equipment selection
6. Control Systems
7. Maintenance and Operations

LEARNING OUTCOMES:

The Mechanical and Materials Engineering Program has been accredited by Canadian Engineering Accreditation Board (CEAB) of Engineers Canada. Accredited programs provide the academic requirements for licensure as a professional engineer in Canada. Western Engineering has defined indicators of the 12 Graduate Attributes (GAs) that the CEAB expects graduating engineering students to demonstrate. The connections between course learning outcomes and Western Engineering's GA Indicators are identified below.

Upon completing this course, students, with attention to sustainability (IES2), will be capable of designing (DE3) and sizing comprehensive systems (DE4) such as:

On completion of the course the student will be able to:

- Understand how an HVAC (hydronic-air) system work (KB4, IESE2, PA3, ITW3)

- Size and select HVAC equipment and components (PA3, I2)
- Design complete HVAC hydronic (ITW3, IESE2, D3)
- Design HVAC air distribution systems (ITW3, IESE2, D3)
- Design and size refrigeration equipment for a cold storage (KB3, PA2, I2, ET2)

CONTACT HOURS: 3 lecture hours, 2 tutorial hours, One-3 laboratory hours, half course

TEXTBOOK: McQuiston, "Heating, Ventilating and Air Conditioning, Analysis and Design" 7th edition, Wiley ISBN 978-1-119-89414-8.

https://www.wiley.com/en-ca/search/?term=McQuiston%2C+F.C.+and+Parker%2C+J.D.%2C+Heating%2C+Ventilating+and+Air+Conditioning+%28Analysis+and+Design%29.+Wiley%2C+6th+Edition&category=products

Approximate textbook price: $104

Students are welcome to purchase second-hand or earlier editions of this textbook. Editions 5, 6, 7 are acceptable.

UNITS: English will be used; however, also SI English units may be introduced through examples as required.

EVALUATION:

Assessment Type	Tentative Due Date	Weight
Homework Assignments (two)	Feb 9 and March 9	10%
Virtual tour and quiz	TBD	5%
Lab	Due at the end of the lab	5%
Mid-term Exam (Open book)	Thursday March 26	45%
Projects (Hydronic, and air system design	Friday April 3	35%

COURSE POLICIES: The following course-specific policies will be enforced throughout the course:

Laboratory sessions

- Students are required to attend one lab session only during the term.
- A maximum of **one** make-up session will be offered to students who have missed a laboratory session **with** academic consideration.
- Missing of a laboratory session **without** academic consideration will translate into a zero mark for that laboratory session.
- Students arriving to a laboratory session later than 30 minutes after the scheduled start time will be considered absent and will receive a zero mark for that laboratory session.
- Complete hard copy of lab report is due at the end of the lab session.
- Lab reports will not be accepted if the student did not attend the laboratory experiment.

Team deliverables

- While the default assumption is that everyone contributes equally to the team effort (*i.e.,* project and labs) and hence everyone should receive the same mark for the team submission, individual adjustments of the marks are also permitted, and they are left at latitude of the instructional team (*i.e.*, course instructor and teaching assistants).

Midterm

- Exams are open-book.
- A student who misses the midterm **without** academic consideration will receive a zero mark for the midterm.
- **The Midterm is designated assessment of this course, therefore absences without valid supporting documents will be denied.** A student who misses the midterm **with** academic consideration will complete a make-up midterm as soon as possible (typically within the same week as the midterm).

NOTE: **The above topics and outline are subject to adjustments and changes as needed.**

General Faculty / University Policies

The Faculty of Engineering and Western University have overarching policies that prescribe how undergraduate courses should run. The course-specific policies described above should be considered *in addition to* those overarching policies, or as course-specific interpretations of them. In the event of contradictions or confusion between course-specific policies above and general Faculty / University policies, please contact your course instructor for clarification.

Western Engineering's undergraduate polices can be found by navigating to:
https://www.eng.uwo.ca/undergraduate/academic-support-and-accommodations/policies.html

and then clicking the "*Engineering Undergraduate Policies framework*" link.