

## MME 4460b - Heating, Ventilating and Air Conditioning II

### COURSE OUTLINE – 2017-2018

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<b>CALENDAR DESCRIPTION:</b>	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.																		
<b>PREREQUISITES:</b>	MME 4483a/b																		
<b>ACCREDITATION UNITS:</b>	Engineering Science = 50%; Engineering Design = 50%																		
<b>TOPICS:</b>	<ol style="list-style-type: none"><li>1. Hydronic system, pumps and piping design (water and steam) for heating or cooling applications</li><li>2. Boiler selection and expansion tank</li><li>3. Air Distribution System Design</li><li>4. Fan selection and furnace sizing and selection</li><li>5. Cooling and Refrigeration cycles and equipment selection</li><li>6. Control Systems</li><li>7. Maintenance and Operations</li></ol>																		
<b>SPECIFIC OBJECTIVES:</b>	<p>This is a capstone design course in Mechanical &amp; Materials Engineering that uses an understanding of thermodynamics, heat transfer, fluid mechanics and HVAC principles to achieve “Smart Building Design”</p> <p>On completion of the course the student will be able to:</p> <ol style="list-style-type: none"><li>1. size and select HVAC equipment and system</li><li>2. design hydronic and air distribution systems</li></ol>																		
<b>TEXT:</b>	McQuiston, “Heating, Ventilating and Air Conditioning, Analysis and Design” 6 <sup>th</sup> or 5 <sup>th</sup> edition, Wiley ISBN 0471350982																		
<b>REFERENCES:</b>	<ol style="list-style-type: none"><li>1. <i>Heating &amp; Cooling of Buildings</i>, J. Kreider &amp; A. Rabl, McGraw-Hill, 2<sup>nd</sup> Edition, 2002. ISBN #0072373415</li><li>2. <i>ASHRAE - Handbook of Fundamentals</i>, 2005.</li><li>3. <i>Direct Digital Controls for HVAC Systems</i>, Thomas B. Hartman 1993. ISBN #0070269777</li><li>4. <i>HVAC Maintenance and Operations Handbook</i>, Robert C. Rosaler, 1997. ISBN #0070521697</li><li>5. <i>HVAC Pump Handbook</i>, Rishel, James B., 1996. ISBN #0070530335</li></ol>																		
<b>UNITS:</b>	Imperial and SI																		
<b>EVALUATION:</b>	<table><tr><td>Assignments, ASHRAE , and tours</td><td>15%</td></tr><tr><td>- Two assignments:</td><td></td></tr><tr><td>    1- Assignment 1 is on Jan 29 and due one week</td><td></td></tr><tr><td>    2- Assignment 2 is on Feb 19 and due in one week</td><td></td></tr><tr><td>- Attend at least one ASHRAE meeting</td><td></td></tr><tr><td>- One tour TBD</td><td></td></tr><tr><td>Lab</td><td>5% (Due two weeks after the lab)</td></tr><tr><td>Mid-term Examination</td><td>40% (Mon. March 26<sup>th</sup>)</td></tr><tr><td>Project</td><td>40% (Due Friday April 6<sup>th</sup>)</td></tr></table>	Assignments, ASHRAE , and tours	15%	- Two assignments:		1- Assignment 1 is on Jan 29 and due one week		2- Assignment 2 is on Feb 19 and due in one week		- Attend at least one ASHRAE meeting		- One tour TBD		Lab	5% (Due two weeks after the lab)	Mid-term Examination	40% (Mon. March 26 <sup>th</sup> )	Project	40% (Due Friday April 6 <sup>th</sup> )
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- If a student is excused from writing a midterm or quiz for legitimate reasons, and with the approval of the Department Chair, the weighting of the final examination can be adjusted accordingly.

**ENGLISH:**

In accordance with Senate and Faculty Policy, students may be penalized up to 10% of the marks on all assignments, tests and examinations for improper use of English. Additionally, poorly written work, with the exception of final examinations, may be returned without grading. If resubmission of the work is permitted, it may be graded with marks deducted for poor English and/or late submission.

**INSTRUCTOR:**

M. Walid Altahan, P.Eng  
Laboratory Manager  
Mechanical and Materials Engineering  
Office: SEB 1067, Telephone: 661-2111 X 88293  
e-mail: [waltahan@eng.uwo.ca](mailto:waltahan@eng.uwo.ca)

Office hours : Wednesday 10:30 to 12:30

**ATTENDANCE:**

Any student who, in the opinion of the instructor, is absent too frequently from class or laboratory periods in any course, will be reported to the Dean (after due warning has been given). On the recommendation of the Department concerned, and with the permission of the Dean, the student will be debarred from taking the regular examination in the course.

**CHEATING:**

University policy states that cheating, including plagiarism, is a scholastic offense. The commission of a scholastic offence is attended by academic penalties, which might include expulsion from the program. If you are caught cheating, there will be no second warning.

**NOTE:**

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

**INSTRUCTIONS FOR STUDENTS UNABLE TO WRITE TESTS OR EXAMINATIONS OR SUBMIT ASSIGNMENTS AS SCHEDULED**

IF, ON MEDICAL OR COMPASSIONATE GROUNDS, YOU ARE UNABLE TO WRITE TERM TESTS OR FINAL EXAMINATIONS OR COMPLETE COURSE WORK BY THE DUE DATE, YOU SHOULD FOLLOW THE INSTRUCTIONS LISTED BELOW. YOU SHOULD UNDERSTAND THAT ACADEMIC RELIEF WILL NOT BE GRANTED AUTOMATICALLY ON REQUEST. YOU MUST DEMONSTRATE TO YOUR DEPARTMENT (OR THE UNDERGRADUATE SERVICES OFFICE) THAT THERE ARE COMPELLING MEDICAL OR COMPASSIONATE GROUNDS THAT CAN BE DOCUMENTED BEFORE ACADEMIC RELIEF WILL BE CONSIDERED. DIFFERENT REGULATIONS APPLY TO TERM TESTS, FINAL EXAMINATIONS AND LATE ASSIGNMENTS. PLEASE READ THE INSTRUCTIONS CAREFULLY. (SEE THE 2017 UWO ACADEMIC CALENDAR).

**A. GENERAL REGULATIONS & PROCEDURES**

1. All first year students will report to the Undergraduate Services Office, SEB 2097, for all instances.
2. If you are an upper year student and you are missing a test/assignment/lab or exam that is worth MORE THAN 10% of your final grade, you will report to the Undergraduate Services Office, SEB 2097. Otherwise, you will report to your department office to request relief.
3. Check the course outline to see if the instructor has a policy for missed tests, examinations, late assignments or attendance.
4. Documentation must be provided as soon as possible. If no one is available in your Department office or the Undergraduate Services Office, leave a message clearly stating your name & student number and reason for your call. The department telephone numbers are given at the end of these instructions.
5. If you decide to write a test or an examination you should be prepared to accept the mark you earn. Rewriting tests or examinations or having the value of a test or examination reweighted on a retroactive basis is not permitted.

**B. TERM TESTS**

1. If you are in first year and you are unable to write a term test, contact the Undergraduate Services Office, SEB 2097 PRIOR to the scheduled date of the test.
2. If you are an upper year student and you are unable to write a term test, inform your instructor PRIOR to the scheduled date of the test. If the instructor is not available, leave a message for him/her at the department office. If the test is worth MORE THAN 10% of your final grade you will report to the Undergraduate Services Office, SEB 2097 to request relief. Otherwise, you will report to your department office to request relief.
3. Be prepared to provide supporting documentation to the Department Chair and/or the Undergraduate Services Office (see next page for information on documentation).
4. Discuss with the instructor if and when the test can be rescheduled. **N.B.** The approval of the Chair or the Undergraduate Services Office is required when rescheduling term tests.

**C. FINAL EXAMINATIONS**

1. If you are unable to write a final examination, contact the Undergraduate Services Office PRIOR TO THE SCHEDULED EXAMINATION TIME to request permission to write a Special Final Examination. If no one is available in the Undergraduate Services Office, leave a message clearly stating your name & student number.
2. Be prepared to provide the Undergraduate Services Office with supporting documentation (see next page for information on documentation) the next day, or as soon as possible (in cases where students are hospitalized). The following circumstances are not considered grounds for missing a final examination or requesting special examinations: common cold, sleeping in, misreading timetable and travel arrangements.
3. In order to receive permission to write a Special Examination, you must obtain the approval of the Chair of the Department **and** the Associate Dean and in order to apply you must sign a "Recommendation for a Special Examination Form" available in the Undergraduate Services Office. The Undergraduate Services Office will then notify the course instructor(s) and reschedule the examination on your behalf.

**N.B. It is the student's responsibility to check the date, time and location of the Special Examination.**

**D. LATE ASSIGNMENTS**

1. Advise the instructor if you are having problems completing the assignment on time (**prior** to the due date of the assignment).
2. Be prepared to provide documentation if requested by the instructor (see reverse side for information on documentation).
3. If you are granted an extension, establish a due date. The approval of the Chair of your Department (or the Associate Dean if you are in first year) is not required if assignments will be completed prior to the last day of classes.
4.
  - i) Extensions beyond the end of classes must have the consent of the instructor, the department Chair and the Associate Dean. Documentation is mandatory.
  - ii) A Recommendation of Incomplete Form must be filled out indicating the work to be completed and the date by which it is due. This form must be signed by the student, the instructor, the department Chair and the Associate Dean.

## E. SHORT ABSENCES

If you miss a class due to a minor illness or other problem, check your course outlines for information regarding attendance requirements and make sure you are not missing a test, laboratory or assignment. Cover any readings and arrange to borrow notes from a classmate.

## F. EXTENDED ABSENCES

If you are absent more than one week or if you get too far behind to catch up, you should consider reducing your workload by dropping one or more courses. (Note drop deadlines listed below). You may want to seek advice from the academic counsellor in your Department or Ms. Karen Murray in the Undergraduate Services Office, if you are in first year.

## G. DOCUMENTATION

If you consulted an off-campus doctor or Student Health Services regarding your illness or personal problem, **you must provide the doctor with a Student Medical Certificate** to complete at the time of your visit and then bring it to the Department (or the Undergraduate Services Office). **This note must contain the following information: severity of illness, effect on academic studies and duration of absence. Regular doctor's notes will not be accepted; only the Student Medical Certificate will be accepted.**

**In Case of Serious Illness of a Family Member:** Provide a Student Medical Certificate to your family member's physician to complete and bring it to the Department (or the Undergraduate Services Office if you are in first year).

**In Case of a Death:** Obtain a copy of the death certificate or the notice provided by the funeral director's office. You must include your relationship to the deceased and bring it to the Department (or the Undergraduate Services Office if you are in first year).

**For Other Extenuating Circumstances:** If you are not sure what documentation to provide, ask the Departmental Office (or the Undergraduate Services Office if you are in first year) for direction.

**Note:** Forged notes and certificates will be dealt with severely. To submit a forged document is a scholastic offence (see below).

## H. ACADEMIC CONCERNS

1. You need to know if your instructors have a policy on late penalties, missed tests, etc. This information may be included on the course outlines. If not, ask your instructor(s).
2. **You should also be aware of attendance requirements in some courses. You can be debarred from writing the final examination if your attendance is not satisfactory.**
3. If you are in academic difficulty, check out the minimum requirements for progression in the calendar. If in doubt, see your academic counsellor.

**Calendar References:** Check these regulations in your 2017 Western Academic Calendar available at [www.westerncalendar.uwo.ca](http://www.westerncalendar.uwo.ca).

Absences Due to Illness: <http://westerncalendar.uwo.ca/2017/pg117.html>

Academic Accommodations for Students with Disabilities: <http://westerncalendar.uwo.ca/2017/pg118.html>

Academic Accommodations for Religious or Holy Days: <http://westerncalendar.uwo.ca/2017/pg119.html>

Course Withdrawals: <http://westerncalendar.uwo.ca/2017/pg157.html>

Examinations: <http://westerncalendar.uwo.ca/2017/pg129.html>

Scheduling of Term Assignments: <http://westerncalendar.uwo.ca/2017/pg135.html>

Scholastic Offences: <http://www.westerncalendar.uwo.ca/2017/pg111.html>

Student Medical Certificate: [http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/medicalform.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf)

Engineering Academic Regulations: <http://www.westerncalendar.uwo.ca/2017/pg1442.html>

**Note:** These instructions apply to all students registered in the Faculty of Engineering regardless of whether the courses are offered by the Faculty of Engineering or other faculties in the University.

### **Drop Deadlines:**

First term half course (i.e. "A" or "F"):	November 5, 2017
Full courses and full-year half courses (i.e. "E", "Y" or no suffix):	November 30, 2017
Second term half or second term full course (i.e. "B" or "G"):	March 7, 2017

### **Contact Information:**

Undergraduate Services Office:	SEB 2097	Telephone: (519) 661-2130	E-mail: <a href="mailto:engugrad@uwo.ca">engugrad@uwo.ca</a>
Dept. of Chemical and Biochemical Engineering & Green Process Engineering:	TEB 477	Telephone: (519) 661-2131	E-mail: <a href="mailto:cbeugrad@uwo.ca">cbeugrad@uwo.ca</a>
Dept. of Civil and Environmental Engineering:	SEB 3005	Telephone: (519) 661-2139	E-mail: <a href="mailto:civil@uwo.ca">civil@uwo.ca</a>
Dept. of Electrical and Computer Engineering, Software Engineering & Mechatronics Engineering:	TEB 279	Telephone: (519) 661-3758	E-mail: <a href="mailto:eceugrad@uwo.ca">eceugrad@uwo.ca</a>
Dept. of Mechanical and Materials Engineering:	SEB 3002	Telephone: (519) 661-4122	E-mail: <a href="mailto:mmeundergraduate@uwo.ca">mmeundergraduate@uwo.ca</a>