

**UNIVERSITY OF NORTH TEXAS – Department of Mechanical Engineering**  
**MEEN 4810-009 / MEEN 5200-001/009** **Principles of HVAC**  
**SYLLABUS**                      **Spring 2026**                      **3 Credit hours**

<p><b>Instructor:</b> Dr. Hassan Qandil (<a href="mailto:hassan.qandil@unt.edu">hassan.qandil@unt.edu</a>) <b>Office Hours:</b> By appointment (Email to Schedule). <b>Lecture &amp; Location:</b> TuTh 5:30PM - 6:50PM - NTDP D201 <b>Teaching Assistant:</b> TBD <b>TA Office Hours:</b> By appointment (Email to Schedule).</p>
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**Prerequisite Knowledge:**

1. Techniques and applications of derivatives and integrals.
2. Mass conservation in fluid flow.
3. Momentum conservation in fluid flow.
4. Energy conservation in control volume.
5. Viscous flow characteristics.
6. Thermal conduction, convection, and radiation
7. Computational skills using a mathematically functional spreadsheet such as Excel.
8. Understanding programming flow chart.
9. Conduct research using the literature database and web.

**Catalog Course Description:**

Thermodynamics and psychometrics applied to the HVAC system calculations, energy estimating methods, ducts and piping systems, heat pump and heat recovery systems, air-processing, refrigeration, and heating equipment.

**Recommended Textbooks:**

- “*Fundamentals of HVACR*”, 4<sup>th</sup>, Stanfield and Skaves, 2022, Pearson. ISBN13: 9780137574612.
- “*Analysis and Design of Heating, Ventilating, and Air-Conditioning Systems*”, 2<sup>nd</sup>, Stanford and Spach, 2019, CRC Press. ISBN13: 9780429890871.
- [2025 ASHRAE Handbook—Fundamentals](#)

**Course Objectives:**

- Develop fundamental understanding of the objectives and principles of heating, ventilating, and air conditioning with emphases on the application of theories of thermodynamics, fluid mechanics, and heat and mass transfer.
- Introduction to HVAC system types and their components.
- Develop the ability to design and analyze HVAC systems.
- Introduction to integrated building design process, and energy modeling for green building system design.

**CALCULATORS:** Only those permitted on (FE) exam. No graphing calculators.

**COURSE POLICY:** **Course delivery method is in-person.** All course announcements, lecture notes, recorded material and assignments to be posted on MEEN 5200/MEEN 4810 Canvas courses. *Students are expected to have access to textbooks on their own.*

**GRADES:** Standard grading scale used: 90/80/70/60. Re-grade request must be made in class the day returned. **No re-grade requests after class dismissed.** Entire exam will be re-graded, which may result in lower score than originally assigned. **Make-ups are NOT allowed,** with the exception being UNT-excused absences with proper documentation.

Attendance            5% **Taken In-class** (Extra credit for lecture participation)  
 Projects                20% **Online PDF submissions,** real-life problem solving / critical thinking  
 Quizzes                10% **In-class,** reading comprehension / multiple choice / qualitative  
 Mid-Term               30% **In-class,** reading comprehension / multiple choice / qualitative  
 Final Exam            30% **In-class,** reading comprehension / multiple choice / qualitative  
**Extra Credit is available in-class and through Exams and Quizzes**

**TENTATIVE LECTURE SCHEDULE**

Week	Dates	Topic	Quiz/Project
1	Jan. 12 <sup>th</sup> – Jan. 16 <sup>th</sup>	Introduction + HVAC Science Basics	
2	Jan. 19 <sup>th</sup> – Jan. 23 <sup>rd</sup>	HVAC Science Basics + Refrigeration Cycle	
3	Jan. 26 <sup>th</sup> – Jan. 30 <sup>th</sup>	Refrigeration Cycle + Comfort & Psychrometrics	
4	Feb. 2 <sup>nd</sup> – Feb. 6 <sup>th</sup>	Fans & Airflow + Ventilation & Dehumidification	
5	Feb. 9 <sup>th</sup> – Feb. 13 <sup>th</sup>	Types of AC Systems	Quiz
6	Feb. 16 <sup>th</sup> – Feb. 20 <sup>th</sup>	Types of AC Systems	
7	Feb. 23 <sup>rd</sup> – Feb. 27 <sup>th</sup>	Duct Design & Installation + AC Troubleshooting	
8	Mar. 2 <sup>nd</sup> – Mar. 6 <sup>th</sup>	<b>Midterm (Tu, Mar 3<sup>rd</sup>) (In-class, same class time)</b>	
9	Mar. 9 <sup>th</sup> – Mar. 13 <sup>th</sup>	<b>NO CLASS - SPRING BREAK</b>	
10	Mar. 16 <sup>th</sup> – Mar. 20 <sup>th</sup>	Envelope System & Load Calculations	
11	Mar. 23 <sup>rd</sup> – Mar. 27 <sup>th</sup>	Load Calculations	
12	Mar. 30 <sup>th</sup> – Apr. 3 <sup>rd</sup>	Green Buildings and Systems	
13	Apr. 6 <sup>th</sup> – Apr. 10 <sup>th</sup>	Integrated Building Control Systems	
14	Apr. 13 <sup>th</sup> – Apr. 17 <sup>th</sup>	eQUEST Intro	
15	Apr. 20 <sup>th</sup> – Apr. 24 <sup>th</sup>	Geothermal Air-Conditioning	
16	Apr. 27 <sup>th</sup> – May. 1 <sup>st</sup>	<b>Final (Tu, April 28<sup>th</sup>) (In-class, same class time)</b>	Project

**HOMEWORK:** All **Homework submissions are online** through CANVAS and in a PDF format. **NO LATE SUBMISSIONS ALLOWED** except for students with UNT-approved excuse (please follow UNT Policy 06.039).

**EXAMS:** All **quizzes and exams will be in-class.** If you have an emergency and need an authorized absence as per UNT Policy 06.039, please connect with the Dean of Students’ office requesting an excused absence in writing ([studentaffairs.unt.edu/dean-of-students](http://studentaffairs.unt.edu/dean-of-students)).

**ATTENDANCE:** Refer to [UNT’s 06.039 Student Attendance & Authorized Absences Policy](#):

- The student is responsible for regular and punctual attendance and is expected to participate in all courses in which the student is enrolled.
- Communicate with the professor prior to being absent, so you can discuss and mitigate the impact of the absence on your attainment of course learning goals.

- *If a student accumulates more than two weeks of unexcused absences (four lectures), the student will be ineligible to sit for the final exam until a formal meeting with the instructor occurs to review the reasons for the absences and written approval to proceed is granted.*
- *Only University Excused Absences indicated in Policy 06.039 are acceptable.*

**ACADEMIC INTEGRITY STANDARDS AND SANCTIONS FOR VIOLATIONS:** According to UNT Policy 06.003, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University. Academic dishonesty will not be tolerated and will result in zero assignment score and reported to Office of Academic Integrity. No exceptions. Having any calculator not on the approved list is a violation of Academic Integrity.

**ADA Policy:** UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific course needs. Students may request accommodations at anytime, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the ODA website (<https://disability.unt.edu/>).

**ACCEPTABLE BEHAVIOR:** Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The University's expectations for student conduct apply to all instructional forums, including University and electronic classroom, labs, discussion groups, field trips, etc. To learn more, visit UNT's Code of Student Conduct (<https://deanofstudents.unt.edu/conduct>).

**STUDENT PERCEPTIONS OF TEACHING EFFECTIVENESS (SPOT)** Course participates in SPOT evaluations (<http://spot.unt.edu/> or email [spot@unt.edu](mailto:spot@unt.edu)).

**RETENTION OF STUDENT RECORDS** Course follows Family Educational Rights and Privacy Act (FERPA) laws and UNT Policy 10.10, Records Management and Retention.

**SYLLABUS CHANGES** Instructor reserves right change syllabus. Any changes announced in class and posted to CANVAS with an accompanying email to student's UNT email address.

**ACCESS TO INFORMATION - EAGLE CONNECT:** Students' access point for business and academic services at UNT is located at: my.unt.edu. All official communication from the University will be delivered to a student's Eagle Connect account. For more information, please visit the website that explains Eagle Connect and how to forward e-mail Eagle Connect (<https://it.unt.edu/eagleconnect>).