

Commercial HVAC Systems

TEAC - 1410 401

Course Description

Introduces the student to the fundamentals of commercial heating and air conditioning systems. Both light commercial and commercial systems will be discussed. Rooftop units, boilers, constant air and variable air systems will be explored. Emphasis is on energy efficiency in operation and service of these systems. Direct Digital Controls, alternative HVAC systems and Indoor Air Quality will also be covered. Troubleshooting skills of commercial HVAC equipment will be discussed.

Semester(s) taught: All

Course Student Learning Outcomes

- Recognize and identify different types of commercial air conditioning systems, including rooftop units, chillers, air handlers and split systems. Demonstrate how to setup these different systems for efficient operation.
- Recognize and identify different types of commercial heating systems, including rooftop units, boilers, air handlers and split systems. Demonstrate how to setup these different systems for efficient operation.
- Demonstrate knowledge and ability to work with alternative HVAC systems like, water source heat pump systems and variable refrigerant flow systems.
- Identify and describe the importance of a Direct Digital Control system. Demonstrate knowledge and ability to install, program and test a DDC system.
- Identify and describe the importance that Indoor Air Quality plays in commercial buildings.
- Demonstrate knowledge and ability to troubleshoot Commercial HVAC equipment.

Engagement Plan

We will respond to email within 24hours. The best way to contact us is via the Canvas Inbox, as I will prioritize this email over other modes of communication.

Brief Description of Assignments/Exams

Assignments and quizzes/exams are scheduled in Canvas.

Assignment Schedule

Due Date	Assignment Name	Assignment Type	Points
	Exercise COM-6: Chiller Barrel Approach Temperature	Assignment	1
	Exercise HPS-13: Checking the Water Flow,Geothermal Heat Pump	Assignment	1
	Air Handlers Progress Written Exam- Requires Respondus LockDown Browser	Quiz	15
	Chapter 53-- Troubleshooting Commercial Systems- System Diagnosis	Assignment	20
	Chapter 54-- Servicing Commercial Systems-Component Diagnosis	Assignment	20

Due Date	Assignment Name	Assignment Type	Points
	Chapter 55-- Servicing Commercial Systems	Assignment	15
	Check Your Knowledge 6	Quiz	22
	Check Your Knowledge: Chapter 33 Review Quiz	Quiz	29
	Check Your Knowledge: Chapter 44 Review Quiz	Quiz	18
	Check Your Knowledge: Chapter 8 Review Quiz	Quiz	9
	Check Your Knowledge: Chapters 49 Chillers Review Quiz	Quiz	8
	Check Your Knowledge: Unit 47 Chillers Review Quiz ***	Quiz	11
	Check Your Knowledge: Unit 48 Chillers Review Quiz ***	Quiz	12
	Check Your Knowledge: Unit 50 Air Handlers Review Quiz ***	Quiz	29

Due Date	Assignment Name	Assignment Type	Points
	Check Your Knowledge: Unit 50 Rooftop Review Quiz ***	Quiz	15
	Chillers Progress Written Exam- Requires Respondus LockDown Browser	Quiz	54
	Economizers Overview	Assignment	
	Exercise COM-11: Packaged Rooftop Units	Assignment	1
	Exercise COM-12: Hand Signals for Communicating with a Crane Operator	Assignment	1
	Exercise COM-13: Variable Air Volume (VAV) Box Familiarization	Assignment	1
	Exercise COM-5:: Chilled- Water Systems Familiarization	Assignment	1
	Exercise COM-7: Mechanical-Draft Cooling Tower Familiarization	Assignment	1
	Exercise COM-8: Mechanical-Draft Cooling Tower	Assignment	1

Due Date	Assignment Name	Assignment Type	Points
	Exercise HPS-12: Familiarization with Geothermal Heat Pump	Assignment	1
	Exercise HTG-30: Filling a Hot Water Heating System	Assignment	1
	Exercise HTG-31: Determining Expansion Tank Pressure	Assignment	1
	Hydronic Heat Systems Progress Written Exam- Requires Respondus LockDown Browser	Quiz	21
	IAQ Assignment	Assignment	22
	Introduce Yourself	Discussion	0
	Lab Exercise: CON-10 Direct Digital Controls	Assignment	1
	Lab Project: Air Conditioning Controls Troubleshooting	Assignment	1
	Lab Project: Blower Motor and Blower Wheels	Assignment	1
	Lab Project: Condenser Fan Motor and Blades	Assignment	1

Due Date	Assignment Name	Assignment Type	Points
	Lab Project: Drawing Wiring Diagrams	Assignment	1
	Lab Project: Economizer Part 1	Assignment	1
	Lab Project: Gas Heat Combustion	Assignment	1
	Lab Project: LAP 8, Three-Phase AC Induction Motors	Assignment	10
	Lab Project: Recovering, Evacuating, and Recharging	Assignment	1
	Lab Project: Rooftop Unit Troubleshooting	Assignment	1
	Rooftop Units Written Progress Exam- Requires Respondus LockDown Browser	Quiz	16
	Three Phase Compressor Trainer	Quiz	10
	Water Source Heat Pump Systems Progress Written Exam- Requires Respondus LockDown Browser	Quiz	15

Grading Scale

Each assignment, quiz, and exam have an assigned point value. The course grade is determined by summing all of the assignments, quizzes, and exams and dividing the sum by the total possible points. A letter grade of A , B, or E (failing) will be assigned according to the percentage of points earned and the following table:

GRADE	RANGE
A	90-100%
B	80-89%
E	Less than 80%

How to Navigate to Canvas

Institutional Policies

As members of our academic community, we would like to invite you to review the Institutional Syllabus which covers important policies and procedures. This document contains important links for students on the code of student rights and responsibilities, academic integrity, and grading policies, Title IX and other important acknowledgements. By familiarizing yourself with this information, you can help us create a safe and respectful environment for everyone.

For more information, navigate to the Institutional Policies tab on the [Institutional Syllabus](#) page.

Learning Support and Tutoring Services

We are pleased to offer a range of tutoring and learning support services to help you achieve your academic goals. Whether you need assistance with a specific subject or want to improve your study skills, you have many options for tutoring or other support.

To learn more about the services we offer and how to access them, visit the [Institutional Syllabus](#) page under the Tutoring and Learning Support tab. We encourage you to take advantage of these resources to help you succeed in your studies. If you have any questions or would like to schedule a tutoring session, please don't hesitate to reach out to us. We are here to support you in any way we can.

Advising and Counseling Support Services

At our institution, we are committed to supporting your academic and personal growth. That's why we offer a range of advising and counseling services to help you navigate the challenges of college life. To learn more about the resources available to you and how to access them, visit the [Institutional Syllabus](#) page under the Advising and Counseling Support Services tab. Our advising team and the support centers across campus are here to support you in achieving your goals and overcoming any obstacles you may face.

Student Academic Calendar

As students you should be aware of all important dates in the semester, such as the day that courses begin and end, as well as the drop date and the last day to withdraw. To learn more about those dates, navigate to the Student Academic Calendar below:

[SLCC Student Academic Calendar](#)