TELV 2300 *LV Building Automation Systems*

Instructor: TBD
Phone: TBD
Email: TBD

TEXTBOOK AND SUPPLIES:
- NCCER Electronic Systems Technician, Level 4, 4th Edition, ISBN-13: 9780136844150
- NCCER HVACR Level 1, 6th Edition, Module 3, ISBN: 978-0-13-795000-3
- NCCER HVACR Level 4, 5th Edition, Module 4, ISBN-13: 9780135185063

PREREQUISITE: BICSI Technician Certification or instructor approval

OTHER REGISTRATION RESTRICTION(S): It is highly recommended that students be registered with DOL by their Sponsor (employer)

COURSE DESCRIPTION: In this course, students will be introduced to automatic centralized control of HVAC, lighting, and other systems through building automation systems (BAS). The integration of different technical systems into larger networks that gather, communicate, and disseminate data are explored along with the technology/devices and the benefits/challenges of the Internet of Things (IoT).

Upon successfully completing this course, students should be able to:

1.	Describe the basic fundamentals of a Building Automation System (BAS)
2.	Describe the basic fundamentals of HVAC and lighting controls systems
3.	Perform low voltage wiring and troubleshoot HVAC and lighting systems
4.	Identify technologies that work together to create the Internet of Things (IoT)
5.	Identify the hardware and software components of IoT, the current and future IoT applications
6.	Install and configure a Wi-Fi router and repeater

COURSEWORK:
- **Weekly Homework:** You are expected to come to class prepared with your weekly readings and assignments.
- **Pre-Post Assessments, Weekly Quizzes:** Take and submit online in Canvas.
  - A pre- and post-assessment will be taken on the first and last day of class to measure progress
  - Weekly quizzes will be taken online in Canvas. The due date for completing each quiz is on the class schedule. You are allowed two attempts with the higher score recorded.
- **Attendance/Participation:** Attendance is expected and crucial to understanding the material and participating in classroom activities. Attendance and participation will be recorded daily and included as part of your coursework grade. 95% attendance is required, which means you are allowed one excused absence.
- **Final Exam:** The final exam will be a comprehensive examination.
- **Lab Projects:** Completion of related lab projects will be required. Missed projects must be coordinated with the instructor and made up.

GRADES: Final grades will be calculated using the following scale and weights.

A	93% and above	C	73% – 78.9%
A-	90% – 92.9%	C-	70% – 72.9%
B+	87% – 89.9%	D+	67% – 69.9%
B	83% – 86.9%	D	63% – 66.9%
B-	80% – 82.9%	D-	60% – 62.9%
C+	77% – 79.9%	E	below 60%

Homework	20%
Pre-Post Assessments, Quizzes	20%
Final Exam	25%
Weekly Projects	25%
Attendance/participation/in-class work	10%

Schedule (Subject to change)

WEEK	DAY 1	DAY 2	ASSIGNMENTS

1	1. Building Management Systems (BMS)
	  a. Basic Digital Controllers
	    i. Control point classification
	    ii. Input and output devices
	    iii. Closed control loops
		1. Building Management Systems (cont'd)
		  a. BMS Architecture
		    i. Peer-to-Peer Networks
		    ii. Packaged Unit Digital Controllers
		    iii. Applied HVAC Systems
			TBD

2	1. Building Management Systems (cont'd)
	  a. BMS User Functions
	    i. User Interfaces
	    ii. Other BMS Functions
		1. Building Management Systems (cont'd)
		  a. System Control Strategies
		    i. Occupied/unoccupied building temperature control
		    ii. Other control strategies
			TBD

3	1. Building Management Systems (cont'd)
	  a. Interoperability
	    i. Building system protocols
	    ii. Web browser system integration
	    iii. The future of interoperability
		1. HVAC Systems and Controls (NCCER HVACR, Level 1)
		  a. Fundamentals of Electricity
		    i. Power source & current types
		    ii. Electrical safety
		    iii. Electrical Protective equipment
			TBD

4	1. HVAC Systems and Controls (cont'd)
	  a. Basic Electrical Theory
	    i. Power definitions and common formula
	    ii. Electrical Circuits
		1. HVAC Systems and Controls (cont'd)
		  a. Electrical Measuring Instruments
		    i. Measuring voltage
		    ii. Measuring current
		    iii. Measuring resistance
			TBD

WEEK	DAY 1	DAY 2	ASSIGNMENTS
5	1. HVAC Systems and Controls (cont'd) a. Common HVACR Electrical Components i. Loads ii. Control devices iii. Electrical diagrams	1. Lighting Systems and Controls a. Safety b. Wired, wireless, and hybrid lighting controls i. Control functionality and benefits ii. Control strategies based on inputs and outputs iii. Control types c. Troubleshooting	TBD
6	1. Lighting Systems and Controls (cont'd)	1. Lighting Systems and Controls (cont'd)	TBD
7	1. EST and the Internet of Things (EST Level 4) a. Internet of Things i. IoT history and developments 2. Technologies and developments	1. EST and the Internet of Things (EST Level 4) a. Components and Networks i. Hardware ii. Wi-Fi, bluetooth, and cellular networks iii. Video and Data	TBD
8	1. EST and the Internet of Things (EST Level 4) a. IoT Applications i. Home and business ii. Future IoT applications b. IoT Impacts c. IoT challenges	1. Wrap up 2. Final exam	TBD

WITHDRAWAL POLICY: The College's withdrawal schedule is followed. No withdrawals will be approved beyond the drop date.

COMMUNICATION and FEEDBACK EXPECTATIONS: Email is the best way to communicate with your instructor through the Canvas Inbox. You can expect to receive responses to emails within 24 business hours. In addition, you can expect that projects and exams will be graded and recorded within one week of when the assignment was submitted. Keep the line of communication open to avoid any misunderstandings.

ELECTRONIC DEVICES IN THE CLASSROOM: No video or audio recording in the classroom is allowed without written authorization from the instructor. Cell phones and other electronic devices should be silent and off the desk during class except to take notes if it is not distracting to classmates. In an emergency, exit the classroom to use your cell phones. Disruptive behavior will cause you to be excused from class and lose participation points. Please let your instructor know of any special circumstances at the start of the semester.

SAVE YOUR WORK: In case of human or computer errors, it is recommended that you save all coursework until you have received a final grade.