El Paso Community College
Syllabus
Part II
Official Course Description

SUBJECT AREA	**Heating, Ventilation and Air Conditioning**
COURSE RUBRIC AND NUMBER	**HART1401**
COURSE TITLE	**Basic Electricity HVAC**
COURSE CREDIT HOURS	**4 3 : 3** **Credits Lec Lab**

I. Catalog Description

Provides instruction in the principles of electricity as required by HVAC, including proper use of test equipment, electrical circuits, and component theory and operation. **(3:3).**

II. Course Objectives

A. **Unit I. Fundamentals of Electricity**

1. Define terms associated with electricity.
2. Distinguish the difference between direct and alternating current.
3. List materials, which are good conductors of electricity.
4. List materials, which are good insulators of electricity.
5. List the equation symbols and the equation for Ohm's Law.
6. List three equations for obtaining wattage.
7. List four common conversions of wattage.
8. List the three items that make a complete electrical circuit.
9. Match terms to the correct basic electrical symbols.
10. Distinguish between series, parallel, and series parallel circuits.
11. State four rules for series circuits.
12. State three rules for a parallel circuit.
13. Match amperage loads to wire sizes.
14. List items of concern when working with solid state controls.
15. Use Ohm's Law correctly.
16. Compute wattage correctly.
17. Select parallel loads.
18. Make electrical connections.
19. Differentiate between load and switches.

B. **Unit II. Electrical Test Instruments**

1. Define terms associated with electrical test instruments.
2. List the general rules for the protection and use of electrical test instruments.
3. Identify electrical test instruments.
4. Match test instruments to their application.
5. List two steps for reading a meter scale.
6. Discuss three circuit conditions.
7. Describe the procedure for zeroing the ohmmeter.
8. Use a voltmeter correctly.
9. Use an ammeter correctly

10. Use an ohmmeter correctly
11. Use hermetic analyzer correctly
12. Use a wattmeter correctly.
13. Use a capacitor analyzer correctly.
14. Test a capacitor using an ohmmeter.
15. Read a watt-hour meter correctly.
16. Verify resistance with a megameter.

C. **Unit III. Electrical Power**

1. Match terms associated with electric power to the correct definitions.
2. Arrange in order the steps for distributing electric power.
3. Distinguish between single-phase and three-phase current characteristics.
4. List three methods of grounding an electrical circuit.
5. Select the functions of transformers.
6. Discuss the types of three-phase circuits.
7. List six major causes and three effects of low line voltage.
8. Evaluate a breaker panel and select proper breakers for various types of circuits and loads.
9. Read schematics and wiring diagrams.

D. **Unit IV. Electric Motors**

1. Explain the operating principles of electric motors.
2. Identify the different types of electric motors.
3. Determine the start, run, and common terminals of a single-phase motor.
4. Calculate the type and size of motor needed for different workloads and situations.
5. Test an electric motor and electric heater using an ammeter correctly.
6. Test an electric motor using an ohmmeter correctly.

E. **Unit V. Safety.**

1. Follow all electrical and mechanical safety procedure.

III. THECB Learning Outcomes (WECM)

1. Demonstrate knowledge of basic principles of electricity, electrical current, circuitry, and air conditioning devices.
2. Apply Ohm's law to electrical calculations.
3. Perform electrical continuity, voltage, and current tests with appropriate meters.
4. Demonstrate electrical safety.

IV. Evaluation

A. Challenge Exam

Students who wish to challenge the course should contact the Testing Center and the Division Dean. Challenges must be accomplished before the census cut-off date. Students who previously have received a W or a letter grade for the course are not eligible to challenge the course.

B. Home Work Assignments and Quizzes

Students are required to turn in review questions at the end of each unit, of the textbook, upon completion of that unit. The student will be given two quizzes; these grades will constitute 30% of the final grade.

C. Lab assignments 40% of final grade.

D. Final Exam

This exam will constitute 30% of the final grade.

E. Grading Scale:

I = Incomplete
W = withdrew or withdrawn

90-100	A
80-89	B
70-79	C
60-69	D
0-59	F

V. Disability Statement (Americans with Disabilities Act [ADA])

EPCC offers a variety of services to persons with documented sensory, mental, physical, or temporary disabling conditions to promote success in classes. If you have a disability and believe you may need services, you are encouraged to contact the Center for Students with Disabilities to discuss your needs with a counselor. All discussions and documentation are kept confidential. Offices located: VV Rm C-112 (831-2426); TM Rm 1400 (831-5808); RG Rm B-201 (831-4198); NWC Rm M-54 (831-8815); and MDP Rm A-125 (831-7024).

VI. 6 Drop Rule

Students who began attending Texas public institutions of higher education for the first time during the Fall 2007 semester or later are subject to a 6-Drop limit for all undergraduate classes. Developmental, ESL, Dual Credit and Early College High School classes are exempt from this rule. All students should consult with their instructor before dropping a class. Academic assistance is available. Students are encouraged to see Counseling Services if dropping because exemptions may apply. Refer to the EPCC catalog and website for additional information.