

El Paso Community College

Syllabus

Part II

Official Course Description

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| SUBJECT AREA | <u>Automotive Technology</u> |
| COURSE RUBRIC AND NUMBER | <u>AUMT 1407</u> |
| COURSE TITLE | <u>Automotive Electrical Systems</u> |
| COURSE CREDIT HOURS | <u>4 3 :</u> Credits Lec Lab |

I. Catalog Description

Presents an overview of automotive electrical systems including topics in operational theory, testing, diagnosis, and repair of charging and starting systems, ignition, and electrical accessories. Emphasizes electrical principles schematic diagrams, and service manuals. May be taught manufacturer specific. **(3:4). Lab fee.**

II. Course Objectives

A. Unit I. Shop Safety

1. Work safely in an automotive shop.
2. Explain laws regarding hazardous materials in the shop.

B. Unit II. Basic Electricity

1. Define current, volts, amps, and resistance.
2. Identify series, parallel, and series-parallel circuits.
3. Use a multi-meter to measure voltage, resistance, and amperage.
4. Correctly use a 12-volt test light without damaging electronic components.
5. Describe the operation of fuses, fuse links, and circuit breakers.
6. Demonstrate wire repair procedures and materials
7. Apply Ohm's law to electrical circuits.
8. Obtain wiring diagrams from manuals and computers.
9. Use wiring diagrams while diagnosing electrical problems.
10. Use a strategy-based diagnostic procedure while solving customer concerns.
11. Document service or repair procedure on the Work Order or Lab Report.
12. Compare actual time spent on a repair to flat rate time.
13. Demonstrate efficiency from start to finish of the job.
14. Identify proper tools and equipment for the job.

C. Unit III. Battery Diagnosis and Service

1. Explain the basic theory of battery operation.
2. Perform battery maintenance and inspection procedures correctly.
3. Perform the different battery checks and tests to determine battery condition.
4. Perform battery jump-start procedures safely and correctly.
5. Diagnose related electrical system components.

D. Unit IV. Starting System Diagnosis and Repair

1. Explain the operating principles of the starting system.
2. Perform starting system diagnostic tests correctly and determine needed repairs

3. Remove and/or replace starter motors and components correctly.
4. Perform bench testing procedures and make required repairs correctly.

E. Unit V. Charging System Diagnosis and Repair

1. List and describe the basic operation of the charging system components.
2. Diagnose charging system problems that cause an undercharge, no charge, or an overcharge condition with the use of a VAT 40, VAT 60, AVR, or multimeter.
3. Remove or replace charging system components such as alternators, belts, pulleys, regulators, connectors, and wires.
4. Perform alternator oscilloscope pattern tests and determine needed repairs.
5. Perform alternator bench testing procedures and make repairs.
6. Correctly use alternator bench testing equipment.

F. Unit VI. Ignition System Diagnosis and Repair

1. Inspect, test, repair, or replace ignition primary and secondary circuit components and wiring in standard and electronic ignition systems.
2. Correctly use common test equipment.
3. List and describe the operation of primary and secondary ignition system components.

III. THECB Learning Outcomes (WECM)

1. Utilize appropriate safety procedures.
2. Define basic electrical principles.
3. Interpret wiring schematics and symbols.
4. Explain operation of batteries, starting/charging systems, and automotive circuits.
5. Use test equipment.
6. Perform basic electrical repairs.

IV. Evaluation

- A. Unit exams will count 60% toward the final grade.
- B. Unit lab exams will count 40% toward the final grade.
- C. Grading Scale

90 to 100 = A
80 to 89 = B
70 to 79 = C
60 to 69 = D
Below 60 = F

- D. Cheating will not be permitted. Any person caught cheating will receive a grade of zero for that exam.

V. Disability Statement (American 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.