



CENTRAL PIEDMONT COMMUNITY COLLEGE

Course Syllabus Electrical Systems AUT-163-10 GENERAL MOTORS ASEP

Syllabus Contents:

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- Course Objectives
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- Safety Regulations
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Time Requirements:

- 8 Weeks
- 5 Class Hours/Week
- 5 Lab Hours/Week
- 3 Semester Hours Credit

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Electrical Systems

AUT-163-10

GENERAL MOTORS ASEP

Prerequisites: None

Course description:

This course covers fundamentals of electrical and electronic circuitry and semiconductors. Topics include Ohm's law, circuits and the use of digital multimeters (one is required for class). Upon completion student should be able to apply ohm's law to diagnostic procedures and handle basic electrical and electronic circuit diagnosis and repair.

- GENERAL MOTORS ASEP Embedded Course

16041.01W-R2	Prerequisite	Battery, Charging, & Starting
18044.17W	Prerequisite	Body Control & Communication Systems
18044.17D1	Embedded	Body Control & Communication Systems
18044.17D2	Embedded	Body Control & Communication Systems
18044.17H	Optional	Body Control & Communication Systems
19047.06W-R2	Prerequisite	Security Systems
19047.03W1	Prerequisite	Entertainment Systems
19047.03W2	Prerequisite	Entertainment Systems
19047.03W3	Prerequisite	Entertainment Systems
19047.03S	Prerequisite	Entertainment Systems
19047.03H-R3	Optional	Entertainment Systems
19040.30D1	Prerequisite	OnStar Systems Diagnosis and Repair
19040.30D2	Prerequisite	OnStar Systems Diagnosis and Repair
10347.01V	Prerequisite	Hummer H2 New Model Features
10347.02V	Prerequisite	Hummer H2 New Model Features
22048.30W	Prerequisite	GM Supplemental Restraint System
22048.30H	Embedded	GM Supplemental Restraint System

Electrical Systems
AUT-163-10
GENERAL MOTORS ASEP
Course Objectives

Course Objectives:

Course objectives are based upon NATEF requirements for automotive students involved in diagnosis and repair of automotive electrical and electronic areas. Course is preparatory to taking the ASE certification test A-6, automotive electricity.

A 1 identify and interpret electrical / electronic system concern; determine necessary action. P1

A 4 Diagnosis electrical/electronic integrity for series, parallel and series parallel circuits using principles of electricity (Ohm's Law) P1

A 5 Use wiring diagram during diagnosis of electrical circuit problems.

A 6 Demonstrate the proper use of a digital multimeter (DMM) during diagnosis of electrical circuit problems P1

A 7 Check electrical circuits with a test light; determine needed action. P1

A 8 Measure source voltage and perform voltage drop test in electrical/electronic circuits using a voltmeter and determine needed action. P1

A 9 Measure current flow in electrical/electronic circuits and components using an ammeter; determine needed action. P1

A 10 Check continuity and measure resistance in electrical/electronic circuits and components using an ohmmeter; determine needed action. P1

A 12 Locate shorts, grounds, opens and resistance problems in electrical/electronic circuits; determine needed action. P1

A 15 Inspect and test switches, connectors, relays, solid state devices and wires of electrical/electronic circuits; determine needed action.

C 1 Perform starter current draw; determine needed repair. P-1

E 1 Diagnosis the cause of brighter than normal, intermittent, dim or no light operation; determine needed action. P-1

E 3 Inspect and diagnosis incorrect turn signal or hazard light operation; perform needed action. P-2

G 1 Diagnosis incorrect horn operation; perform needed action. P-2

H 1 Diagnosis incorrect operation of motor-driven accessory circuits; determine needed action. P-2

Weekly Outline
Electrical Systems
AUT-163-10
GENERAL MOTORS ASEP

Required Textbook: ATech Automotive Electricity/Electronics
Student Manual 1801A, 1820A

GM ASEP Embedded Course Credit:

ATech Workbook and DVOM will be needed for all coursework. Workbook is used in conjunction with ATech training software installed in computer lab. Course will include testing at each section completion point to verify understanding. Portions of program will be self paced

Week 1 & 2

Orientation
Safety Regulations
Grading and Attendance Policy
Introduction to Electricity Workbook pages 1-1 to 1-11
How to use a volt, amp and ohmmeter. Pages 1-4 to 3-5 (fluke video)

Week 3 & 4

Series circuit and electrical behavior Pages 4-1 to 7-12
Parallel Circuits and electrical behavior Pages 8-1 to 11-13
Series-Parallel circuits and electrical behavior Pages 12-1 to 14-

Week 5 & 6

Use of troubleshooting equipment / Automotive Circuits
Pages 15-1 to 20-8
Use of schematics in troubleshooting automotive circuits
Pages 21-1 to 26 - 7

Week 7& 8

Start of 1820 section Automotive Electronics Pages 1-1 to 9-13
Transistors and other electronics in automotive use Pages 10-1 to 16- 5



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STUDENT GRADE POINT AVERAGE

Students will be graded according to the following grade point system.

Grade	Point Value	Description
A	4	Excellent
B	3	Very Good
C	2	Satisfactory
D	1	Poor
F	0	Failing
The following grades will not be used in computing the grade point average.		
I = Incomplete		W = Withdrawal
S = Satisfactory		U = Unsatisfactory
AUD = Audit		N = Never Attended
X = Credit by Examination		

- **Since this course is preparatory to entering the automotive service industry, job attitude, neatness, promptness and care of equipment will be considered part of the final grade. The final grade on these items will be determined by the instructor and based upon accepted industry standards.**

GRADING

1. FOR A GRADE OF "A":

- Complete all written tests with an average of 93% to 100%.
- Attend 90% of all scheduled class/lab hours.
- Complete all lab/shop work in a manner as would be determined EXCELLENT in an actual shop.

2. FOR A GRADE OF "B":

- Complete all written test with an average of 85% to 92%.
- Attend 85% of all scheduled class/lab hours.
- Complete all lab/shop work in a manner as would be determined VERY GOOD in an actual shop.

3. FOR A GRADE OF "C":

- Complete all written tests with an average of 77% to 84%.
- Attend 80% of scheduled class/lab hours.
- Complete all lab/shop work in a manner as would be determined SATISFACTORY in an actual repair shop.

4. FOR A GRADE OF "D":

- Complete all written tests with an average of 70% to 76%.
- Attend 80% of all scheduled class/lab hours.
- Complete all lab/shop work in a manner as would be determined POOR in an actual repair shop.



CENTRAL PIEDMONT COMMUNITY COLLEGE

Automotive Department Student Dress Code Effective August 2005

All automotive students will have and wear safety glasses at all times in shop or lab areas. Failure to adhere to safety glasses rules may result in disciplinary action.

1. All students are required to wear their dealer sponsored uniform to school each day. If a student has not been sponsored by a dealer, the student may purchase approved CPCC shirts from the school store. All shirts must be clean and tucked in. Rips and tears must be mended in a timely manner.
2. Dark colored work-style pants are recommended or Proper fitting jeans that meet the following requirements (length above the shoes, jeans above the hip with belt). No oversized jeans will be permitted. **Shorts are not allowed.** Rips and tears must be mended in a timely manner.
3. Facial jewelry of any type is **NOT** permitted. This includes ear, nose, lip, eyebrow, and cheek rings and/or studs. We also suggest that you refrain from wearing necklaces, rings, or bracelets of any kind as these items may pose a safety hazard.
4. All belts will be of the type that does not have an exposed buckle. No keys, chains or wallets hanging out of pockets.
5. Hats are permitted in the shop area only! If a hat has a brim, it must be worn with it facing forward.
6. Students must wear leather work boots or shoes with steel toes. We highly recommend oil resistant soles. No sneakers, tennis shoes, open toed shoes, or dress shoes are permitted.
7. Other appearance issues not directly covered by these rules will be considered on a case-by-case basis. CPCC staff will decide what is professional in appearance and what is not.

Any Student Not Following These Guidelines Will Be Dismissed From Class And Attendance Credit For That Day Will Not Be Given. No Excuses Will Be Considered.

- Students will bring tools required for class with them at class time.
 - **No Tools, No Lab Credit.**
- **Remember how you act and present yourself will reflect on the department and presentations to prospective employers.**



CENTRAL PIEDMONT COMMUNITY COLLEGE

Automotive Department Student Guidelines / Expectations

- No tobacco products usage is allowed inside any college building at any time.
- Eating or drinking in classrooms is with permission of instructor only; **there will be no eating or drinking in shop or lab or lab areas.**
- Students are expected to be in class on time and will be held responsible for any information covered by instructor, even if late or absent. Tests and quizzes missed may be made up only with instructor permission.
- Missed or late assignments will affect student's course grade.
- Tardiness is a problem; any student who is over 15 minutes late for a class will be counted as absent. CPCC attendance policy is in the on line student handbook.
- Students are expected to conduct themselves in a mature manner at all times. Students caught cheating, fighting, stealing, spinning tires, vandalizing or purposely damaging a vehicle or equipment will be **EXPELLED** from the automotive program. Care should be shown to college vehicles and property.
- Leaving class or shop/lab early without instructor permission will not be tolerated.
- Students are expected to come prepared for class. This means with paper, textbook, pens, pencils or other required material.
- Cell phones and pagers must be turned off during all class or lab times. Cell phones may only be used outside of the automotive buildings. Cell phones which ring during class will be subject to forfeiture or may result in student loss of privilege.
- The area in front of the main lab is not a parking area for students. The laneway must remain open for emergency vehicles. Vehicles inappropriately parked will be ticketed and towed. No parking means No Parking.
- All students are expected to clean up and put away all tools and equipment used during class or lab before leaving. Housekeeping is very important and will be part of your grade.
- Whenever you are unsure about anything ask your instructor! It is your responsibility to make sure that no physical damage occurs to any vehicle that you are working on or driving. Students are responsible for their actions!
- **Safety glasses** and student tools are mandatory in all shop/lab areas, no exceptions.
- All vehicles brought into the main lab will have a CPCC work order filled out and visible on windshield.



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Automotive Technology, Tool List

Safety Glasses or Goggles Mandatory in Labs

- Toolbox
- Common slotted screwdrivers, 4"x3/16, 6"x1/4, 8"x1/4
- Phillips screwdrivers number 1 and number 2
- Torx bit set T10 to T60
- Standard combination wrench set 5/16 to 1 1/4"
- Metric combination wrench set 6mm to 22mm
- 16 oz ball peen hammer
- 6" needle nose pliers
- Regular slip joint pliers
- 10 or 12" Channel Lock pliers
- 6 or 7" side cutting pliers
- Set of punches and chisels
- Feeler gauge set
- 3/8" drive socket set, including ratchet, extensions, standard and metric sockets,
 - 3/8 to 7/8 and 8mm to 17mm
- 3/8" to 1/2" socket adapter, 1/2" to 3/8" socket adapter
- 1/2" drive socket set with extensions and ratchet,
- 1/2" drive flex handle at least 18" long (breaker bar)
- 1/2" drive sockets, 7/16 to 1 1/4 and 10mm to 22mm
- 1/2" inch drive torque wrench
- Spark plug sockets 5/8" and 13/16" 3/8" drive
- Gasket scraper
- Set of Allen wrenches
- 12-volt test light
- 1/4" drive socket set, standard and metric sockets, including ratchet
- Non-sparking drift punch, brass or aluminum
- Digital Volt, Ohm and Ammeter DVOM, with Leads Example Fluke model 83

You may wish to purchase additional tools for the specific program you are enrolled in such as ASEP, BMW, T-TEN, CAP. Check with your instructor for a list.



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Automotive Technology Safety Regulations

- An Instructor must be present any time a class or session is working in the lab

Use of safety glasses is required/mandatory in lab areas.

- Any safety hazard will be reported to the instructor immediately. Floor will be kept clear of all liquids and tripping hazards.
- No equipment will be operated by students until they have received instruction on proper and safe operation of same equipment.
- Vehicle lifts must be secured with mechanical locks prior to working under vehicle
- Jack stands will be used when jacking up a vehicle for service.
- Brake asbestos "dust" will be controlled any time work is done which could lead to asbestos exposure.
- Floor exhaust system will be used anytime an engine is running in the lab.
- Use of tobacco is not permitted in any lab or classroom.
- Use of audio equipment is not permitted during class/lab hours.
- Students and faculty must follow OSHA rules concerning exposure to blood borne diseases.
- Proper disposal of automotive waste products, including hazardous wastes, is required.