



South Portland, Maine 04106

Title: **Electricity & Electronics II**

Catalog Number: **AUTO-205**

Credit Hours: **4**

Lecture (or Lab): **2 hours lecture / 2 hours lab**

Instructor: **Ruth Morrison**

Total Contact Hours: **30 / 60**

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Course Syllabus

Course Description

The second of two courses, this course examines the electrical and electronic systems of automobiles. Students will study inputs, outputs, and processors of electronic systems. Students will diagnose and determine the necessary action for the following systems: starting and charging systems, lighting systems, driver information systems, and accessories. Prerequisite: AUTO- 155.

Course Objectives

After completing this course, the student will be familiar with all tasks listed below. He or she must perform all high priority tasks to manufacturer's specifications and document the completion of each task.

NATEF 2013 Standards TASKS FOR THIS COURSE:

VI. ELECTRICAL/ELECTRONIC SYSTEMS MAST tasks minus the MLR tasks (MLR tasks are in AUTO 155)

For every task in Electrical/Electronic Systems, the following safety requirement must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

VI. ELECTRICAL/ELECTRONIC SYSTEMS

A. General: Electrical System Diagnosis

1. Use wiring diagrams during the diagnosis (troubleshooting) of electrical/electronic circuit problems. P-1
2. Diagnose the cause(s) of excessive key-off battery drain (parasitic draw); determine necessary action. P-1
3. Inspect and test switches, connectors, relays, solenoid solid state devices, and wires of electrical/electronic circuits; determine necessary action. P-1
4. Repair wiring harness. P-1
5. Check electrical/electronic circuit waveforms; interpret readings and determine needed repairs. P-2
6. Repair CAN/BUS wiring harness. P-1

C. Starting System Diagnosis and Repair

1. Differentiate between electrical and engine mechanical problems that cause a slow-crank or a no-crank condition. P-2

D. Charging System Diagnosis and Repair

1. Diagnose (troubleshoot) charging system for causes of undercharge, no-charge, or overcharge conditions. P-1

E. Lighting Systems Diagnosis and Repair

1. Diagnose (troubleshoot) the causes of brighter-than-normal, intermittent, dim, or no light operation; determine necessary action. P-1

F. Gauges, Warning Devices, and Driver Information Systems Diagnosis and Repair

1. Inspect and test gauges and gauge sending units for causes of abnormal gauge readings; determine necessary action. P-2
2. Diagnose (troubleshoot) the causes of incorrect operation of warning devices and other driver information systems; determine necessary action. P-2

G. Horn and Wiper/Washer Diagnosis and Repair

1. Diagnose (troubleshoot) causes of incorrect horn operation; perform necessary action. P-1
2. Diagnose (troubleshoot) causes of incorrect wiper operation; diagnose wiper speed control and park problems; perform necessary action. P-2
3. Diagnose (troubleshoot) windshield washer problems; perform necessary action. P-2

H. Accessories Diagnosis and Repair

1. Diagnose (troubleshoot) incorrect operation of motor-driven accessory circuits; determine necessary action. P-2
2. Diagnose (troubleshoot) incorrect electric lock operation (including remote keyless entry); determine necessary action. P-2
3. Diagnose (troubleshoot) incorrect operation of cruise control systems; determine necessary action. P-3
4. Diagnose (troubleshoot) supplemental restraint system (SRS) problems; determine necessary action. P-2
5. Check for module communication errors (including CAN/BUS systems) using a scan tool. P-2
6. Diagnose (troubleshoot) radio static and weak, intermittent, or no radio reception; determine necessary action. P-3
7. Diagnose (troubleshoot) body electronic system circuits using a scan tool; determine necessary action. P-3
8. Diagnose the cause(s) of false, intermittent, or no operation of anti-theft systems. P-3
9. Describe the process for software transfers, software updates, or flash reprogramming on electronic modules. P-3

Topical Outline of Instruction

1. Review
2. Electronics
3. Oscilloscope
4. Scan tools
5. Networking
6. Lighting systems
7. Driver information systems
8. Accessories

Course Requirements

- Students will develop a three-ring binder / portfolio of all hand outs, quizzes and tests.
- Students will successfully complete homework, quizzes and tests. Homework assignments and studying outside of class will take approximately twice the time spent in class.
- Students will successfully complete shop projects as assigned and approved by instructor and maintain documentation of completion.

ASE Student Certification Test

The final week of this course will consist of an ASE Student Certification Test. It will be administered by the Testing Center, located in the Campus Center building. Students will be responsible for taking the test at their convenience during the normal operating hours of the Testing Center. A photo ID is required. For information about the Testing Center, please see www.smccme.edu/tests

Student Evaluation and Grading

10%: Attendance and Participation

10%: Homework

20%: Quizzes

30%: Tests

30%: Practice of Safety and Shop Participation, including portfolio

Attendance Policy

Late homework will not be accepted.

Tardy assignments (class assignments, quizzes, and tests) will receive a grade reduction of 10 points for each day late.

Missed assignments (except for homework) must be made up by 5 PM Friday of the week the work was missed, unless other arrangements are made.

Students missing 15 % of the total hours for the course, tardy or absent, will result in an administrative failure for the class. This equals 13.5 hours for this 4 credit course. This is a “no fault” policy, which means the reason(s) for absence are not considered in implementation of the policy.

Attendance Grade

Out of 100 possible points, 10 points will be deducted for each class absence and 5 points will be deducted for each time tardy.

Text, Tools and/or Supplies

- Automotive Technology with NATEF Correlated Task Sheets (5th Edition) by James D. Halderman (ISBN# 9780134209227).
- Electude Argo E Learning Software subscription
- Each student must supply and maintain his or her own set of tools as listed on the “SMCC Automotive Technology Required Student Tool List.”
- Personal protective equipment must be worn at all times in lab. Leather, steel-toe work boots; clear safety glasses with side shields; and a uniform are required for this course.
- Highlighters and a clipboard are required for lab.
- Students must use their tool tags when they remove tools from the tool room.

Please note: The following items are required to participate in lab:

- 1. Leather steel-toe work boots**
- 2. Clear safety glasses with side shields**
- 3. Uniform**
- 4. Tool tags**
- 5. Tools listed on the “SMCC Automotive Technology Required Student Tool List”**
- 6. Clipboard and highlighters**

If a student does not bring or use the items on the above list, the following consequences will result:

- **The student can not participate in lab.**
- **The student will be marked absent.**
- **The attendance grade will reflect the absence.**
- **The hours missed will be counted towards a student’s Administrative Failure for 15% absence.**
- **The student will earn a grade of 0 for the assignments during that lab session.**

Telephones and Computers

The use of computers, cell phones, smart phones, or other mobile communication devices is prohibited during lecture, unless the instructor indicates a special circumstance. In case of emergency, phones should be silenced, and answered outside the classroom. Special requests to use a computer for note taking will be considered by the instructor on a case by case basis. Violations of this policy will result in dismissal from the class period and an absence recorded. Repeat problems may result in a sanction from the Dean of Students.

Learning Outcomes

1. When necessary, utilize information-literacy skills, including evaluation of information from a variety of media and proper MLA and/or APA documentation.
2. Use critical thinking and listening skills in written and oral communication as a tool for learning.

3. Read and demonstrate understanding of complex ideas by identifying key concepts.
4. Apply theory to practice using problem solving techniques and data analysis.
5. Solve problems using algebraic techniques.
6. Interpret information presented in charts and graphs or illustrate a scenario using graphic techniques.
7. Utilize quantitative methods to solve and/or assess complex problems to support decision making, forecasting, and recommendations.
8. Participate in a direct experience of scientific inquiry of the natural world using the scientific method.
9. Find and evaluate credible sources of scientific information using a variety of media to support a research need.
10. Demonstrate the capacity to make informed and ethical judgments about the impact of science and technology on the self, the environment, and the practice of sustainability.

Office Hours

Appointments can be made to accommodate student needs. They can be scheduled in person by walk-in basis, by e-mail at rmorrison@smccME.edu, or by phone at 207-741-5856.

End-of-Course Evaluation

In order to gain access to final course grades, students must complete evaluations for each course attended at SMCC. Evaluations are submitted online and can be accessed through the student portal site. Students can access the course evaluation report beginning two weeks before the end of classes. The deadline for submission of evaluations occurs 24 hours after the last day of classes each semester. Instructors will announce when the online course evaluation is available.

ADA Syllabus Statement

Southern Maine Community College is an equal opportunity/affirmative action institution and employer. For more information, please call [207-741-5798](tel:207-741-5798). If you have a disabling condition and wish to request accommodations in order to have reasonable access to the programs and services offered by SMCC, you must register with the Disability Services Coordinator, Sandra Lynham, who can be reached at 741-5923. Further information about services for students with disabilities and the accommodation process is available upon request at this number. Course policies about online testing are modified to suit each individual's accommodations.

Student Printing Policy

This policy identifies the cost per page for black and white as well as color printing in varying page sizes. Specifics of the policy are outlined below:

Per Page Costs

Each semester students receive a \$20 printing credit. The balance resets at the end of the semester and any remaining credits are removed. The cost varies depending upon page size and whether printing is done in black and white or color.

- a. There is a \$0.10 per page fee for standard 8.5" by 11" black and white documents.
- b. The reverse sides of duplex (double-sided) documents are free.
- c. There is a \$.50 per page fee for standard 8.5" by 11" color documents.
- d. There is a \$.20 per page fee for 8.5" by 14" (legal) or 11" by 17" (tabloid) black and white documents.
- e. There is a \$1.00 per page fee for 8.5" by 14" (legal) or 11" by 17" (tabloid) color documents.

Duplex charges (printing on both sides of a page) work in the following fashion: One page is \$0.10, two pages are \$0.10, three pages are \$0.20, and four pages are \$0.20, *etc.* The flipsides are free, but another sheet of paper is \$0.10. Please be aware that a document with any color at all (when printed to a color printer) will by default be printed in color. You are responsible for setting the print job to print black and white if you do not need color. For directions, please go to the IT Help tab in My SMCC.

How does it work?

The College's pay-for-print system monitors printing on all printers (including those in general access labs, library printers, the Academic Achievement Center, Noisy Lounge and technology labs). Students can check the number of pages they have printed by using the Printing Balance tool available on SMCC computers (located in the lower right corner of the screen, near the clock). Departments with work study students who need to print documents for the department should contact the HelpDesk at 741-5696 to have a special account set up.

Refunds

Print jobs are eligible for a refund in the event of mechanical or electronic error on the part of the printer, print server, or software used to submit the job. Jobs are not eligible for a refund in cases where the job was not set up correctly, was submitted multiple times, or the student is not satisfied with the result. To request a refund, please bring the offending print to the IT Department in the basement of the Ross Technology Center. Refunds will be granted in the form of a credit to the student's account.

Why is SMCC charging for printing?

The pay-for-print system is an effort to control escalating printing costs. Charging for printing helps offset the increasing cost of supplies and encourages students to conserve resources. To find ways to reduce your printing charges, please go to the IT Help tab on My SMCC. If you have questions about the pay-for-printing policy or your printing charges, please contact the HelpDesk at 741-5696 or send an email to helpdesk@smccme.edu.

Be sure to log OUT of the system when you've finished your printing, to prevent unauthorized access to your account.

Add-Drop Policy

Students who drop a course during the one-week “add/drop” period in the fall and spring semesters and the first three days of summer sessions receive a 100% refund of the tuition and associated fees for that course. Please note any course that meets for less than the traditional semester length, i.e., 15 weeks, has a pro-rated add/drop period. There is no refund for non-attendance.

Withdrawal Policy

A student may withdraw from a course only during the semester in which s/he is registered for that course. The withdrawal period is the second through twelfth week of the fall and spring semesters and the second through ninth week of twelve-week summer courses. This period is pro-rated for shorter-length courses. To withdraw from a course, a student must complete and submit the appropriate course withdrawal form, available at the Enrollment Service Center (no phone calls, please). The designation “W” will appear on the transcript after a student has officially withdrawn. A course withdrawal is an uncompleted course and may adversely affect financial aid eligibility. Failure to attend or ceasing to attend class does not constitute withdrawal from the course. There is no refund associated with a withdrawal.

Plagiarism Statement

Adherence to ethical academic standards is obligatory. Cheating is a serious offense, whether it consists of taking credit for work done by another person or doing work for which another person will receive credit. Taking and using the ideas or writings of another person without clearly and fully crediting the source is plagiarism and violates the academic code as well as the Student Code of Conduct. If it is suspected that a student in any course in which s/he is enrolled has knowingly committed such a violation, the faculty member should refer the matter to the College’s Disciplinary Officer and appropriate action will be taken under the Student Code of Conduct. Sanctions may include suspension from the course and a failing grade in the course. Students have the right to appeal these actions to the Disciplinary Committee under the terms outlined in the Student Code of Conduct.

Cancellations

When weather conditions require the College to close, we will:

- Notify you through your SMCC email account and send a text alert
- Post a storm message on the SMCC Storm Line (741-5900)
- Post the closure on a banner at the top of the SMCC website
- Post a message on the SMCC Facebook page
- Notify local media outlets
- Post a message on Twitter

When the weather forces the College to close altogether, open late or close early, the following guidelines are in place:

- When the College closes altogether for the day, all classes are canceled and all offices are closed.
- When the College closes early at a specific time, all classes beginning at that time and later are canceled. All classes beginning before the closure time will be held as scheduled. All offices will close at the closing time.
- When the College opens late, all classes beginning before the specified scheduled opening time are canceled. Classes beginning at the opening time and later will be held as scheduled. All offices will open at the opening time.