



Columbus State Community College
Engineering & Transportation Technology Department
Automotive Technology

COURSE NUMBER: AUTO 2390

COURSE TITLE: Advanced Hybrid Vehicles: Diagnosis and Repair

INSTRUCTOR: TBD OFFICE: DE CONTACT:

CREDITS: 2 CLASS HOURS PER WEEK: 3 (1.5 lecture, 1.5 lab)

PREREQUISITES:

Students should have successfully completed have completed AUTO 2190, AUTO 2360 and AUTO 2280 or completion of Auto 2190 and current ASE A6 & A8 certifications.

FACULTY ADVISORS:

Each faculty member of the Automotive Department serves as a faculty advisor for a particular group of students. These groups are determined by your major and the first initial of the students' last name.

Table with 5 columns: Major, If your last name starts with:, Your advisor is:, Office, Phone #. Rows include Auto. Tech (A-H, I-Q, R-Z), TechLINK (A-Z), ASSET (A-Z), and Mgmt. Major (A-Z) with corresponding advisor names and contact info.

Faculty advisors will help you with career planning, schedule planning and course selection, and will help you fill out any forms that you may need completed. You should also see your advisor any time you are having problems in courses.

All students should see Mark Gerko, Department Chairperson, in Davidson Hall 209 for special circumstances and requests.

DESCRIPTION OF COURSE:

This course builds on the fundamentals covered in AUTO 2190 Hybrid Vehicles Theory & Operation. The emphasis of this course will focus on high voltage systems: safety, service, diagnosis and repair. Must have completed AUTO 2190, AUTO 2360 and AUTO 2280? or completion of Auto 2190 and current ASE A6 & A8 certifications. This course is designed to complement the knowledge learned in AUTO 2190, 2280 and 2360 to prepare student to pass the ASE Light Duty Hybrid/Electric Vehicle Specialist Test (L3).

**COURSE TIME ALLOTMENT:**

This course is scheduled to meet 6 hours each week. Approximately 3 of those hours are spent in the classroom and the remaining hours are spent doing lab work. It is recommended that you spend approximately 2 hours outside of class for each class hour and 1 hour for each lab hour. This class could require as much as 9 hours outside of class. This is a general formula as some classes may require more time and some may actually require less time.

**COURSE STUDENT LEARNING OUTCOMES**

Upon completion of this course, students should be able to,

1. Evaluate condition and approximate life expectancy of the high voltage battery
2. Diagnosis and repair common high voltage circuit malfunctions. Including contactors and loss of insulation problems
3. Evaluate operation of the motor/generator and determine need for repair or replacement
4. Evaluate operation of AC/DC inverter and determine need for repair or replacement
5. Evaluate operation of DC/DC converter and determine need for repair or replacement
6. Replace some common high voltage components following proper safety procedures

**PROGRAM OUTCOMES**

This course provides a foundation for the following outcomes:

1. Identify the major systems of the automobile and correctly assess a system for proper operation.
2. Synthesize a customer's symptom into a set of possible system malfunctions and then into a sub-set of possible system component malfunctions.
3. Select the correct type and source of Automotive Information and then employ that information to devise a repair strategy.
4. Evaluate components and identify the failed component and the root cause of failure.
5. Present the prescribed solution and justify the cost of the solution to address a repair concern including presenting alternatives and explaining why the recommendation is the best choice.
6. Determine the correct procedure for the repair and then correctly perform the procedure.
7. Apply proper ethical consideration when recommending needed repairs and managing the employer's resources when conducting such repairs.
8. Employ self-teaching techniques mastered during the program in order to remain abreast of advancements in technology.
9. Apply good customer relations skills in all interactions with service customers.

**OUTCOMES BASED ASSESSMENT OF STUDENT LEARNING** For this course, students are expected to demonstrate the skills associated with the Institutional Learning Goals (ILG) identified below:

1. Critical Thinking
2. Communication Competence

In class students are assessed on their achievement of these outcomes. Names will not be used when reporting results. Outcomes-based assessment is used to improve instructional planning and design and the quality of student learning throughout the college.

### **COURSE MATERIALS REQUIRED**

Safety Glasses, non-flammable clothing, hard-soled shoes (No Sandals), pencils and pens. All students will be required to wear safety glasses at all times in the automotive lab area. If you enter these areas without safety glasses on, you will be required to leave the area immediately until you have your safety glasses on.

A copy of the student lab policy is (attached) (on blackboard). If you have any questions or comments regarding these, see your advisor.

### **TEXTBOOK(S), MANUALS, REFERENCES, AND OTHER READINGS**

Electric Drive Vehicle Automotive Technician Training. By National Alternative Fuels Training Consortium. Morgantown West Virginia. Copyright 2013

### **GENERAL INSTRUCTIONAL METHODS**

In-class discussions, Lecture, Demonstrations, PowerPoints, Reading, Lab activities and videos

### **STANDARDS AND METHODS FOR EVALUATION**

Periodic quizzes will be worth 30% of the final grade

All lab worksheets will be worth 50% of the final grade.

A comprehensive final exam worth 20% of the final grade will be given at the end of the quarter.

### **GRADING SCALE (Departmental)**

92 - 100 % = A    85 - 91 % = B    75 - 84 % = C    70 - 74 % = D    0 - 69 % = E

### **SPECIAL COURSE REQUIREMENTS**

**NOTE:** Lab worksheets will be handed out in class and available on blackboard after class. Lab worksheets are due at (or before) the beginning of the next class period after they are assigned. They may be submitted in person or via e-mail. Lab assignments that turned in after the due date & time will be penalized 10% for each day they are late. ***There will be no make-up work (labs, quizzes or tests) given without prior approval from the instructor.*** If a situation arises that demands a grade of incomplete to be given, arrangements for this must be made with the instructor prior to the end of the term

## **ATTENDANCE POLICY**

The Automotive Department does not deduct from students grades for missing class periods, however poor attendance does normally cause learning and grades to be lower, due to missed assignments, lectures and demonstrations. We encourage students to attend every class. Attendance will be taken at each class session. Columbus State is required by federal law to verify the enrollment of students who participate in Federal Title IV student aid programs and/or who receive educational benefits through the Department of Veteran's Affairs. Non-attendance is reported quarterly by each instructor, and results in student being administratively withdrawn from the class section. Please contact the Financial Aid Office for information regarding the impact of course withdrawals on financial aid eligibility."

## **COLLEGE SYLLABUS STATEMENTS**

Columbus State Community College required College Syllabus Statements on College Policies and Student Support Services can be found at [www.csc.edu/syllabus](http://www.csc.edu/syllabus) or on the College website Quick Links "Syllabus Statements". It is the students' responsibility to read and understand the information on this page.

This page contains more information on the following:

- [Institutional Learning Goals](#)
- [Student Code of Conduct](#)
- [Americans with Disabilities Act \(ACT\) Policy](#)
- [Counseling Services](#)
- [Title IX and Non-Discrimination](#)
- [Tobacco-Free Columbus State](#)
- [Financial Aid Attendance Reporting](#)
- [Audio/Video Recording of Class](#)
- [Inclement Weather or Other Emergencies](#)