**Barton Community College**

**Course Syllabus**

## GENERAL COURSE INFORMATION

Course Number: AUTO 1140

Course Title: Hybrid and Electric Powertrains

Credit Hours: 1

Division/Discipline: Workforce Training & Community Education/Automotive Technology

Prerequisite: AUTO 1114 Electrical II, AUTO 1122 Engine Performance II, or the consent of the instructor.

Course Description: This course provides students the opportunity to examine AC/DC high voltage systems utilized in hybrid and electric automobiles. Students will identify HV components, employ recognized safety precautions, and practice maintenance/diagnostic procedures associated with hybrid and electric automobiles.

## INSTRUCTOR INFORMATION

## COLLEGE POLICIES

Students and faculty of Barton Community College constitute a special community engaged in the process of education. The College assumes that its students and faculty will demonstrate a code of personal honor that is based upon courtesy, integrity, common sense, and respect for others both within and outside the classroom.

Plagiarism on any academic endeavors at Barton Community College will not be tolerated. The student is responsible for learning the rules of, and avoiding instances of, intentional or unintentional plagiarism. Information about academic integrity is located in the Student Handbook.

The College reserves the right to suspend a student for conduct that is determined to be detrimental to the College educational endeavors as outlined in the College Catalog, Student Handbook, and College Policy & Procedure Manual. (Most up-to-date documents are available on the College webpage.)

Any student seeking an accommodation under the provisions of the Americans with Disability Act (ADA) is to notify Student Support Services via email at disabilityservices@bartonccc.edu.

### COURSE VIEWED IN TOTAL CURRICULUM

Hybrid and Electric Powertrains is an elective course.

## ASSESSMENT OF STUDENT LEARNING

Barton Community College is committed to the assessment of student learning and to quality education. Assessment activities provide a means to develop an understanding of how students learn, what they know, and what they can do with their knowledge. Results from these various activities guide Barton, as a learning college, in finding ways to improve student learning.

Course Outcomes, Competencies, and Supplemental Competencies:

1. Identify and examine hybrid/electric automobile components.
2. Identify/examine electric AC/DC inverter.
3. Identify/examine HV battery pack.
4. Identify/examine safety disconnect device.
5. Identify/examine HV cables.
6. Identify/examine HV AC/DC motors/powertrains.
7. Employ industry recognized safety and service practices associated with hybrid and electric automobile repair.
8. Identify high voltage circuits; employ safety precautions.
9. Identify the location of the high voltage service disconnect switch/plug.
10. Demonstrate procedure for disabling/enabling the high voltage system.
11. 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.
12. Evaluate electrical/electronic systems utilized in hybrid and electric vehicles.
13. Research applicable vehicle and service information, such as electrical/electronic system operation, vehicle service history, service precautions, and technical service bulletins.
14. Identify and interpret electrical/electronic system concern; determine necessary action.
15. Demonstrate the proper use of a digital multimeter (DMM) during diagnosis of electrical circuit problems.
16. Inspect and test switches, connectors, relays, solenoid solid state devices, and wires of electrical/electronic circuits; perform necessary action.
17. Diagnose electronic systems utilizing a scan tool; determine necessary action.
18. Identify hybrid vehicle auxiliary (12v) battery service, repair and test procedures.
19. Check for module communication (including CAN/BUS systems) errors using a scan tool.
20. Inspect and test sensors, connectors, and wires of electronic (digital) instrument circuits; determine necessary action.

## INSTRUCTOR’S EXPECTATIONS OF STUDENTS IN CLASS

## TEXTBOOKS AND OTHER REQUIRED MATERIALS

## REFERENCES

###### METHODS OF INSTRUCTION AND EVALUATION

1. **ATTENDANCE REQUIREMENTS**
2. **COURSE OUTLINE**