

Washtenaw Community College Comprehensive Report

ATT 282 Electric Vehicle (EV) Energy Management Effective Term: Fall 2024

Course Cover

College: Advanced Technologies and Public Service Careers

Division: Advanced Technologies and Public Service Careers

Department: Transportation Technologies

Discipline: Automotive & Transportation Tech (new)

Course Number: 282

Org Number: 14100

Full Course Title: Electric Vehicle (EV) Energy Management

Transcript Title: EV Energy Management

Is Consultation with other department(s) required: No

Publish in the Following:

Reason for Submission: New Course

Change Information:

Rationale: New course submission for the ATT department. This course is the third EV course in the series for the proposed mini certificate, certificate or the degree.

Proposed Start Semester: Winter 2025

Course Description: In this course, students will learn how to service and maintain electric vehicle (EV) batteries and on-board charging systems according to the manufacturers' recommendations. Topics of study will include EV battery subsystems and battery charging component and wiring locations. In addition, battery heating and cooling system identifications as well as safety standards and practices for EV battery service will be addressed. Students will also explore specialty battery tooling, battery management system (BMS) data, and the diagnostic tooling needed to perform battery diagnostics and removal in a shop environment.

Course Credit Hours

Variable hours: No

Credits: 4

Lecture Hours: Instructor: 45 **Student:** 45

Lab: Instructor: 60 **Student:** 60

Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 105 **Student:** 105

Repeatable for Credit: NO

Grading Methods: Letter Grades

Audit

Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Requisites

Prerequisite

ASV 256 minimum grade "C"

and

Prerequisite

ATT 280 minimum grade "C"

General Education

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Identify safety standards and protocols when servicing electric vehicle batteries.

Assessment 1

Assessment Tool: Outcome-related exam questions

Assessment Date: Winter 2028

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 70% of the students will score 70% or higher.

Who will score and analyze the data: Departmental faculty

2. Diagnose and service EV batteries and operating subsystems.

Assessment 1

Assessment Tool: Outcome-related exam questions

Assessment Date: Winter 2028

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 70% of the students will score 70% or higher.

Who will score and analyze the data: Departmental faculty

Assessment 2

Assessment Tool: Outcome-related student achievement checklist

Assessment Date: Winter 2028

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Rubric

Standard of success to be used for this assessment: 70% of the students will score 70% or higher.

Who will score and analyze the data: Departmental faculty

3. Collect and analyze data from battery management systems.

Assessment 1

Assessment Tool: Outcome-related exam questions

Assessment Date: Winter 2028

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 70% of the students will score 70% or higher.

Who will score and analyze the data: Departmental faculty

Assessment 2

Assessment Tool: Outcome-related student achievement checklist

Assessment Date: Winter 2028

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Rubric

Standard of success to be used for this assessment: 70% of the students will score 70% or higher.

Who will score and analyze the data: Departmental faculty

Course Objectives

1. Identify and understand safety protocols to properly handle low and high voltage batteries and cells.
2. Identify low-voltage systems and components.
3. Identify high-voltage systems and components.
4. Identify on-board charging systems and components.
5. Discuss electric vehicle (EV) battery contactors.
6. Identify contactor test procedures.
7. Discuss advancements in battery technologies.
8. Define battery management systems.
9. Test battery management systems.
10. Collect data from battery management systems.
11. Understand different manufacturers' battery charging strategies.
12. Diagnose, remove, and test EV batteries.
13. Identify EV battery venting systems.
14. Test sealed EV batteries using a smoke tester.
15. Discuss different HVAC systems for vehicle batteries.
16. Test DC to DC converters.
17. Test AC to DC converters.
18. Identify loss of isolation testing and diagnostic procedures.
19. Identify EV battery maintenance procedures.
20. Discuss EV battery degradation data.

New Resources for Course

Course Textbooks/Resources

Textbooks

Manuals

Periodicals

Software

Equipment/Facilities

Level III classroom

Reviewer

Action

Date

Faculty Preparer:

Shawn Deron

Faculty Preparer

Jan 30, 2024

Department Chair/Area Director:

Rocky Roberts

Recommend Approval

Jan 31, 2024

Dean:

Jimmie Baber

Recommend Approval

Feb 01, 2024

Curriculum Committee Chair:

Randy Van Wagnen

Recommend Approval

Feb 14, 2024

Assessment Committee Chair:

Jessica Hale

Recommend Approval

Feb 14, 2024

Vice President for Instruction:

Brandon Tucker

Approve

Feb 19, 2024