

## Washtenaw Community College Comprehensive Report

### ATT 284 Electric Vehicle (EV) Drivelines & Chassis 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:** 284

**Org Number:** 14100

**Full Course Title:** Electric Vehicle (EV) Drivelines & Chassis

**Transcript Title:** EV Drivelines & Chassis

**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 fourth 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) drivelines and HVAC systems as well as follow manufacturers' recommendations to align EV chassis. Topics of study will include, but will not be limited to, motors used in EV drive systems, EV gearbox service, as well as passenger cabin heating and cooling system identification and maintenance. Safety standards and practices for servicing EV drivelines and HVAC systems will also be addressed as well as specialty service tooling and suggested maintenance intervals.

#### 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**

ATT 282 minimum grade "C"

## General Education

### Request Course Transfer

#### **Proposed For:**

### Student Learning Outcomes

1. Identify safety standards and protocols for servicing EV gearboxes and drive 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 students will score 70% or higher.

Who will score and analyze the data: Departmental faculty

2. Diagnose and service EV drivelines and 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 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 students will score 70% or higher.

Who will score and analyze the data: Departmental faculty

3. Diagnose and service EV heat pump and resistive HVAC 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 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 students will score 70% or higher.

Who will score and analyze the data: Departmental faculty

### Course Objectives

1. Identify electric vehicle (EV) motors.
2. Identify EV motor diagnostic procedures.
3. Discuss EV driveline differences.
4. Identify EV driveline maintenance procedures.
5. Diagnose and service EV drivelines.
6. Identify EV driveline gearbox differences.
7. Discuss EV regenerative braking.
8. Identify EV brake system differences.
9. Identify EV brake system maintenance procedures.
10. Discuss diagnostic procedures of EV brake systems.
11. Discuss EV suspension system differences.
12. Diagnose EV wheel alignment issues.
13. Identify EV heat pump systems.
14. Identify EV resistive heating systems.
15. Identify battery consumption symptoms related to driveline issues.
16. Identify battery consumption symptoms related to chassis and handling issues.

### New Resources for Course

#### Course Textbooks/Resources

Textbooks

Manuals

Periodicals

Software

#### Equipment/Facilities

Level III classroom

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
<b>Faculty Preparer:</b> <i>Shawn Deron</i>	<i>Faculty Preparer</i>	<i>Jan 30, 2024</i>
<b>Department Chair/Area Director:</b> <i>Rocky Roberts</i>	<i>Recommend Approval</i>	<i>Jan 31, 2024</i>
<b>Dean:</b> <i>Jimmie Baber</i>	<i>Recommend Approval</i>	<i>Feb 01, 2024</i>
<b>Curriculum Committee Chair:</b> <i>Randy Van Wagnen</i>	<i>Recommend Approval</i>	<i>Feb 14, 2024</i>
<b>Assessment Committee Chair:</b> <i>Jessica Hale</i>	<i>Recommend Approval</i>	<i>Feb 14, 2024</i>
<b>Vice President for Instruction:</b> <i>Brandon Tucker</i>	<i>Approve</i>	<i>Feb 19, 2024</i>