

## Washtenaw Community College Comprehensive Report

### ATT 277 Automotive Powertrain Systems Effective Term: Fall 2025

#### 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:** 277

**Org Number:** 14100

**Full Course Title:** Automotive Powertrain Systems

**Transcript Title:** Automotive Powertrain Systems

**Is Consultation with other department(s) required:** No

**Publish in the Following:** College Catalog , Web Page

**Reason for Submission:** Course Change

**Change Information:**

**Consultation with all departments affected by this course is required.**

**Rationale:** Update the course for the new discipline.

**Proposed Start Semester:** Fall 2024

**Course Description:** In this course, students will learn about the use of a chassis roll dynamometer for testing and validation of powertrain systems. Students will learn the principles of dynamometer operation including safety systems, road cycle testing, emissions testing, and durability testing. Students also gain practical experience in the laboratory, as well as develop and execute a test sequence for horsepower, emissions testing, and fuel system testing. This course was previously ASV 277.

#### Course Credit Hours

**Variable hours:** No

**Credits:** 4

**Lecture Hours: Instructor:** 60 **Student:** 60

**Lab: Instructor:** 45 **Student:** 45

**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

No Level Required

#### Requisites

**Prerequisite**

ATT 130 minimum grade C

and

**Prerequisite**

ATT 131 minimum grade C

**General Education****Request Course Transfer****Proposed For:****Student Learning Outcomes**

1. Apply dynamometer safety techniques when preparing a vehicle for dynamometer testing.

**Assessment 1**

Assessment Tool: Outcome-related student project

Assessment Date: Winter 2025

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Outcome-related rubric criteria

Standard of success to be used for this assessment: 75% of students will score 75% or higher.

Who will score and analyze the data: Departmental faculty

2. Create dynamometer vehicle output data sets during testing.

**Assessment 1**

Assessment Tool: Outcome-related student project

Assessment Date: Winter 2025

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Outcome-related rubric criteria

Standard of success to be used for this assessment: 75% of students will score 75% or higher.

Who will score and analyze the data: Departmental faculty

3. Employ cloud-based computing to store and share formatted test data sets.

**Assessment 1**

Assessment Tool: Outcome-related student project

Assessment Date: Winter 2025

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Outcome-related rubric criteria

Standard of success to be used for this assessment: 75% of students will score 75% or higher.

Who will score and analyze the data: Departmental faculty

4. Evaluate data sets that have been processed with post-processing tools.

**Assessment 1**

Assessment Tool: Outcome-related student project

Assessment Date: Winter 2025

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Outcome-related rubric criteria

Standard of success to be used for this assessment: 75% of students will score 75% or higher.

Who will score and analyze the data: Departmental faculty

5. Create a test cycle that will be used to control an emissions test on a chassis dynamometer.

### **Assessment 1**

Assessment Tool: Outcome-related student project

Assessment Date: Winter 2025

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Outcome-related rubric criteria

Standard of success to be used for this assessment: 75% of students will score 75% or higher.

Who will score and analyze the data: Departmental faculty

### **Course Objectives**

1. Demonstrate the procedure for installing a vehicle on a chassis dynamometer.
2. Identify the proper use of tie down straps.
3. Recognize appropriate vehicle restraint points.
4. Discuss the storage and retrieval of test data.
5. Recognize the characteristics of acceptable test data.
6. Generate repeatable test data.
7. Discuss forms of data management and storage.
8. Demonstrate proper formatting and retrieval of test data.
9. Utilize a cloud-based storage system and link data files for access.
10. Analyze data for performance metrics.
11. Build data visualizations using best line fit techniques.
12. Generate a test report that explains testing results.
13. Identify the operation of external sensors used for data collection.
14. Build a test cycle for determining vehicle emission performance.
15. Execute a drive cycle test.
16. Interpret drive cycle data.

### **New Resources for Course**

#### **Course Textbooks/Resources**

Textbooks

Manuals

Periodicals

Software

#### **Equipment/Facilities**

Level III classroom

Other: OE169 with Chassis Dynamometer

| <b><u>Reviewer</u></b>   | <b><u>Action</u></b>      | <b><u>Date</u></b>  |
|--|---------------------------|---------------------|
| <b>Faculty Preparer:</b><br><i>Shawn Deron</i>                 | <i>Faculty Preparer</i>   | <i>Mar 27, 2024</i> |
| <b>Department Chair/Area Director:</b><br><i>Rocky Roberts</i> | <i>Recommend Approval</i> | <i>Mar 27, 2024</i> |
| <b>Dean:</b><br><i>Eva Samulski</i>                            | <i>Recommend Approval</i> | <i>Apr 03, 2024</i> |
| <b>Curriculum Committee Chair:</b><br><i>Randy Van Wagnen</i>  | <i>Recommend Approval</i> | <i>Mar 20, 2025</i> |
| <b>Assessment Committee Chair:</b><br><i>Jessica Hale</i>      | <i>Recommend Approval</i> | <i>Mar 20, 2025</i> |

**Vice President for Instruction:**

*Brandon Tucker*

*Approve*

*Mar 21, 2025*

## Washtenaw Community College Comprehensive Report

### ASV 277 Automotive Powertrain Systems Effective Term: Fall 2023

#### Course Cover

**College:** Advanced Technologies and Public Service Careers

**Division:** Advanced Technologies and Public Service Careers

**Department:** Transportation Technologies

**Discipline:** Auto Services (new)

**Course Number:** 277

**Org Number:** 14100

**Full Course Title:** Automotive Powertrain Systems

**Transcript Title:** Automotive Powertrain Systems

**Is Consultation with other department(s) required:** No

**Publish in the Following:** College Catalog , Web Page

**Reason for Submission:**

**Change Information:**

**Other:**

**Rationale:** The goal is to move this course from conditionally approved to fully approved. This will include additions and updates to the outcomes, objectives, assessments, and evaluation.

**Proposed Start Semester:** Winter 2022

**Course Description:** In this course, students will learn about the use of a chassis roll dynamometer for testing and validation of powertrain systems. Students will learn the principles of dynamometer operation including safety systems, road cycle testing, emissions testing, and durability testing. Students also gain practical experience in the laboratory, as well as develop and execute a test sequence for horsepower, emissions testing, and fuel system testing.

#### Course Credit Hours

**Variable hours:** No

**Credits:** 4

**Lecture Hours: Instructor:** 60 **Student:** 60

**Lab: Instructor:** 45 **Student:** 45

**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

No Level Required

#### Requisites

**Prerequisite**

ASV 130 minimum grade "C"

and

**Prerequisite**

ASV 131 minimum grade "C"

**General Education**

**Request Course Transfer**

**Proposed For:**

**Student Learning Outcomes**

1. Apply dynamometer safety techniques when preparing a vehicle for testing.

**Assessment 1**

Assessment Tool: Outcome-related student project

Assessment Date: Winter 2023

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Departmentally-developed rubric

Standard of success to be used for this assessment: 75% of students will score 75% or higher.

Who will score and analyze the data: Departmental faculty

2. Create dynamometer vehicle output data sets during testing.

**Assessment 1**

Assessment Tool: Outcome-related student project

Assessment Date: Winter 2023

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Departmentally-developed rubric

Standard of success to be used for this assessment: 75% of students will score 75% or higher.

Who will score and analyze the data: Departmental faculty

3. Employ cloud based computing to store and share formatted test data sets.

**Assessment 1**

Assessment Tool: Outcome-related student project

Assessment Date: Winter 2023

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Departmentally-developed rubric

Standard of success to be used for this assessment: 75% of students will score 75% or higher.

Who will score and analyze the data: Departmental faculty

4. Evaluate data sets that have been processed with post processing tools.

**Assessment 1**

Assessment Tool: Outcome-related student project

Assessment Date: Winter 2023

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Departmentally-developed rubric

Standard of success to be used for this assessment: 75% of students will score 75% or higher.

Who will score and analyze the data: Departmental faculty

5. Create a test cycle that will be used to control an emissions test on a chassis dynamometer.

### **Assessment 1**

Assessment Tool: Outcome-related student project

Assessment Date: Winter 2023

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Departmentally-developed rubric

Standard of success to be used for this assessment: 75% of students will score 75% or higher.

Who will score and analyze the data: Departmental faculty

### **Course Objectives**

1. Demonstrate the procedure for installing a vehicle on a chassis dynamometer.
2. Identify the proper use of tiedown straps.
3. Recognize appropriate vehicle restraint points.
4. Discuss the storage and retrieval of test data.
5. Recognize the characteristics of acceptable test data.
6. Generate repeatable test data.
7. Discuss forms of data management and storage.
8. Demonstrate proper formatting and retrieval of test data.
9. Utilize a cloud-based storage system and link data files for access.
10. Analyze data for performance metrics.
11. Build data visualizations using best line fit techniques.
12. Generate a test report that explains test results.
13. Identify the operation of external sensors used for data collection.
14. Build a test cycle for determining vehicle emission performance.
15. Execute a drive cycle test.
16. Interpret drive cycle data.

### **New Resources for Course**

#### **Course Textbooks/Resources**

Textbooks  
Manuals  
Periodicals  
Software

#### **Equipment/Facilities**

Level III classroom

Other: OE169 with Chassis Dynamometer

| <b><u>Reviewer</u></b>   | <b><u>Action</u></b>      | <b><u>Date</u></b>  |
|--|---------------------------|---------------------|
| <b>Faculty Preparer:</b><br><i>Allen Day</i>                   | <i>Faculty Preparer</i>   | <i>May 05, 2022</i> |
| <b>Department Chair/Area Director:</b><br><i>Rocky Roberts</i> | <i>Recommend Approval</i> | <i>May 20, 2022</i> |
| <b>Dean:</b><br><i>Jimmie Baber</i>                            | <i>Recommend Approval</i> | <i>May 26, 2022</i> |
| <b>Curriculum Committee Chair:</b><br><i>Randy Van Wagnen</i>  | <i>Recommend Approval</i> | <i>Feb 09, 2023</i> |
| <b>Assessment Committee Chair:</b>                             |                           |                     |

*Shawn Deron*

*Recommend Approval*

*Feb 10, 2023*

**Vice President for Instruction:**

*Victor Vega*

*Approve*

*Feb 13, 2023*



# Washtenaw Community College Comprehensive Report

## ASV 277 Automotive Powertrain Systems Conditional Approval Effective Term: Fall 2015

### Course Cover

**Division:** Advanced Technologies and Public Service Careers

**Department:** Automotive Services

**Discipline:** Auto Services

**Course Number:** 277

**Org Number:** 14100

**Full Course Title:** Automotive Powertrain Systems

**Transcript Title:** Automotive Powertrain Systems

**Is Consultation with other department(s) required:** No

**Publish in the Following:** College Catalog , Web Page

**Reason for Submission:** New Course

#### **Change Information:**

**Rationale:** This course is one of three new courses that support the Powertrain Development Technician and Automotive Test Technician programs.

**Proposed Start Semester:** Fall 2015

**Course Description:** In this course, students will learn about the use of a chassis roll dynamometer for testing and validation of powertrain systems. Students will learn the principles of dynamometer operation including safety systems, road cycle testing, emissions testing, and durability testing. Students also gain practical experience in the laboratory, and develop and execute a test sequence for horsepower, emissions testing, and fuel system testing.

### Course Credit Hours

**Variable hours:** No

**Credits:** 4

**Lecture Hours: Instructor:** 60 **Student:** 60

**Lab: Instructor:** 45 **Student:** 45

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

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

**Repeatable for Credit:** NO

**Grading Methods:** Letter Grades

**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 131 minimum grade "C"

##### **Prerequisite**

ASV 132 minimum grade "C"

### General Education

**Request Course Transfer  
Proposed For:**

**Student Learning Outcomes**

1. Apply principles of testing and validation during an emission test cycle to determine vehicle emissions output during the test.

**Assessment 1**

**Assessment Tool:** Project

**Assessment Date:** Fall 2016

**Assessment Cycle:** Every Three Years

**Course section(s)/other population:** All

**Number students to be assessed:** All

**How the assessment will be scored:** Departmentally-developed rubric

**Standard of success to be used for this assessment:** 75% of students will score 75% or better.

**Who will score and analyze the data:** ASV faculty

**Course Objectives**

1. Apply an appropriate vehicle test cycle to be used for vehicle emissions testing.

**Matched Outcomes**

1. Apply principles of testing and validation during an emission test cycle to determine vehicle emissions output during the test.

**New Resources for Course**

**Course Textbooks/Resources**

Textbooks

Manuals

Periodicals

Software

**Equipment/Facilities**

**Reviewer**

**Action**

**Date**

**Faculty Preparer:**

*Allen Day*

*Faculty Preparer*

*Apr 06, 2015*

**Department Chair/Area Director:**

*Allen Day*

*Recommend Approval*

*Apr 06, 2015*

**Dean:**

*Brandon Tucker*

*Recommend Approval*

*Apr 14, 2015*

**Vice President for Instruction:**

*Bill Abernethy*

*Conditional Approval*

*Apr 17, 2015*