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

Reviewer	Action	Date
Faculty Preparer:		
Allen Day	*Faculty Preparer*	*May 05, 2022*
Department Chair/Area Director:		
Rocky Roberts	*Recommend Approval*	*May 20, 2022*
Dean:		
Jimmie Baber	*Recommend Approval*	*May 26, 2022*
Curriculum Committee Chair:		
Randy Van Wagnen	*Recommend Approval*	*Feb 09, 2023*
Assessment Committee Chair:		

| *Shawn Deron* | *Recommend Approval* | *Feb 10, 2023* |

Vice President for Instruction:

| *Victor Vega* | *Approve* | *Feb 13, 2023* |

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.

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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