

AUTO 299: ENGINE DYNAMOMETER OPERATION AND TESTING PROCEDURES

Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2024
Credits:	3
Total Contact Hours:	90
Lecture Hours :	36
Lab Hours:	54
Hours Arranged:	0
Outside of Class Hours:	72
Total Student Learning Hours:	162
Prerequisite:	AUTO 295 or one year experience in the automotive field with an emphasis on engine machining or chassis dynamometer operation.
Strongly Recommended:	ENGL 101.
Transferable to CSU:	No
Transferable to UC:	No
Grading Method:	Standard Letter

Catalog Course Description

This course covers engine dynamometer operation and testing procedures with evaluation of test results for tuning of emissions, fuel economy, and performance. 36 lecture hours, 54 lab hours.

Course Objectives

- Properly set an engine up on the engine dynamometer for testing.
- Establish a testing procedure for the proper evaluation of a test engine.
- Conduct a series of dynamometer tests following all industry standards.
- Analyze and assess the dynamometer test results.
- Prepare a final report of the test procedures, results and analysis.

Major Course Content

Dynamometer introduction

1. Choosing the right dynamometer
2. Flow Systems: fuel, water, intake air, and exhaust

1. Dynamometer operation
 - a. Coupling the engine to the dynamometer
 - b. Setting test parameters – insuring accuracy of results
 - c. Measurement of torque, power, speed and fuel consumption
 - d. Output correction factors
 - e. Measurement of air consumption
 - f. Thermal efficiency and measurement of heat losses
2. Dynamometer tuning

- a. Effects of air/fuel ratio, fuel quality, and mixture
- b. Analysis of exhaust emissions and causes of increased HC, CO and NOx.
- c. Adjustments and retesting

Lab Content

1. Dynamometer introduction
 - a. Dynamometer controls
 - b. Flow Systems: fuel, water, intake air, and exhaust
2. Dynamometer operation
 - a. Coupling the engine to the dynamometer
 - b. Setting test parameters – insuring accuracy of results
 - c. Measurement of torque, power, speed and fuel consumption
 - d. Output correction factors
 - e. Measurement of air consumption
 - f. Thermal efficiency and measurement of heat losses
3. Dynamometer tuning
 - a. Effects of air/fuel ratio, fuel quality and mixture
 - b. Analysis of exhaust emissions and causes of increased HC, CO and NOx.
 - c. Adjustments and retesting

Suggested Reading Other Than Required Textbook

Automotive technical articles or internet related material as approved by the instructor.

Examples of Required Writing Assignments

An analysis and evaluation of a given automotive technical article or internet related material as approved by the instructor.

Examples of Outside Assignments

A written paper is required that provides the student the opportunity to read and evaluate an automotive technical article or internet related material (related to the class - engine dynamometer) for technical accuracy and the value of the information to the subject area.

Instruction Type(s)

Lab, Lecture