NC AU296: CYLINDER HEAD DEVELOPMENT

Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2025
Credits:	0
Total Contact Hours:	108
Lecture Hours :	54
Lab Hours:	54
Hours Arranged:	0
Outside of Class Hours:	108
Total Student Learning Hours:	216
Strongly Recommended:	ENGL C1000, and NC AU141 or AUTO 141 or AUTO 151.
Transferable to CSU:	No
Transferable to UC:	No
Grading Method:	Non-Credit Course

Catalog Course Description

A course designed to teach the skills necessary to develop a cylinder head for total performance. Emphasis will be placed on cylinder head development and reconditioning, head CCing, and basic flowbench operation. This course is the noncredit equivalent of credit course AUTO 296. 54 lecture hours, 54 lab hours.

Course Objectives

- explain the theory of operation of the four stroke internal combustion engine
- identify the proper methods and procedures for cleaning cylinder heads and components
- measure all cylinder head components using the proper measuring instruments and procedures
- set-up and complete required machine operations on familiar and unfamiliar upper engine components
- machine and assemble upper engines components to manufacture specifications
- describe the correct procedures for operating the cylinder head flow bench

Major Course Content

1. Orientation
   a. EPA and OSHA regulations
   b. Shop safety
2. Engine Theory of Operation
   a. Nomenclature
   b. Four stroke principle
   c. Cylinder head design and function
3. Cylinder Head Disassembly Procedures
   a. Cleaning and inspecting cylinder head components
   b. Measuring cylinder head components and checking against factory specifications
   c. Evaluating needed service and repairs from measurements and inspections
4. Engine Machining
   a. Setting up various types of automotive machine equipment
   b. Machine operations
   c. Holding machine operations to factory specifications
5. Cylinder Head Assembly
   a. Assembling cylinder head components to factory specifications
   b. Checking and cylinder head component assemblies and comparing to factory specifications
6. Cylinder Head Port Design and Flow Bench Operation
   a. Operation of flow bench to industry standards
   b. Evaluating flow bench data
   c. Development of best port design

Lab Content

1. Cylinder head teardown and inspection
   a. Disassembly of cylinder head
   b. Cleaning of cylinder head
   c. Inspection of cylinder head component parts
2. Cylinder head machining
   a. Valve guide machining
   b. Valve machining
   c. Valve seat machining
   d. Surfacing of cylinder head
3. Cylinder head assembly
   a. Cleaning of cylinder head and component parts
   b. Pre-assembly measurement of valve springs
   c. Cylinder head assembly
4. Cylinder head performance development - flow bench
   a. Baseline flow test and analysis
   b. Modification through porting, seat and valve machining
   c. Flow test and analysis of all modifications
   d. Duplication of modifications for all ports

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

Typically two written papers are required that provide the student the opportunity to read and evaluate an automotive technical article or internet related material (related to the class - cylinder heads) for technical accuracy and the value of the information to the subject area.

Instruction Type(s)

Lab, Lecture