

**NVCC COLLEGE-WIDE COURSE CONTENT SUMMARY
AUT 114 - CYLINDER HEAD SERVICE II (3 CR.)**

Course Description

Studies cylinder head reconditioning, including valve seat grinding, re-facing valves, servicing valve guides, valve seat inserts, cutting for valve seals and spring, thread repair and resurfacing mating surfaces. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

General Course Purpose

AUT 114 is designed to provide the student with a thorough knowledge of the design and performance characteristics of the upper engine assembly and valve drive mechanisms. Additionally, discussion and application includes the inspection and measurement techniques used to determine what overall operations are required. The course will provide the required machining skills necessary to completely remanufacture cylinder head and valve drive mechanisms.

Course Prerequisites/Co-requisites

Prerequisite AUT 113

Course Objectives

Upon completion of this course the student will be able to:

- Develop a thorough knowledge of design and performance of various types of upper engine designs with particular emphasis on the overhead valve configurations.
- Develop the skills necessary to operate the various machine shop tools and equipment required to rebuild or remanufacture cylinder heads including:
 - a. valve face and seat re-facing
 - b. valve guide repairs and/or replacement
 - c. head resurfacing
 - d. rocker arm stud removal and replacement
 - e. valve seat replacement
 - f. valve stem re-facing and hardening
 - g. crack detection and repair
 - h. rust and scale removal from water passages
 - i. steam hot tank, and glass bead cleaning
 - j. determination of camshaft specifications
 - k. measurement
- Formulate safe and proper work habits necessary for the successful operation of an automotive machine shop.

Major Topics to be Included

- Physical principles of power and engine fundamentals
- Contemporary power plants
- Pre-tear down diagnosis and general methods of cleaning
- Engine removal and disassembly
- Breathing systems
- Heads and crack repair
- Valves, valve guides and seals, seats and valve parts, valve spring assemblies, valve lifters and tappets
- Rocker arms and push rods
- Camshafts and cam drives
- Upper engine assembly