

## **NVCC COLLEGE-WIDE COURSE CONTENT SUMMARY**

### **AUT 113 - CYLINDER BLOCK SERVICE (3 CR.)**

#### **COURSE DESCRIPTION**

Studies basic cylinder block reconditioning, including boring, resleeving, line boring, and deck resurfacing. Includes repair techniques for damaged block and cylinder head castings to include cold welding, brazing, welding, and epoxy. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

#### **GENERAL COURSE PURPOSE**

This course will provide the student with a thorough knowledge of the design and performance characteristics of the cylinder block assembly, the inspection and measurement techniques necessary to determine what overall operations are required, and the machining skill to completely remanufacture a cylinder block to equal or better factory specs.

#### **ENTRY LEVEL COMPETENCIES**

None

#### **COURSE OBJECTIVES**

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

- A. develop a thorough knowledge of the design and performance of various cylinder block materials and types, with particular emphasis on modern 4, 6 and V8 cylinder engines
- B. development skills in the operation of various machine shop tools and equipment required to remanufacture cylinder blocks including:
  - 1. cylinder block boring and honing
  - 2. milling block decks
  - 3. removal and replacement of cam bearing
  - 4. line boring of main bearing journals
  - 5. rust and scale removal from water passages
  - 6. removal and replacement of cylinder block core plugs
  - 7. chasing threads
  - 8. measurement
  - 9. sleeve installation
  - 10. crack and thread repairs

#### **MAJOR TOPICS TO BE INCLUDED**

- A. Introduction: cleaning and inspection
- B. Measurement
- C. Cylinder boring with both portable boring bar and Rottler boring machine
- D. Sleeve fitting and installation
- E. Cylinder honing by hand and also by Sunnen CK-10
- F. Line boring main bearing journals
- G. Crock detection and repair
- H. Both hole retapping and thread repair

- I. Freeze plug removal and replacement
- J. Tapping and cleaning oil gallery ports
- K. Block designs
- L. Metallurgy of block materials
- M. Milling operations using the SV Blockmaster
- N. Cylinder wall/surface finishes
- O. Piston and ring designs
- P. Head plates
- Q. Removal and reinstalling cam bearings