

MINNESOTA WEST COMMUNITY & TECHNICAL COLLEGE

COURSE OUTLINE

DEPT. AUTO

COURSE NUMBER: 1136

NUMBER OF CREDITS: 4

Lecture: 1 Lab: 3 OJT 0

Course Title:
Engine Technology and Lab

Catalog Description:
Engine Technology and Lab explains and demonstrates the theory of engine cooling and lubrication systems. Students will inspect, repair, and/or adjust the following engine components and systems: valves, cylinder heads, blocks, crank shafts, cooling and lubrication systems. Students will also learn to identify the basic operation, nomenclature and function of engines.

Prerequisites or Necessary Entry Skills/Knowledge:
None

FULFILLS MN TRANSFER CURRICULUM AREA(S) (*Leave blank if not applicable*)

- ☐ Goal 1: Communication: By meeting the following competencies:
- ☐ Goal 2: Critical Thinking: By meeting the following competencies:
- ☐ Goal 3: Natural Sciences: By meeting the following competencies:
- ☐ Goal 4: Mathematics/Logical Reasoning: By meeting the following competencies:
- ☐ Goal 5: History and the Social and Behavioral Sciences: By meeting the following competencies:
- ☐ Goal 6: The Humanities and Fine Arts: By meeting the following competencies:
- ☐ Goal 7: Human Diversity: By meeting the following competencies:
- ☐ Goal 8: Global Perspective: By meeting the following competencies:
- ☐ Goal 9: Ethical and Civic Responsibility: By meeting the following competencies:
- ☐ Goal 10: People and the Environment: By meeting the following competencies:

Topics to be Covered
Piston engine operation
Cooling and lubrication systems
Engine problems
Engine disassembly
Engine inspection
Servicing cylinder heads and engine blocks
Engine reassembly

Student Learning Outcomes

Research vehicle service information, including fluid type, vehicle service history, service precautions, and technical service bulletins.
Verify operation of the instrument panel engine warning indicators.
Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action.
Install engine covers using gaskets, seals, and sealers as required.
Verify engine mechanical timing.
Perform common fastener and thread repair, to include: remove broken bolt, restore internal and external threads, and repair internal threads with thread insert.
Identify service precautions related to service of the internal combustion engine of a hybrid vehicle.
Adjust valves (mechanical or hydraulic lifters).
Identify components of the cylinder head and valve train.
Perform cooling system pressure and dye tests to identify leaks; check coolant condition and level; inspect and test radiator, pressure cap, coolant recovery tank, heater core, and galley plugs; determine necessary action.
Inspect, replace, and/or adjust drive belts, tensioners, and pulleys; check pulley and belt alignment.
Remove, inspect, and replace thermostat and gasket/seal.
Identify components of the lubrication and cooling systems and inspect and test coolant; drain and recover coolant; flush and refill cooling system; use proper fluid type per manufacturer specification; bleed air as required.
Remove engine; disassemble, inspect, reassemble engine assembly; and reinstall engine into automobile
Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations
*The required outcomes follow the Auto Service Technician (AST) model of the Board of the National Institute for Automotive Service Excellence (ASE)

Is this course part of a transfer pathway: Yes ☐ No ☒

Revised Date: 04/2022