SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON

COURSE OUTLINE

COURSE TITLE: ELECTRICAL, ELECTRONICS & FUELS

CODE NO.: MVM112 SEMESTER: 32 Week Program

PROGRAM: MOTOR VEHICLE MECHANIC PRE-APPRENTICE PROGRAM

AUTHOR: DAN TREGONNING

DATE: MAY 1997 PREVIOUS OUTLINE DATED: FEBRUARY 1997

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TOTAL CREDITS: 20

PREREQUISITE(S): ONTARIO SECONDARY SCHOOL DD7LOMA WITH GRADE 12 ENGLISH AT GENERAL LEVEL AND 1 SENIOR LEVEL HIGH SCHOOL AUTOMOTIVE COURSE OR EQUIVALENT WORK EXPERIENCE.

LENGTH OF COURSE: 32 WEEKS TOTAL CREDIT HOURS: 288

I. COURSE DESCRIPTION: This course is designed to follow the approved curriculum prepared by the Motive Power College Curriculum Advisory Committee. The student will be taught the necessary electrical, electronics and fuel systems to confidently repair automobiles using the proper procedures and equipment.

H. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:
(Generic Skills Learning Outcomes placement on the course outline will be determined and communicated at a later date.)

Upon successful completion of this course the student will demonstrate the ability to:

1) Describe the basics of electrical fundamentals.

Potential Elements of the Performance:

1) Use a meter in an automotive shop.
2) Remove and replace a headlamp and parklamp.
3) Test a ignition pickup coil using a digital multimeter.
4) Watch for the dangers of static electricity.
5) Install permanent magnet motors (heater, wiper).
6) Replace battery cable noting wire gauge size and length.
7) Repair corroded wiring using proper soldering methods.
8) Read and understand automotive schematics.

2) Demonstrate a working knowledge of the fundamental principles of batteries and starter motors.

Potential Elements of the Performance:

1) Test, service and charge a battery.
2) Remove and replace a battery.
3) Dismantle, inspect, perform starter component test and assemble starter motors.
4) Perform on vehicle tests of the starting circuits.
5) Test starter motors, relays, switches and solenoids.

H. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE (Continued)

3) The student will demonstrate a working knowledge of modern charging systems.

Potential Elements of the Performance:

1) Remove, disassemble and repair alternators.
2) Perform on vehicle tests of alternators including regulated output and full fielding.
3) Have a understanding to test all internal alternator components.

4) Explain the operating principles, fuel supply intake and exhaust systems.

Potential Elements of the Performance:

1) Test & replace fuel system components such as fuel pumps and carburetors.
2) Test intake and exhaust systems, using a vacuum gauge.

5) Demonstrate how to test and repair electronic ignition systems.

Potential Elements of the Performance:

1) Test and repair ignition components.
2) Use a spark tester to test ignition coils.
3) Check pickup coils and ignition coils for opens, shorts and grounds.
4) Locate electronic ignition components on live vehicles.
5) Remove and install distributors.
6) Check firing order and verify correct.
7) Adjust timing on fuel injected vehicles.
8) Hookup scope to vehicle and interpret the results.

H. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE (Continued)

6) Diesel and gasoline fuel systems.

Potential Elements of the Performance:

1) Show a procedure used in repairing fuel injection faults.
2) Perform on vehicle tests using modern scan tools.
3) Perform basic tune-up to automotive equipped diesel engines.
4) Do on vehicle self tests on fuel injected vehicles.
5) Identify and replace defective fuel injected components.
6) Perform fuel pressure testing - dead head & leak down tests.
7) Follow manufacturers test procedures for diagnosing computer failures.

m. TOPICS:

1) Basic Fundamentals
2) Batteries and Starters
3) Charging Systems
4) Fuel Supply, Intake and Exhaust Systems
5) Ignition Systems
6) Diesel & Gas Fuel Injection

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Test supplied by College
Workbook available at Bookstore
Coveralls
Safety Glasses
Safety Boots 6" high (minimum)
Handouts supplied

V. EVALUATION PROCESS/GRADING SYSTEM

Random tests and quizzes
Attendance
Shop participation
Weekly tests

VI. SPECIAL NOTES:

Special Needs
If you are a student with special needs (eg. physical limitations, visual impairments, hearing impairments, learning disabilities), you are encouraged to discuss required accommodations with the instructor and/or contact the Special Needs Office, Room El204, Ext. 493, 717, 491 so that support services can be arranged for you.

- Retention of Course Outlines
  It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other post-secondary institutions.

- Disclaimer for Meeting the Needs of the Learners

  Substitute Course Information is available at the Registrar's Office.

- Any Other Special Notes appropriate to your course.

VH. PRIOR LEARNING ASSESSMENT

Students who wish to apply for advanced credit in the course should consult the instructor. Credit for prior learning will be given upon successful completion of the following: