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SET 177T.01: Motorcycle and ATV Electrical and Fuel Systems

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**THE UNIVERSITY OF MONTANA-MISSOULA
COLLEGE OF TECHNOLOGY
INDUSTRIAL TECHNOLOGY DEPARTMENT**

COURSE SYLLABUS

COURSE NUMBER AND TITLE: SET 177T MOTORCYCLE and ATV ELECTRICAL
and FUEL SYSTEMS

DATE REVISED: Fall 2004

SEMESTER CREDIT: 4

CONTACT HOURS PER SEMESTER: 125 (5 week class)
Lecture hours per week: 10
Lab hours per week: 15

PREREQUISITES: SET 160 BASIC ELECTRICITY
SET 176 MOTORCYCLES and ATV'S ENGINES, SUSPENSION &
CHASSIS

INSTRUCTOR: Jim Lizotte

E-MAIL: jim.lizotte@mso.umt.edu

PHONE: 406-243-7642

OFFICE LOCATION: T & T II, West Campus

OFFICE HOURS: Mondays, 8 am to 11 am

RELATIONSHIP TO PROGRAM:

Recreational Power Equipment technicians must have the fundamental knowledge and skills necessary to service and repair motorcycle and ATV electrical systems. This course, along with the prerequisites, provides the foundation necessary for entry level technicians to be successful on the job.

COURSE DESCRIPTION : Principles of ignition, charging, and cranking systems and the design and function of carburetor, fuel injection, and lubrication systems. Includes the diagnosis and testing of these systems.

STUDENT PERFORMANCE OUTCOMES:

Occupational Performance Objectives

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

1. Test various electrical components and systems with a multi-meter
2. Test and adjust ignition and components used on motorcycles and ATV's
3. Trace and troubleshoot wiring diagram simulated problems
4. Identify various types of carburetors, identify their circuits and troubleshoot associated problems
5. Adjust and synchronize carburetors to factory specifications

REQUIRED TEXT: **Common Service Manual** by Honda
 Motorcycles by Johns and Edmundson & Scharff
 Goodhart Willcox Pub.

NOTE: a digital multi-meter with a minimum of 10 amp D.C. capabilities
is also required.

STUDENT PERFORMANCE ASSESMENT METHODS AND GRADING PROCEDURES:

The following criteria will be used for grading SET 177T MOTORCYCLE and ATV ELECTRICAL
and FUEL SYSTEMS:

1. Written Tests 25%
2. Written Final Test 15%
3. Lab 45%
 - a. Accuracy and quality of required worksheet completion
 - b. Good use of lab time and following instructions
 - c. Use of shop manuals and forethought
4. Complete, neat and organized notebook of all handout materials and notes 5%
5. Demonstrating skills on a daily basis 5%
6. Lab organization, management, and neatness 5%
- 7.

Safety glasses will be worn at **ALL** times when working in the lab; and in the classroom when working with
storage batteries, chemicals, and soldering.

GRADING SCALE:

A= 93-100
B= 86-92
C= 75-85
D= 65-74
F= Below 65

NOTE: If you will not be able to attend class, you **MUST** call Lizotte at 243-7642. You are responsible for
all make-up. Tests will be announced in advance. There will be no make-up tests except for very
extenuating circumstances.

SAFETY: College of Technology safety rules will be followed at all times. Each student will receive a
copy. A list is also posted on the classroom bulletin board. Failure to follow the rules can result in removal
from class.

Suggestions for success in the RPE program:

1. Attitude is everything
2. Regular attendance is critical; tardiness is unacceptable
3. Take good notes
4. Pay attention
5. Study all assigned material on a regular basis and for tests

HOW VARIOUS ASSESSMENT METHODS WILL BE USED TO IMPROVE THE COURSE:

1. Student course evaluations
2. Peer feedback
3. Advisory committee feedback

COURSE OUTLINE:

1. Ignition Systems
 - A. Types
 - a. Energy Transfer
 - b. Battery
 - c. TPI
 - d. CDI
 - B. Principles of operation
 - C. Components
 - D. Service and adjustment
 - E. Ignition suppression
2. Charging Systems
 - A. Principles of operation
 - B. Testing
 - a. Components
 - b. Voltage
 - c. Resistance
 - d. Amperage
 - C. Types
 - a. Half wave
 - b. Full wave
 - c. Three phase
3. Fuel Systems
 - A. Parts
 - a. Float
 - b. Float valve
 - c. Idle Jet
 - d. Main Jet
 - e. Metering needle
 - f. Needle jet
 - g. Accelerator pump
 - h. Slide
 - i. Pilot screw
 - B. Carburetor types
 - a. Slide controlled
 - b. Vacuum controlled
 - c. Butterfly controlled
 - C. Carburetor circuits
 - a. Float
 - b. Idle
 - c. Mid-range
 - d. High sped
 - e. Enrichment

- D. Electronic Fuel Injection
 - a. ECM
 - b. Sensors
 - c. ECM Self-Diagnostics
- E. Carburetor synchronization
- F. Carburetor rebuilding
- G. Emission control systems
- H. Four-Stroke Cycle lubrication
 - 1. Functions of oil
 - a. Clean
 - b. Cool
 - c. Seal
 - d. Lubricate
 - 2. Oil classifications and types
 - a. API
 - b. SAE
 - 3. Four-stroke lubricating systems
 - a. Dry sump
 - b. Wet sump
 - 4. Types of oil pumps
 - a. Gear
 - b. Plunger
 - c. Rotor
 - 5. Valves
 - a. Check
 - b. Relief
 - 6. Filters
 - 7. Coolers