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SET 176T.01: Motorcycles and ATV Engines, Suspension and Chassis

Jim Lizotte

University of Montana - Missoula, jim.lizotte@mso.umt.edu

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

COURSE SYLLABUS

COURSE NUMBER AND TITLE: SET 176T MOTORCYCLES and ATV's ENGINES,
SUSPENSION and CHASSIS

DATE REVISED: Fall 2003

SEMESTER CREDIT: 4

CONTACT HOURS PER SEMESTER: 135 (7 ½ week class)

Lecture hours per week: 6

Lab hours per week: 12

PREREQUISITES: None

INSTRUCTOR: Jim Lizotte

E-MAIL:

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 motorcycles and ATV's. This course provides the foundation necessary for entry level technicians to be successful on the job.

COURSE DESCRIPTION: Students will study the design and function of several types of motorcycle and ATV engines, transmissions, suspensions, and brake systems. Students will work with/on all of these systems in the lab.

STUDENT PERFORMANCE OUTCOMES:

Occupational Performance Objectives

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

1. Completely disassemble, reassemble and test run a 4-stroke motorcycle or ATV engine.
2. Completely disassemble, reassemble and test run a 2-stroke motorcycle or ATV engine.
3. Rebuild motorcycle front forks.
4. Make compression tests on two and four-stroke cycle engines.

5. Make cylinder leakdown tests on four-stroke cycle engines.
6. Adjust valves by both rocker arm and shim type engines.
7. Pressure test the two-stroke cycle crankcase.
8. Check 4 stroke cycle engine oil pressure with a gauge and compare to specs.
9. Grind valves and cut seats.
10. Make proper clutch inspection and adjustment.
11. Remove/replace cycle wheel bearings.
12. Completely rebuild and bleed brake systems.
13. Remove/replace tires of cycles and ATV's using two types of tire changers.

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

STUDENT PERFORMANCE ASSESMENT METHODS AND GRADING PROCEDURES:

The following criteria will be used for grading SET 176T MOTOR CYCLES and ATV's ENGINE, SUSPENSION & CHASSIS

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%

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:

- A. Introduction to motorcycle systems
 1. Engine
 2. Transmission
 3. Chassis
 4. Wheels, tires, & brakes
 5. Suspension
- B. Introduction to ATV systems
 1. Engine
 2. Transmission
 3. Chassis
 4. Wheels, tires, & brakes
 5. Suspension
- C. Four-stroke cycle engine
 1. Valve trains and adjustment
 2. Crankshaft designs
 3. Pistons
 4. Bearings
 5. Cooling
 6. Lubrication
- D. Clutches, transmissions, and primary drives
 1. Types of drives
 2. Clutch construction and repair
 3. Clutch types
 4. Gearboxes
 5. Shifters
 6. Kickstarters
- E. Frame and suspension
 1. Types
 - a. cradle

- b. backbone
 - c. stamped
 - 2. Telescoping forks
 - a. Parts
 - b. Operation
 - c. Rebuilding
 - 3. Steering geometry
 - 4. Front suspension and servicing
 - 5. Rear suspension systems
 - a. Conventional
 - b. Long travel
- F. Wheels, tires, and brakes
 - 1. Wheels
 - a. wire
 - b. case
 - c. stamped
 - 2. Wheel inspection
 - 3. Wheel servicing
 - 4. Tire sizes
 - 5. Tire types
 - 6. Tube and tire service
 - 7. Brakes
 - a. Mechanical
 - b. Hydraulic
 - 8. Hydraulic theory
 - 9. Brake designs
 - a. Drum
 - b. Disc
 - 10. Brake bleeding
 - a. Manual bleeding
 - b. Mechanized bleeding