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DET 221T.01: Brakes, Suspension, and Undercarriage

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**THE UNIVERSITY OF MONTANA MISSOULA
COLLEGE OF TECHNOLOGY
DIESEL TECHNOLOGY DEPARTMENT**

COURSE SYLLABUS

COURSE NUMBER AND TITLE: DET 221T BRAKES, SUSPENSION, AND UNDERCARRIAGE

DATE REVISED: JUNE 99

SEMESTER CREDITS: 6

CONTACT HOURS PER SEMESTER: [For administrative purposes only]

Lecture hours per week: 10

Lab hours per week: 15

Clinical/internship hours per week:

PREREQUISITES: NONE

INSTRUCTOR NAME, E-MAIL ADDRESS, PHONE NUMBER, OFFICE LOCATION, OFFICE HOURS: 9:00am-3:00pm

Carl S.Scott

E-MAIL: Carl.Scott@mso.umt.edu

PHONE: 243-7649

OFFICE LOCATION: WEST CAMPUS

OFFICE HOURS: MONDAY- FRIDAY 8:00 AM-9:00 AM

RELATIONSHIP TO PROGRAM(S):

Brakes, Suspension, and Undercarriage a contributes to the objectives of the Diesel Technology program by increasing the students knowledge of rebuild , maintenance, repair and principles of brake systems, suspension and crawler tractor undercarriage.

COURSE DESCRIPTION:

Air brake design, construction and operation principles including an in-depth study of diagnostic procedures for troubleshooting and repair of brake systems. Suspension systems and undercarriage design and repair will be covered along with common alignment procedures found in industry.

STUDENT PERFORMANCE OUTCOMES:

Occupational Performance Objectives

Life-Long Learning Skill Codes* [Include Code and Number]

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

- | | |
|--|---|
| 1. Understand the principles and operation of a crawler tractor undercarriage. | 1. BSKL 15,18 THINK 3,5,6,,
INFO 1,2,3 SYS 1 TECH 2 |
| 2. Identify, rebuild, troubleshoot and maintain the component of a crawler tractor undercarriage. | 2. BSKL 15,18 THINK 3,5,6,,
INFO 1,2,3, SYS 1 TECH 2 |
| 3. Understand the working principles of the following brake systems.
a. Pneumatic wedge and s-cam brake systems
b. Hydraulic disk and shoe brake systems | 3. BSKL 15,18 THINK 3,5,6,,
INFO 1,2,3 SYS 1 TECH 2 |
| 4. Repair, maintain and troubleshoot the following brake systems.
a. Pneumatic wedge and s-cam brake systems
b. Hydraulic disk and shoe brake systems | 4. BSKL 15,18 THINK 3,5,6
INFO 1,2,3 SYS 1 TECH 2 |
| 5. Understand the principles of suspension and steering systems | 5. BSKL 15,18 SYS 1
THINK 2,3,6, |
| 6. Repair and troubleshoot suspension and steering systems | 6. BSKL 15,18 SYS 1
THINK 2,3,6 |
| 7. Use correct safety procedures when working on undercarriage, brake systems, suspension, or steering systems. | 7. IPS 1 INFO 1,2,3 SYS 1
PQ 1 THINK 1,2,3,6, |

STUDENT PERFORMANCE ASSESSMENT METHODS AND GRADING PROCEDURES:

Lecture and Lab tests are given at the end of each chapter covered.

ATTENDANCE POLICY (if any):

DET prefix classes all have the same attendance policy available on request.

ATTENDANCE and GRADING POLICY

The following guidelines will be used pertaining to attendance and grading in the classroom, and lab areas in all Diesel Technology classes using the D.E.T. prefix.

The reasoning behind a attendance policy is to make the students aware of the importance of attendance at school, and with their employers in the future.

DAYS ABSENT WILL DEDUCT FROM THE FINAL GRADE AS FOLLOWS:

- 3- days----- no deduction
- 4th day----- 1% point
- 5th day----- 2% points
- 6th day----- 6% points
- 7th day----- 10% points
- 8th day----- 16% points
- 9th day----- 18% points
- 10th day----- 20% points
- 11th day----- 25% points
- 12th day----- 30% points

GRADING POLICY:

- 100-90 (A)
- 80---89 (B)
- 70---79 (C)
- 60---69 (D)
- 59 and below (F)

TEST MAKE UP:

There will be no test make up. If you are late, you will not take the test. All students will start testing at the same time.

BEING LATE FOR CLASS:

Any student that is late for class will be counted as absent.

ATTENDANCE and GRADING POLICIES:

Any changes to the attendance or grading policies will be handled on a one to one basis with the student as required.

FINAL GRADES:

Final grades will be determined by the following. The lab grade will only raise, or lower the final grade one letter grade. To receive a final grade of (A), you must have a grade average of (A) on tests, and written papers. In order to receive a passing grade of (C), the student must achieve a minimum grade of (C) in lecture and lab.

STUDENTS SIGNATURE : _____

D.E.T. COURSE: _____

DATE: ____/____/____

**OTHER POLICIES (if any): [For students only]
NONE**

HOW VARIOUS ASSESSMENT METHODS WILL BE USED TO IMPROVE THE COURSE:
 All student comments are taken into consideration at the end of the course including the student evaluation, also any new technology found or gained by attending any factory updates will be used to increase the amount of knowledge passed on to the student. Tests, both lab and lecture are used to evaluate the course structure and reorganization as needed.

REQUIRED TEXT:

Heavy Duty Truck Systems 2nd Edition
 Andrew Norman, Robert Scharff, John A Corinchock

SUGGESTED REFERENCE MATERIALS:

Service manuals

SUPPLIES:

COURSE OUTLINE:

1. Principles of Crawler Tractor Undercarriage
 - a. Undercarriage Components
 - b. Undercarriage Measuring and Rebuild Procedures
 - c. Disassembly and Assembly of Tractor Undercarriage
 - d. Crawler Tractor Undercarriage Maintenance
 - e. Correct lifting, Removal and Installation Procedure
2. Principles of Hydraulic and Air Brake Systems
 - a. Air Brake system Component Identification
 - b. Air Brake Operating System
 - c. Air Brake Rebuild and Maintenance Procedure
 - d. Troubleshoot Air Brake Systems
 - e. Hydraulic Brake System Component Identification
 - f. Hydraulic Brake Operating Systems
 - g. Hydraulic Brake Rebuild and Maintenance Procedures
 - h. Troubleshooting Hydraulic Brake Systems
3. Principles of Suspension and Steering Systems
 - a. Suspension and Steering Component Identification
 - b. Rebuild Procedures for Suspension and Steering Systems
 - c. Troubleshooting Suspension and Steering Systems
 - d. Suspension and Steering System Maintenance
4. Safety in the Lab
 - a. Correct Usage of Hand and Power Tools in the Lab Area
 - b. Instruction in the Correct Rigging and Lifting Procedures

*Life-Long Learning Skills Codes and Numbers	
FOUNDATIONAL SKILLS:	COMPETENCIES:
BASIC SKILLS [BSKL] 1. Reading 2. Writing 3. Arithmetic/Mathematics 4. Listening 5. Speaking	RESOURCES [RSRC] 1. Manages Time 2. Manages Money 3. Manages Materials and Facility Resources 4. Manages Human Resources

<p>THINKING SKILLS [THINK]</p> <ol style="list-style-type: none"> 1. Creative Thinking 2. Decision Making 3. Problem Solving 4. Mental Visualization 5. Knowing How to Learn 6. Reasoning <p>PERSONAL QUALITIES [PQ]</p> <ol style="list-style-type: none"> 1. Responsibility 2. Self-esteem 3. Sociability 4. Self-management 5. Integrity/Honesty 	<p>INTERPERSONAL SKILLS [IPS]</p> <p>Participates as Member of a Team</p> <ol style="list-style-type: none"> 1. Teaches Others 2. Serves Clients and Customers 3. Exercises Leadership 4. Negotiates to Arrive at a Decision 5. Works with Diversity <p>INFORMATION [INFO]</p> <ol style="list-style-type: none"> 1. Acquires and Evaluates Information 2. Organizes and Maintains Information 3. Interprets and Communicates Information 4. Uses Computers to Process Information <p>SYSTEMS [SYS]</p> <ol style="list-style-type: none"> 1. Understands Systems 2. Monitors and Corrects Performance 3. Improves and Designs Systems <p>TECHNOLOGY [TECH]</p> <ol style="list-style-type: none"> 1. Selects Technology 2. Applies Technology 3. Maintains and Troubleshoots Technology
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