



**I. COURSE DESCRIPTION:**

Suspension Steering And Braking Systems at level 3 is designed to teach students a more advanced level of skills required to work on the more modern types of steering, suspension and braking systems used and legislated into the Heavy Commercial On Road Vehicles and towing equipment. Students will be taught how to interpret pneumatic diagrams and symbols, service manuals, trouble shooting manuals and test results as they pertain to conventional air brake as well as electronic anti-lock (air and hydraulic) braking systems, hydraulic power steering controlled systems and suspensions. More emphasis is placed on the proper alignment of the steering and suspension system to provide a greater efficiency and wear life to the vehicle suspension, tires and steering components The course requires the students to learn and perform specific pin point testing of electronic components and controllers used to manage the use of ABS on all on highway vehicles and equipment since 2004. Students are taught how to use specific Manufacturer and aftermarket software programs for diagnostics with Electronic Scan Tools and or Personal Computers.

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

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

1. Define the fundamentals of safe practices and procedures when working with electrical, pneumatic and hydraulic systems.
2. Define the purpose, construction and operation of the power steering system.
3. Perform a power steering analysis using the power steering Pressure and Flow Tester.
4. Define the construction, and operation of hydraulic ABS system components used on medium duty trucks and buses.
5. Describe the purpose of Medium and Heavy truck Alignment Factors that affect the Steering system and components.
6. Describe the purpose, construction and operation of the electronic controlled valves and components of the 121 dual air brake ABS systems.

7. Perform pneumatic and electronic pin point testing of the air brake system using Electronic Testing equipment according to Vehicle and Manufacturer's service manuals and specifications.
8. Perform the proper pin point testing for Hydraulic Electronic abs braking systems used on medium duty trucks and buses according to Manufacturer's service manuals and specifications.
9. Perform and apply the proper vehicle alignment techniques to the steering and suspension systems used on trucks, trailers, buses and commercial coach vehicles according to Manufacturer's suggestions and specifications.

### **III. TOPICS:**

1. Electrical and Electronic fundamentals
2. Medium and Heavy Duty Truck Braking Systems
3. Medium and Heavy Duty Truck ABS Systems
4. Medium and Heavy Duty Truck Power Steering Systems
5. Medium and Heavy Duty Truck Suspension and Steering Alignment Angles
6. ABS Systems and conformity to CMVSS 121 Braking systems
7. Medium and Heavy Duty Truck ABS Air Brake System Components
8. Anti-Lock Brake System Testing

### **IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

Heavy Duty Truck Systems, 5<sup>th</sup> ed.,  
Author: Bennett  
Publisher: Thomson Nelson Learning Canada

Hand-outs provided by instructor as needed for more extensive learning

**V. EVALUATION PROCESS/GRADING SYSTEM:**

***Students will be tested on the material covered per apprenticeship curriculum by multiple choice questions, assignments, and practical tests. The weigh factor for each area of testing will be as follows***

- Theory Tests      50 %
- Practical Tests    30 %
- Assignments        20 %

This evaluation can change depending on the emphasis placed on each of the above testing procedures.

The following semester grades will be assigned to students:

<b>Grade</b>	<b><u>Definition</u></b>	<b><i>Grade Point Equivalent</i></b>
A+	90 – 100%	
A	80 – 89%	4.00
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% and below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.	
NR	Grade not reported to Registrar's office.	
W	Student has withdrawn from the course without academic penalty.	

If a faculty member determines that a student is at risk of not being successful in their academic pursuits and has exhausted all strategies available to faculty, student contact information may be confidentially provided to Student Services in an effort to offer even more assistance with options for success. Any student wishing to restrict the sharing of such information should make their wishes known to the coordinator or faculty member.

**VI. SPECIAL NOTES:**Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

***It is the departmental policy that once the classroom door has been closed, the learning process has begun. Late arrivers will not be granted admission to the room.***

**VII. COURSE OUTLINE ADDENDUM:**

The provisions contained in the addendum located in D2L and on the portal form part of this course outline.