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I. COURSE DESCRIPTION:

Upon successful completion of this course, the CICE student, with assistance from a Learning Specialist, will become familiar with the legal responsibilities of employees and employers relating to safe work practices, protection of the environment, and operation of lifting rigging, and blocking equipment according to government safety and environmental legislation, be able to use precision measuring tools, be able to perform fastening device installation and removal procedures, be able to describe the repair procedures for bearings, seals, and sealants, be able to identify and perform proper cleaning methods, be able to select and use proper hand tools including electric and pneumatic tools and be able to identify and perform proper lifting techniques using powered lift trucks and all in accordance to and following manufacturers' recommended procedures, government regulations and safe work practices.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the CICE student along with the assistance of a Learning Specialist, will demonstrate the basic ability to:

1. *Use the correct safety and environmental practices associated in an automotive shop.***Potential Elements of the Performance:**

- List the safety equipment required to operate a motive power shop
- Describe the potential dangers associated with in the motive power repair industry
- Describe the rights and responsibilities of the employer and employees under the Occupational Health and Safety Act. (OHSA).
- Outline the proper procedures to defuse potentially hazardous situations in the work place
- Exhibit knowledge and understanding of the WHMIS Safety Act
- Demonstrate proper use of cleaning equipment
- Explain the laws and proper handling of air conditioning refrigerants
- Fire Safety
- Proper Personal Protective Safety Equipment
- Outline Hybrid safety guidelines and precautions
- Be able to identify potential safety hazards in a motive power environment:
 - electrical hazards
 - proper ventilation
 - glove requirements
 - slipping hazards
 - tripping hazards
 - lifting techniques
 - eye hazards

- hearing hazards
- rings and jewelry

2. *Demonstrate the use of proper jacking and lifting equipment used in the motive power industry.*

Potential Elements of the Performance:

Demonstrate the proper method of raising and lowering vehicles using hoists, fork lifts, jacks, blocking and safety stands.

- Use safety stands and jacks
- Perform vehicle placement and movement
- Find the lifting points
- Outline equipment maintenance
- State lifting capacities of hoisting equipment
- Use adaptors & extensions
- Describe types of hoists and lifting equipment
- Operate safety locks and releases
- Position vehicle / wheel chocks
- Check overhead environment
- Verify correct engagement of lift points
- Verify balance
- Verify correct use of safety locks

3. *Identify and safely use hand and power tools common to the motive power industry.*

Potential Elements of the Performance:

Perform the following metal working operations:

- verify thread strengths and torque requirements for wet and dry
- repair damaged threads
 - free seized threads, remove broken studs / cap screws
 - install helicoils and keenserts
 - apply thread locker and anti-seize
- perform metal working tasks related to
 - drilling
 - tapping
 - hack sawing
 - filing
- Identify hand and power tools used the repair of motive power vehicles and equipment.
- Perform component removal and installation using proper tools.

4. Define the purpose and fundamentals of fasteners and tightening procedures

Potential Elements of the Performance:

- identify fastener grades and applications
- demonstrate the ability to identify SAE vrs SI
- explain tensile, yield, shear strength and how they differ
- choose the proper grade pitch threads per inch for the job being performed
- explain the factors that affect torque such as thread condition, lubrication, temperature and fastener composition

5. Demonstrate a working knowledge of the purpose, construction, principals of operation, and calibration of precision and non-precision measuring tools

Potential Elements of the Performance:

- metric and imperial measurements and conversions
- demonstrate use of micrometers (inside and outside)
- use small hole gauges, calipers. Verniers and telescoping gauges
- measure brake drums with metric and imperial drum gauges
- apply torque wrenches to the trade (click, dial, and beam)

6. Upon successful completion, the student will be able to operate heating and cutting equipment following manufacturers' recommendations, government regulations, and safe work practices.

Potential Elements of the Performance:

- oxy-fuel gases
- eye, face, hand, foot, and clothing protection
- set-up, ignition, and shutdown sequence
- cylinder handling/storage
- fire prevention
- combustible material (eg. Butane lighter risks)
- flashback
- backfire
- removing damaged or broken fasteners
- using heat to free seized fasteners
- cylinders
- identification features
- pressure regulator

- manual valves
- gauges and hoses
- cutting attachments
- tips
- cutting metals
- heating
- torch body
- heating tips
- flashback arresters
- equipment set-up, ignition, and shutdown sequence
 - oxygen and acetylene pressure settings
 - ignition procedures
 - select heating and cutting tips
 - observe tip angle, travel speed, and gap
 - demonstrate awareness of potential damage from heating or cutting to surrounding materials
 - identify potential risks for altering metallurgical properties
 - perform appropriate pressure settings, ignition, and flame adjustments for specific heating and cutting tasks
 - remove damaged fasteners
 - heating and removing procedures of seized fasteners

7. *Identify various types and styles of equipment utilized in the Motive Power Industry.*

Potential Elements of the Performance:

- Complete assigned project

III. TOPICS:

1. Shop Safety
2. Hoisting and Lifting
3. Hand and Power Tools
4. Fasteners
5. Precision Measuring Tools
6. Oxy-Fuel Processes
7. Motive Power Equipment Identification

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Title: Heavy Duty Truck Systems

Edition: 6th ed.,

Author: Bennett

Publisher: Thomson Nelson Learning Canada

Title: Automotive Technology: A Systems Approach

Edition: 3rd Canadian Ed.

Author: Erjavec

Publisher: Thomson Nelson Learning Canada

Pens, pencils, calculator, 3-ring binder

4 – colour pen or coloured pencils, or high-lighters

Blue, Red, Yellow and green are required.

Pocket flashlight and a pocket magnet

The following items are mandatory in the Shop:

- CSA approved steel toe boots (high top)
- CSA approved safety glasses
- Approved coveralls

V. EVALUATION PROCESS/GRADING SYSTEM:

The final grade for this course will be based on the results of classroom, assignments and shop evaluations weighed as indicated:

- Classroom – 40% of the final grade is comprised of term tests
- Assignments – 10% of the final grade is comprised of a number of technical reports
- Shop – 50% of the final grade is comprised of attendance, punctuality, preparedness, student ability, work organization and general attitude

(Student will be given notice of test and assignment dates in advance)

NOTE: All assignments will be in typed format. NO hand written assignments will be accepted.

The following semester grades will be assigned to students:

Grade	Definition	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
F (Fail)	49% and below	
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.

**Cell phones are not allowed
in the classrooms or shop areas during class time.**

VII. COURSE OUTLINE ADDENDUM:

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

Addendum:

Further modifications may be required as needed as the semester progresses based on individual student(s) abilities and must be discussed with and agreed upon by the instructor.

CICE Modifications:**Preparation and Participation**

1. A Learning Specialist will attend class with the student(s) to assist with inclusion in the class and to take notes.
2. Students will receive support in and outside of the classroom (i.e. tutoring, assistance with homework and assignments, preparation for exams, tests and quizzes.)
3. Study notes will be geared to test content and style which will match with modified learning outcomes.
4. Although the Learning Specialist may not attend all classes with the student(s), support will always be available. When the Learning Specialist does attend classes he/she will remain as inconspicuous as possible.

A. Tests may be modified in the following ways:

1. Tests, which require essay answers, may be modified to short answers.
2. Short answer questions may be changed to multiple choice or the question may be simplified so the answer will reflect a basic understanding.
3. Tests, which use fill in the blank format, may be modified to include a few choices for each question, or a list of choices for all questions. This will allow the student to match or use visual clues.
4. Tests in the T/F or multiple choice format may be modified by rewording or clarifying statements into layman's or simplified terms. Multiple choice questions may have a reduced number of choices.

B. Tests will be written in CICE office with assistance from a Learning Specialist.***The Learning Specialist may:***

1. Read the test question to the student.
2. Paraphrase the test question without revealing any key words or definitions.
3. Transcribe the student's verbal answer.
4. Test length may be reduced and time allowed to complete test may be increased.

C. Assignments may be modified in the following ways:

1. Assignments may be modified by reducing the amount of information required while maintaining general concepts.
2. Some assignments may be eliminated depending on the number of assignments required in the particular course.

The Learning Specialist may:

1. Use a question/answer format instead of essay/research format
2. Propose a reduction in the number of references required for an assignment
3. Assist with groups to ensure that student comprehends his/her role within the group
4. Require an extension on due dates due to the fact that some students may require additional time to process information
5. Formally summarize articles and assigned readings to isolate main points for the student
6. Use questioning techniques and paraphrasing to assist in student comprehension of an assignment

D. Evaluation:

Is reflective of modified learning outcomes.