



## COURSE OUTLINE: AST611 - WORK PRACTICES

Prepared: Stephen Kent

Approved: Corey Meunier, Chair, Technology and Skilled Trades

<b>Course Code: Title</b>	AST611: WORK PRACTICES
<b>Program Number: Name</b>	
<b>Department:</b>	MOTIVE POWER APPRENTICESHIP
<b>Semesters/Terms:</b>	21F, 22W, 22F
<b>Course Description:</b>	<p>In this course, the student will demonstrate the ability to identify types and purpose of fasteners including tightening procedures. The student will be introduced to bearings, seals and sealants and the purpose of each. The student will demonstrate a working knowledge of the purpose, construction, principles of operation, and calibration of precision and non-precision measuring tools. They will also show their ability to properly lift and support vehicles using hoists and lifting equipment. Oxyacetylene, heating and cutting will also be performed as well as producing word documents and accessing trade related information from computer based software.</p> <p>Students will be required to follow proper safety procedures when performing the above tasks according to both Sault College Motive Power Department Standards and Vehicle Manufacturers safety regulations and specifications.</p>
<b>Total Credits:</b>	4
<b>Hours/Week:</b>	0
<b>Total Hours:</b>	30
<b>Prerequisites:</b>	There are no pre-requisites for this course.
<b>Corequisites:</b>	There are no co-requisites for this course.
<b>Essential Employability Skills (EES) addressed in this course:</b>	<p>EES 1 Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.</p> <p>EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication.</p> <p>EES 3 Execute mathematical operations accurately.</p> <p>EES 4 Apply a systematic approach to solve problems.</p> <p>EES 5 Use a variety of thinking skills to anticipate and solve problems.</p> <p>EES 6 Locate, select, organize, and document information using appropriate technology and information systems.</p> <p>EES 7 Analyze, evaluate, and apply relevant information from a variety of sources.</p> <p>EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others.</p> <p>EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.</p> <p>EES 10 Manage the use of time and other resources to complete projects.</p> <p>EES 11 Take responsibility for ones own actions, decisions, and consequences.</p>

In response to public health requirements pertaining to the COVID19 pandemic, course delivery and assessment traditionally delivered in-class, may occur remotely either in whole or in part in the 2021-2022 academic year.



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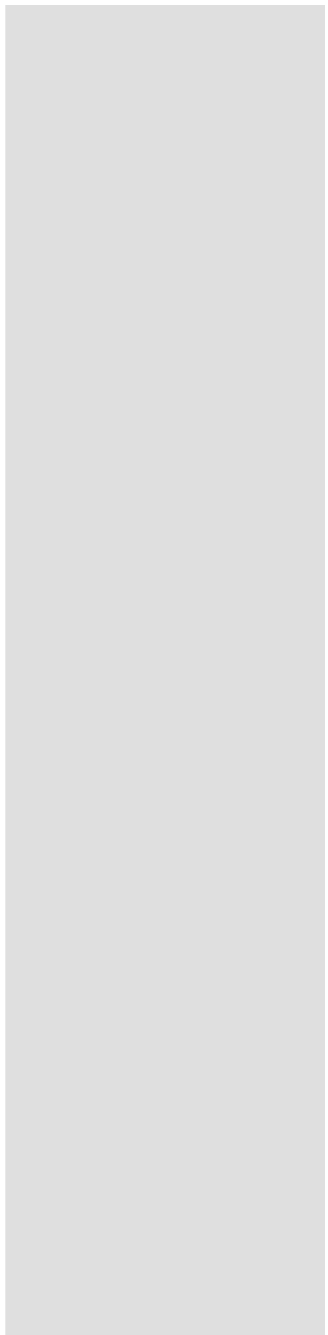
<b>Course Evaluation:</b>	<p>Passing Grade: 50%, D</p> <p>A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.</p>
<b>Other Course Evaluation &amp; Assessment Requirements:</b>	<p>The final grade for this course will be based on the results of classroom, assignments and shop evaluations weighed as indicated:</p> <p>Classroom 70% of the final grade is comprised of term tests Shop 30% of the final grade is comprised of attendance, punctuality, preparedness, student ability, work organization and general attitude</p> <p>Students will be given notice of test and assignment dates in advance</p>
<b>Books and Required Resources:</b>	<p>Automotive Technology: A Systems Approach by Erjavec Publisher: Thomson Nelson Learning Canada Edition: 4th Canadian</p>

<b>Course Outcomes and Learning Objectives:</b>	<b>Course Outcome 1</b>	<b>Learning Objectives for Course Outcome 1</b>
	<p>Define the purpose and fundamentals of fasteners and perform fastener selection, retention, removal and tightening procedures</p>	<p>1.1 Explain the fundamental characteristics of fasteners and retention techniques as to the following. specifications created by Society of Automotive Engineers (SAE) standards specifications of International Organization of Standards (ISO) bolt strength (tensile, shear) fastener grade, pitch, threads per inch, threads per millimeter fastener diameter, length, head size use of anti-seize application • factors that affect torque thread condition lubrication compatibility temperature fastener compositio</p> <p>1.2 Identify the construction, types, styles and application of the following fasteners. bolts / nuts screws studs locking devices pins rivets keys washers retaining rings helicoils, timeserts thread sealants</p> <p>1.3 Describe fastener applications, retention techniques and metal working skills. thread lockers torque to yield fasteners</p>

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	<p>torque effects of wet, dry and clean threads locking techniques drilling tapping hack sawing filing riveting</p> <p>1.4 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 timeserts apply thread locker and anti-seize perform metal working tasks related to drilling tapping hack sawing filing riveting fastener torqueing</p>	
	<p><b>Course Outcome 2</b></p> <p>Demonstrate the purpose, construction, principals of operation, inspection and testing of bearings, seals and sealants</p>	<p><b>Learning Objectives for Course Outcome 2</b></p> <p>2.1 Explain the following fundamentals. friction characteristics effects of temperature lubrication bearing loads axial / radial pre-load and end play hydrodynamic suspension</p> <p>2.2 Identify the purpose, construction and applications of bearings, seals and sealants. friction bearings anti-friction bearings ball roller needle Seals dynamic static sealants anaerobic non-anaerobic gaskets specialty sealants</p> <p>2.3 Describe cause of failure of bearings, seals and sealants. scoring / spalling clearance over-heating vibration</p>

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	lubrication 2.4 Perform bearing, seal and sealant removal, installation. remove / install bearings - non-friction friction remove / install seals - dynamic static 2.5 Explain the following fundamentals. friction characteristics effects of temperature lubrication bearing loads axial / radial pre-load and end play hydrodynamic suspension 2.6 Identify the purpose, construction and applications of bearings, seals and sealants. friction bearings anti-friction bearings ball roller needle Seals dynamic static sealants anaerobic non-anaerobic gaskets specialty sealants 2.7 Describe cause of failure of bearings, seals and sealants. scoring / spalling clearance over-heating vibration lubrication 2.8 Perform bearing, seal and sealant removal, installation. remove / install bearings - friction non friction remove / install seals - dynamic static remove and install sealants and gaskets
<b>Course Outcome 3</b>	<b>Learning Objectives for Course Outcome 3</b>
Demonstrate a working	3.1 Explain Unit conversions

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	<p>knowledge of the purpose, construction, principals of operation, and calibration of precision and non-precision measuring tools</p>	<p>Convert between metric and Imperial measurements including fractions.</p> <p>3.2 Identify the construction, types and application of precision measuring tools.</p> <ul style="list-style-type: none"> <li>micrometers</li> <li>inside</li> <li>outside</li> <li>depth</li> <li>small hole gauges</li> <li>calipers</li> <li>Vernier calipers</li> <li>telescoping gauges</li> <li>straight edges</li> <li>dial indicators</li> <li>torque wrenches</li> <li>straight edges</li> <li>cylinder gauges</li> </ul> <p>3.3 Describe measuring procedures using the following tools.</p> <ul style="list-style-type: none"> <li>micrometers</li> <li>inside</li> <li>outside</li> <li>depth</li> <li>small hole gauges</li> <li>calipers</li> <li>Vernier calipers</li> <li>telescoping gauges</li> <li>straight edges</li> <li>thickness gauges</li> <li>dial indicators</li> <li>straight edges</li> <li>cylinder gauges</li> <li>torque wrenches</li> </ul> <p>3.4 Perform maintenance and calibration on precision measuring tools and perform precision measurements.</p> <ul style="list-style-type: none"> <li>describe maintenance / calibration procedure</li> <li>storage</li> <li>lubrication</li> <li>adjustment / calibration</li> <li>restoring critical surfaces</li> <li>perform measurement and clearance checks</li> </ul>
	<b>Course Outcome 4</b>	<b>Learning Objectives for Course Outcome 4</b>
	<p>Apply a working knowledge and safe operating principals for the use of oxyacetylene when cutting and heating</p>	<p>4.1 Explain the functions, construction, and applications of oxyacetylene welding equipment.</p> <ul style="list-style-type: none"> <li>tanks</li> <li>identification features</li> <li>pressure regulators</li> <li>manual valves</li> <li>gauges</li> </ul>

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	<p>torch tips heating and cutting torches</p> <p>4.2 Describe the safe use of oxy-acetylene equipment. personal safety equipment and clothing setup, inspection, ignition and shutdown sequence cylinder handling fire prevention</p> <p>4.3 Perform heating and cutting procedures. heating / cutting seized fasteners / components heating / cutting damaged fasteners / components</p>
<b>Course Outcome 5</b>	<b>Learning Objectives for Course Outcome 5</b>
Demonstrate a working knowledge of the use of a personal computer.	<p>5.1 Perform the following functions on a Networked PC. access trade related information access internet browsing file download access Email reading attachments</p>
<b>Course Outcome 6</b>	<b>Learning Objectives for Course Outcome 6</b>
Demonstrate the use of proper jacking and hoisting equipment used in the motive power industry.	<p>6.1 Explain safe practices for hoist and lifting equipment. Use of safety stands, jacks Vehicle placement and movement Finding the lifting points Equipment maintenance</p> <p>6.2 Identify lifting and hoisting equipment. Lifting capacities Adaptors &amp; extensions Types of hoists and lifting equipment Safety locks and releases</p> <p>6.3 Perform lifting of vehicles using shop lifts and hoisting equipment. Position vehicle / wheel chocks Check overhead environment Verify correct engagement of lift points Verify balance Verify correct use of safety lock</p>

**Evaluation Process and Grading System:**

Evaluation Type	Evaluation Weight
shop	40%
Theory Tests	60%

**Date:**

July 30, 2021

**Addendum:**

Please refer to the course outline addendum on the Learning Management System for further information.

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