COURSE OUTLINE: AST711 - AIR COND SYSTEMS

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Course Code: Title	AST711: AIR CONDITIONING SYSTEMS
Program Number: Name	6068: AUTO SERV TN LEVEL 2
Department:	MOTIVE POWER APPRENTICESHIP
Semesters/Terms:	20F, 21S
Course Description:	This course deals with the study and inter-relationship of mobile air conditioning design and control systems. It will also outline the use of receiver dryers, accumulator dryers and types of compressors. Students will observe the proper testing of system operating pressures as well as perform an A/C performance test. Students will also describe the pertinent information relating to Workplace Hazardous Materials Information Safety, Occupational Health and Safety Act, Repair and Storage Lien Act and Workplace Safety Insurance Board.
Total Credits:	4
Hours/Week:	0
Total Hours:	30
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
Essential Employability Skills (EES) addressed in this course:	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. EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication. EES 3 Execute mathematical operations accurately. EES 4 Apply a systematic approach to solve problems. EES 5 Use a variety of thinking skills to anticipate and solve problems. EES 6 Locate, select, organize, and document information using appropriate technology and information systems. EES 7 Analyze, evaluate, and apply relevant information from a variety of sources. EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others. EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals. EES 10 Manage the use of time and other resources to complete projects. EES 11 Take responsibility for ones own actions, decisions, and consequences.
Course Evaluation:	Passing Grade: 50%, D A minimum program GPA of 2.0 or higher where program specific standards exist is required

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 2020-2021 academic year.

	for graduation.
Other Course Evaluation & Assessment Requirements:	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 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 (Student will be given notice of test and assignment dates in advance)
Books and Required Resources:	Automotive Technology: A Systems Approach by Erjavec Publisher: Thomson Nelson Learning Canada Edition: 3rd Canadian

Course Outcomes and Learning Objectives:

Course Outcome 1	**Learning Objectives for Course Outcome 1**
1. Explain the construction and operation of automotive air conditioning systems.	1.1 Draw & label a simple A/C system. Describe 3 methods of heat transfer. Compare & contrast R12 with R134A refrigerant. Outline refrigerant oils used in R12 and R134A systems. Explain the temperature and humidity relationship. Interpret the difference between a fixed orifice and a expansion valve system. Describe the construction and operation of A/C compressors, axial, radial & variable displacement. Explain the purpose and function of the following components, evaporator, condenser, receiver dryer, accumulator dryer, hoses, lines and fittings. Outline refrigerant waste laws.
Course Outcome 2	**Learning Objectives for Course Outcome 2**
2. Explain the purpose & construction of A/C system control valves.	2.1 Describe low and high pressure cut out valves. Explain low temperature lock out necessity. Outline low charge protection valves. List & describe two types of evaporator temperature control valves, expansion valve and fixed orifice. Discuss the interrelationship between cycling clutch control and low & high pressure cutouts.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Inspect and test air conditioning systems with the prescribed service tools and equipment.	3.1 Outline major differences in testing R12 and R134A systems. Perform 4 methods of A/C leak detection, dye, high pressure nitrogen. Electronic and propane. Recover, Recycle and Recharge Perform an A/C system performance test Identify the location and type of service valves used.
Course Outcome 4	**Learning Objectives for Course Outcome 4**
4. Describe Workplace Hazardous Information	4.1 Describe the following. Right to know

	Safety	Legislation and safe handling of products Hazardous Materials and Material Safety Data Sheets
	Course Outcome 5	**Learning Objectives for Course Outcome 5**
	5. Describe the Occupational Health and Safety Act	5.1 Describe the following. Legislation Obligation of the employer
	Course Outcome 6	**Learning Objectives for Course Outcome 6**
	6. Describe the Repair and Storage Lien Act	6.1 Describe the following. Payments for repairs and storage Liens and disputes over liens
	Course Outcome 7	**Learning Objectives for Course Outcome 7**
	7. Describe the Workplace Safety Insurance Board	7.1 Describe the following. Reporting accidents to company Reporting accidents to WSIB Requiring records and training requirements Accident prevention and safety precautions Personal protection equipment as well as housekeeping

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
shop	30%
Theory Tests	70%

Date: October 6, 2020

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

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