

10/10/2024

DATE



REQUIRED COURSE



ELECTIVE COURSE

TEC

DIVISION

☐ NEW COURSE☒ REVISION

Lake Land College

Course Information Form

COURSE NUMBER:	AUT-054		TITLE: (30 Characters Max)		Vehicle Heating & AC Systems						
SEM CR HRS:	3	Lecture:	2	Lab:	2			ECH:	4		
Course Level:	<input type="checkbox"/> Gen Ed / IAI <input type="checkbox"/> Baccalaureate /Non-IAI		<input checked="" type="checkbox"/> Career/Technical <input type="checkbox"/> Dev Ed/ Not in Degree Audit		Clinical Practicum:	0	Work-based Learning:	0	SOE ECH:	0	
COURSE PCS #	12 - 47.0604		IAI Code		N/A		Contact Hours (Minutes/Week)				
Repeatable (Y/N):	N	Pass/Fail (Y/N):	N	Variable Credit (Y/N):	N	Min:	Max:	16 Wks	200	8 Wks	400
Prerequisites:	AUT-048 and AUT-051 or consent of instructor										
Corequisites:	None										
Catalog Description: (40 Word Limit)	This course is a study of vehicle heating and air conditioning systems as used on current vehicles today. Experience will be provided in diagnosis, repair and service of various components.										

List the Major Course Segments (Units)	Contact Lecture Hours	Contact Lab Hours	Clinical Practicum	Work-based Learning
Heating and air-conditioning principles	1			
The refrigeration cycle	1			
Air-conditioning compressors and service	2	5		
Refrigerants and refrigerant oils	1	1		
A/C system components, operation and service	1	5		
Air management system	2	5		
Engine coolant	1			
Cooling system operation and diagnosis	2	1		
Heating system operation and diagnosis	2	1		
Automatic temperature control systems	2	2		
Hybrid and electric vehicle HVAC systems	2	2		
Heating and air-conditioning system inspection	4	2		
Refrigerant recovery, recycling, and recharging	4	3		
A/C system diagnosis and repair	5	3		
TOTAL	30	30	0	0

EVALUATION			
QUIZZES <input checked="" type="checkbox"/>	EXAMS <input checked="" type="checkbox"/>	ORAL PRES <input type="checkbox"/>	PAPERS <input type="checkbox"/>
LAB WORK <input checked="" type="checkbox"/>	PROJECTS <input type="checkbox"/>	COMP FINAL <input type="checkbox"/>	OTHER <input type="checkbox"/>

COURSE MATERIALS	
TITLE:	Automotive Heating and Air Conditioning
AUTHOR:	James D. Halderman
PUBLISHER:	Pearson
VOLUME/EDITION/URL:	Eighth Edition
COPYRIGHT DATE:	2018

MAJOR COURSE SEGMENT	HOURS	LEARNING OUTCOMES
		<i>The student will be able to:</i>
Heating and air-conditioning principles	1	1. Explain the changes of states of matter, types of humidity, heating load and cooling load, the flow of heat and the air-conditioning process.
The refrigeration cycle	1	1. Explain the purpose, function and components of the A/C system.
Air-conditioning compressors and service	7	1. Explain the types, operation, components and service of the A/C compressor. 2. Demonstrate the inspecting, testing and replacement of components as required.
Refrigerants and refrigerant oils	2	1. Explain global warming and the laws on automotive systems. 2. Identify oils, refrigerants, proper storage containers, precautions and changes for the future.

A/C system components, operation and service	6	1. Explain the purpose and function of various A/C components, including condensers, expansion valves, accumulators and evaporators. 2. Demonstrate the inspecting, testing and replacement of components as required.
Air management system	7	1. Explain the purpose and function of the air management systems. 2. Demonstrate the inspecting, testing and replacement of components as required.
Engine coolant	1	1. Explain the fundamentals of coolant. 2. Discuss the different types and testing.
Cooling system operation and diagnosis	3	1. Explain the purpose and function of the cooling system. 2. Demonstrate the inspecting, testing and replacement of components as required.
Heating system operation and diagnosis	3	1. Explain the operation of the heating system. 2. Demonstrate the inspecting, testing and replacement of components as required.
Automatic temperature control systems	4	1. Explain the purpose and operation of the automatic temperature control systems. 2. Demonstrate the inspecting, testing and replacement of components as required.
Hybrid and electric vehicle HVAC systems	4	1. Explain the operation and components of the HVAC systems used in hybrid and electric vehicles.
Heating and air-conditioning system inspection	6	1. Demonstrate the inspecting, testing and replacement of components as required.
Refrigerant recovery, recycling, and recharging	7	1. Explain and demonstrate refrigerate recovery, recycling and recharging for vehicles.
A/C system diagnosis and repair	8	1. Demonstrate the inspecting, testing and replacement of components as required.
60		

Outcomes*	At the successful completion of this course, students will be able to:
Course Outcome	Assessing the air-conditioning compressor for operation.
Course Outcome	Testing of the refrigerate to recover properly.
Course Outcome	Displaying the proper A/C system charging procedures.
Primary Laker Learning Competency	Information & Technology Literacy: Students not only identify when information is necessary, but they also find, evaluate and use that information effectively with the appropriate technological tools.
Secondary Laker Learning Competency	Creative Thinking & Problem Solving: Students think creatively and solve problems by successfully combining knowledge in new ways.

*Course and program outcomes will be used in the software for outcomes assessment and should include at least 1 primary and 1 secondary Laker Learning Competency. Limit to 3-5.