10/10/2024 DATE
☑ REQUIRED COURSE
☐ ELECTIVE COURSE

TEC DIVISION
☐ NEW COURSE
☑ REVISION

Lake Land College

Course Information Form

COURSE NUMBER:	AUT-051		TITLE: *(30 Characters Max)*	Electrical Systems I							
SEM CR HRS:	3	Lecture:	2	Lab:	2				ECH:	4	
Course Level:	☐ Gen Ed / IAI ☐ Baccalaureate /Non-IAI ☑ Career/Technical ☐ Dev Ed/ Not in Degree Audit			Clinical Practicum:	0	Work-based Learning:	0	WBL 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:	None										
Coequisites:	None										
Catalog Description: (40 Word Limit)	This course is a study of basic electrical systems of a vehicle. It includes basic Ohm's Law, electrical circuits, automotive meters and oscilloscopes, Automotive wiring and wiring repair, schematics, cranking circuits and charging systems.										

List the Major Course Segments (Units)	Contact Lecture Hours	Contact Lab Hours	Clinical Practicum	Work-based Learning
Electrical fundamentals	5			
Electrical circuits and Ohm's Law	4			
Series circuits	1			
Parallel circuits	1			
Series-parallel circuits	1			
Circuit testers and digital meters	2	5		
Oscilloscopes and graphing multimeters	2	5		
Automotive wiring and wire repair	3	5		
Wiring schematics and circuit testing	3	5		
Cranking system	2			
Cranking system diagnosis and service	2	5		
Charging system	2			
Charging system diagnosis and service	2	5		
TOTAL	30	30	0	0

EVALUATION							
QUIZZES	☑	EXAMS	☑	ORAL PRES	☐	PAPERS	☐
LAB WORK	☑	PROJECTS	☐	COMP FINAL	☑	OTHER	☐

COURSE MATERIALS		
TITLE:	Automotive Electricity and Electronics	
AUTHOR:	James D. Halderman	
PUBLISHER:	Pearson	
VOLUME/EDITION/URL:	Sixth Edition	
COPYRIGHT DATE:	2021	

MAJOR COURSE SEGMENT	HOURS	LEARNING OUTCOMES
		The student will be able to:
Electrical fundamentals	5	1. Discover units of electrical measurement and the relationship among volts, amps and ohms. 2. Classify conductors, resistors, capacitors and other electronic components. 3. Learn about magnetism and electromagnetism.
Electrical circuits and Ohm's Law	4	1. Identify parts of a complete circuit. 2. Apply Ohm's law on automotive circuits.
Series circuits	1	1. Explain series circuit laws. 2. Apply series circuit laws to a series circuit.
Parallel circuits	1	1. Explain parallel circuit laws. 2. Apply parallel circuit laws to a parallel circuit.
Series-parallel circuits	1	1. Explain series-parallel circuit laws 2. Apply series-parallel circuit laws to a series-parallel circuit.

Circuit testers and digital meters	7	1. Demonstrate how to apply different electrical testers, including digital meters, on automotive circuits.
Oscilloscopes and graphing multimeters	7	1. Demonstrate how to apply oscilloscopes and graphing multimeters on automotive circuits.
Automotive wiring and wire repair	8	1. Classify the different wire gauge systems. 2. Identify types of circuit protections. 3. Demonstrate how to remove electrical terminals from electrical connectors. 4. Perform automotive wire repairs.
Wiring schematics and circuit testing	8	1. Interpret wiring schematics. 2. Locate different electrical circuit problems. 3. Develop steps for repairs.
Cranking system	2	1. Recognize how the cranking system operates, parts involved and different systems that control it.
Cranking system diagnosis and service	7	1. Demonstrate procedures on trouble shooting cranking systems. 2. Perform services necessary to repair the system.
Charging system	2	1. Recognize how the charging system operates, parts involved and different systems that control it.
Charging system diagnosis and service	7	1. Demonstrate procedures on trouble shooting charging systems. 2. Perform services necessary to repair the system.
	60	

Outcomes*	At the successful completion of this course, students will be able to:
Course Outcome	Displaying the use of a digital meter, oscilloscope, and a graphing multimeter.
Course Outcome	Testing the cranking system to determine the necessary service required.
Course Outcome	Testing the charging system to determine the necessary service required.
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.*