

9/3/2024

DATE



REQUIRED COURSE



ELECTIVE COURSE

TEC



DIVISION

NEW COURSE



REVISION

Lake Land College

Course Information Form

COURSE NUMBER:	APT-048		TITLE: (30 Characters Max)		Electrical Sensors I						
SEM CR HRS:	0.5	Lecture:	0.5		Lab:	0.5	ICCB Lab:	1	ECH:	1	
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	WBL ECH:	0	
COURSE PCS #	12 - 15.0406		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	50	8 Wks	100
Prerequisites:	AET-040, AETC-040 or previous electrical experience										
Corequisites:	None										
Catalog Description: (40 Word Limit)	Students will learn the characteristics of various electric sensors used in automation and industrial processes. (Meets SACA Automation Specialist I C-205 Sensor Logic Systems 1 credential.)										

List the Major Course Segments (Units)		Contact Lecture Hours	Contact Lab Hours	Clinical Practicum	Work-based Learning
1	Standard 205.1 Identify and select an electronic sensor for an application	1	1		
2	Standard 205.2 Connect and test an inductive proximity sensor	0.75	1		
3	Standard 205.3 Connect and test a capacitive proximity sensor	0.75	1		
4	Standard 205.4 Connect and test a magnetic reed switch	0.75	1		
5	Standard 205.5 Connect and test a hall-effect sensor	0.75	1		
6	Standard 205.6 Connect and test a photoelectric sensor	0.75	1		
7	Standard 205.7 Interpret basic electrical control schematics	1	1		
8	Standard 205.8 Connect and test electro-pneumatic power circuits	1	2		
9	Standard 205.9 Connect and test electric-relay sequence control circuits	0.75	2		
10	Standard 205.10 Connect and test relay sequence circuit that uses electronic sensors	0.5	2		
TOTAL		8	13	0	0

EVALUATION

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

COURSE MATERIALS

TITLE:	Learning materials
AUTHOR:	Amatrol
PUBLISHER:	
VOLUME/EDITION/URL:	
COPYRIGHT DATE:	

MAJOR COURSE SEGMENT	HOURS	LEARNING OUTCOMES
		The student will be able to:
Standard 205.1 Identify and select an electronic sensor for an application	2	Performance Indicator 1. Select an electronic sensor type for an application. 2. Select sensor switch output type, NPN or PNP, for an application. Knowledge Indicator 1. Describe applications of electronic sensors. 2. Describe the operation of 2 types of transistor(NPN,PNP) used in electronic sensors. 3. Define sinking and sourcing signals. 4. Describe the limitations of interfacing transistor devices to other control devices. 5. Describe the function and application of opto-isolation
Standard 205.2 Connect and test an inductive proximity sensor	1.75	Performance Indicator 1. Connect an inductive proximity sensor. 2. Test an inductive proximity sensor. 3. Adjust an inductive proximity sensor for best performance. Knowledge Indicator 1. Describe characteristics that affect inductive proximity sensor operation.

Standard 205.3 Connect and test a capacitive proximity sensor	1.75	<p>Performance Indicator</p> <ol style="list-style-type: none"> 1. Connect a capacitive proximity sensor. 2. Test a capacitive proximity sensor. 3. Adjust a capacitive proximity sensor for best performance. <p>Knowledge Indicator</p> <ol style="list-style-type: none"> 1. Describe characteristics that affect capacitive proximity sensor operation.
Standard 205.4 Connect and test a magnetic reed switch	1.75	<p>Performance Indicator</p> <ol style="list-style-type: none"> 1. Connect a magnetic reed switch. 2. Test a magnetic reed switch. 3. Adjust a magnetic reed switch for best performance. <p>Knowledge Indicator</p> <ol style="list-style-type: none"> 1. Describe characteristics that affect magnetic reed switch operation.
Standard 205.5 Connect and test a hall-effect sensor	1.75	<p>Performance Indicator</p> <ol style="list-style-type: none"> 1. Connect a hall-effect sensor. 2. Test a hall-effect sensor. 3. Adjust a hall-effect sensor for best performance. <p>Knowledge Indicator</p> <ol style="list-style-type: none"> 1. Describe characteristics that affect hall-effect sensor operation.
Standard 205.6 Connect and test a photoelectric sensor	1.75	<p>Performance Indicator</p> <ol style="list-style-type: none"> 1. Connect a photoelectric sensor. 2. Test a photoelectric sensor. 3. Adjust a photoelectric sensor for best performance. <p>Knowledge Indicator</p> <ol style="list-style-type: none"> 1. Describe characteristics that affect photoelectric sensor operation.
Standard 205.7 Interpret basic electrical control schematics	2	<p>Performance Indicator</p> <ol style="list-style-type: none"> 1. Interpret basic electrical ladder control schematics. <p>Knowledge Indicator</p> <ol style="list-style-type: none"> 1. Describe the schematic symbols for electrical control circuits. 2. Describe the operation of basic control logic. 3. Describe basic electrical ladder schematic guidelines.
Standard 205.8 Connect and test electro-pneumatic power circuits	3	<p>Performance Indicator</p> <ol style="list-style-type: none"> 1. Use the manual override of a solenoid-operated pneumatic DCV to jog a cylinder. 2. Connect and operate a double-acting cylinder using a 5/2 solenoid-operated pneumatic DCV. <p>Knowledge Indicator</p> <ol style="list-style-type: none"> 1. Describe the function of a power diagram. 2. Describe the function of electro-pneumatic controls and give an application.
Standard 205.9 Connect and test electric-relay sequence control circuits	2.75	<p>Performance Indicator</p> <ol style="list-style-type: none"> 1. Interpret the operation of basic 2-step electric-relay sequence circuit schematic and power diagram. 2. Connect and operate a motor control start/stop circuit. 3. Connect and operate a relay-controlled sequence circuit. 4. Interpret the operation of a relay-controlled sequence circuit diagram. <p>Knowledge Indicator</p> <ol style="list-style-type: none"> 1. Describe the operation of a seal-in logic circuit. 2. Describe operation of sequence interlock logic.
Standard 205.10 Connect and test relay sequence circuit that uses electronic sensors	2.5	<p>Performance Indicator</p> <ol style="list-style-type: none"> 1. Connect and test an electronic sensor in an electrical relay circuit. 2. Interpret the operation a relay-controlled sequence circuit diagram that uses an electronic sensor. 3. Test electronic sensors in-circuit. 4. Test relay control components in-circuit. 5. Troubleshoot relay sequence circuits. <p>Knowledge Indicator</p> <ol style="list-style-type: none"> 1. Describe control applications of electronic sensors. 2. Describe symptoms and faults of electronic sensors. 3. Describe symptoms and faults of relay control components. 4. Describe methods of troubleshooting relay control sequence circuits.
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Outcomes*	At the successful completion of this course, students will be able to:
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Course Outcome	Select the correct sensor needed based on the application for which it will be used.
Course Outcome	Describe how each type of electrical sensor covered works and how it might perform in a given application.
Course Outcome	Demonstrate proper use and connectivity of electrical sensors covered in the class.
Primary Laker Learning Competency	Creative Thinking & Problem Solving: Students think creatively to solve problems.
Secondary Laker Learning Competency	Communication: Students communicate through the exchange of information.

**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.*