9/3/2024	DATE	TEC	DIVISION
☑	REQUIRED COURSE	☑	NEW COURSE
☐	ELECTIVE COURSE	☐	REVISION

Lake Land College

Course Information Form

COURSE NUMBER:	AETC-042			**TITLE:** *(30 Characters Max)*			Mechanical Power Systems I						
SEM CR HRS:	1.0	**Lecture:**		0.5		**Lab:**	1.0	**ICCB Lab:**		1.0	**ECH:**	1.5	
Course Level:	☐ Gen Ed/IAI ☐ Baccalaureate/Non-IAI		☑ Career/Technical ☐ Dev Ed/Not in Degree Audit			**Clinical Practicum:**	0.0	**Work-based Learning:**		0.0	**WBL ECH:**	0.0	
Course PCS & CIP:	12 - 15.0407			**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**	75	**8 Wks**	150
Prerequisites:	None												
Corequisites:	None												
Catalog Description: (40 Word Limit)	Students will identify mechanical power transmission types; safely install motors, shaft keys and hubs; install and align pillow blocks, bearings, V belts chain drives and gear drive systems; perform maintenance and lubricate mechanical components. (Meets SACA Automation Specialist I C-210 Mechanical Power Systems I credential.)												

List the Major Course Segments (Units)	Contact Lecture Hours	Contact Lab Hours	Clinical Practicum	Work-based Learning
Standard 210.1 Identify mechanical power transmission type and application	1	1		
Standard 210.2 Apply mechanical power transmission safety procedures	1	1		
Standard 210.3 Use a dial indicator to measure component dimensions	1	1		
Standard 210.4 Install and mount a motor	1	2		
Standard 210.5 Select and install a shaft key and hub	0.5	1		
Standard 210.6 Install and adjust pillow block and flange bearings	0.5	1		
Standard 210.7 Install and align shaft system with flexible jaw coupling	1	2		
Standard 210.8 Install and adjust a basic V-belt drive system	1	2		
Standard 210.9 Install and adjust a basic chain drive system	1	2		
Standard 210.10 Install and align a gear drive system	1	2		
Standard 210.11 Monitor the performance of mechanical power transmission system	1	0.5		
Standard 210.12 Apply lubrication to mechanical components	1	1		
TOTAL	11	16.5	0	0

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

COURSE MATERIALS		
TITLE:	Power Transmission Equipment (Mechanical Systems)	Mechanical Drive Systems LAP books
AUTHOR:		
PUBLISHER:	TPC Training Systems, a Division of Telemedia, Inc.	Amatrol, Inc
VOLUME/EDITION/URL:		
COPYRIGHT DATE:	Date: 1998	2002

MAJOR COURSE SEGMENT	HOURS	LEARNING OUTCOMES
		The student will be able to:

Standard 210.1 Identify mechanical power transmission type and application	2	Performance Indicator 1. Identify mechanical power transmission type by sight. 2. Identify a mechanical power transmission type for a given an application. Knowledge Indicator 1. Describe methods of coupling a mechanical power transmission system. 2. Describe methods of parallel shaft mechanical power transmission. 3. Define 3 types of levers. 4. Calculate the mechanical advantage of a lever. 5. Define torque and give its units of measurement.
Standard 210.2 Apply mechanical power transmission safety procedures	2	Performance Indicator 1. Identify and correct mechanical power transmission hazards. 2. Isolate stored mechanical power/energy. Knowledge Indicator 1. Describe types of mechanical power transmission hazards. 2. Describe mechanical power transmission safety guidelines.
Standard 210.3 Use a dial indicator to measure component dimensions	2	Performance Indicator 1. Calibrate a dial indicator. 2. Use a dial indicator to measure part dimension. 3. Use a dial indicator to measure Runout (TIR). Knowledge Indicator 1. Describe the operation of a dial indicator.
Standard 210.4 Install and mount a motor	3	Performance Indicator 1. Mount and level a motor. 2. Interpret motor nameplate data to ensure correct motor. 3. Select size and type of motor mounting hardware. 4. Correct a motor soft foot. Knowledge Indicator 1. Define a soft foot. 2. Describe the importance of motor mounting.
Standard 210.5 Select and install a shaft key and hub	1.5	Performance Indicator 1. Install a shaft key and attach a hub to a shaft. 2. Select and size a key for a keyway. Knowledge Indicator 1. Describe the function/applications of a key and keyway. 2. Describe how keys are specified.
Standard 210.6 Install and adjust pillow block and flange bearings	1.5	Performance Indicator 1. Install and adjust a pillow block bearing. 2. Install and adjust a flange bearing. Knowledge Indicator 1. Define types of friction and their effect on machine operation. 2. Define handling and storage procedures for pillow block bearings. 3. Describe the basic operation/ construction of a pillow block bearing. 4. Describe the basic operation/ construction of a flange bearing.

Standard 210.7 Install and align shaft system with flexible jaw coupling	3	Performance Indicator 1. Install and align a flexible jaw coupling. 2. Use straight edge and feeler gage shaft alignment method. 3. Identify size and type of flexible jaw couplings. Knowledge Indicator 1. Describe the basic operation/construction of a flexible jaw couplings. 2. Identify types of flexible couplings.
Standard 210.8 Install and adjust a basic V-belt drive system	3	Performance Indicator 1. Install, align and tension a basic v-belt drive system. 2. Identify size and type of v-belt and sheaves. Knowledge Indicator 1. Identify types of belts/sleeves. 2. Describe the basic operation/construction of a belt drive. 3. Calculate belt drive ratio, output speed and output torque.
Standard 210.9 Install and adjust a basic chain drive system	3	Performance Indicator 1. Install, align and set chain sag of a basic chain drive system. 2. Identify size and type of chain and sprocket. Knowledge Indicator 1. Describe the basic operation/construction of a basic chain drive. 2. Calculate chain drive sprocket ratio, output speed and output torque.
Standard 210.10 Install and align a gear drive system	3	Performance Indicator 1. Install and align a gear drive 2. Identify size and type of spur gears Knowledge Indicator 1. Describe the basic operation/construction of open and closed gear drives 2. Calculate gear drive sprocket ratio, output speed and output torque
Standard 210.11 Monitor the performance of mechanical power transmission system	1.5	Performance Indicator 1. Identify factors that affect mechanical power transmission efficiency. Knowledge Indicator 1. Define rotary mechanical power and give units of measurement. 2. Define power efficiency. 3. Calculate mechanical power given torque and speed. 4. Calculate mechanical power transmission efficiency.
Standard 210.12 Apply lubrication to mechanical components	2	Performance Indicator 1. Grease a bearing using grease gun and Zerk fitting. 2. Use machine documentation to identify machine lubrication points, select lubrication and identify schedule. 3. Inspect and fill lubrication reservoirs. Knowledge Indicator 1. Describe the basic operation of a grease gun. 2. Describe oil and grease specifications. 3. Describe the basic operation of automatic lubricators.
	27.5	

Outcomes*	Outcome Title	At the successful completion of this course, students will be able to:
Course Outcome 1	SACA 210.2 AETC042	Standard 210.2 Apply mechanical power transmission safety procedures.
Course Outcome 2	SACA 210.3 AETC042	Standard 210.3 Use a dial indicator to measure component dimensions.
Course Outcome 3	SACA 210.6 AETC042	Standard 210.6 Install and adjust pillow block and flange bearings.
Course Outcome 4	Motor Hub AETC042	Install and mount a motor and hub.
Course Outcome 5	Shaft Coupl AETC042	Install and align shafts and couplings.
Course Outcome 6	DrivSys AETC042	Install adjust/align basic drive systems (belt, chain, gear).
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.*