

Technology
DIVISION
NEW COURSE
X **REVISION**

COURSE NUMBER	<u>MET045</u>	TITLE	<u>Mechanical Drive Systems</u>								
SEM	<u>CR</u>	HRS	<u>2</u>	LT HRS	<u>1</u>	LAB HRS	<u>2</u>	SOE HRS	<u>0</u>	ECH	<u> </u>
COURSE PCS#						(Assigned by Administration)					

Prerequisites: None

Catalog Description (40 Word Limit): This course is designed to provide a basic understanding of mechanical drive systems and components. Students will learn industry-relevant skills including how to: install, analyze performance, maintain, and troubleshoot heavy duty mechanical transmission systems.

List the Major Course Segments (Units)	Contact Lt Hrs	Contact Lab Hrs
Motor Leveling	2	6
Shaft Alignment	2	5
Belt Drives	2	4
Chain Drives	2	4
Gear Drives	2	5
Couplings	2	3
Bearings & Seals	3	3

EVALUATION:							
Quizzes	X	Exams	X	Oral Pres.		Papers	
Lab Work	X	Projects		Comp Final	X	Other	

Textbooks:

Power Transmission Equipment (Mechanical Systems),
TPC Training Systems, a Division of Telemedia, Inc. Copyright Date: 1998

Bearings(Mechanical Systems),
TPC Training Systems, a Division of Telemedia, Inc. Copyright Date: 2001

Mechanical Drive Systems LAP books,
Amatrol, Inc., Copyright Date: 2002

Major Course Segment	Hours Lct/Lab	Learning Outcomes Student will be able to:
Motor Leveling	2/6	<p>Install an electric motor that is level.</p> <p>Select the required hardware and correctly fasten motor to the mounting surface.</p> <p>Perform the safety procedure of lock-out/ tag-out.</p> <p>Use of precision measurement tools to check run-out, end float, rpm, etc. of motor shaft.</p>
Shaft Alignment	2/5	<p>Determine the corrections needed to align two shafts, using the reverse dial indicator method.</p> <p>State at least three advantages of using laser alignment equipment over using dial indicators.</p> <p>Align two shafts using a straight edge and a feeler gauge.</p>
Belt Drives	2/4	<p>List the factors that affect the power transmitted by a belt drive.</p> <p>Explain the reason for using group belts.</p> <p>Install and align a fractional HP V-belt Drive with a finished bore.</p> <p>Measure the belt deflection force and move adjustable mounting base for proper belt tension.</p>
Chain Drives	2/4	<p>Explain the differences between chain drives and belt drives.</p> <p>Install and align a roller chain drive system with adjustable centers.</p> <p>Calculate the allowable chain sag for an application and adjust chain sag for proper chain tension.</p>
Gear Drives	2/5	<p>Identify different types of gears and gear failures.</p> <p>Calculate the diametral pitch of a gear.</p> <p>Install and align a spur gear drive system with adjustable centers.</p> <p>Determine the allowable backlash in a gear drive.</p> <p>Measure the backlash with dial indicator and adjust the gear spacing to obtain the allowable backlash.</p>

Couplings	2/3	<p>List three functions usually performed by a coupling.</p> <p>Install a flexible jam coupling with the proper gap between couplings.</p> <p>Explain the operation of shear-pin couplings.</p>
Bearings & Seals	3/3	<p>Install and adjust a pillow block antifriction bearing and shaft.</p> <p>Discuss the three types of bearing loads: radial, thrust and combination.</p> <p>Describe the applications for plain journal bearings and antifriction bearings.</p> <p>Identify damage and failure of bearings and seals.</p> <p>Demonstrate proper installation of various types of bearings and seals.</p>

Course Outcomes: At the successful completion of this course, students will be able to:

- Install an electric motor with the shaft level.
- Install and align a v-belt drive with the proper belt tension.
- Install and align a chain drive system with the proper amount of chain sag.
- Install and align a spur gear drive system with an acceptable backlash.