

2-26-15 DATE
X REQUIRED COURSE
 _____ ELECTIVE COURSE

Technology DIVISION
 _____ NEW COURSE
X REVISION

LAKE LAND COLLEGE
Course Information Form

COURSE NUMBER MET045 TITLE Mechanical Drive Systems

SEM CR HRS 2 LT HRS 1 LAB HRS 2 SOE HRS 0 ECH

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
Motor Leveling	2/6	<p data-bbox="743 138 1062 170">Student will be able to:</p> <p data-bbox="743 212 1247 243">Install an electric motor that is level.</p> <p data-bbox="743 285 1438 348">Select the required hardware and correctly fasten motor to the mounting surface.</p> <p data-bbox="743 390 1438 422">Perform the safety procedure of lock-out/ tag-out.</p> <p data-bbox="743 464 1438 527">Use of precision measurement tools to check run-out, end float, rpm, etc. of motor shaft.</p>
Shaft Alignment	2/5	<p data-bbox="743 579 1398 642">Determine the corrections needed to align two shafts, using the reverse dial indicator method.</p> <p data-bbox="743 684 1406 747">State at least three advantages of using laser alignment equipment over using dial indicators.</p> <p data-bbox="743 789 1446 852">Align two shafts using a straight edge and a feeler gauge.</p>
Belt Drives	2/4	<p data-bbox="743 905 1455 968">List the factors that affect the power transmitted by a belt drive.</p> <p data-bbox="743 1010 1308 1041">Explain the reason for using group belts.</p> <p data-bbox="743 1083 1446 1146">Install and align a fractional HP V-belt Drive with a finished bore.</p> <p data-bbox="743 1188 1430 1251">Measure the belt deflection force and move adjustable mounting base for proper belt tension.</p>
Chain Drives	2/4	<p data-bbox="743 1304 1430 1367">Explain the differences between chain drives and belt drives.</p> <p data-bbox="743 1409 1406 1472">Install and align a roller chain drive system with adjustable centers.</p> <p data-bbox="743 1514 1463 1577">Calculate the allowable chain sag for an application and adjust chain sag for proper chain tension.</p>
Gear Drives	2/5	<p data-bbox="743 1629 1430 1661">Identify different types of gears and gear failures.</p> <p data-bbox="743 1703 1284 1734">Calculate the diametral pitch of a gear.</p> <p data-bbox="743 1776 1382 1839">Install and align a spur gear drive system with adjustable centers.</p> <p data-bbox="743 1850 1430 1881">Determine the allowable backlash in a gear drive.</p> <p data-bbox="743 1923 1463 1986">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.