# MECHANICAL POWER TRANSMISSION THEORY & PRINCIPLES

## Course Syllabus

<table>
<thead>
<tr>
<th>Course Number:</th>
<th>ARMT-0434</th>
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<tbody>
<tr>
<td>OCAS Code:</td>
<td>None</td>
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<tr>
<td>Course Length:</td>
<td>75 Hours</td>
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<tr>
<td>Career Cluster:</td>
<td>Manufacturing</td>
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<tr>
<td>Career Pathway:</td>
<td>Maintenance, Installation &amp; Repair</td>
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<tr>
<td>Career Major(s):</td>
<td>Mechatronics Systems Technician</td>
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**Pre-requisite(s):**

**Course Description:**

This course teaches students the theory behind and practical principles of using mechanical power to do work and includes power sources, drive trains, gearboxes, conveyor systems, and specialized transmission devices. Emphasis will be placed on troubleshooting and repair techniques, safety and reliability.

**Textbooks:**

TBA

## Course Objectives:

### A. Use PM Checklists and Equipment Manuals to Identify Lubrication Requirements

1. List the purposes of lubrication.
2. Identify terms associated with lubricants.
3. Describe splash method.
4. Describe bath method.
5. Describe pressure method.
7. Describe gravity or drip methods.

### B. Select and Apply Proper Lubricants

1. Identify lubricants.
2. Identify required lubricants using a PM checklist.
3. Identify required lubricants using equipment manuals.
4. Lubricate equipment using the manual method.
5. Lubricate equipment using the pressure method.

### C. Identify Types and Uses of Bearings

1. Discuss the purpose of bearings.
2. Identify types of bearings.
3. Identify bearing usage.
4. Discuss bearing lubrication.

### D. Inspect Conditions of Belt Drives

1. Evaluate belt tension.
2. Examine belt condition.
3. Examine sheave condition.
4. Examine pulley condition.
5. Examine bearing condition.

### E. Inspect Condition of Chain Drives

1. Inspect chain tension.
2. Inspect chain condition.
3. Inspect sprocket condition.
4. Inspect bearing condition.
5. Identify types of chain.

F. Inspect and Maintain Gear Drive Lubrication
   1. Identify types of drives.
   2. Check for proper lubrication.
   3. Service or lubricate as needed.

G. Identify Selected Couplings
   1. Discuss the purposes of couplings.
   2. Identify types of couplings.

H. Identify Types of Packing and Seals
   1. Discuss the purpose of packing and seals.
   2. Discuss packing and seal materials.
   3. Identify types of packing and seals.

I. Maintenance and Install of Bearings
   1. Clean bearings.
   2. Inspect bearings.
   3. Lubricate bearings.
   4. Store bearings.
   5. Remove/install internal bearings.
   6. Remove/install external bearings.

J. Install and Maintain Belt Drives
   1. Calculate belt length.
   2. Read typical belt code markings.
   3. Use charts and tables to select belts.
   4. Use charts and tables to select sheaves.
   5. Use charts and tables to select pulleys.
   6. Install belt drives.
   7. Align belt drives.
   8. Apply tension to belt drives.

K. Install and Maintain Chain Drives
   1. Calculate length requirements.
   2. Identify types of sprockets.
   3. Use charts and tables to select chain.
   4. Use charts and tables to select sprockets.
   5. Install chain drives.
   6. Align chain drives.
   7. Apply tension to chain drives.

L. Install and Maintain Gear Drives
   1. Identify types of gears.
   2. Identify types of drives.
   3. Match terms associated with gears with their correct definitions.
   4. Check drive alignments.
   5. Check for proper lubrication.
   6. Recognize wear patterns on gear teeth.
   7. Check bearing wear.
8. Install gears.
9. Install bearings.
10. Service lubrication.
11. Align drives.

M. Install Selected Couplings
1. Describe procedures for coupling installation.
2. Install rigid couplings.
3. Install flexible couplings.

N. Perform Thickness Gauge and Straight Edge Coupling Alignment
1. Describe procedures for thickness gauge and straight edge alignment.
2. Calculate shim requirements for vertical-angular alignment.
3. Perform thickness gauge and straight edge alignment.

O. Perform Rim and Face Coupling Alignment
1. Describe procedures for rim and face alignment.
2. Calculate shim requirements for vertical-angular alignment.
3. Perform rim and face alignment.

P. Perform Reverse Dial Coupling Alignment
1. Describe procedures for reverse dial alignment.
2. Calculate shim requirements for vertical-angular alignment.
3. Perform reverse dial coupling alignment.

Q. Inspect and Install Packing and Seals
1. Inspect seals.
2. Use charts and tables to select appropriate seal.
3. Install seals.

TTC objectives

Teaching Methods: The class will primarily be taught by the lecture and demonstration method and supported by various media materials to address various learning styles. There will be question and answer sessions over material covered in lecture and media presentations. Supervised lab time is provided for students to complete required projects.

Grading Procedures: 1. Students are graded on theory and shop practice and performance.
2. Each course must be passed with seventy (70%) percent or better.
3. Grading scale: A=90-100%, B=80-89%, C=70-79%, D=60-69%, F=50-59%.

Description of Classroom, Laboratories, and Equipment: Tulsa Technology Center campuses are owned and operated by Tulsa Technology Center School District No. 18. All programs provide students the opportunity to work with professionally certified instructors in modern, well-equipped facilities.
Available Certifications/College Credit

The student may be eligible to take state, national or industry exam after completion of the program. College credit may be issued from Oklahoma State University-Okmulgee or Tulsa Community College. See program counselor for additional information.

College Credit Eligibility:

The student must maintain a grade point average of 2.0 or better.