

**GRANDE PRAIRIE REGIONAL COLLEGE**  
**Industrial Training**

**Industrial Maintenance Technician Program**

**COURSE SYLLABUS - SEMESTER II**

---

**TRADE THEORY II: IM0052**

This course is designed to give students an understanding of mechanical principles and concepts.

**Prerequisites:** IM0051  
**Textbooks:** See Trade Theory I Syllabus  
**Class Hours:** See Timetable

**Course Objectives**

**Bearings and Seals**

This unit studies the use of bearings in machines. The students will be able to classify the types of bearings and how they are installed and used. Students will examine lubricants and lubricating systems and will determine causes of failure of those systems.

Upon completion of this unit, students will be able to:

1. identify the types and purposes of bearings.
2. describe procedures for fitting and installing bearings.
3. identify causes of bearing failure.
4. identify corrective procedures.
5. list bearing preventative maintenance procedures.
6. identify lubricants.
7. explain characteristics of friction.
8. describe the types of oil applications and their advantages and disadvantages.
9. describe the types of grease and their advantages and disadvantages.

## **Lubrication**

This unit will provide knowledge in the types and applications of various lubricants.

Upon completion of this unit, students will be able to:

1. explain the characteristics of friction.
2. discuss the lubrication theory and the importance of lubricants.
3. describe different lubrications and application methods.

## **Couplings**

This unit will centre on the application and method of connecting two rotating shafts and various types of couplings. Proper alignment will also be studied.

Upon completion of this unit, students will be able to:

1. identify the different types of couplings.
2. list safety rules for installing, removal and maintenance of couplings.
3. describe the applications of different couplings.

## **Brakes and Clutches**

This unit will introduce the student to the applications and functions of brakes and clutches.

Upon completion of this course, students will be able to:

1. describe the function of brakes and clutches.
2. list the materials in brakes and clutches.
3. identify the types of positive drive clutches.
4. identify the types of friction clutches.
5. describe the types of brakes.
6. describe the methods of applying brakes.

## **Alignment**

In this unit the students will understand the procedures used for double dial indicator alignment.

Upon completion of this course, students will be able to:

1. identify the safety rules.
2. describe the types of alignment.
3. identify the types of cross dialing.
4. illustrate the graph method of alignment.
5. describe end float and thermal growth.

## **Power Transmissions**

In this unit, students will examine the transmission of power through shafts and belts, and the types of transmission belts, belt pulleys and methods of attachment.

Upon completion of this unit, students will be able to:

1. know the safety methods pertaining to power transmissions.
2. describe shafting and characteristics.
3. identify key fit and applications.
4. describe the types of belts.
5. describe the types of pulleys.
6. describe maintenance procedures.
7. know the transmission chain features, applications, installations and maintenance concerns.
8. identify sprockets.

## **Gears and Speed Changers**

In this unit the students will examine gears and speed changers and the application of:

1. identify the types of gears and terminology.
2. List the various gear systems and characteristics.

3. Describe the types of drives.
4. Identify and describe the types of speed changers.
5. List the purpose, applications, advantages and disadvantages of units.

### **Reciprocating Compressors**

This unit will introduce the student to the different types of compressors as well as general operation and maintenance procedures.

Upon completion of this course, students will be able to:

1. list safety precautions and regulations.
2. list the types of compressor classifications.
3. explain positive displacement compressors, parts and components.
4. describe dynamic compressors.
5. explain the general operations of compressors.
6. identify reciprocating, rotary and dynamic compressor parts and terms.
7. Describe general compressor operating procedures and criteria.
8. list and describe procedures for dismantling, inspection, repair and installation.
9. identify preventative maintenance procedures.

### **Gaskets**

This unit will provide knowledge in the types and application of gaskets, packing and seals.

Upon completion of this course, students will be able to:

1. know the safety rules and precautions pertaining to removal and installation.
2. identify the types and applications of various gaskets and gasket material.

### **Hydraulics**

Hydraulics will cover the use of fluids (liquids, gases) and the force created or transmitted by fluids. Emphasis will be placed on basic hydraulic principles and fundamentals including Pascal's Law and Bernoulli's Principle. Basic hydraulic circuits, components, and their operations will be examined.

Upon completion of this unit, students will be able to:

1. explain Pascal's Law and hydraulic principle, conservation of energy, Bernoulli's Principle.
2. explain the application of constant and variable volume systems as applied to machines.
3. describe components of a hydraulic system.
4. calculate the various valves in hydraulic systems.
5. sketch hydraulic schematics.
6. identify the theory of hydraulic pumps and motors.
7. explain maintenance and troubleshooting procedures.

### **Evaluation**

The students will be evaluated as follows.

1. Assignments .....	10%
2. Quizzes .....	15%
3. Midterm Exam (1).....	20%
4. Midterm Exam (2).....	20%
5. Final Exam .....	35%

### **Attendance**

Refer to the Attendance Policy - Progression Criteria