

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

**Industrial Maintenance Technician Program**

**COURSE SYLLABUS - SEMESTER II**

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**APPLIED MECHANICS II: IM0012**

A continuation of the topics in mathematics and physics discussed in Applied Mechanics I.

**Prerequisites:** IM0011  
**Textbook:** TBA  
**Class Hours:** See Timetable

**Course Objectives**

**Unit 7: Fluid Principles**

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

1. define terms related to fluids including: atom, molecule, element, density, relative density, specific volume, laminar flow, turbulent flow, viscosity, and flash point.
2. describe the properties of fluids including: molecular attraction of fluids and solids, cohesion, adhesion, capillary action, buoyancy, the effects of resistance and turbulence on flow, compressibility and expandability of fluids.
3. describe Pascal's Law.
4. describe Archimedes principle.
5. describe the continuity equation.
6. describe Bernoulli's equation.
7. solve problems involving mass, weight, volume and density for liquids and solids.
8. solve problems involving Pascal's Law and calculations of pressure head of fluids.
9. solve problems involving Archimedes principle, the force of buoyancy and objects submerged in fluids.
10. solve problems involving the continuity equation and venturi meters.
11. solve problems involving Bernoulli's equation and the linear velocity of fluids.

## **Unit 8: Thermodynamics**

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

1. define temperature, heat, specific heat, sensible heat, latent heat, saturation temperature and superheat.
2. describe the principle of linear, surface and volumetric expansion of solids and liquids,
3. describe the kinetic molecular theory of heat and the importance to phase changes.
4. describe the relationship between the four temperature scales: Fahrenheit, Celsius, Rankine and Kelvin.
5. describe methods of heat transfer: conduction, convection and radiation.
6. perform calculations for heat gain/loss of a liquid including simple steam table questions,
7. perform calculations for heat gain/loss for mixtures,
8. perform calculations for the expansion of solids.

## **Unit 9: Perfect Gases**

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

1. define Boyle's Law, Charles' Law, Gay Lussac's Law and the general gas law for perfect gases.
2. discuss compressibility and expandability of gases.
3. perform basic pressure, volume, temperature calculations.

## **Unit 10: Solids**

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

1. define concepts related to solids including: stress, strain, elasticity, factor of safety, Hooke's Law, elastic limit, yield point, ultimate strength, working stress and Young's modulus.
2. discuss compressive, tensile and shear forces.
3. perform calculations for stress, strain, factor of safety and elasticity.

## **Evaluation**

The students will be evaluated as follows.

1.	Assignments .....	20%
2.	Midterm Exam .....	30%
3.	Final Exam (theory).....	30%
4.	Quizzes .....	20%

## **Attendance**

Refer to the Attendance Policy - Progression Criteria