## Course Description

| Advisor Counsel | | | |
|---|---|---|---|
| Yr. : 1~4 | Sem. : 1~2 | Course Code: | FP0001 |

Course Description

The accredited and non-certified students will be able to make a good university life through counseling about the overall contents such as the academic program educational goals, learning outcomes, and the subject area such as study, school life, and employment.

| Computer Assisted Drafting | | | |
|---|---|---|---|
| Yr. : 1 | Sem. : 2 | Course Code: | MD0002 |

Course Description

The emphasis is on improving the drawing ability of machine elements using computers. It deals with the basic principles of computer graphics to improve this ability. In addition, by using the CAD program, the construction of the mechanical element is learned through practical training.

| Statics | | | |
|---|---|---|---|
| Yr. : 1 | Sem. : 2 | Course Code: | MD0003 |

Course Description

The course covers the application of the fundamental principles of Newtonian mechanics to the statics of particles and the equilibrium of trusses, frames, beams and other rigid bodies. Students will develop thinking skills necessary to formulate appropriate approaches to problem solutions

| Solid Mechanics1 | | | |
|---|---|---|---|
| Yr. : 2 | Sem. : 1 | Course Code: | MD0004 |

Course Description

The course covers the stress and the strain formed inside the structure due to external load. The problems with various loads such as bending load, torsional load, and buckling load are discussed

| Thermodynamics | | | |
|---|---|---|---|
| Yr. : 2 | Sem. : 1 | Course Code: | MD0005 |

Course Description

Understands the laws of thermodynamics 1 and 2 and deals with the fundamentals of thermodynamics such as changes in the state of matter, properties of ideal gas, and conversion of heat energy.

| **Fundamental Laboratory of Mechanical Engineering1** | | | |
|---|---|---|---|
| Yr. : 2 | Sem. : 2 | Course Code: | MD0006 |

Course Description

Fundamental Laboratory of Mechanical Engineering1 cover measurement principles, data processing methods and measurement techniques, and include thermal engineering experiments, material experiments, precision measurement experiments, fluid engineering experiments, mechanical mechanics experiments, and machine tool experiments

| **Solid Mechanics2** | | | |
|---|---|---|---|
| Yr. : 2 | Sem. : 2 | Course Code: | MD0007 |

Course Description

The course covers the stress and the strain formed inside the structure due to external load. The problems with various loads such as bending load, torsional load, and buckling load are discussed

| **Dynamics** | | | |
|---|---|---|---|
| Yr. : 2 | Sem. : 2 | Course Code: | MD0008 |

Course Description

The dynamic class teaches basic concepts through dynamic analysis of dynamic objects (mass points, rigid bodies) and develop the application ability to analyze and design dynamic mechanical structures.

| **Fluid Mechanics1** | | | |
|---|---|---|---|
| Yr. : 2 | Sem. : 2 | Course Code: | MD0009 |

Course Description

In this course, fluid under static or moving motion is analyzed based on an understanding of fluid properties. Mass flow, momentum and energy conservation equations are used to study various flows and engineering applications.

| **Introduction to Mechanical Design** | | | |
|---|---|---|---|
| Yr. : 2 | Sem. : 2 | Course Code: | MD0010 |

Course Description

In this class, students learn creative thinking and design methods for developing mechanical component parts and systems. Teams will be formed on a new topic presented each semester to directly experience the whole process of designing, manufacturing, testing, and evaluating mechanical parts and systems.

| Kinematics of Machinery | | | |
|---|---|---|---|
| Yr. : 2 | Sem. : 1 | Course Code: | MD0011 |

Course Description

This course deals with four gear pairs, a parallel motion and a linear motion mechanism, a rolling contact, and a transmission.

| Introduction to Electronic Engineering | | | |
|---|---|---|---|
| Yr. : 2 | Sem. : 1 | Course Code: | MD0012 |

Course Description

In this class, students will learn the ability to understand the theory of the circuits such as amplifiers and generators using various electronic devices and to apply them to practical applications.

| Computer Aided Design | | | |
|---|---|---|---|
| Yr. : 2 | Sem. : 1 | Course Code: | MD0013 |

Course Description

In this class, students will learn the basic theories of computer aided design (CAD), and develop their ability to design 3D product shapes using commercial modeling systems.

| Material Science | | | |
|---|---|---|---|
| Yr. : 2 | Sem. : 2 | Course Code: | MD0015 |

Course Description

In this class, students will learn the mechanical, thermal, electrical, and chemical properties of engineering materials (especially solids) with relating them to solid internal structures. This course deals with chemical bonding, crystal structure, crystal defects, diffusion, mechanical properties, electrical properties, phase equilibrium.

| Fundamental Laboratory of Mechanical Engineering2 | | | |
|---|---|---|---|
| Yr. : 3 | Sem. : 1 | Course Code: | MD0016 |

Course Description

This course covers measurement principles, data processing methods and measurement techniques, and include thermal engineering experiments, material experiments, precision measurement experiments, fluid engineering experiments, mechanical mechanics experiments, and machine tool experiments

| Machine Element Design1 | | | |
|---|---|---|---|
| Yr. : 3 | Sem. : 1 | Course Code: | MD0017 |

Course Description

This course deals with the fundamentals of designing mechanical elements, permissible forces and safety factors, rivets, screws, coaters, couplings, bearings, transmission systems, springs and valves.

| Manufacturing Processes | | | |
|---|---|---|---|
| Yr. : 3 | Sem. : 2 | Course Code: | MD0018 |

Course Description

This course focuses on the history of machinery, machine making process, machine and environment, and focuses on mastery of mechanical engineering so that it can adapt well in industrial society in the future. In parallel with the lecture, practical exercises on simple machine parts manufacturing process are also carried out.

| Applied Laboratory of Mechanical Engineering1 | | | |
|---|---|---|---|
| Yr. :3 | Sem. : 2 | Course Code: | MD0019 |

Course Description

In this lecture, experiments and exercises on the fields of thermal fluid and energy systems, design and materials, production and processing, mechanical and electronic fields and automobiles are carried out based on Fundamental Laboratory of Mechanical Engineering1 and 2

| Field Practice Project1 | | | |
|---|---|---|---|
| Yr. : 3 | Sem. : 2 | Course Code: | MD0020 |

Course Description

In this class, students will determine the project related to industry-academy collaboration and develop the ability to solve them creatively and actively. The project can include production project, design project, theoretical analysis project, and experimental project.

| Engineering Materials | | | |
|---|---|---|---|
| Yr. : 3 | Sem. : 1 | Course Code: | MD0021 |

Course Description

In this class, students will understand the characteristics of various industrial materials composing the machine in relation to chemical composition and manufacturing method. The course cover the basic knowledge and theories about steel materials, nonferrous materials, ceramics, plastics, etc.

| Mechanical Vibration: | | | |
|---|---|---|---|
| Yr. : 3 | Sem. : 1 | Course Code: | MD0022 |

Course Description

This course deals with the properties of dynamic systems with mass and elasticity, and covers 1 or 2 DOF systems, methods of calculating natural frequencies and vibration phenomena of continuum.

| Fluid Mechanics2 | | | |
|---|---|---|---|
| Yr. : 3 | Sem. : 1 | Course Code: | MD0024 |

Course Description

In this class, students will study fluid mechanics to deepen knowledge and develop application skills based on the basic understanding of fluid mechanics 1. This course introduces various approaches such as theoretical analysis, numerical computation, and experimentation. We discusses various fields such as potential flow, viscous flow, internal flow and external flow, compressible flow, and in vivo flow.

| Fundamentals of Mechatronics | | | |
|---|---|---|---|
| Yr. : 3 | Sem. : 1 | Course Code: | MD0025 |

Course Description

In this class, students will learn the basic knowledge of electronics, basic logic circuits, electronic actuators, generators and motors, and develop the ability to apply.

| Mechanical Engineering Design | | | |
|---|---|---|---|
| Yr. : 3 | Sem. : 1 | Course Code: | MD0026 |

Course Description

In this class, students will learn and exercise how to design elements, processes, or systems of machines based on basic knowledge of mechanical engineering and taking into account constraints such as cost and stability. Students organize a team to identify design challenges related to the industry and implement design project to implement systems that can solve them.

| Machine Element Design2 | | | |
|---|---|---|---|
| Yr. : 3 | Sem. : 2 | Course Code: | MD0027 |

Course Description

This course deals with the fundamentals of designing mechanical elements, permissible forces and safety factors, rivets, screws, coaters, couplings, bearings, transmission systems, springs and valves.

| | | | |
|---|---|---|---|
| **Automatic Control** | | | |
| Yr. : 3 | Sem. : 2 | Course Code: | MD0028 |

Course Description

This course deals with modeling, analysis and design methods of automatic control systems. The course also deals with the basic mathematical Laplace transformation and matrix related content. It covers modeling various systems, system analysis through block diagram construction, basic feedback method, and compensator design method.

| | | | |
|---|---|---|---|
| **Heat Transfer** | | | |
| Yr. : 3 | Sem. : 2 | Course Code: | MD0030 |

Course Description

In this class, students will understand the basic principles of conduction, convection, and radiation heat transfer. The course deals with heat conduction equations, basic theory of forced and natural convection, radiation phenomenon, phase change heat transfer, heat exchanger, etc.

| | | | |
|---|---|---|---|
| **Applied Laboratory of Mechanical Engineering2** | | | |
| Yr. : 4 | Sem. : 1 | Course Code: | MD0031 |

Course Description

In this lecture, experiments and exercises on the fields of thermal fluid and energy systems, design and materials, production and processing, mechanical and electronic fields and automobiles are carried out based on Fundamental Laboratory of Mechanical Engineering1 and 2

| | | | |
|---|---|---|---|
| **Field Practice Project2** | | | |
| Yr. : 4 | Sem. : 1 | Course Code: | MD0032 |

Course Description

In this class, students will determine the project related to industry-academy collaboration and develop the ability to solve them creatively and actively. The project can include production project, design project, theoretical analysis project, and experimental project.

| | | | |
|---|---|---|---|
| **Machine Tools** | | | |
| Yr. : 4 | Sem. : 1 | Course Code: | MD0033 |

Course Description

In this class, students will learn the basic knowledge necessary for the design, fabrication and operation of machine tools by studying the working methods of various machine tools used in machining, cutting theories, temperature occurring during cutting, tool wear and life, cutting oil and

surface roughness.

## Mechanical Behaviors of Materials

| Yr. : 4 | Sem. : 1 | Course Code: | MD0034 |
|---------|----------|--------------|--------|

Course Description

To understand macroscopic and microscopic material behavior of industrial materials under various external force operating conditions, this course deals with fracture mechanics design techniques that can be applied to design by understanding material behavior and fracture mechanism under simple tensile, creep and cyclic loading.

## Finite Element Analysis

| Yr. : 4 | Sem. : 1 | Course Code: | MD0035 |
|---------|----------|--------------|--------|

Course Description

In this class, students will understand the basic principles of finite element analysis and learn how to evaluate the performance of the structure through practical operation of the finite element analysis program.

## Mechanical Engineering Capstone Design

| Yr. : 4 | Sem. : 1 | Course Code: | MD0036 |
|---------|----------|--------------|--------|

Course Description

In this class, students will design mechanical elements, devices, and systems that take into account constraints such as cost, stability, and performance using the theories and design knowledge they have learned throughout the mechanical engineering.

## Optimal Design

| Yr. : 4 | Sem. : 2 | Course Code: | MD0037 |
|---------|----------|--------------|--------|

Course Description

In this class, students will understand the technique of finding the optimum condition of the objective function within a limited range of various variables and develop the ability to apply to all engineering design.

## Jig and Fixture

| Yr. : 4 | Sem. : 2 | Course Code: | MD0038 |
|---------|----------|--------------|--------|

Course Description

This course deals with the definition and types of jig and fixture that are essential for efficient and economical mass production of workpieces in the industrial field, and develops their design ability.

## Computational and Structural Dynamics

| Yr. : 4 | Sem. : 2 | Course Code: | MD0039 |
|---|---|---|---|

Course Description

This course deals with the dynamic analysis of elastic structures, induction of motion equation of strings, beams and plates, natural vibration coefficient, response and oscillation analysis, changes in vibration response of structures due to internal and external damping and surrounding materials.

## Applied Solid Mechanics

| Yr. : 4 | Sem. : 2 | Course Code: | MD0055 |
|---|---|---|---|

Course Description

In this class, students will learn the basic theory of elasticity as an extension of solid mechanics. This course deal with the complicated solid mechanics problems that can be analyzed up to now and briefly introduces typical finite element commercial codes which are widely used for solving the problems.

*Related Course: Solid Mechanics1,2

## Introduction to Mechanical Design Engineering

| Yr. : 1 | Sem. : 1 | Course Code: | MD0058 |
|---|---|---|---|

Course Description

In this class, students will learn basic physical quantities such as length, time, force and energy, and develop basic skills that mechanical engineering professions such as data investigation and analysis, report writing, discussion and presentation, and team activities should have.

## Numerical Analysis

| Yr. : 3 | Sem. : 2 | Course Code: | MD0059 |
|---|---|---|---|

Course Description

In this class, students will learn the numerical analysis theory and programming techniques to solve various engineering problems using computers. The course cover the methods to find solution of linear simultaneous equations, numerical differentiation and integration, and solution of differential equations

## Robotics and Artificial Intelligence

| Yr. : 4 | Sem. : 1 | Course Code: | MD0060 |
|---|---|---|---|

Course Description

After studying the introduction of robotics such as historical background and system configuration of robot, kinematics, dynamics and control method of robot will be investigated. In addition, this course introduces artificial intelligence as well as the concept of machine learning and its applications.