Course Description

Introduction to the Mechanical Engineering			
Yr. : 1	Sem. : 1	Course Code:	MA0054
This course includes the communications skills, applications, and the broad topics of the mechanical engineering profession. Course topics include: the campus life, the basic concepts of mechanical engineering, dimension and units, design engineering analysis. This course is intended to allow students to develop some hands-on experience by executing the creative projects that are supervised on the team basis.			
Advisor Counsel			
Yr. : 1	Sem. : 1	Course Code:	FP0001
Consult the student with/without accreditation of ABEEK about a sound campus life including educational purpose, educational outcome, grade, job hunting, graduate school and friendship.			
Computer Assisted Drafting			
Sem. : 1	Sem. : 2	Course Code:	MA0002
This course focuses on drawing ability of mechanical parts using computer. To improve drawing ability, we will deal with the basic principle of computer graphics and learn mechanical part drawing methods using commercial CAD program.			
Basic Mechanical Mechanics			
Yr. : 1	Sem. : 2	Course Code:	MA0003
This course provides students with the tools and guidance to master the use of equilibrium equations and Free Body Diagrams (FBD) and to solve real engineering problems. Students should leave this class with the ability to logically approach a variety of static engineering problems, to translate a physical situation into an analytic model, and to use various mathematical tools to determine desired information. Course topics include: introduction and vectors, problem solving, force vectors, particle equilibrium, moments/couples, equivalent systems, distributed loads/FBD, rigid body equilibrium, trusses, frames and machines, 3-D equilibrium, friction, centroids and center of gravity, and moments of inertia.			
Solid Mechanics1			
Yr. : 2	Sem. : 1	Course Code:	MA0004
Deal with the basic principle of internal force, stress, strain, and stress concentration for the structural members subjected to the applied loads capability. Also provide the capability for analyzing the behavior of the structural member, which is applicable to the design of the pressure vessels as well as axial loaded members.			
Thermodynamics			
Yr. : 2	Sem. : 1	Course Code:	MA0005

This course covers the basis of thermodynamics such as materials properties, ideal gas, heat energy transform related with the 1st and the 2nd laws of thermodynamics.

Introduction to Creative Mechanical Design

Yr. : 2	Sem. : 1	Course Code:	MA0006

This course deals with creative thinking and design methods required to develop mechanical components and systems. In this course, students develop their abilities for mechanical design by performing the entire manufacturing process of mechanical systems.

Kinematics of Machinery

Yr. : 2	Sem. : 1	Course Code:	MA0017

Kinematics deals with analysis of motion variables of mechanism such as position, velocity, acceleration, and finally designing a mechanism with desired motion specifications. Students learn about basic theory of motion, graphical analysis of linkage, and graphical synthesis of linkage.

Fundamental of Electrical and Electronic Engineering

Yr. : 2	Sem. : 1	Course Code:	MA0018

This courses focuses on understanding of circuit of generator and amplifier using many kinds of electronic devices. In addition, students learn the ability to utilize and apply the theory.

Fundamental Laboratory of Mechanical Engineering1

Yr. : 2	Sem. : 2	Course Code:	MA0007

This course helps students to concretely understand general mechanical engineering curriculum through various experiments such as experiment for thermal engineering, precision measurement, fluid mechanics, solid mechanics, manufacturing and material test.

Dynamics

Yr. : 2	Sem. : 2	Course Code:	MA0008

This course helps students to understand the dynamic problems of the realistic situations for engineering problems. This course also makes students to understand the concepts of displacement, velocity and acceleration for particles and rigid body. Furthermore, We equate the dynamic equations and analyze the dynamic problems for solving equations.

Fluid Mechanics

Yr. : 2	Sem. : 2	Course Code:	MA0009

Based on understanding of fluid properties, fluids at rest or in motion are analyzed. Mass, momentum, and energy conservation equations are used for the investigation of various flows and their engineering applications.

Computer Aided Design

Yr. : 2	Sem. : 2	Course Code:	MA0020
This course introduces the fundamental principles and concepts underlying computer-aided geometric modeling systems. Students can also learn how to manipulate a specific geometric modeler for the purpose of representing the product shape in three dimensions.			

Solid Mechanics2

Yr. : 2	Sem. : 2	Course Code:	MA0019
This course deals with torsional problem for the shaft, flexural stress and deflection for the beam, Buckling problem for the column. Also provide the capability for analyzing the behavior of the structural members, which is applicable to the design of the structural member subjected to various applied loads.			

Introduction to Engineering Materials

Yr. : 2	Sem. : 2	Course Code:	MA0025
Machines is made of various industrial materials, such as ferrous and nonferrous metals, ceramics, plastics, etc. This course helps students to understand the chemical composition and manufacturing process of these materials, and learn the basic properties and theory.			

Fundamental Laboratory of Mechanical Engineering2

Yr. : 3	Sem. : 1	Course Code:	MA0010
This course helps students to concretely understand general mechanical engineering curriculum through various experiments such as experiment for thermal engineering, precision measurement, fluid mechanics, solid mechanics, manufacturing and material test.			

Machine Element Design

Yr. : 3	Sem. : 1	Course Code:	MA0011
Based on solid mechanics including fluid mechanics and mechanical vibration, design method is introduced by safety factor, strength and stress. We treat threads, shaft, bearing and gear among machine elements.			

Internal Combustion Engine

Yr. : 3	Sem. : 1	Course Code:	MA0021
This course emphasizes on gasoline engine and diesel engine, and helps students to learn the structure of engines, engine operating characteristics, thermodynamic analysis, fuel, the flow phenomena of cylinders, combustion phenomena, lubrication, atmospheric pollution, etc. Students develop the basic ability of engine design.			

Vibration Engineering

Sem. : 3	Sem. : 1	Course Code:	MA0022
The objectives of this study are first to understand how the vibrations are generated, transmitted and magnified based on theories such as dynamics, strength of materials, differential equations, and secondly to establish the methodology to control the effects of vibrations. To do so, students face the tasks of obtaining			

the natural frequencies of the real machine structures, also analyze if there exist the resonance(s) in the structures, and are supposed to find the design alteration(s) to suppress those vibrations.			
Heat Transfer			
Yr. : 3	Sem. : 1	Course Code:	MA0023
This course helps students to understand fundamental principles of heat transfer by conduction, convection, or thermal radiation. Students learn the basic equations and their applications of thermal conduction, forced and free convection, phase change and heat exchangers. Heat transfer is a basic science that deals with the rate of heat transfer of thermal energy.			
Numerical Analysis			
Yr. : 3	Sem. : 1	Course Code:	MA0024
Introduction to numerical methods with emphasis on algorithm construction and implementation, and analysis using MATLAB. Understanding and programming algorithms regarding to transcendental function, polynomial, determinant, solvers for linear systems, eigenvalue problems, numerical differentiation and integration, and ordinary differential equations.			
Applied Thermodynamics			
Yr. : 3	Sem. : 1	Course Code:	MA0029
This course deals with gas power cycles, vapor and combined power cycles, refrigeration cycles, thermodynamic property relations, and gas-vapor mixtures/air-conditioning.			
Manufacturing Processes			
Yr. : 3	Sem. : 2	Course Code:	MA0012
This course introduces various manufacturing processes including the casting, metal forming, machining, joining, and heat treatment. Practical examples on these processes are also introduced.			
Applied Laboratory of Mechanical Engineering1			
Yr. : 3	Sem. : 2	Course Code:	MA0013
Prerequisites to this class are fundamental lab of mechanical engineering 1 and 2, which provide basic knowledges. Experiments on thermodynamics, fluid dynamics, mechanical design, materials, and production engineering are carried out. As a system, mechatronics, automobile, and energy system are also introduced.			
Mechanical Engineering Project 1			
Yr. : 3	Sem. : 2	Course Code:	MA0014
A research project is decided by a student and a professor. During two semesters, the student conducts the project under the supervision of the professor. The project could be fabrication project, design project, theory project, or experiment project.			
Fluid Machinery			

Yr. : 3	Sem. : 2	Course Code:	MA0026
This course helps students to learn the principle and the structure of machines operated by fluid on the base of knowledge about hydrodynamics. Students study hydraulic turbines, pumps, wind machines and oil pressure equipment.			
Mechanical Control			
Yr. : 3	Sem. : 2	Course Code:	MA0027
Automatic control is a technology for application of control strategies. In order to implement, it covers modeling and analyzing of the subject to be controlled. It also deals with basic mathematics such as the Laplace Transformation and the matrix theory for the help of a technical understanding. It treats various system modeling methods, system analysis with block diagrams, concepts of a basic feedback and compensation design methods.			
Applied Thermal and Fluid Engineering			
Yr. : 3	Sem. : 2	Course Code:	MA0028
This course provides an ability to apply basic understanding of Fluid Mechanics and Heat Transfer by means of theoretical analysis, numerical simulation, and experiment. A variety of applications are introduced such as automobile, bio, micro, and energy systems.			
Refrigeration and Air Conditioning			
Yr. : 3	Sem. : 2	Course Code:	MA0030
This course helps students to understand fundamental principles of air conditioning and refrigerations with the basic knowledges of thermodynamics and heat transfer. Students learn the basic characteristics of humid air, refrigeration cycles of vapor compression or absorption, and how to design the air conditioning systems.			
Creative Engineering			
Yr. : 3	Sem. : 2	Course Code:	MA0031
This course provides how to solve engineering problems creatively. In addition, students learn various techniques and knowledge to solve the problems creatively. Finally, how to file patents is introduced and students actually file a patent in this course.			
Creative Mechanical Engineering Capstone Design			
Yr. : 4	Sem. : 1	Course Code:	MA0036
This is a capstone design class designed to introduce students to the steps in a systematic design process, to provide design experience through a capstone design project, and to build teaming, organizational, and communication skills. Students are expected to identify an appropriate problems or desired need and then design a system, component, or program to solve the problem based on the knowledge of mechanical engineering.			
Applied Laboratory of Mechanical Engineering2			

Yr. : 4	Sem. : 1	Course Code:	MA0015
Prerequisites to this class are fundamental lab of mechanical engineering 1 and 2, which provide basic knowledges. Experiments on thermodynamics, fluid dynamics, mechanical design, materials, and production engineering are carried out. As a system, mechatronics, automobile, and energy system are also introduced.			
Mechanical Engineering Project 1			
Yr. : 4	Sem. : 1	Course Code:	MA0016
A research project is decided by a student and a professor. During two semesters, the student conducts the project under the supervision of the professor. The project could be fabrication project, design project, theory project, or experiment project.			
Fundamental of Quality & Reliability Engineering			
Yr. : 4	Sem. : 1	Course Code:	MA0055
The class covers fundamental theories and techniques for the analysis and prediction of the quality and reliability of manufacturing systems, processes, and the resulting products. It also covers the introductions to the important concepts, trends, and issues of the recent developments in the machine design and manufacturing, including six-sigma, smart factory, etc.			
Computational Fluid Dynamics			
Yr. : 4	Sem. : 1	Course Code:	MA0032
This course covers how to solve problems related to fluid flow and heat transfer computationally. Students learn how to operate computation fluid dynamics tools such as FLUENT.			
Green Energy Engineering			
Yr. : 4	Sem. : 1	Course Code:	MA0033
This course helps students to widely learn forms and properties of fossil energy. Also, students can learn the forms and basic working principles of the new and renewable energy for alternating the fossil energy.			
Automotive Engineering			
Yr. : 4	Sem. : 2	Course Code:	MA0037
This course introduces the following topics for the automobile: engine; power transmission system; running gear system; control system; running mechanics and performance of vehicle.			
Finite Element Method			
Yr. : 4	Sem. : 2	Course Code:	MA0038
Deal with the concept of finite element analysis, how to use finite element analysis software, and how to conduct structural and thermal analysis for engineering structural problem. Also provide how to interpret its results and how to predict its structural performance.			
Green Energy Systems			

Yr. : 4	Sem. : 2	Course Code:	MA0039
This course helps students to widely learn the fossil energy systems and 11 kinds of the new & renewable energy system. In particular, students can learn the photovoltaic power generation system, kinds of the PV cell, properties of the PV cells fundamental principle, the fuel cell system, properties of the fuel cells, applications of the fuel cell, etc.			
Introduction to Semiconductor Process			
Yr. : 4	Sem. : 2	Course Code:	MA0056
This course deals with the development process of semiconductor chips, the semiconductor chip manufacturing processes and the thermal management problem of chips. In addition, students learn the ability to utilize and apply the theory for semiconductor process.			