- **Course Description (Chemical Engineering)**

Advisor Counsel			
Yr. : Evry Yr.	Sem. : Evry Sem.	Course Code:	FP0001
Advisors in the ABEEK (Accreditation Board for Engineering Education of Korea) program give counsel for students in both the accredited and the non-accredited to help the students to meet certain standards in achieving program mission/objectives, student outcomes, and curriculum including overall college life such as preparation for getting job and studying for higher degree, peer relationships, etc.			
Introduction to Design to Creative Design			
Yr. : 1	Sem. : 2	Course Code:	GC0002
Establish an understanding and basic concept of design through creative and interesting design programs and task execution.			
Introduction to Energy and Chemical Engineering			
Yr. : 2	Sem. : 1	Course Code:	GC5001
This course introduces and teaches the concepts and applications of energy and chemical engineering as an introductory course for students who want to major in chemical engineering.			
Organic Chemistry1			
Yr. : 2	Sem. : 1	Course Code:	GC5002
In this lecture, you will learn about nomenclature of carbon compounds, mechanism, structure and property, analysis and identification methods to understand structure and property of polymers, organic advanced materials and bio-related materials. * Related subjects : General chemistry1, General chemistry2, General chemistry Lab.1, General chemistry Lab.2, Polymer synthesis1, Polymer synthesis2, Organic chemistry2, Organic chemistry Lab.			
Physical Chemistry Lab.			
Yr. : 2	Sem. : 1	Course Code:	GC5003
This laboratory course focuses on four parts: (1) understanding of basic concept of physical chemistry through various lab. experiments; (2) increasing of capability of experimental set-up, (3) improving of writing ability in technical reports (4) learning how to cooperate with experimental lab. coworkers			
Physical Chemistry1			
Yr. : 2	Sem. : 1	Course Code:	GC5004
The physical chemistry is to systematize the basic theory , laws, and the organizing principles of chemistry and is to learn the deviation of basic equations, the physical meaning, and its application.			
Organic Chemistry2			
Yr. : 2	Sem. : 2	Course Code:	GC5006

In this lecture, you will learn about nomenclature of carbon compounds, mechanism, structure and property, analysis and identification methods to understand structure and property of polymers, organic advanced materials and bio-related materials.

* Related subjects : General chemistry1, General chemistry2, General chemistry Lab.1, General chemistry Lab.2, Polymer synthesis1, Polymer synthesis2, Organic chemistry2, Organic chemistry Lab.

Organic Chemistry Lab.

Yr. : 2	Sem. : 2	Course Code:	GC5007

This class try to have understanding of basic concept and experimental skill via application of theory of organic chemistry to real experiments.

Physical Chemistry2

Yr. : 2	Sem. : 2	Course Code:	GC5008

The physical chemistry is to systematize the basic theory , laws, and the organizing principles of chemistry and is to learn the deviation of basic equations, the physical meaning, and its application.

Basic Calculations in Energy Engineering

Yr. : 2	Sem. : 2	Course Code:	GC5009

This course covers the unit conversion, thermodynamic properties, materials, and energy balance used for basic calculation of energy engineering such as the unit operation and chemical reaction engineering

Energy and Petrochemistry

Yr. : 2	Sem. : 2	Course Code:	GC5010

As a basic materials industry to use oil, the naphtha and natural gas produced in crude oil is used to produce ethylene, propylene, BTX which is based on oil production, and these again produce synthetic resins, synthetic fibers, synthetic rubber and fine chemicals. This course covers the manufacturing industry of above materials and applying them to new energy (solar, fuel cells, hybrid car battery, etc.).

Thermodynamics

Yr. : 3	Sem. : 1	Course Code:	GC5011

Maccroscopic phenomena concerned with heat and energy will be discussed based on the fundamental thermodynamic laws.

Fluid Mechanics

Yr. : 3	Sem. : 1	Course Code:	GC5012

This subject covers the fluid mechanics on the specific materials of nano fluids, such as blood, emulsion, etc, in both phases of liquid and gas.

Chemical Engineering Experiment 1

Yr. : 3	Sem. : 1	Course Code:	GC5013

This course is aimed to immerse yourself in a professional lab experiments that can be applied in practice related to technology based on the theory that can be related to chemical engineering majors such as manipulation, reaction engineering, process control. Students learn to understand themselves through the basic principles and operation of the device which constitute chemical plants and reflect in the device design through data analysis.

Introduction to Renewable Energy

Yr. : 3	Sem. : 1	Course Code:	GC5014

Learn about various materials that apply to various energy devices such as fuel cells and secondary batteries. Especially, we deal with electrochemistry early in the course of the course, which is equivalent to the basic concepts of the two devices, and find out how each applies to energy devices later in the course.

Analytical Chemistry

Yr. : 3	Sem. : 1	Course Code:	GC5015

You learn about the different analytical methods that are the basis of chemical analysis. It deals with acid salt titration method, oxidative titration method, electrochemical analysis method, separation method, etc.

Environmental engineering

Yr. : 3	Sem. : 1	Course Code:	GC5017

Basic concepts on chemical production process to minimize environmental inhibitors such as by-products and wastes, and effective treatment process of the environmental inhibitors to be utilized as renewable resources.

Heat Transfer and Mass Transfer

Yr. : 3	Sem. : 2	Course Code:	GC5018

Heat related issues on reactors and heat transfer devices in chemical process or chemical reactor, and theories of energy balance with respect to the conduction, convection, and radiation energy transfer.

Mass transfer introduces it's basic concept and covers essential techniques such as design and control of reactor or mass transfer and separation apparatus which have functions such as distillation, gas absorption, dehumidification, liquid extraction, and leaching.

Reaction Engineering

Yr. : 3	Sem. : 2	Course Code:	GC5019

The reaction engineering is to understand qualitatively the large-scale polymerization processes and chemical reactions and covers the reaction pathways when implemented in industry.

Chemical Engineering Experiment 2

Yr. : 3	Sem. : 2	Course Code:	GC5020

This subject aims to learn basic experimental practical skills based on energy-related theories such as unit operation, response engineering, and process control. The principles and operation of the basic devices that make up energy-related factories are understood and mastered by the students themselves.

Chemical Engineering Materials			
Yr. : 3	Sem. : 2	Course Code:	GC5022
Learn about the structure, characteristics, synthesis process and analysis of materials used in chemical engineering. The application field of materials according to their characteristics and structure is discussed.			
Creative and Integrative Chemical Engineering Design			
Yr. : 3	Sem. : 1	Course Code:	GC5023
In this class, student will perform creative team projects to design materials and integrated systems for engineering with the integrative knowledge of the chemical, electrical, and mechanical engineering.Presentation skill, communication skill and information collection and understanding abilities will be educated as well.			
Capstone Design1			
Yr. : 4	Sem. : 1	Course Code:	GC5024
To perform creative team projects and integrated material designs for energy and chemical engineering, based not only on material design and characterization, but also on introductory design and fundamental engineering designs. In this subject, with performing team projects, presentation skill, communication skill. and information collection and understanding abilities will be educated.			
Carbon Materials			
Yr. : 4	Sem. : 1	Course Code:	GC5026
It covers the foundation of carbon materials such as carbon fiber and graphene, which are popular as next-generation materials, and lectures on general contents of carbon materials such as structure and various applications and technology trends..			
Research Project of Science & Engineering1			
Yr. : 4	Sem. : 1	Course Code:	GC5027
Under the supervision of his/her research advising professor, every senior student should learn how to select his/her bachelor thesis topic, how to process thesis experiment efficiently using correct experimental tools, and how to analyze experimental data.			
Catalytic Engineering			
Yr. : 4	Sem. : 1	Course Code:	GC5028
This subject covers the basic concepts and principles of catalyst, catalytic chemical phenomena, instrumental method of surface analysis, and reaction mechanism concerned with biocatalyst, such as enzyme.			
Process Control			
Yr. : 4	Sem. : 1	Course Code:	GC5029
This course is to understand and covers the chemical process dynamics theory and its control. Also it deals with the applications, the control theory, interpretation of multi variable control systems, optimum control theory and the stability of system.			

Capstone Design2			
Yr. : 4	Sem. : 2	Course Code:	GC5030
To perform creative team projects and integrated material designs for energy and chemical engineering, based not only on material design and characterization, but also on introductory design and fundamental engineering designs. In this subject, with performing team projects, presentation skill, communication skill. and information collection and understanding abilities will be educated.			
Research Project of Science & Engineering2			
Yr. : 4	Sem. : 2	Course Code:	GC5031
Under the supervision of his/her research advising professor, every senior student should learn how to discuss his/her experimental results in comparison with previous results, how to write correctly his/her bachelor thesis, how to make the presentation materials of his/her thesis and how to make feed-back in response to questions.			
Separation Process			
Yr. : 4	Sem. : 2	Course Code:	GC5033
This course studies advanced engineering principles related to the separation. It includes the phase separation, settlement, filtering, membranes separation, distillation, ion exchange, and dissolution.Specific topics will include the recovery of materials, thermal and biological transformation processes.			
Polymer Physics			
Yr. : 3	Sem. : 1	Course Code:	GC5039
Learn the basic theory needed to understand the properties of polymeric materials and learn the physical phenomena of polymeric materials such as size, molecular weight, solubility, molecular weight discernment, and amorphous/crystalline polymers.			
Polymer Processing			
Yr. : 3	Sem. : 2	Course Code:	GC5040
Various methods (compression, injection, calendering, radiation, etc.) that are used corely to enhance the added value of polymeric materials, as well as the principle and characteristics of forming.			
Nanobiotechnology			
Yr. : 4	Sem. : 1	Course Code:	GC5041
It covers the overall understanding of nanotechnology and materials and their relevance and applications.			