

● **Course Description (Polymer Science and Engineering)**

Advisor Counsel			
Yr. : Evry Yr.	Sem. : Evry Sem.	Course Code:	FP0001
<p>Course Description</p> <p>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.</p>			
Introduction to Creative Design			
Yr. : 1	Sem. : 2	Course Code:	GC0002
<p>Establishing basic concepts and understanding on engineering design by performing a project involving creativity and technology.</p>			
Introduction to Polymer Science & Engineering1			
Yr. :2	Sem. : 1	Course Code:	GC1001
<p>In order to provide the basic concepts in polymer science and engineering, this subject gives a general survey of polymer synthesis, structures, properties, and applications.</p>			
Organic Chemistry1			
Yr. : 2	Sem. : 1	Course Code:	GC1002
<p>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.</p> <p>* Related subjects : General chemistry1, General chemistry2, General chemistry Lab.1, General chemistry Lab.2, Polymer synthesis1, Polymer synthesis2, Organic chemistry2, Organic chemistry Lab.</p>			
Physical Chemistry Lab.			
Yr. : 2	Sem. : 1	Course Code:	GC1003
<p>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</p>			
Physical Chemistry1			
Yr. : 2	Sem. : 1	Course Code:	GC1004
<p>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.</p>			
Organic Chemistry2			
Yr. : 2	Sem. : 2	Course Code:	GC1006

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:

GC1007

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

Introduction to Polymer Science & Engineering2

Yr. : 2

Sem. : 2

Course Code:

GC1008

In order to provide the basic concepts in polymer science and engineering, this subject gives a general survey of polymer synthesis, structures, properties, and applications.

Physical Chemistry2

Yr. : 2

Sem. : 2

Course Code:

GC1009

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:

GC1010

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

Polymer Synthesis1

Yr. : 3

Sem. : 1

Course Code:

GC1011

In this lecture, you will learn about polymerization kinetics, polymerization mechanism, copolymerization, structure and property, and stereochemistry of polymers etc. related with chain growth polymerization, step growth polymerization, emulsion polymerization and ring opening polymerization etc..

* Related subjects : Organic chemistry1, Organic chemistry2, Introduction to Polymer Science & Engineering1, Introduction to Polymer Science & Engineering2, polymer chemistry, Polymer Synthesis Lab, Polymer Physical2, Polymer synthesis2, Instrumental Polymer Analysis2

Polymer Physical1

Yr. : 3

Sem. : 1

Course Code:

GC1012

To understand physical properties of polymer materials, some basic theories related physical properties, morphology, molecular weight measurements, and thermodynamics in polymer solution, are the key parts of the course, which are discussed in details in this course.

Polymer Synthesis Lab.			
Yr. : 3	Sem. : 1	Course Code:	GC1013
This class try to have understanding of theory and experimental skill via application of theory of polymer synthesis to real experiments.			
Instrumental Polymer Analysis1			
Yr. : 3	Sem. : 1	Course Code:	GC1014
To educate understanding and analysis ability of characteristics of organic materials by understanding fundamental principles and concepts of characterizing various spectroscopic methods of organic and polymeric materials. *Relevant Subjects: Instrumental Polymer Analysis 2, Instrumental Polymer Analysis Lab, Design for Polymer Analysis			
Fusion Design for Polymer Applications			
Yr. : 3	Sem. : 1	Course Code:	GC1015
This subject provides the application design of polymeric materials through the instrumental analysis for the unknown samples.			
Organic Materials for Information			
Yr. :3	Sem. : 1	Course Code:	GC1016
The lecture will cover (1) organic electronic materials and application, (2) properties of organic semiconductors and solid physics, (3) introduction of various organic electronic applications			
Polymer Synthesis2			
Yr. : 3	Sem. : 2	Course Code:	GC1017
In this lecture, you will learn about polymerization kinetics, polymerization mechanism, copolymerization, structure and property, and stereochemistry of polymers etc. related with chain growth polymerization, step growth polymerization, emulsion polymerization and ring opening polymerization etc.. * Related subjects : Organic chemistry1, Organic chemistry2, Introduction to Polymer Science & Engineering1, Introduction to Polymer Science & Engineering2, polymer chemistry, Polymer Synthesis Lab, Polymer Physical2, Polymer synthesis2,Instrumental Polymer Analysis2			
Polymer Physical2			
Yr. : 3	Sem. : 2	Course Code:	GC1018
To understand physical properties of polymer materials, some basic theories related physical properties, viscoelasticity, rubber elasticity, polymer crystallinity, dynamics of polymer chains, mechanical properties are the key parts of the course, which are discussed in details in this course.			

Polymer Physical Properties Lab.			
Yr. : 3	Sem. : 2	Course Code:	GC1019
This laboratory course focuses on four parts: (1) understanding of basic concept of polymer physical properties through various lab. experiments; (2) increasing of capability of experimental set-up and its application, (3) improving of writing ability in technical reports (4) learning how to cooperate with experimental lab. coworkers			
Instrumental Polymer Analysis2			
Yr. : 3	Sem. : 2	Course Code:	GC1020
To educate understanding and analysis ability of characteristics of polymer materials by understanding fundamental principles and concepts of characterizing various thermal, mechanical, microscopic, rheological properties of polymer materials such as plastics, films, rubbers, fibers, and composites. *Relevant Subjects: Polymer Physical Properties 1, Polymer Synthesis 1, Polymer Synthesis Lab., Instrumental Polymer Analysis 1, Instrumental Polymer Analysis Lab, Design for Polymer Analysis, Polymer Processing Design, Polymer Materials 1, Polymer Capstone Design 1			
Design for Polymer Analysis			
Yr. : 3	Sem. : 2	Course Code:	GC1022
To increase the design ability of polymer materials by studying the fundamentals of polymer materials and characterization, by selecting polymer materials, which can be found in our living environment and industries, and performing team projects with them in order to learn material characterization, presentation skill, communication skill. and information collection and understanding abilities, *Relevant Subjects: Polymer Physical Properties 1, Polymer Synthesis 1, Instrumental Polymer Analysis 1, Instrumental Polymer Analysis Lab, Design for Polymer Applications, Polymer Capstone Design			
Reaction Engineering			
Yr. : 3	Sem. : 2	Course Code:	GC1023
The reaction engineering is to understand qualitatively the large-scale polymerization processes and chemical reactions and covers the reaction pathways when implemented in industry.			
Polymer Processing1			
Yr. : 4	Sem. : 1	Course Code:	GC1024
To educate the processing design ability of polymer materials using polymer processing facilities. *Relevant Subjects: Polymer Physical Properties 2, Polymer Synthesis 2, Instrumental Polymer Analysis 2, Polymer Processing			
Polymer Materials1			
Yr. : 4	Sem. : 1	Course Code:	GC1025
Introducing a variety of commercial thermoplastic polymers including engineering and super-engineering plastics in relation to their molecular structures, bonding forces, phases, thermal/mechanical properties and applications.			

Advanced Biomedical Polymers			
Yr. : 4	Sem. : 1	Course Code:	GC1026
his class covers fundamentals of currently used polymeric materials for artificial organs. It is understood that many different polymeric materials which have biocompatibility and tissue compatibility are used as biomaterials for restoration of damaged tissue or organs.			
Polymer Capstone Design			
Yr. : 4	Sem. : 1	Course Code:	GC1027
To perform creative team projects and integrated polymer material designs, based not only on polymer characterization and material design, 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. *Relevant Subjects: Polymer Physical Properties 2, Polymer Synthesis 2, Instrumental Polymer Analysis 2, Design for Polymer Applications			
Research Project of Science & Engineering1			
Yr. : 4	Sem. : 1	Course Code:	GC1028
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.			
Polymer Processing2			
Yr. : 4	Sem. : 2	Course Code:	GC1029
To educate the fundamental concepts and principles of polymer processing such as extrusion, injection, blow molding, calendering processes of polymer materials. *Relevant Subjects: Polymer Physical Chemistry, Polymer Processing Design, Polymer Materials 1			
Polymer Materials2			
Yr. : 4	Sem. : 2	Course Code:	GC1030
Introducing a variety of thermosetting polymers in relation to their molecular structures, bonding forces, phases, thermal/mechanical properties, and applications along with reaction kinetics.			
Industrial Chemistry			
Yr. : 4	Sem. : 2	Course Code:	GC1031
The lecture will cover the industrial manufacturing process involved in organic chemical industry. They will cover the industrial energies, industrial gases, industrial water and its treatment, nuclear energy, explosion and explosives, photochemicals, fermentation, agricultural industry, coating and paint industry, soap and detergent, sugar and oil, paper industry, plastic industry, rubber industry, etc.			
Polymeric Drug Delivery System			

Yr. : 4	Sem. : 2	Course Code:	GC1032
<p>The lectures on controlled and sustained drug release, regulation of drug absorption and targeting drugs to specific body sites. This course instructs drug delivery system based on new pharmaceutical technique and polymeric excipients.</p>			
Research Project of Science & Engineering2			
Yr. : 4	Sem. : 2	Course Code:	GC1033
<p>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.</p>			
Polymer Composite Materials			
Yr. : 4	Sem. : 1	Course Code:	GC1037
<p>Basic formulas for polymeric matrices, fibers, particles, etc. that make up fiber reinforced or particle reinforced polymeric composite materials, composite material forming process and material property, application of characteristic analysis are studied.</p>			
Functional Polymers			
Yr. : 4	Sem. : 1	Course Code:	GC1038
<p>The chemistry and engineering of functional polymeric materials are dealt with from the point of view of processes, synthesis and applications.</p>			