College of Engineering

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School of Architecture

- Architecture & Urban Design
- Architectural Engineering

School of Mechanical Engineering

- Mechanical Engineering
- Automotive Engineering

School of Materials Science and Engineering

- Metallurgical Engineering
- Ceramic Engineering
- Optoelectronic Materials

School of Chemical Engineering

- Chemical Engineering Materials
- Chemical Engineering Safety
- Chemical Process Engineering

School of Electronics and Computer Engineering

- Electronics Engineering
- Software Engineering
- Computer Engineering

School of Polymer Science and Engineering

- Polymer Engineering
- Fiber Science Engineering

Department of Industrial Engineering
Department of Biotechnology and Bioengineering
Department of Energy and Resources Engineering
Department of Electrical Engineering
Department of Civil Engineering
Department of Environment and Energy Engineering
Affiliated Research Center

- Construction & Environment Research Center
- Electronic & Telecommunication Technology Research Center
- Engineering Education Research Center
- Institute of Advanced Materials & Technology
- Institute of Bio-industrial Technology
- Mining and Urban Contamination Protection Institute
- Polymer Science and Technology Research Center
- Research Facilities Center
- Soil Technology Research Institute
- Solar Energy Research Institute
- System Automation Research Institute

School of Architecture

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What is Architecture?

Architecture is a profession where technology, ecology, philosophy, art, and science combine to solve the problems of the building environment.

The buildings we live and work in shape our experiences, our memories, and the way we view the world. Homes, office buildings, opera houses, art galleries, schools, and factories are all designed by architects. It is the role of the architect to analyze a client's needs and to design a building which fulfills those needs. The architect then documents the design and manages the construction process. The architectural engineer develops new technologies and materials to construct buildings.

School of Architecture at Jeonnam National University

Emphasizing the awareness of social and cultural contexts that underpin the architectural practice, encouraging a comprehensive and creative thinking ability among students, and researching the conditions of the environment of human dwelling, the School of Architecture remains committed to educating architects who can contribute to social progress and welfare.

Founded in 1952, the School of Architecture continues to make efforts to be a core architectural institute leading regional academic research and quality education open to the community.

In 2002, the Department of Architecture was reorganized into the School of Architecture with a five-year Bachelor of Architecture program and a four-year Bachelor of Architectural Engineering program. With a common curriculum in the first semester of studies, students can select and advance to one of the two programs in their second semester.

To achieve this goal, the School of Architecture provides an opportunity for students to understand the methods of creating buildings and architectural environments through design and experiments. The objective is to develop creative, scientific, and future-oriented architect engineers with a professional and comprehensive overview in order to contribute to the creation of architecture culture and academic development of Korea.

In addition, the nationally funded Bio-housing Institute is both designing and researching various aspects of environmentally-friendly architecture based on ecology, health, and sustainability. The goal of the Institute is to develop models of bio-housing through the integration of traditional materials and high technology, and to educate professionals who are equipped with original future technologies and expertise.

Undergraduate and graduate students of the School of Architecture are eligible for various scholarships and funding for overseas training.

Architecture & Urban Design Major

The Architecture & Urban Major provides education with the recognition that architecture is not only

to provide places in which human beings live and aesthetic structures which gives pleasure but also to become a public device where individuals and society, as a whole, can gather and interact. On such recognition the program has set to realize architectural and urban products that secure human dignity, fulfill social responsibility and pursue aesthetic beauty. Therefore, the goals of the Architecture & Urban major is to cultivate creative and internationalized professional architects and urban designers who understand socio-cultural interconnections through a competitive curriculum including lectures, design studios, and an internship for developing students' architectural and urban professional skills in a comprehensive manner.

▮ Architectural Engineering Major

Architectural Engineering helps students fulfill their roles as competent professionals who can design, construct, and manage safe and rational buildings and structures after graduation.

The Architectural Engineering Major intends to develop competitive talents in architectural environments at home and abroad. It pursues realistic architecture by studying engineering applications with a focus on curricula such as Architectural Construction, Architectural Structure, and Architectural Environment and Equipment.

Professors

Architecture & Urban Design Major

- Deuk-Youm Cheon, Ph.D.
  [Professor, Pagoda, Traditional Architecture Buddhist Architecture Cultural Heritage dycheon@jnu.ac.kr]
- Se-Gyu Oh, Ph.D.
  [Professor, Architectural and Housing Design, Sustainable Green Housing Design, Architectural Design and Renovation, Urban Renewal Design, oskar@jnu.ac.kr]
- Hyo-Won Lee, Ph.D.
  [Professor, Architectural Design, Design Theory, Planning and Research of Facility for the Aged, Louis I. Kahn, leehw@jnu.ac.kr]
- Uoo-Sang Yoo, Ph.D.
  [Professor, Architectural Design and Evaluation, usyoo@jnu.ac.kr]
- Seung-Hoon Han, Ph.D.
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- Min-Seok Lee, Dr.-Ing
  [Associate Professor, Urban Design Planning, leeminseok@jnu.ac.kr]

Architectural Engineering Major

- Jin-Kyu Song, Ph.D.
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- Jae-Seung Hwang, Ph.D.
  [Professor, Structural Performance Enhancement against Wind and Seismic Loads, Sustainable Control Device, Structural Control, jshwang@jnu.ac.kr]
- Seong-Seok Go, Ph.D.
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- Kang-Seok Lee, Ph.D.
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- Bang Yeon Lee, Ph.D.
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- Jong Kwan Ryu, Ph.D.
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Degree Requirements

Architecture & Urban Design Major

Architecture & Urban Design students are required to earn 160 credits to graduate, taking an average of 18 credits per semester. The program is based on the Bachelor of Architecture program which normally takes 5 years to complete.

Architectural Engineering Major

Architectural Engineering students are required to earn 140 credits to graduate, taking an average of 18 credits per semester. The program is based on the Bachelor of Engineering Program which normally takes 4 years to complete.

What Do You Study?

Architecture & Urban Design Major

Architecture Environmental Control System Design
Interior Planning
Reinforced Concrete Structure Design 1
Steel Structure Design 1
Landscape Architecture
Free-form Architecture
Intelligent Building System
Asian Architecture
Design Theory
Region, Culture and Space
Advanced Course in Computer-Aided Architectural Design
Introduction to Urban Planning
Practical English
City and Culture
Culture Planning and Remodeling
Digital Design
Contents of Urban Space
Theory of Contemporary Architecture
Place Planning
Design Research Methodology
Architectural Estimation and Supervision
Regional Industry and Architecture
History of Western Architecture
Introduction to Building Structure
History of Korean Architecture
History of Modern Architecture
Architectural Mechanical System
Architectural Planning
Architectural Structure System
Practical Internship
Environmental Technology
Housing and Culture
Presentation of Spatial Forms
Fundamentals of Computer-Aided Architectural Design
Spatial Design
Environment-Friendly Architecture
Building Materials
Program and Design
Building and City Codes
Environment-Friendly Design
Site Planning
Community Housing Design
Urban Planning and Rehabilitation
Integrative Design
Construction Management
Professional Practice
Urban Design
Integrated Architectural Planning
Research and Design
Practical Design
Fundamental Space Design
Architectural Space and Society
Structural Mechanics

Architectural Engineering Major

Building Structure
Computer Science Foundation
Computer Science Application
Building Materials Experiment
Numerical Analytics
System of Building Structure
Architectural Equipment Application
Architecture Environmental Technology Experiment
Architectural Estimate
Architectural Acoustics
Soil & foundation engineering
Building Code & Regulation
Steel Structure Design2
Architectural Management
Architectural Capstone Design 2
Architectural Engineering Design
Creative Architectural Engineering Design
Mechanics of Materials
Engineering Mathematics 2
Statics
Building Structural Mechanics 1
Architecture Environmental Technology
Building Materials
Architecture Environmental Control System Design
Construction Technology
Structure Dynamics
Architectural Equipment
Reinforced Concrete Structure Design 1
Steel Structure Design 1
Practical Internship
Architectural Capstone Design 1
Housing and Culture
Presentation of Spatial Forms
Construction Method & Technique Design
Engineering Mathematics 1
Introduction to Creative Design

Careers

There is a diverse and exciting range of career opportunities for architecture graduates. As well as a career in private architectural practice, career opportunities include Architectural Design, Interior Design, Architectural and Urban Planning, Construction, Structural/Mechanical Engineering, Public Authorities, Project management, Property Development, Research, Restoration, and Conservation.

School of
Mechanical Engineering

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What is Mechanical Engineering?

Mechanical engineering is the branch of engineering concerned with design, manufacture, installation, and operation of engines, machines, and manufacturing processes. Mechanical engineering involves application of the principles of dynamics, control, thermodynamics and heat transfer, fluid mechanics, strength of materials, materials science, electronics, and mathematics. It is a creative and total academic field that materializes scientific imagination into reality by mechatronics, nano/micro system technology, IT-based intelligent mechanical systems, thermo-fluids, and energy systems. Technological innovation by mechanical engineering involves systematic technological materialization through scientific principles and engineering designs. Mechanical engineering has been continuously advancing, setting a base for modern industrial development, and leading the future industry.

Mechanical engineers play a central role in such industries as automotive (car chassis, engine, transmission); aerospace (airplanes, aircraft engines, control systems for airplanes and spacecraft); biotechnology (implants, prosthetic devices, fluidic systems for pharmaceutical industries); computers and electronics (disk drives, printers, cooling systems, semiconductor tools); MEMS (sensors, actuators, micropower generation); energy conversion (gas turbines, wind turbines, solar energy, fuel cells); environmental control (HVAC, air-conditioning, refrigeration, compressors); automation (robots, data and image acquisition, recognition, control); and manufacturing (machining, machine tools, prototyping, microfabrication).

School of Mechanical Engineering

The School of Mechanical Engineering at JNU was established in 1970. Today, the school has 24 faculty members, 650 undergraduate students, and 80 graduate students. The school aims to provide an excellent education to our undergraduate and graduate students and to conduct leading-edge research in mechanical engineering.

The School of Mechanical Engineering has successfully accomplished several government- supported projects such as the National Project to Foster the Engineering College (’94~’98), Brain Korea 21 (BK21, ’99~’05), New University for Regional Innovation (NURI, ’04~’09), and post- BK21 (’06~’13) for graduate education. In 2013, the school was selected again for the BK21+ project (’13~’20). Through these projects, the school continually strives to recruit the best new students, provide sufficient scholarships for students, support short-term overseas language training and various educational activities, invite competitive faculty members, support cooperation with regional industries, and update its educational and laboratory facilities. Since 2014, the school was selected CK-1(‘14~’19), through the fusion of ICT-based eco-friendly cars characterization education, are raising regional strategic industry leader and global creative talent.

The School of Mechanical Engineering acquired accreditation in engineering education from ABEEK in 2010. The mechanical engineering program satisfied all the requirements set by ABEEK.

The goal of the program is to keep its educational program at pace with the rapidly changing circumstances both within and outside the country, while providing the creative research opportunities required for essential industries and research institutions, and to train students to work in related fields.

All students must complete a basic curriculum by the first semester of their junior year, after which they will choose a major of mechanical engineering or automotive engineering.

Mechanical Engineering Major

The mechanical engineering major offers basic courses in mechanical engineering such as fluid dynamics, materials science, solid mechanics, controls and manufacturing processes, thermodynamics, and heat transfer. Students will also take advanced computer classes that deal with design.

Automotive Engineering Major

The automotive engineering major provides specialized knowledge of the latest technological developments in automotive applications of mechanical engineering, including internal combustion engines, vehicle dynamics and aerodynamics, industry-standard CAD tools, and renewable energy and alternative fuels.

Professors

- Byeong-Soo Oh, Ph.D.
  [Professor, Non-pollution Hydrogen Engine and Cryogenic Storage, bysoh@jnu.ac.kr]
- Ki-Ju Kang, Ph.D.
  [Professor, Mechanics of Solids and Structures, jkang@jnu.ac.kr]
- Hi-Seak Yoon, Ph.D.
  [Professor, Nano-Composite Materials, hsyoon@jnu.ac.kr]
- Myung-Taeck Lim, Ph.D.
  [Professor, Internal Combustion Engines, mtlim@jnu.ac.kr]
- Jae-Tack Jeong, Ph.D.
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- Young-Soo Yang, Ph.D.
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- You-Gon Kim, Ph.D.
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- Young-Bae Kim, Ph.D.
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- Seoung-Yun Seol, Ph.D.
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- Jong-Oh Park, Dr.-ing.
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- Byung-Chul Choi, Ph.D.
  [Professor, Combustion Engineering, Technology for Engine After-treatment, bcchoi @jnu.ac.kr]
- Bo-Seon Kang, Ph.D.
  [Professor, Spray Analysis using Optical Techniques, bskang@jnu.ac.kr]
- Gyuhae Park, Ph.D.
  [Professor, Smart Material/sensor/actuator, gpark@jnu.ac.kr]

- Dong-Weon Lee, Ph.D.
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- In-Su Jeon, Ph.D.
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- Bong-Kee Lee, Ph.D.
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- Lee, Wonoh
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- Hyun Wook Kang, Ph.D.
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- Moon, Chang-bae, Ph.D.
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- Chang-Sei Kim, Ph.D.
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- Eunpyo Choi, Ph.D.
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Degree Requirements

The undergraduate programs are designed to help students develop both understanding and capability needed to meet the challenges of the modern technological society in mechanical engineering. Students are required to earn at least 140 credit hours (78 from Department courses and 20 from electives), which normally takes four years of full-time study. Students are also able to earn double majors or minors as a means of broadening the scope of their studies.

What Do You Study?

Air Conditioning and Refrigeration
Alternative Energy Vehicles
Applied Fluid Mechanics
Applied Heat Transfer
Applied Mechanical Engineering Lab
Applied Solid Mechanics
Applied Thermodynamics
Automotive and Environmental Engineering
Automotive Chassis Systems
CAD/CAM with Practice
Computer Aided Engineering Graphics
Control Engineering
Creative Engineering Design 1
Creative Engineering Design 2
Design of Fluid machinery
Design Of Machine Elements 1
Design of Machine Elements 2
Design of Thermo-Fluid System
Dynamics
Elementary Mechanical Engineering Lab

Engine design and performance
Engineering Mathematics 1
Engineering Mathematics 2
Environment-Friendly Vehicles
Finite Element Method
Fluid Mechanics
Fuel and Combustion Engineering
Fuel Cell Vehicles
Gas Dynamics
General Drawing
Heat Transfer
Hydraulic Engineering
Intelligent Vehicle
Internal Combustion Engine
Internship 1
Internship 2
Introduction of Electricity and Electronics
Introduction To Automobile
Introduction to Automotive Engineering
Introduction to Engineering Design
Introduction to MEMS(micro electro mechanical systems)
Introduction to Sensors
Introduction to Solid Mechanics
Kinematics of Mechanisms
Manufacturing Processes with Practice
Measurement Engineering
Mechanical Engineering Capstone Design 1
Mechanical Engineering Capstone Design 2
Mechanical Materials
Mechanical Metallurgy
Mechanical Vibrations
Mechatronics Application
Microprocessor Basic
Mold Design with Practice
Numerical Analysis
Plastic Forming
Renewable Energy
Robot Engineering
Service Robotics
Signals and System
Special Lecture on Industrial Topics
System Engineering
Theories of Engineering Education
Thermodynamics
Vehicle Dynamics
Welding Engineering

Careers Options

Graduates are able to pursue careers in engineering, electronics, automobile industry, and construction firms. They may also enroll in a graduate program in the field of mechanical engineering.

Specific positions that graduates may be qualified for include technical public officials, and government officers.

School of Materials Science and Engineering

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What is Materials Science and Engineering?

Materials Science and Engineering (MSE) is an interdisciplinary field which deals with the discovery and design of new or high-performance materials constituting modern civilization and industrial developments. The field involves studying materials through the materials paradigm-synthesis, structure, properties and performance. It incorporates elements of physics and chemistry and is at the forefront of nanoscience and nanotechnology research. Mechanical, electrical, optoelectronic, and electrochemical properties of metals and ceramic materials are utilized for the transport machinery, semiconductor devices, energy and environmental devices such as batteries, fuel cells, and solar cells, and also medical applications.

School of Materials Science and Engineering

In order to keep up with the world-wide trend and to make the most of the interdisciplinary nature, Department of Metallurgical Engineering and Department of Ceramic Engineering were integrated in 1999 into School of Materials Science and Engineering (SMSE) with two Majors. In 2002, upon the regional and national industrial demands Optoelectronic Materials Major was additionally established. SMSE is currently constituted of about 360 undergraduate 80 graduate students, and 18 faculty members. Since 2007 SMSE has implemented ABEEK curriculum and *Materials Science and Engineering Program* was officially accredited in 2014. The students are encouraged to aim for the comprehensive knowledge and understanding of *Materials Science and Engineering* in general until 4th year when they choose a Major to focus on. For the last decade or so SMSE has run the major large-scale education programs such as NURI, LINC, and CK-1, which provide undergraduates with scholarships and opportunities for language and engineering training courses (6 Sigma, TRIZ etc), industrial internships, domestic and international excursions etc. The undergraduate students are also greatly benefited by the research experience provided by the Laboratories operated by the faculty members. Their research activities, indicated by the eminent national projects such as WCU, BRL, Get-Future, and BK21^{+} as well as numerous industrial projects and collaborations, are further supported by the continued studies in the graduate course of the motivated undergraduate students.

Professors

- Choong-Nyeon Park, cnpark@jnu.ac.kr [Hydrogen Storage Materials, Ni-MH Secondary Batteries]
- Byung-Teak Lee, btlee@jnu.ac.kr [Thin Film Growth & Fabrication of Optoelectronic Devices]
- Ho-Sung Kim, symmetry@jnu.ac.kr [Crystal Structure Analysis & Crystal Growth]
- Kwangmin Lee, kmlee@jnu.ac.kr [Nano- & Bio-materials]

- Youngman Kim, kimy@jnu.ac.kr [Mechanical & Thermal Characterizations of Thin Films]
- Jong-Ha Moon, jhmoon@jnu.ac.kr [Photonic Electronic Thin Films]
- Sung-Kil Hong, skhong@jnu.ac.kr [Light Metals, Mold & Automotive Parts Materials]
- Jin-Hyeok Kim, jinhyeok@jnu.ac.kr [Photonic Electronic Thin Film Growth & Characterization]
- Jaekook Kim, jaekook@jnu.ac.kr [Design, Synthesis, Characterization of Nano Energy Materials]
- June Key Lee, junekey@jnu.ac.kr [Semiconductor Process Design]
- Jong-Sook Lee, jongsook@jnu.ac.kr [Electroceramics]
- Sun-Ju Song, song@jnu.ac.kr [Ionics, Energy Materials]
- Chan-Jin Park, parkcj@jnu.ac.kr [Corrosion & Energy Materials, Materials Electrochemistry]
- John Gerard Fisher, johnfisher@jnu.ac.kr [Green Energy Materials]
- Won Bin Im, imwonbin@jnu.ac.kr [High Functional Inorganic Materials for Energy]
- Jaeyeong Heo, jheo@jnu.ac.kr [Nanodevices & Materials for Energy]
- Hoonsung Cho, cho.hoonsung@jnu.ac.kr [Biomaterials]
- Uk Sim, usim@jnu.ac.kr [Synthesis and characterization of multi-functional low-dimensional nanostructured materials]

Degree Requirements

Students are required to earn at least 140 credit hours (73 major required courses, 45 general courses and 22 elective courses), which normally takes four years of full-time study. Students have the option to double major or to earn additional submajor within Materials Science and Engineering or in other programs.

What Do You Study?

Introduction to Engineering Design
Materials Science Seminar 1/2/3/4
Introduction to Materials Science & Engineering 1/2
Engineering Mathematics
Physical Chemistry
Thermodynamics in Materials
Mechanical Properties of Materials
Electrical and Magnetic Properties of Materials
Introduction to Nano- and Bio-material
Crystal Structures and Defects
X-ray and Electron Diffraction
Materials Engineering Project 1/2/3
Electrical Engineering for Materials Engineers
Instrumental Analytical Methods
Engineering Internship
Special Lecture on Industrial Topics 1/2
Taguchi Design of Experiments
Capstone Design 1/2

Metallurgical Engineering Major

Ferrous Alloys
Ferrous Production Metallurgy
Foundry Engineering
Light Metal Processing & Design
Materials Electrochemistry
Corrosion and Oxidation
Mechanics of Materials
Metals Working
Nonferrous Materials
Phase Transformations
Powder Metallurgy
Solidification Theory and Design
Structure of Metals
Welding and Microbonding

Ceramic Engineering Major

Ceramic Engineering
Solid State Chemistry
Modern Material Physics
Phase Equilibria
Diffusion and Crystal Defect
Theory and Phenomena of Sintering
Electroceramics
Ceramics in Energy Applications
Composite Materials
Fundamental Ceramics
Bioceramics

Optoelectronic Materials Major

Electromagnetics
Solid State Physics
Electronic Display Engineering
Optics
Optoelectronic Materials
Optoelectronics Device Engineering
Optical Fiber Communications
Semiconductor Device Design
Semiconductor Device Physics
Semiconductor Materials and Processing
Sensor Materials & Engineering
Thin Film Process Engineering

Careers

Graduates are currently playing major roles in various industrial fields of steel, automotive, semiconductor, display, optical communication, and energy storage devices. Many students study further in graduate courses and are trained for the research and development career path.

School of Chemical Engineering

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What is Chemical Engineering?

The goal of the School of Chemical Engineering (SCE) is to promote the development of engineering education by improving standards and guidelines of educational programs for engineering colleges and related education, thereby performing certification and consultation, and ultimately producing competent engineers.

School of Chemical Engineering

The SCE was established in March 2002 by merging the existing faculty of Chemical Engineering and faculty of Applied Chemistry. The newly restructured School of Chemical Engineering comprises the following three departments to foster understanding that is necessary for the development of engineering: chemical engineering materials, chemical engineering safety, and chemical process engineering.

Professors

- Nam-Cook Park, Ph.D.
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- Hee Moon, Ph.D.
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- Yo-Soon Song, Ph.D.
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- Ki-Young Lee, Ph.D.
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- Jae-Soon Shin, Ph.D.
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- Chang-Bock Chung, Ph.D.
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- Hye-Ryung Park, Ph.D.
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- Jin-Bong Kim, Ph.D.
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- Choon-Hyoung Kang, Ph.D.
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- Taek-Hyeon Kim, Ph.D.
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- Dong-Lyun Cho, Ph.D.
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- Jong-Ho Kim, Ph.D.
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- Moo-Sung Lee, Ph.D.
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- Young-Chul Kim, Ph.D.
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- Hyung Jin Kim, Ph.D.
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- Do-Heyoung Kim, Ph.D.
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- Jong-Il Rhee, Ph.D.
  [Professor, Development
  for Optic Biosensors and Biochips,
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- Young-Dae Kim, Ph.D.
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- Eun-Mi Han, Ph.D.
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- Kwang Ha, Ph.D.
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  Materials,
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- Jun-Seok Ha, Ph.D.
  [Associate Professor, Nano Photonic Devices,
  jsha@jnu.ac.kr]
- Chang-Kook Hong, Ph.D.
  [Associate Professor, Solar Cells, Energy
  Engineering, Polymer Materials,
  hongck@jnu.ac.kr]
- Jeong-Woo Yun, Ph.D.
  [Associate Professor, Fuel Cell, Capacitor,
  Fuel reforming,
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- Chang-Hyun Ko, Ph.D.
  [Associate Professor, Synthesis and Catalytic
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- Yong-Il Park, Ph.D.
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- Young-Si Jun, Ph.D.
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- Byung-Chol Ma, Ph.D.
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  Process Risk Analysis
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Degree Requirements

Students are required to earn 140 credits, with 84 credits from Chemical Engineering courses, and 40 credits from general courses.

Students in the ABEEK Program are required to earn 12 credits from general courses, 32 credits from MSC courses, and 75 credits from engineering topics courses.

What Do You Study?

General Courses

Core Courses

Writing
Global Communication English
Mathematics 1
General Chemistry 1
General Physics 1
Chemistry Laboratory 1
Computer for Real Life
Mathematics 2
General Chemistry 2
General Physics 2
Chemistry Laboratory 2

Chemical Engineering Materials Major Courses

Core Courses

Polymer Chemistry
Engineering Mathematics 1
Chemical Process Calculation 1
Instrumental Analytical Methods
Physical Chemistry 1
Organic Chemistry 1
Transfer Operations 1
Materials Science
Electro Chemistry
Introduction to Creative Design
Basic Experiment of Chemical Engineering Lab 1
Basic Experiment of Chemical Engineering Lab 2
Design of Chemical Engineering and Materials
Experiments for Chemical Materials
Chemical Engineering Lab.
Chemical Engineering Capstone Design

Electives

MATLAB Programming
Chemistry of Interface
Introduction to Polymer Processing
Polymer Materials
Industrial Analytical Chemistry
Engineering Mathematics 2
Chemical Process Calculation 2
Chemical Process Thermodynamics
Chemical Process risk assessment
Chemical Process Control
Fundamentals of Photonics
Fuctional Polymers
Display Engineering
Inorganic Materials
Inorganic Chemistry
Physical Chemistry 2
Semiconductor·Photonic Devices Engineering
Semiconductor Device Fabrication
Reaction Engineering
Separation Process
Separation And Purification Processes
Nonuniform Reaction Engineering
Engineering Seminar 1
Engineering Seminar 2
Biochemical Engineering
Petrochemical Industry
Combustion and Explosion Protection Engineering
Organic Industrial Chemistry
Organic Reaction Mechanism
Organic Synthetic
Organic Chemistry 2
Medicinal Chemistry
Transfer Operations 2
Catalyst Chemistry
Carbon Materials Engineering
Plant Safety Facility
Fundamentals & Design to Chemical process
Numerical Analysis in Chemical Engineering
Chemical Safety Engineering
Chemical Engineering Termodynamics
Chemical Engineering Quality Control
Field Practice for Chemical Engineering 1
Field Practice for Chemical Engineering 2
Environmental Chemistry

Chemical Enginieering Safety Major Courses

Core Courses

Introduction to Creative Design
Transfer Operations 1
Chemical Process Calculation 1
Physical Chemistry 1
Organic Chemistry 1
Engineering Mathematics 1
Basic Experiment of Chemical Engineering Lab 1
Basic Experiment of Chemical Engineering Lab 2
Chemical Engineering Lab
Chemical Safety Experiment
Chemical Engineering of Chemicals
Combustion and Explosion Protection Engineering
Chemical Precess risk assessment
Plant Safety Facility
Chemical Process Design
Chemical Engineering Capstone Design

▮ Electives

MATLAB Programming
Transfer Operations 2
Chemical Process Calculation 2
Organic Chemistry 2
Physical Chemistry 2
Engineering Mathematics 2
Basic Design of Chemical Engineering
Inorganic Chemistry
Materials Science
Chemical Engineering Thermodynamics
Reaction Engineering
Separation Processes
Chemical Process Control
Petrochemical Industry
Nonuniform Reaction Engineering
Separation Purification Processes
Chemical Precess Control System Analysis
Chemical Precess Thermodynamics
Numerical Analysis in Chemical Engineering
Electrochemistry
Polymer Chemistry
Energy Engineering
Engineering Economy
Patent based Research and Development
Environmental Engineering
Instrumental Analytical Methods
Chemical Engineering Quality Control
Industrial Safety Regulations
Engineering Seminar 1
Engineering Seminar 2
Technology Management
Chemical Equipment and Facilities
Energy Storage System Engineering
Measurement Sensor Engineering
Field Practice for Chemical Engineering 1
Field Practice for Chemical Engineering 2

Chemical Process Engineering Major Courses

▮ Core Courses

Introduction to Creative Design
Transfer Operations 1
Chemical Process Calculation 1
Physical Chemistry 1
Organic Chemistry 1
Engineering Mathematics 1
Basic Experiment of Chemical Engineering Lab 1
Basic Experiment of Chemical Engineering Lab 2
Nonuniform Reaction Engineering
Separation and Purification Processes
Chemical Process Thermodynamics
Chemical Process Control System Analysis
Numerical Analysis in Chemical Engineering
Chemical Engineering Lab
Chemical Engineering Intensive Lab
Chemical Process Design
Chemical Engineering Capstone Design

▮ Electives

MATLAB Programming
Transfer Operations 2
Chemical Process Calculation 2
Organic Chemistry 2
Physical Chemistry 2
Engineering Mathematics 2
Basic Design of Chemical Engineering
Inorganic Chemistry
Materials Science
Reaction Engineering
Separation Processes

Chemical Engineering Thermodynamics
Chemical Process Control
Organic Composite Materials
Petrochemical Industry
Energy Engineering
Electrochemistry
Inorganic Materials
Measurement Sensor Engineering
Combustion and Explosion Protection Engineering
Polymer Chemistry
Organic Reaction Mechanism
Particle Engineering
Transfer Phenomena
Chemical Safety Engineering
Computer Aided Design of Chemical Engineering
Catalyst Engineering
Engineering Seminar 1
Engineering Seminar 2
Green Chemistry Technology
Energy Storage System Engineering
Chemical Equipments and Facilities
Environmental Engineering
Instrumental Analytical Methods
Quality Control
Technology Management
Engineering Economy
Chemical Technology and Patent
Chemical Process risk assessment
Plant Safety Facility
Chemical Engineering Quality Control
Field Practice for Chemical Engineering 1
Field Practice for Chemical Engineering 2

Careers

Graduates obtain employment in chemical plants (oil refinery, petrochemical, fertilizer, synthetic resin, oil and fat, food industry, inorganic chemistry, explosives, cement, glass, dye, rubber, paint, pulp and paper, metal, and smelting) in all parts of the country, including the Yeocheon and Ulsan districts, thermo-electrical and nuclear power plants, steel mills, photoelectron fields (semiconductor component/ equipment, LCD, and photo component manufacturing), textile-related fields, sales fields for trading companies, pharmaceutical fields, cosmetics fields, polymer-related fields, research institutes, and civil service.

School of Electronics and Computer Engineering

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What is Electronics and Computer Engineering?

The goals of Electronics and Computer Engineering (ECE) are to introduce concepts in electronics and computers in an integrated manner; to motivate basic concepts in the context of real applications; to illustrate a logical way of thinking about problems and their solutions; and to convey excitement about the profession. These goals are attained through the analysis, construction, and testing of systems that incorporate concepts from a broad range of areas within electronics and computer engineering.

School of Electronics and Computer Engineering

School of Electronics and Computer

The School of Electronics and Computer Engineering is a combined department, originating from a merger in 2002 of the former two Departments of Information & Communication Engineering in the Engineering College and the Computer Information in Science College. The objectives of the department are not only to improve personal capability but also to largely contribute to nationwide development, by obtaining and utilizing the technology in information and communication engineering leading to contributions to the information-oriented society of the 21st century. To achieve the goals, students are required to start the basic subjects relevant to the major based on their own ability & aptitudes and finally complete the entire courses. The curriculum of the department is segmented into three majors: Electronics Information & Communication Engineering; Computer Information & Communication Engineering; and Software Engineering, which are options for students to determine at the beginning of the second year. The studies for postgraduates will mainly focus on the basic theories in order to perform research creatively onwards, while students desiring to start careers at the companies in the same industry are to acquire practical skills as well as the theoretical knowledge for the purpose of being competent engineers. In addition, the syllabi include another aim which is to form a well-rounded personality because good attitudes and philosophies are necessary for beneficial research for the wider community.

Division of Electronic Information and Communication Engineering

Electronic Information & Communication Engineering is a fundamental discipline to study and apply electrons' kinetics in vacuums, gases, and solids, which is a leading research area of the cutting-edge technologies which are demanded by the information-oriented society in 21st century. The industry of Electronics and Information Communications is centered on signals, transmissions, digital signal processing, system software, and so on, and can be also seen as the field behind state-of-the-art technologies in Korea. In particular, this discipline has highly integrated technologies and rapid innovation which guides national industries. In this major, it is emphasized for students to have reasonable & future-oriented thinking while considering contemporary trends of globalization & information-orientation; thus, the course includes a

balanced composition between theoretical & design-related lectures, field-based experiments, extended projects, & intensive training in order to enhance creativity in technology. Accordingly, it allows students to understand the correlation between theories and practices in electronic information & communication engineering, and then to be experts who can apply their knowledge for further research and development. The electronic information & communication industry, one of the strategic industries in Korea, incorporating large-sized companies such as Samsung Electronics, LG Electronics, SKT, KT and SK Hynix Semiconductors, Inc. require a lot of skilled employees. This faculty offers proper courses for students to acquire demanding skills and knowledge with high-tech equipment. As a result, students sponsored through employment-linked company track scholarships have been hired by those companies such as Samsung, LG Display, and SK Hynix.

Division of Computer and Information Communication Engineering

Electrical appliances, communication equipment, medical equipment, and information service systems that are easily seen in our daily lives result from the combination of electronic circuit technology, imbedded computer technology, and software operation technology. The combination of hardware and software occurs simultaneously in all the current industries and the combination of computer-based IT and other technologies can manufacture high value products. As hardware manufacturing technology becomes more diversified and generalized, engineers with hardware and software-related knowledge are needed in various fields of the industry.

Computer and Information Communication Engineering is the study of the technologies of mobile equipment such as Smartphones, and software technologies needed for the manufacturing of network systems such as clouds, internet service systems, etc. Courses include logic circuits, basic circuit theory, computer structures, digital synthesis design, etc. In addition, communication theory, data communication, and computer networking are taught for the understanding of information communication systems and intelligence systems, multimedia systems, imbedded systems, and computer medical systems as well as generic IT application systems.

In Computer and Information Communication Engineering, the concepts of hardware and software are taught and understood through experimentation. The combination of SOC (System on a Chip) design technology and computer OS helps students understand the technology needed for applied systems in IC components such as MP3 players. Also, understanding data communication and multimedia transmission technology software helps them experience futuristic multimedia systems, such as smart TVs, and students operate robots and vehicles through programming and acquire knowledge. Courses also provide chances for field experience in connection with industry (companies). Customized scholarship programs benefit students in school and after graduation with the cooperation of prominent local companies, Samsung Electronics, LG Innotek, Hynix Semiconductor, Inc, and LG Display among others.

Division of Software Engineering

Now the world is in a software supremacy struggle. It accounts for 52.4% of the automobile industry, 40.9% of the medical industry, and 51.4% of the warplane industry.

Korea was ranked 10th in the world economy due to a combination of basic industries such as automobile, steel, electronics, and software industries. However, as the demand for manpower in software development increases, the supply of highly-skilled people is insufficient. The majority of people working in the software industry are non-specialists.

Technologies and methods in developing and utilizing computer software are taught in software engineering. There are many departments for computer engineering in other universities, but there are only a few

universities specializing in computer software. Software Engineering at Chonnam National University trains talented persons in combined software technology to lead the future information society. CNN Money announced the top 100 jobs in America, based on quality of life, and software designer was ranked at the top. Software designers are technicians developing and utilizing software, and making blueprints that are equivalent to those of an architect.

Microsoft, the leader in the global operation systems market; Apple, the leader in the intelligent mobile phones market with the iPhone; Google the dominant force in the information search market (and seeking to enter telecommunications); and Naver, leading the domestic information search market are all prominent software companies.

These companies have also grown rapidly in recent times. Dear young people, full of passion and dreams, challenge yourselves and embrace the learning. Software engineering awaits you. Find your own Blue Ocean and become an important person in the infinity of cyberspace.

Machines like Smart phones enable us to access anything. Mobile phone operation systems such as Android, iOS, or Windows as well as game or utility apps can be made and installed by you..

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Degree Requirements

Electronic Information & Communication Engineering Major Courses

Electronic Information Communication Engineering students are required to earn 140 credits including 20 credits from liberal arts education courses, 32 credits from MSC courses, 33 credits from EE compulsory courses, 27 credits from EE electives, and 28 credits from general electives.

Computer and Information Communication Engineering Major Courses

Computer and Information Communication Engineering students are required to earn 140 credits including 24 credits from liberal arts, 26 credits from MSC courses, 37 credits from core CE courses, 26 credits from CE electives, and 27 credits from electives.

Software Engineering Major Courses

Software Engineering students are required to earn 140 credits including 24 credits from liberal arts education courses, 26 credits from MSC courses, 37 credits from CE compulsory courses, 27 credits from CE electives, and 26 credits from general electives.

What Do You Study?

Electronic Information & Communication Engineering Major Courses

Core Courses

Engineering Mathematics 1
Introduction to Engineering Design
C Programming & Practice
Advanced Computer Programming & Practice
Linear Algebra
Logic Circuits Design
Circuit Theory 1
Engineering Mathematics 2
Basic Electronic Engineering Lab 1
Basic Electronic Engineering Lab 2
Electromagnetics
Signals and System Engineering
Basic Probability Theory
Electronic Circuit 1
Electronic Engineering Seminar 1
Introduction Project of Electronic Engineering
Basic Project of Electronic Engineering
Design Project of Electronic Engineering
Capstone Design 1

Electives

ICT Fusion Introduction
Computer System Architecture
Circuit Theory 2
Electronic Circuit 2
Physical Electronics
Microprocessors
Radio Engineering
Integrated circuit Design
Communication Theory
Digital Signal Processing
Control Engineering 1
Digital Communication Engineering & Design
Design of Microprocessor Applications
Microwave Frequency Engineering & Design
Digital Image Processing
Semiconductor Engineering
Electronic Engineering Seminar 2
Control Engineering 2
Numerical Analysis
Data Communication
Introduction to Robotics
Automotive Multimedia System
Design of applied Optical System
Digital Synthesis Design
Antenna Engineering & Design
Embedded System
Acoustic Communication Engineering
Mobile Communication Engineering & Design
Multimedia Applications
Communication System Engineering
Intelligent Vehicle
SOC Design
Optical Communication System
ICT Convergence Automotive Experiment
Electronic Engineering Field Practice 1
Electronic Engineering Field Practice 2

Computer and Information Communication Engineering Major Courses

Core Courses

Engineering Mathematics 1
Introduction to Engineering Design
C Programming & Practice
Linear Algebra
Logic Circuits Design
Discrete Mathematics

Computer System Architecture
Data Structures
Basic Practice in Computer Engineering
Probability and Statistics
C++ Programing and Lab
Operating System
Computer Engineering Project
Embedded Software
Computer Engineering Seminar 1
Computer Engineering Seminar 2
Computer Engineering Project 1 (Capstone Design)
Computer Engineering Project 2 (Capstone Design)

▮ Electives

ICT Fusion Introduction
Basic Circuit Theory
Applied Mathematics
Data Communication
Electronic Circuit 1
Electromagnetics
Data Base Systems
Signals and System Engineering
Digital Signal Processing
Digital Synthesis Design Project
Software Application Project
Artificial Intelligence
Microprocessors
Computer Networks
Ubiquitous Computing
Parallel Processing
Communication Theory
Distributed Systems
Digital Communication Engineering
Mobile Communication System
Digital Image Processing
SOC Design
Embedded Systems
Routing Protocol
Computer Systems in Medicine
Smart Vehicle System
Multimedia Systems
Intelligence Systems
Network Programming & Practice
Embedded Application Software
Application of Computer Fusion
Human Interface
Computer Information Security
Field Practice of Computer Engineering 1
Field Practice of Computer Engineering 2

Software Engineering Major Courses

▮ Core Courses

C Programming & Practice
Java Programming and Lab
Discrete Mathematics
Linear Algebra
Data Structures
Computer System Architecture
Probability and Statistics
Theory of Software Engineering
Data Base Systems
Operating Systems
Career Exploration
Software Engineering Integrated Project (Capstone Design)
Algorithm
Computer Networks
Theory of Programming Languages

▮ Electives

Logic Circuits
Linux System
Software Engineering-based Projects
Network Programming
C/C++ Programming and Lab
Object-oriented Design Project
Data Communication
Problem Solving Project
Computer Graphics
Windows Programming Project
Database Design Project
Web Programming and Lab
Artificial Intelligence
Computer & Networks Security
Compilers
3D Animation

Pattern Recognition
Mobile Application Software
Field Practice
Distributed Systems
Theory of Computation
Embedded Software
Digital Image Processing

Careers

Graduates of Electronic and Computer Engineering are actively working in various fields of society such as domestic companies, TV stations, and in public and venture companies as high-ranking public officers or patent agents.

Otherwise, they continue their studies at graduate schools for masters or doctoral degrees and become professors at universities or leading researchers in many industrial institutes or laboratories headed by large domestic companies and national and public laboratories. They include Samsung, LG, Daewoo, Hyundai, SK Hynix, TV stations, financial companies, KEPCO (Korea Electric Power Corporation), KT, SKT, NHN, ETRI, etc.

School of Polymer Science and Engineering

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What is School of Polymer Science and Engineering?

The goal of the School of Polymer Science and Engineering is to promote the development of engineering education by improving standards and guidelines of educational programs for engineering colleges and related education, thereby performing certification and consultation, and ultimately producing competent engineers.

School of Polymer Science and Engineering

School of Polymer Science and Engineering the following two majors to foster understanding that is necessary for the development of engineering: Polymer Engineering and Fiber Science Engineering.

Professors

- Su-Kyung Kim, Ph.D.
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- Gyun-Taek Lim, Ph.D.
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- Chang-Nam Choi, Ph.D.
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- Dong-Il Yoo, Ph.D.
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• Hyung-Woo Kim, Ph.D.
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Degree Requirements

Students are required to earn 140 credits, with 87 credits from School of Polymer Science and Engineering, and 41 credits from general courses.

Students in the ABEEK Program are required to earn 18 credits from general courses, 30 credits from MSC courses, and 70 credits from engineering topics courses.

What Do You Study?

Polymer Engineering Major Courses

Core Courses

Mathematics 1
Mathematics 2
General Chemistry 1
General Chemistry 2
Chemistry Laboratory 1
Chemistry Laboratory 2
Writing
Global Communication English
Computer for Real Life
Introduction to Engineering Design
Engineering Mathematics 1
Engineering Mathematics 2
Organic Chemistry 1
Physical Chemistry 1
Chemical Process Calculation 1
MATLAB Programming and Practice
Basic Experiment of Engineering Lab.1
Basic Experiment of Engineering Lab 2
Polymer Chemistry 1
Thermodynamics
Fluid Mechanics
Polymer Processing 1
Properties of Polymer 1
Polymer Engineering Lab. 1
Polymer Engineering Lab. 2
Separation Process

Electives

Materials Science
Energy Science and Technology
Organic Chemistry 2
Physical Chemistry 2
Chemical Process Calculation 2
Polymer Materials
Basic Design of Polymer Engineering
Polymer Chemistry 2
Instrumental Analytical Methods and Practice1
Nano Surface Science
Instrumental Analytical Methods and Practice2
Functional Polymers
Reaction Engineering
Heat Transfer
Polymer Processing 2
Properties of Polymer 2
Polymer Engineering Capstone Design 1
Polymer Engineering Capstone Design 2
Reactions of Polymers
Polymeric Composite Materials
Tests of Polymer Materials and Practice
Engineering Seminar
Elastomer Engineering
Rheology
Polymeric Nano-composites
Polymer Physical Chemistry and Practice
Plastics Recycling
Biopolymer

Energy Materials
Electronic Materials

Fiber Science Engineering Major Courses

Core Courses

Mathematics 1
Mathematics 2
General Chemistry 1
General Chemistry 2
Chemistry Laboratory 1
Chemistry Laboratory 2
Writing
Global Communication English
Computer for Real Life
Introduction to Engineering Design
Energy Science and Technology
Engineering Mathematics 1
Engineering Mathematics 2
Organic Chemistry 1
Organic Chemistry 2
Physical Chemistry 1
Physical Chemistry 1
MATLAB Programming and Practice
Basic Experiment of Engineering Lab.1
Basic Experiment of Engineering Lab 2
Introduction to Polymer Science
Introduction to IT Convergence Engineering
Nano Surface Science
Fundamental Design in Convergence Engineering
Convergence Engineering Lab. 1
Convergence Engineering Lab. 2

Electives

Materials Science
Natural polymers
Instrumental Analytical Methods
Fiber Physics
Carbon Materials Science and Technology
Synthetic Fibers
Nano Bio-technology
Color Science
Fiber Function Design
Convergence Materials Testing
Electrochemistry
Electronic Materials
Nano Science and Technology
Engineering Seminar
Application of coloring material and experiment
Fiber Assembly Engineering
Capstone Design 1 in Convergence Engineering
Capstone Design 2 in Convergence Engineering
Medical polymers
Property Design of Carbon Fibers
Functional Fiber
Applied Engineering for Nano Materials
Smart Fiber Materials
Energy Materials
High Tech Fibers
IT Applications in Convergence Engineering with Experiments

Careers

Graduates obtain employment in chemical plants (oil refinery, petrochemical, fertilizer, synthetic resin, oil and fat, food industry, inorganic chemistry, explosives, cement, glass, dye, rubber, paint, pulp and paper, metal, and smelting) in all parts of the country, including the Yeocheon and Ulsan districts, thermo-electrical and nuclear power plants, steel mills, photoelectron fields (semiconductor component/ equipment, LCD, and photo component manufacturing), textile-related fields, sales fields for trading companies, pharmaceutical fields, cosmetics fields, polymer-related fields, research institutes, and civil service.

Department of Industrial Engineering

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What is Industrial Engineering?

Industrial Engineering (IE), which plays a more important role in modern society than ever before, is a discipline that focuses on design, management, and improvement of systems composed of humans, machines, materials, energy, and information in a rapidly changing industrial environment. IE is primarily concerned with how to organize people, information, technology, money, and materials to produce and distribute products and services more efficiently. Its main objectives are to improve the productivity, safety, and resilience of systems and to find their optimal operation schemes. It is an interdisciplinary program, using engineering analyses, design principles and methods as well as natural scientific theories such as mathematics and physics, management, and professional knowledge of social sciences.

Department of Industrial Engineering

In the department of Industrial Engineering (IE), students learn about the design, management, and improvement of systems composed of human beings, machines, materials, energy, and information under rapidly changing industry surroundings, ultimately to determine the optimal operation scheme of a system and to improve system productivity and efficiency. The department of IE teaches students to analyze the cardinal characteristics of the industry and the business environment, and trains them how to utilize various methods towards optimal management and operation under given circumstances. The educational goals of IE program are to help students cultivate their management skills as well as engineering proficiency, to guide them to develop their problem solving and decision making skills, and to encourage them to be competent engineering leaders in a range of work domains.

Students are expected to obtain strong academic basics in undergraduate programs that are developed to offer classical as well as modern subjects in the field of IE in a systematic and logical manner.

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Degree Requirements

Students are required to earn 130 credit hours with 30 credits from liberal arts courses, 15 credits from department core courses, 33 credits from department electives, 21 credits from other courses, and 31 from general electives.

What Do You Study?

Core Courses

Introduction to Probability and Statistics
Basics of computer programming
Operations Research-I
Production Management-I
Capstone Design for Industrial Engineering

Electives

Object-Oriented Programming
Operations Research-II
Management Information System
Engineering Economy
Introduction to Engineering Design
Engineering Mathematics
Starting Up a Venture Business for Engineers
Management of Technology
Guides for University Students
Introduction to Data Mining
Data Analysis and its Applications
Design Engineering
Digital Design and Applications
Marketing and Technological Innovation Strategy
Logistics Management
Office Automation and DB Applications
Case Studies of Industrial Engineering
Introduction to Industrial Engineering
Special Topics in Industrial Engineering
Project of Industrial Engineering
Production Management-II
Service Engineering
Simulation and S/W Practice
Systems Analysis & Design
System Safety Engineering
Reliability Analysis & Design
Design of Experiments
Human Factors Engineering
Artificial intelligence and applications
Work & Process Management
Financial and Management Analysis
Information & Communication Systems
Theory of Constraints
Manufacturing engineering and practice
Product development engineering
Case Studies on Product and Technology Innovation
Knowledge Engineering
Quality Management
Quality Control
Project Management
Matrix and Linear Algebra
Human Interface Engineering
Application of C Programming

Careers

Graduates often find lucrative careers in the manufacturing industry. Alumni have also found positions in academia, civil service, and IT. The degree promises to be even more valuable in the future.

Department of Biotechnology & Bioengineering

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What is Biotechnology & Bioengineering?

Biotechnology & Bioengineering is believed to be one of the key disciplines leading to solve some of the most challenging problems that face our world today. Biotechnology & Bioengineering is defined as the biological application of engineering principles or engineering equipment in biological systems, food, energy, and the environment as well as healthcare. Incorporating recent advances in science and engineering including the fields of biology, chemistry, medicine, electrical and mechanical engineering, and information technology, Biotechnology & Bioengineering allows us to understand the phenomena of life and develops effective biology-based technologies.

Department of Biotechnology & Bioengineering

In 2012, the Biotechnology & Bioengineering department was reorganized into the College of Engineering from the major of Bioengineering at the School of Biological Sciences and Technology. Our department has been creatively fusing a broad area of bioengineering and life sciences to train and foster students to have an impact in corporate, professional and academic communities. Our mission aims to provide a fundamental bioengineering discipline grounded in basic sciences and the ability in realizing many various biological applications powered by practical and comprehensive curricula. It will allow students to acquire a high degree of confidence and motivation as bio-technologists and bio-engineers and to become engines in the fields of biotechnology including foods, medicine, pharmaceuticals, cosmetics, bioenergy and the environment.

Professors

- Jong-il Choi, Ph.D.
  [Biomolecules Engineering, choiji01@jnu.ac.kr]
- Seung Hwan Lee. Ph.D.
  [Metabolic Engineering. leesh@jnu.ac.kr]
- Sooim Shin, Ph.D.
  [Protein Engineering, sooim.shin@jnu.ac.kr]
- Tae Wan Kim, Ph.D.
  [Bioprocess Development & Optimization, chekimtw@jnu.ac.kr]

Degree Requirements

The undergraduate programs are designed to help students learn bioengineering disciplines as well as mathematics, physics, chemistry and biology. Students also obtain broad exposure to Chonnam National University's other great classes offered in other departments and colleges such as humanities and social sciences. Undergraduate students are required to earn at least 140 credits of coursework for graduation (a minimum of 69 units in department courses, a minimum of 41 units in liberal arts courses and a minimum of 30 units in elective courses). It normally takes four academic years of full-time study. Students may also undertake a second major or minor to broaden the scope of their studies.

What Do You Study?

Core Courses

Writing (3)
Global Communication English (3)
Mathematics 1 (3)
Mathematics 2 (3)
General Chemistry 1 (3)
Chemistry Laboratory 1 (1)
General Physics 1 (3)
General Biology 1 (3)
General Biology 2 (3)
Biology Laboratory 1 (1)
Biology Laboratory 2 (1)
Introduction to Engineering Design (3)
Biochemical Process Calculation (3)
Biochemical Separation Process (3)
Bio Engineering 1 (3)
Biochemical engineering Lab 1 (2)
Biochemical engineering Lab 2 (2)
Biochemical engineering Lab 3 (2)
Microbiology (3)
Bioprocess Engineering 1 (3)
Biochemistry 1 (3)
Organic Chemistry (3)
Physical Chemistry (3)
Engineering Mathematics 1 (3)
Capstone Design (3)

Electives

Bio Engineering 2 (3)
Applied Microbiology (3)
Introduction to Bioengineering and Biotechnology (3)
Transfer Operation (3)
Bioreaction Engineering and Design (3)
Bioanalytical Chemistry (3)
Bioprocess Control (3)
Bioinfomatics (3)
Metabolic Engineering (3)
Plant Design (3)
Bio Engineering Seminar 1 (1)
Fermentation Technology and Design (3)
Basic Research for Biotechnology & Bioengineering 1 (2)
Basic Research for Biotechnology & Bioengineering 2 (2)
MATLAB programing & Practice (3)
Enzyme Engineering (3)
Bioseparation and Purification Techniques (3)
Bioengineering Exercise (2)
Biochemical engineering Lab 4 (2)
Biomedical Engineering (3)
Instrumental Analytical Methods (3)
Protein Engineering (3)
Introduction to Biomedical Engineering (3)
Bioprocess Engineering 2 (3)
Biomaterials (3)
Environmental Biotechnology (3)
Biochemistry 2 (3)
Molecular Biology (3)

Principles of Chemical and Textile Engineering Education (3)
Materials Evaluation and Teaching Methods of Chemical and Textile (3)
Logic and Essay Writing in Chemical and Textile Engineering (2)
Engineering Mathematics 2 (3)
Food Engineering (3)
Genetic Engineering (3)

Careers

Some undergraduate students continue their academic endeavor by entering graduate schools in Korea as well as abroad. Others take a position in academia, public and private research institutes, and the industry. Moreover, some become involved in bio-venture businesses quite successfully.

Department of Energy & Resources Engineering

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What is Energy & Resources Engineering?

These days, natural resources are essential to develop domestic economies. Each country is trying to secure natural resource stability due to a lack of resources. Currently, our government is making efforts to develop the technology of resource extraction and to encourage advanced resource engineers because the issue of gaining resources is not simply based on geopolitical situations. In order to meet the demands of the time, the Department of Energy & Resource Engineering deals with applied geology & geochemistry, geophysical prospecting, resource development engineering, petroleum engineering, mineral processing, mine safety & environment, drilling engineering, and resource economics.

Professors

- Yang Hyungsik, Ph.D.
  [Professor, Rock Mechanics and Blasting Engineering,
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- Yoon Wangjung, Ph.D.
  [Professor, Geophysical Prospecting,
  wjyoon@jnu.ac.kr]
- Kim Myungjun, Ph.D.
  [Professor, Hydro-metallurgy and Recycling,
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- Lee Jong-Un, Ph.D.
  [Professor, Microbial Geochemistry,
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- Tam Tran, Ph.D.
  [Professor, Mineral Economics,
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- Lee Jeonghwan, Ph.D.
  [Associate Professor, Petroleum & Natural Gas,
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- Kil Youngwoo, Ph.D.
  [Associate Professor, Applied Geology & Geochemistry,
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- Kim Joonsoo, Ph.D.
  [Professor, Mineral Processing& Extractive metallurgy,
  jskim1186@jnu.ac.kr]

Degree Requirements

Students are required to earn 140 credits, with 48 credits from core courses within the Department, and 29 from general electives. Students will also be required to submit a graduate thesis, and demonstrate ability in a foreign language.

What Do You Study?

Core Courses

Engineering Mathematics 1
Introduction to Creative Design
Petrology and Lab
Exploration of Geochemistry & Lab
Exploration Geophysics & Design
Reservoir Engineering
Rock Mechanics & Design
Petroleum Engineering Laboratory
Seismic Prospecting & Lab
Hydrometallurgy and Lab
Resource Recycling Engineering & Lab
Resource Development Engineering
Field Training
Applied Geochemistry and Lab
Resource Economics
Energy & Resources Engineering Capstone Design

Electives

Engineering Mathematics 2
Mineralogy and Lab
Introduction of Energy Resources Engineering
Geology Information System Application
Power Technology, Mineral Processing & Design
Future Energy Resources Development Engineering
Rock Blasting and Design
Environmental geology
Science of Ore Deposits and Lab
Industrial Mineralogy and Lab
Tunnel Engineering & Design
New and Renewable Energy Engineering
Petroleum Production Engineering
Petroleum Drilling Engineering
Remote Sensing & Lab
GPR and Electromagnetic Prospecting
Interface Reactions-Flotation Design
Resource Evaluation and Design
Petroleum Geology
Mineral Processing & Plant Design
Safety Engineering for Resources Development
Underground Fluid Engineering
Mine Planning and Design
Thermodynamics of Natural Systems

Careers

Government Ministry

Ministry of Environment Republic of Korea, Ministry of Knowledge Economy

Institutes

Korea Institute of Geoscience and Mineral Resources(KIGAM), Korea Ocean Research & Development(KORDI), Korea Environment Institute, Korea Institute of Science & Technology Evaluation and Planning, etc.

Public Organization

Korea National Oil Corporation(KNOC), Korea Resources Corporation(KORES), Korea Rural Community Corporation, Korea GAS Corporation (KOGAS), etc.

Domestic Companies

SK, SK Energy, GS Caltex, SK E&C, GS E&C, Samsung C&T, Posco, Daewoo International Corporation, Daewoo Shipbuilding and Marine Engineering, STX Energy, etc.

The others

Mine Reclamation Corporation, Korea Energy Management Corporation, Korea Petroleum Association, etc.

Department of Electrical Engineering

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What is Electrical Engineering?

Electrical Engineering (EE) is based on sciences such as mathematics, physics, and chemistry. Electrical engineering students learn how to transform power sources such as fossil fuels, hydro-electricity, atomic, wind, solar light or heat, and tidal energy into electricity. Students learn how to transport this energy efficiently and steadily to distant places. Students also study how to transform electricity into other types of energy such as light, heat, and power. Ultimately, students search for the best materials, components, and systems when generating and transforming electricity.

Department of Electrical Engineering

The Department's primary educational goal is to train professionals who will play leading roles in the electrical engineering field. It also aims to cultivate students' abilities to earn careers in the industry by providing them with broad research opportunities that build on the academia-industry cooperation system.

The Department's goals can be broken down into the following practical aims:

- acquiring systematic knowledge and skills about general electrical engineering fields
- mastering the development, operation, and management ability of electrical application skills
- making effort toward the development of the electrical engineering industry.

The Department was chosen to participate in the Electrical Industry Basic Human Power Fostering Project and the New University for Regional Innovation Project by the Ministry of Commerce, Industry, and Energy. It provides students with various educational opportunities and scholarships. It recognizes the importance of rewarding scholarship systems to encourage outstanding students who have exceptional academic records and demonstrate good conduct, and welfare scholarship systems that support financially-limited students.

Professors

- Young-Cheol Lim, Ph.D.
  [Professor, Control and Instrumentation, yclim@jnu.ac.kr]
- In-Seon Yeo, Ph.D.
  [Professor, Illuminating Systems, isyeo@jnu.ac.kr]
- Kwang-Heon Kim, Ph.D.
  [Professor, Electric Machine Design, khk@jnu.ac.kr]
- Kyung-Woo Ryu, Ph.D.
  [Professor, Superconductivity Applications, kwryu@jnu.ac.kr]

- Joon-Ho Choi, Ph.D.
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- Sung-Jun Park, Ph.D.
  [Professor, Design of Electronic System Based on Micro Processors, sjpark1@jnu.ac.kr]
- Seon-Ju Ahn, Ph.D.
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- Yong-Hoon Choi, Ph.D.
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- Sang-Yun Yun, Ph.D.
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- Dong-Hee Kim, Ph.D.
  [Assistant Professor, Energy Mechatronics]

Degree Requirements

The undergraduate programs are designed to help students develop the understanding and capabilities needed to meet the challenges of a modern technological society. The students are required to take 140 credit hours (101 credits in a major of related courses and 39 credits in general studies courses), which normally takes four years of full-time study. The minor and double major programs are offered to give students an opportunity to broaden the scope of their major field.

What Do You Study?

Major required

Engineering Mathematics
Vector Analysis
Applied Mathematics
Electrical Engineering Basic Lab
Theory of Electrical Materials Properties
Electromagnetism 1
Electromagnetism 2
Circuit Theory 1
Circuit Theory 2
Automatic Control Engineering
Micro electronics Lab
Electric Machines
Smart Power System Engineering1
Electromagnetic Energy Conversion
Electronic Circuit

Major Electives

Internship
Introduction to Engineering Design
Introduction to Electrical Engineering
Engineering Software Applications
Computer Programming Language for Engineers
Optical Engineering
Digital Circuit
Design of Microprocessor Applications
High Voltage and High Current Engineering
Digital System Engineering
Renewable Energy System Engineering
Sensor Engineering
Automation of Industrial Process
Micom Applications Lab
Smart Power System Engineering 2
Dielectrics Engineering
Materials Engineering
Power Electronics
Illuminating Design
LED and OLED Lighting
Electric Vehicle Technology
Electrical Engineering Capstone Design 1
Electrical Engineering Capstone Design 2
Display Optics and Color Engineering
Power Distribution System Engineering

Display Electronics
Electrical Energy Storage Systems
Vehicle Power Conversion Control
Fundamentals of Power Communication Systems
Information and Communication Technology for Power System
Power System Operation Practice
Electricity Market Theory and Practice
Recent technical trends in Smart Grid
Electric Circuit Basic Lab
Electrical Engineering Seminar
Elecric Machine Applications Lab

Minor Required

Electromagnetism 1
Circuit Theory 1
Electromagnetic Energy Conversion
Electric Machine

Minor Electives

At least 9 credit hours of the major courses should be chosen.

Careers

Thanks to the fundamental engineering characteristics of electrical engineering, graduates are obtaining distinction in all industrial positions, including key national industrial companies and IT venture companies.

In particular, many graduates are currently employed by KEPCO, Samsung Electronics, LG Electronics, and Hyundai Heavy Industries.

Department of Civil Engineering

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What is Civil Engineering?

The fields of civil engineering offer careers in the planning, design, construction and management of the built environment as well as in the interaction between the built environment and the natural environment. Civil engineering plays an essential role to our community. There are significant interdisciplinary challenges in refining and maintaining the quality and sustainability of the infrastructure of interconnected systems, which are important to our quality of life. These systems include transportation, highways, rapid transit lines, airports, civil structures, construction materials, land surveying, stream channels, pipelines and wastewater treatment systems. The response of this infrastructure to natural hazards and environmental interaction is a critical challenge in this area. The faculty and staff within the civil engineering department are committed to educating the next generation of engineers and leading the development of this field through research and outreach

School of Civil Engineering at Jeonnam National University

The School of Civil Engineering is concerned with the control of the environment for the benefit of humankind. Civil engineers provide modern society with vital infrastructure and lifeline systems such as cities, roads, buildings, bridges, railroads, and water systems.

- 1951. 01: Establishment of Department of Civil Engineering
- 1999. 03: Reorganization of Departments of Civil, Earth, and Environmental Engineering
- 2002. 03: Reorganization of Departments of Civil, Geosystems, and Environmental Engineering
- 2009. 03: Reorganization of Department of Civil Engineering

Professors

- Woo Kim, Ph.D.
  [Professor, Structural Engineering, wkim@jnu.ac.kr]
- Tae-Jun Ha, Ph.D.
  [Professor, Highway and Traffic Engineering, tjha@jnu.ac.kr]
- Kyong-Hoon Rhee, Ph.D.
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- Inkyu Rhee, Ph.D.
  [Professor, Structural Mechanics and Material Science, rheei@jnu.ac.kr]
- Jae-Hong Oh, Ph.D.
  [Assistant Professor, Surveying and GIS, ojh@jnu.ac.kr]

Degree Requirements

The undergraduate programs are designed to help students develop the understanding and capabilities needed to meet the challenges of a modern technological society. Students are required to earn at least 130 credits (102 credits from Department courses and 28 from electives), which normally takes four years of full-time study to complete. The minor and the double major programs are offered to give students an opportunity to broaden the scope of their major fields.

What Do You Study?

Courses

Introduction to Civil Engineering & Design
Surveying and Practice 1
Fluid Mechanics
Probability and Statistic
Hydraulics and lab
Mechanics of Materials
Civil Engineering Materials and Lab
Civil Engineering (AI)
Structural Mechanics
Engineering Mathematics 1
Engineering Mathematics 2
Surveying and Practices 2
Dynamics Hydrology
Applied Hydraulics
Environmental Engineering
Advanced River Hydraulics
Soil Mechanics and Lab 1
Design of Concrete Structures 1
Highway Engineering and Design
Transportation Engineering
Soil Mechanics and Lab 2
Photogrammetry
Design of Concrete Structures 2
Construction Works & Design
Water Supply, Sewage Engineering & Design
Steel Structural Engineering
Dam Engineering
Pre-stressed Concrete
Urban & Transportation Planning
Foundation Engineering & Design
Coastal & Harbor Engineering
Geospatial Information Surveying
Construction Environment Influence Valuation & Design
Environmental Impact Assessment & Design
Noise and Vibration
Bridge Engineering
Railroad Engineering
Transportation Engineering
Rock Engineering & Design
Design for Soil Structure
Pavement Engineering & Design
Practical Design of Civil Engineering
Water Resources Engineering
Basic Computer Programming & Practice
Physics Laboratory 1
Chemistry Laboratory 1
Educational Theory in Construction
Study and Guidance on Constructional Teaching
Constructional Technology Logic and Essay Writing
Teaching Children with Learning Disabilities
Practical Affairs for the Teaching Profession
Teaching Practice 1
Teaching Practice 2

Careers

Graduates are currently playing active roles in central and local government organizations (e.g., Ministry of Construction and Transportation, Ministry of Environment, etc.), public corporations (Korea Water Resources Corporation, Korea SH Corporation, Korea Rural Community Corporation, Korea Highway Corporation, etc.), and research institutes (e.g., Korea Institute of Construction Technology). Also, private companies and corporations dealing with bridges, harbors, roads, and dams prefer to hire environmental engineers. Some graduates go on to graduate school to further specialize in their discipline in the field of civil engineering.

Department of Environment and Energy Engineering

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What is Environment and Energy Engineering?

The main objectives of environment and energy engineering are controlled use and preservation of environment and developing new renewable energy. Environment and energy engineering applies engineering and scientific principles to protect human health and to maintain and improve eco-systems. Our graduates are trained to design, build, operate, and manage organizations and facilities that protect people and the environment by developing new renewable energy. Environment and energy engineering is generally treated as an independent engineering discipline by the engineering profession. We live amid intricate interactions and complex problems created between living beings and their environments, or by variabilities of nature itself. These problems can have disastrous consequences of enormous magnitude and are very difficult to resolve. Environmental researchers investigate these interactions to guard each being from the harmful effects of others.

Department of Environment and Energy Engineering at Jeonnam National University

- 1992. 03: Establishment of Department of Environmental Engineering
- 1999. 03: Reorganization of Departments of Civil, Earth, and Environmental Engineering
- 2002. 03: Reorganization of Departments of Civil, Geosystems, and Environmental Engineering
- 2009. 03: Reorganization of Department of Environmental Engineering
- 2013. 03: Reorganization of Department of Environment and Energy Engineering

Professors

- Seon-Yong Chung, Ph.D.
  [Professor, Environmental Microbiology and Ecology, sychung@jnu.ac.kr]
- Yong-Woon Lee, Ph.D.
  [Professor, Water Quality Management System, ywlee@jnu.ac.kr]
- Sung-Yong Cho, Ph.D.
  [Professor, Eco-Energy and Air Pollution Engineering, syc@jnu.ac.kr]
- Seong-Jun Kim, Ph.D.
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- Jeong-Hun Park, Ph.D.
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- Seung-Shik Park, Ph.D.
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- Ho-Young Jung, Ph.D.
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- Sok-Hee Jung, Ph.D.

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Degree Requirements

The undergraduate programs are designed to help students develop both the understanding and capability needed to meet the challenges of a modern technological society. Students are required to earn at least 140 credit hours (69 from Department courses, 42 from cultural studies and 29 from electives), which normally takes four years of full-time study. Students may also earn double majors or minors as a means of broadening the scope of their studies.

What Do You Study?

Core Courses

Introduction to Engineering Design
Renewable Energy
Environmental Chemistry
Water Quality Management and Practice
Environmental Microbiology
Environmental Reaction and Design Engineering
Environmental Biotechnology and Practice
Coping Engineering with Air Pollution and Climate Change
Design of Combustion Facilities
Waste Resource Treatment and Energy Engineering
Environmental Energy Engineering and Practice
Air Pollution Management
Energy System Design
Hazardous Wastes Management and Soil Remediation Engineering
Environmental Engineering Capstone Design
Environmental Electrochemistry

Electives

Green Energy
Fluid Mechanics
Probability and Statistics
Engineering Mathematics 1
Introduction to Environmental Engineering
Environmental Ecology
Environmental and Energy Engineering Laboratory
Engineering Mathematics 2
Wastewater Treatment Engineering and Practice
Environmental Fundamental Laboratory
Environmental Engineering Laboratory 1
Environmental and Climate Change Impact Assessment
Atmospheric Particle Engineering and Experiments
Wastewater Treatment Engineering and Practice
Environmental Engineering Laboratory 2
Water Supply and Sewage Engineering
Energy Convergence Engineering
Waste Energy Engineering
Field Practice
Environmental Toxicology and Practice
Environment and Safety Engineering and Practice
Resources from Biomass
Bioenergy
Noise and Vibration
Environmental Chemistry of Soils
Industry-oriented Education and Practice
Environmental Process Design and Practice
Environmental Laws
Intellectual Properties in Environmental Energy Engineering

Careers

Graduates are currently playing active roles in central and local government organizations (e.g., Ministry of Environment), some public corporations (Korea Water Resources Corporation, Korea Environment Corporation, Korea Electric Power Corporation) and research institutes (e.g., National Institute of Environmental Research, Korea Institute of Energy Research).

Graduates also have careers in business corporations dealing with environmental impact assessment, air pollution control facilities, wastewater treatment, hazardous wastes treatment, environmental remediation, new renewable energy, and waste recycling facilities. They are usually in charge of the environment and safety of their company. Some graduates go on to graduate school to further specialize in their discipline of environment or energy engineering.