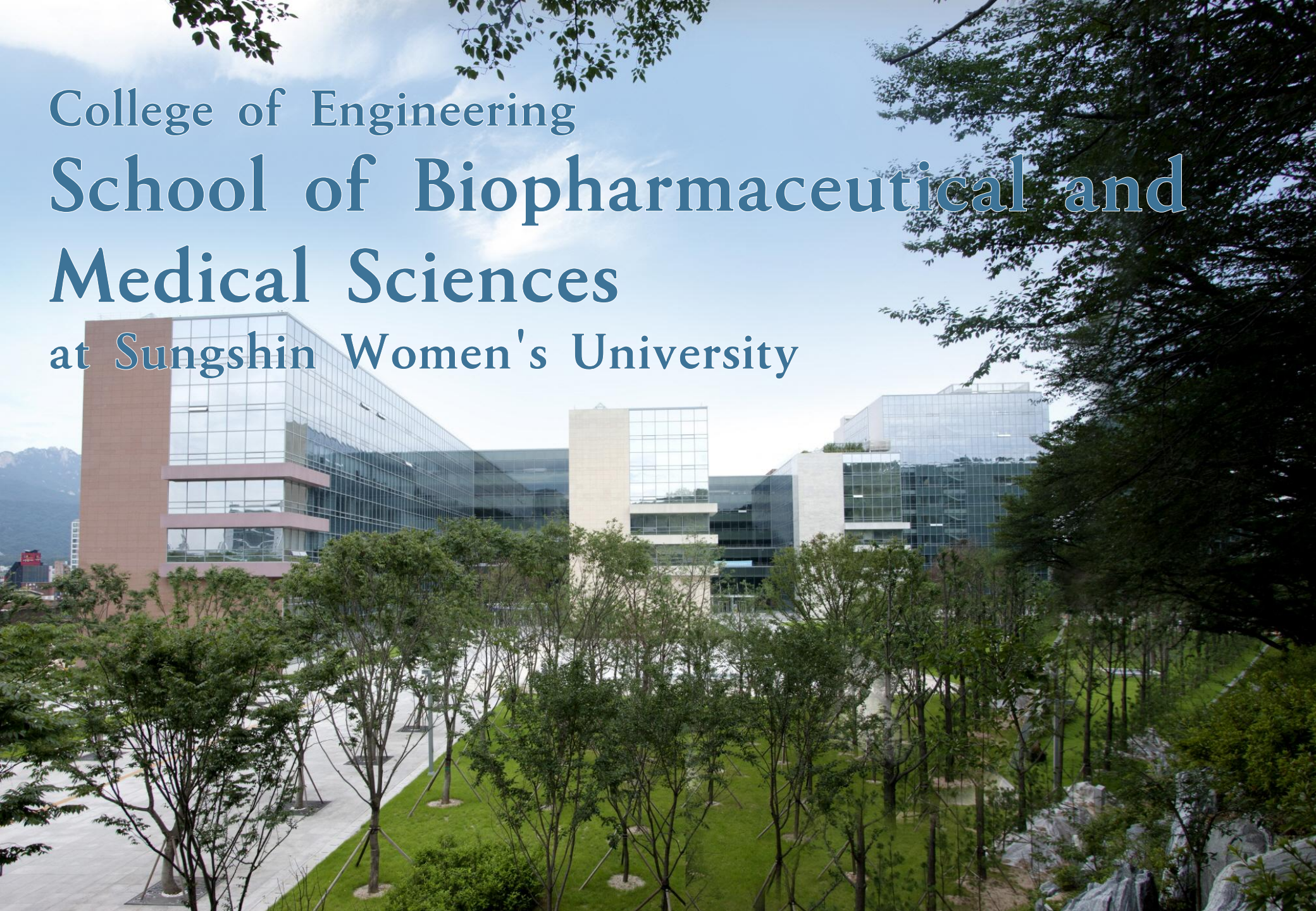
College of Engineering
School of Biopharmaceutical and Medical Sciences
at Sungshin Women's University

School Introduction

The School of Biopharmaceutical and Medical Sciences offers majors in Biopharmaceuticals and Global Medical Sciences. Students receive broad foundational training in biology, chemistry, mathematics, and related disciplines. In later years, specialized courses focus on biopharmaceutical development or medical life sciences. The Biopharmaceuticals major covers essential theories and practical skills for drug development processes, including cell culture and pharmaceutical analysis. The Global Medical Sciences major combines basic medical science courses with advanced English language learning, preparing students for research in medical life sciences and clinical medicine. Personalized academic and career guidance is provided through specialized tracks and a mentorship system.

Educational Goals

▶ Training expert researchers and industry professionals in the fields of new drug development and medical life sciences.
▶ Cultivating professionals with a strong grasp of phenomena and creative thinking skills.
▶ Developing future leaders with specialized expertise in each major.

Desired Student Model

▶ Problem-solving talents with a profound understanding of phenomena and interdisciplinary creativity
▶ Goal-oriented individuals embracing challenges with a proactive approach
▶ Global healthcare professionals with ethical values and professional integrity

Educational Goals

1. We cultivate creative female engineering talents leading the future biotechnology industry
2. We nurture life scientists exploring biological phenomena.
3. We foster creative talents with self-directed problem-solving skills.
4. Our goal is to cultivate practical talents by providing a balanced education in theoretical and experimental subjects.

Department Introduction

In the Department of Biotechnology, students delve into understanding life principles in diverse organisms and gain skills applicable to the biotech industry. The curriculum focuses on cultivating creative female engineering talents in life sciences, emphasizing hands-on experiences to develop biopharmaceuticals, stem cells, and more for the future food industry. The department's goal is to nurture practical biotech talents by bridging theoretical knowledge with experiments. Biotechnology, a key player in the future Fourth Industrial Revolution, creates a rising demand for professionals. The curriculum aims to prepare students for diverse roles in life sciences, biopharmaceutical development, drug management, and related fields. Graduates can pursue careers in various industries or engage in bio and biotech research or academia.

Desired Student Model

Creative and innovative female engineer with theoretical and technical expertise in the field of biotechnology.

Professors

Yoon Jinho, PhD

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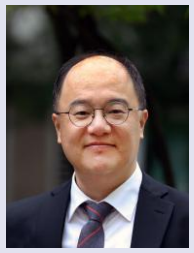

Kim Sangtae, PhD

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Kang Changsoo, PhD

Field	Human Genetics
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Cheon Yongpil, PhD

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Lee Jiyoun, PhD

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Choi Sangchul, PhD

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Professors

Ko Byoung Joon, PhD

Field	Biopharmaceutical Process Development; Omics-based Drug Discovery; Mass Spectrometry-based Protein Analysis
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Lee Jaewon, PhD

Field	Synthetic Biology, Metabolic Engineering, Microbiome
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Kim Dahyun, PhD

Field	Stem cell reprogramming, organoids, tissue engineering, regenerative medicine
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Na Junghyun, PhD

Field	Antibody Drug Discovery & Engineering; Antibody-based Drug Modalities; Antibody Discovery Platforms
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Kyung-A Hyun, PhD

Field	Biochip & Biosensor
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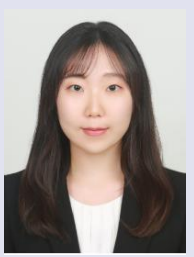

Yoo Soyeon, PhD

Field	Biopharmaceutical Delivery Platforms; Lipid Nanoparticle-based Gene Therapy; High-throughput Screening Platforms
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Lee Soojin, PhD

Field	Molecular Mechanisms of Neurodegenerative Diseases; RNA-based Gene Therapy
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Curriculum

Freshman

Department	Completion Type	Course Title (Course Code)	Schedule	Semester	Credit	Remarks
Biotechnology Major	Primary	General Biology Laboratory 1 (LG000200)	Annual	First	2	
Biotechnology Major	Primary	Introduction to Biotechnology 1 (LG004700)	Annual	First	3	
Biotechnology Major	Primary	General Biology Laboratory 2 (LG000500)	Annual	Second	2	
Biotechnology Major	Primary	Introduction to Biotechnology 2 (LG004800)	Annual	Second	3	

Curriculum

Sophomore

Department	Completion Type	Course Title (Course Code)	Schedule	Semester	Credit	Remarks
School of Biopharmaceutical and Medical Sciences	Primary	Organic Chemistry 1 (HB001900)	Annual	First	3	
School of Biopharmaceutical and Medical Sciences	Primary	Biochemistry 1 (HB003100)	Annual	First	3	
School of Biopharmaceutical and Medical Sciences	Primary	Biomedical Physics Laboratory (HB005600)	Annual	First	2	
Biotechnology Major	Primary	Cell Biology (LG000800)	Annual	First	3	
Biotechnology Major	Primary	Plant Systematics (LG000900)	Annual	First	3	
Biotechnology Major	Primary	Plant Systematics Laboratory (LG001200)	Annual	First	2	
Biotechnology Major	Primary	Ecology (LG001400)	Annual	First	3	
Biotechnology Major	Primary	Molecular Biology 1 (LG001700)	Annual	First	3	

Curriculum

Sophomore

Department	Completion Type	Course Title (Course Code)	Schedule	Semester	Credit	Remarks
Biotechnology Major	Primary	Introduction to Computational Biology (LG002900)	Annual	First	3	
School of Biopharmaceutical and Medical Sciences	Primary	Organic Chemistry 2 (HB002000)	Annual	Second	3	
School of Biopharmaceutical and Medical Sciences	Primary	Biomedical Calculus (HB004000)	Annual	Second	3	
School of Biopharmaceutical and Medical Sciences	Primary	Biochemistry 2 (HB004300)	Annual	Second	3	
Biotechnology Major	Primary	Anatomy, Histology, and Laboratory (LG001600)	Annual	Second	3	
Biotechnology Major	Primary	Microbiology (LG002400)	Annual	Second	3	
Biotechnology Major	Primary	Medical Genetics (LG004200)	Annual	Second	3	
Biotechnology Major	Primary	Molecular Biology 2 (LG004900)	Annual	Second	3	

Curriculum

Junior

Department	Completion Type	Course Title (Course Code)	Schedule	Semester	Credit	Remarks
School of Biopharmaceutical and Medical Sciences	Advanced	Immunology (HB002300)	Annual	First	3	
School of Biopharmaceutical and Medical Sciences	Advanced	Biopharmaceutical Process Laboratory (HB051100)	Annual	First	2	
School of Biopharmaceutical and Medical Sciences	Advanced	Pathophysiology (HB051800)	Annual	First	3	
School of Biopharmaceutical and Medical Sciences	Advanced	Advanced Biomaterials (HB052700)	Annual	First	3	
School of Biopharmaceutical and Medical Sciences	Advanced	Neuroscience (HB052800)	Annual	First	3	
School of Biopharmaceutical and Medical Sciences	Advanced	Biosensor Engineering (HB053000)	Annual	First	3	

Curriculum

Junior

Department	Completion Type	Course Title (Course Code)	Schedule	Semester	Credit	Remarks
School of Biopharmaceutical and Medical Sciences	Advanced	Advanced Biopharmaceuticals (HB050700)	Annual	Second	3	
School of Biopharmaceutical and Medical Sciences	Advanced	Biopharmaceutics (HB051300)	Annual	Second	3	
School of Biopharmaceutical and Medical Sciences	Advanced	Virology (HB051400)	Annual	Second	3	
School of Biopharmaceutical and Medical Sciences	Advanced	Pharmaceutical Quality Control and Biosensing Laboratory (HB052900)	Annual	Second	2	
Biotechnology Major	Advanced	Microbial Genetic Engineering Laboratory (LG002200)	Annual	Second	2	
Biotechnology Major	Advanced	Molecular Phylogenetics (LG002500)	Annual	Second	3	
Biotechnology Major	Advanced	Developmental Biology and Engineering (LG002600)	Annual	Second	3	
Biotechnology Major	Advanced	Conservation Biology (LG003100)	Annual	Second	3	

Curriculum

Senior

Department	Completion Type	Course Title (Course Code)	Schedule	Semester	Credit	Remarks
School of Biopharmaceutical and Medical Sciences	Advanced	Medicinal Chemistry 1 (HB004700)	Annual	First	3	
School of Biopharmaceutical and Medical Sciences	Advanced	Biomolecular Structure (HB051600)	Annual	First	3	
School of Biopharmaceutical and Medical Sciences	Advanced	Drug Delivery (HB052000)	Annual	First	3	
School of Biopharmaceutical and Medical Sciences	Advanced	Infection and Immunity Laboratory (HB052100)	Annual	First	2	
School of Biopharmaceutical and Medical Sciences	Advanced	Microbiome Engineering (HB053300)	Annual	First	3	
Biotechnology Major	Advanced	Stem Cell Engineering (LG003200)	Annual	First	3	
Biotechnology Major	Advanced	Creative Design in Biotechnology 1 (LG003300)	Annual	First	3	
Biotechnology Major	Advanced	Developmental Biology and Engineering Laboratory (LG003400)	Annual	First	2	
Biotechnology Major	Advanced	Evolutionary Biology (LG004100)	Annual	First	3	

Curriculum

Senior

Department	Completion Type	Course Title (Course Code)	Schedule	Semester	Credit	Remarks
School of Biopharmaceutical and Medical Sciences	Advanced	Medicinal Chemistry 2 (HB010100)	Annual	Second	3	
School of Biopharmaceutical and Medical Sciences	Advanced	Cancer Biology (HB052400)	Annual	Second	3	
School of Biopharmaceutical and Medical Sciences	Advanced	AI-based Drug Development Laboratory (HB052600)	Annual	Second	2	
School of Biopharmaceutical and Medical Sciences	Advanced	Gene Therapy Engineering (HB053100)	Annual	Second	3	
School of Biopharmaceutical and Medical Sciences	Advanced	Vaccinology (HB053200)	Annual	Second	3	

Curriculum

Senior

Department	Completion Type	Course Title (Course Code)	Schedule	Semester	Credit	Remarks
Biotechnology Major	Advanced	Bioinformatics (LG003500)	Annual	Second	3	
Biotechnology Major	Advanced	Bioinformatics Laboratory (LG003700)	Annual	Second	2	
Biotechnology Major	Advanced	Creative Design in Biotechnology 2 (LG003900)	Annual	Second	3	
Biotechnology Major	Advanced	Reproductive Physiology and Assisted R eproductive Technology (LG004000)	Annual	Second	3	
Biotechnology Major	Advanced	Tissue Engineering (LG004500)	Annual	Second	3	

Biopharmaceutical Track

Track Description

This track prepares students for biopharmaceutical research and development through coursework in biochemistry, biopharmaceutics, biopharmaceutical manufacturing, and quality control.

Related Major Competencies

Research proficiency, Practical expertise

Specialized Career Paths

Biopharmaceutical R&D, manufacturing and quality control, pharmaceutical companies, and graduate study

Curriculum

Area	Semester	Course Title	Credit
2	1	Organic Chemistry 1 (HB001900)	3
2	1	Biochemistry 1 (HB003100)	3
2	2	Biochemistry 2 (HB004300)	3
3	1	Biopharmaceutical Process Laboratory (HB051100)	2
3	2	Advanced Biopharmaceuticals (HB050700)	3
3	2	Biopharmaceutics (HB051300)	3
3	2	Pharmaceutical Quality Control and Biosensing Laboratory (HB052900)	2
3	1	Instrumental Analysis for Bioengineering (LG003600)	3

Biomedical Science Research Track

Track Description

This track is designed to cultivate research professionals in biomedical science through courses in disease mechanisms, molecular biology, immunology, and biotechnology.

Related Major Competencies

Research proficiency, Communication skills

Specialized Career Paths

Biomedical research, pharmaceutical and life science research, government-funded research institutes, graduate study

Curriculum

Area	Semester	Course Title	Credit
2	1	Organic Chemistry 1	3
2	2	Organic Chemistry 2	3
3	1	Immunology	3
3	1	Biopharmaceutical Process Laboratory	2
3	1	Pathophysiology	3
2	1	Cell Biology	3
3	1	Genetic Engineering	3
2	1	Molecular Biology 1	3
2	2	Molecular Biology 2	3

International Medical Specialist Track

Track Description

This track is designed to cultivate internationally oriented professionals with foundational knowledge in medicine and life sciences and practical communication skills for global healthcare settings.

Related Major Competencies

Practical expertise, Global communication skills

Specialized Career Paths

Pharmaceutical companies, medical data organizations, and international healthcare institutions

Curriculum

Area	Semester	Course Title	Credit
2	1	Biomedical Physics Laboratory	2
2	1	Organic Chemistry 1	3
2	2	Organic Chemistry 2	3
3	1	Immunology	3
3	1	Pathophysiology	3
3	2	Advanced Biopharmaceuticals	3
2	2	Anatomy, Histology, and Laboratory	3
2	1	Molecular Biology 1	3
2	2	Molecular Biology 2	3
2	2	Medical Genetics	3

Bio-Technology Entrepreneurship Track

Track Description

This track is designed to cultivate entrepreneurs who can translate biopharmaceutical and biotechnology knowledge into new products, services, and ventures.

Related Major Competencies

Practical expertise, Creativity and convergence

Specialized Career Paths

Biotechnology start-ups, pharmaceutical ventures, technology commercialization, and healthcare entrepreneurship

Curriculum

Area	Semester	Course Title	Credit
2	1	Organic Chemistry 1	3
2	2	Organic Chemistry 2	3
3	1	Immunology	3
2	1	Biochemistry 1	3
2	2	Biochemistry 2	3
3	2	Pharmaceutical Quality Control and Biosensing Laboratory	2
3	1	Biopharmaceutical Process Laboratory	2
3	2	Biopharmaceutics	3
4	2	AI-based Drug Development Laboratory	2
4	2	Gene Therapy Engineering	3

SUNGSHIN
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