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2026
COURSE CATALOG Graduate

Graduate Program

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College of Engineering

Department of Mechanical Engineering
[기계공학과]

■ Department Introduction [학과소개]

Mechanical Engineering deals with numerous systems and has a variety of important applications such as automobiles, aircraft, ships, home appliances, electronic devices, power plants and so on. The mechanical systems and the fundamental science and technology of mechanical and aerospace engineering have made dramatic advances and high impacts on the global economies and the standard of living. In the track of mechanical and aerospace engineering, students are educated and trained to learn the underlying principles of mechanical and aerospace engineering and to apply the knowledge to real-world examples and case studies hands-on. Disciplines include thermodynamics, fluid mechanics, solid mechanics, dynamics, machine design, advanced materials processing, laser-assisted manufacturing, micro/nano machining, unmanned vehicle control, MEMS, biomedical products, controls and mechatronics, acoustics, tribology and so on.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
Mechanical Engineering	Masters Program	At least 18 credits	At least 10 credits	At least 28 credits
	Doctoral Program	At least 18 credits	At least 42 credits	At least 60 credits
	Combined Master's-Doctoral Program	At least 30 credits	At least 30 credits	At least 60 credits

2. Curriculum [기계공학과 교육과정]

Category	Course Code	Classifi-cation	Course Title (Eng.)	Course Title (Kor.)	Cred.-Lect.-Exp.	Pre-requisite
Required	MEN590	Research	The Seminars	세미나	1-1-0	
	MEN690		Master's Research	석사논문연구	1~3	
	MEN890		Doctoral Research	박사논문연구	3~9	
Elective	MEN500	Lecture	Advanced Numerical Methods	수치해석특론	3-3-0	
	MEN501		Continuum Mechanics	연속체역학	3-3-0	
	MEN502		Advanced Mechanical Engineering Analysis	기계공학해석특론	3-3-0	
	MEN510		Advanced Thermodynamics	열역학특론	3-3-0	
	MEN511		Advanced Heat Transfer	열전달특론	3-3-0	
	MEN512		Advanced Combustion	연소특론	3-3-0	
	MEN513		Convection Heat Transfer	대류열전달	3-3-0	MEN310

Category	Course Code	Classifi-cation	Course Title (Eng.)	Course Title (Kor.)	Cred.-Lect.-Exp.	Pre-requisite
	MEN520		Advanced Fluid Mechanics	유체역학특론	3-3-0	
	MEN521		Microfluidics and Nanofluidics	미세유체역학	3-3-0	MEN220
	MEN522		Computational Thermofluid Engineering	전산열유체공학	3-3-0	
	MEN523		Aerosol Technology: Introduction	입자공학개론	3-3-0	[Code Share] MEN420
	MEN525		Turbulence	난류유동	3-3-0	
	MEN526		Experimental Methods in Fluid Mechanics	실험유체역학	3-3-0	
	MEN530		Advanced Solid Mechanics	고체역학특론	3-3-0	
	MEN531		Finite Element Method	유한요소법특론	3-3-0	[Code Share] MEN402
	MEN532		Mechanics of Composites	복합재역학특론	3-3-0	MEN432
	MEN533		Analysis and Design of Structures	구조해석 및 설계	3-3-0	
	MEN535		Computational Nanomechanics	전산나노역학	3-3-0	
	MEN540		Advanced MEMS	MEMS특론	3-3-0	
	MEN541		Bio MEMS	바이오MEMS	3-3-0	
	MEN542		Unconventional Nanomanufacturing	비전통적 나노가공기술	3-3-0	
	MEN543		Bio-Optofluidics: An Introduction	바이오광유체공학-기초개론	3-3-0	
	MEN544		Introduction to Optical Engineering	광공학개론	3-3-0	[Code Share] MEN441
	MEN552		Manufacturing Processes and Systems	생산공정 및 시스템	3-3-0	
	MEN554		Machine Tool Analysis and Control	공작기계 해석 및 제어	3-3-0	
	MEN556		Laser Material Interaction and Processing I	레이저 재료 상호작용 및 가공 I	3-3-0	
	MEN557		Polymer and Composite Manufacturing	고분자 및 복합재료 제조공정	3-3-0	
	MEN558		Reliability Engineering	신뢰성 공학	3-3-0	
	MEN559		Advanced Additive Manufacturing	고등적층제조	3-3-0	
	MEN570		Advanced Dynamics	동역학특론	3-3-0	
	MEN573		Advanced Control Systems I	고급제어 I	3-3-0	
	MEN575		Electromechanical dynamics	전자기기 동력학	3-3-0	
	MEN576		Biomechanics of Movement	생체역학	3-3-0	
	MEN577		Optimal State Estimation: Kalman Filter	최적상태추정: 칼만필터	3-3-0	
	MEN591		Special Topic Ⅰ	기계공학특론 Ⅰ	3-3-0	
	MEN592		Special Topic Ⅱ	기계공학특론 Ⅱ	3-3-0	
	MEN593		Special Topic Ⅲ	기계공학특론 Ⅲ	3-3-0	
	MEN594		Special Topic Ⅳ	기계공학특론 Ⅳ	3-3-0	

Category	Course Code	Classifi-cation	Course Title (Eng.)	Course Title (Kor.)	Cred.-Lect.-Exp.	Pre-requisite
	MEN595		Special Topic V	기계공학특론 V	3-3-0	
	MEN601		Introduction to Optimization	최적화개론	3-3-0	[Code Share] MEN454
	MEN624		Aerosol Technology	에어로졸특론	3-3-0	MEN523
	MEN631		Elastic Waves	탄성파특론	3-3-0	
	MEN656		Laser Material Interaction and Processing Ⅱ	레이저 재료 상호작용 및 가공Ⅱ	3-3-0	
	MEN670		Autonomous Unmanned Vehicles	자율무인이동체	3-3-0	MEN577
	MEN671		Robot Mechanics	로봇역학	3-3-0	
	MEN672		Nonlinear Systems	비선형 시스템	3-3-0	MEN573
	MEN741		Bioinspired Technology	생체모사공학	3-3-0	
	MEN742		Bioaerosol Technology	바이오에어로졸	3-3-0	
	MEN755		Net Shape Manufacturing	소성가공	3-3-0	
	MEN773		Advanced Control Systems Ⅱ	고급제어Ⅱ	3-3-0	MEN573
	MEN774		System Identification and Adaptive Control	시스템식별 및 적응제어	3-3-0	
	MEN796		Special Topic Ⅵ	기계공학특론 Ⅵ	3-3-0	
	MEN797		Special Topic Ⅶ	기계공학특론 Ⅶ	3-3-0	
	MEN798		Special Topic Ⅷ	기계공학특론 Ⅷ	3-1-4	
	MEN799		Special Topic Ⅸ	기계공학특론 Ⅸ	3-1-4	

1) Rule of Course no.: The second number indicates the characteristics of the subject.
- MEN*0*: Common subjects
- MEN*1*: Thermal engineering
- MEN*2*: Fluid engineering
- MEN*3*: Mechanics
- MEN*4*: Nano / Bio engineering
- MEN*5*, MEN*6*: Design / Manufacturing
- MEN*7*, MEN*8*: Dynamics / Control / Robotics

3. Curriculum Change [교육과정 변경사항]

2025	→	2026
<NEW>	→	MEN544 Introduction to Optical Engineering 광공학개론 *MEN441 교과목과 학위과정 간 코드셰어
		MEN671 Robot Mechanics 로봇역학

Department of Civil, Urban, Earth, and Environmental Engineering [지구환경도시건설공학과]

■ Department Introduction [학과소개]

Climate change and environmental pollution caused by global urbanization and industrialization have imposed an increasing threat to the entire future of mankind. With no surprise, studies on these issues are drastically gaining in importance. Urban and Environmental Engineering is an interdisciplinary field of study that is dedicated to education and research on the resilient protection of natural and built environments against disasters, as well as the sustainable development of urban society. In this field, the students will learn fundamental knowledge associated with urban and environmental issues, and will explore more advanced courses regarding Environmental Sciences and Engineering (climate change, water and air treatment, environmental analysis and modeling), Urban Infrastructure Engineering (urban planning, construction materials, structural mechanics and design, health monitoring), and Disaster Management Engineering (fine dust, earthquake, typhoon). The Department of Urban and Environmental Engineering at UNIST is committed to developing innovative technologies in the related fields and cultivating future leaders who will make a huge impact on our profession and society.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
Urban Infrastructure Engineering 도시건설공학 Disaster Management Engineering 재난관리공학 Environmental Science and Engineering 환경과학공학 Water-Energy Nexus 물·에너지 융합	Masters Program	At least 18 credits	At least 10 credits	At least 28 credits
	Doctoral Program	At least 15 credits	At least 45 credits	At least 60 credits
	Combined Master's-Doctoral Program	At least 24 credits	At least 36 credits	At least 60 credits

2. Curriculum [지구환경도시건설공학과 교육과정]

Category	Course Code	Classification	Course Title (Eng.)	Course Title (Kor.)	Cred. -Lect. -Exp.	Pre requisite
Required	CUEE690	Research	Master's Research	석사논문연구	Value of Credit	
	CUEE890		Doctoral Research	박사논문연구	Value of Credit	
Elective	EES590	Research	Seminar	세미나	1-1-0	
	UIE590		Seminar	세미나	1-1-0	
	ENV505	Lecture	Wastewater Microbiology	폐수미생물학	3-3-0	
	ENV604		Aquatic Chemistry	수질화학	3-3-0	
	ENV607		Environmental Ethics	환경윤리학	3-3-0	
	ENV608		Bioprocess Modeling and Control	생물공정모델링 및 공정제어	3-3-0	
	ENV610		Advances in Water Quality Modeling	고급 수질 모델링	3-3-0	
	ENV703		Introduction to Advanced Oxidation Technology	고도산화기술개론	3-3-0	
	ENV706		Introduction to Membrane Technology to Water/Wastewater Treatment	수처리/폐수처리 분리막 개론	3-3-0	
	ENV707		Environmental Biotechnology	환경생명공학기술	3-3-0	
	ENV802		Special Topics for Environmental Engineers I	환경문제특수해석 I	3-3-0	
	ENV803		Special Topics for Environmental Engineers II	환경문제특수해석 II	3-3-0	
	ENV805		Special Topics for Environmental Engineers III	환경문제특수해석 III	3-3-0	
	ENV808		Special Topics for Environmental Engineers	환경과학공학 특론	3-3-0	
	EES502		Introduction to Environmental Analysis	환경분석개론	3-3-0	
	EES503		Advanced Atmospheric Dynamics I	고급대기역학 I	3-3-0	
	EES504		Mass Spectrometry	질량분석학	3-3-0	CHM211
	EES505		Tropical Meteorology	열대기상학	3-3-0	
	EES602		Gas Hydrates and Climate Change	가스 하이드레이트와 기후변화	3-3-0	
	EES603		Advanced Atmospheric Dynamics II	고급대기역학 II	3-3-0	
	EES604		Analysis and Monitoring of Organic Pollutants	유기오염물질 분석 및 모니터링	3-3-0	
	EES605		Air Pollution Management	대기오염관리	3-3-0	
	EES611		Climate-Environment Modeling	기후환경 모델링	3-3-0	
	EES620		Modeling of Atmospheric Chemistry	대기화학 모델링	3-3-0	

Category	Course Code	Classification	Course Title (Eng.)	Course Title (Kor.)	Cred. -Lect. -Exp.	Pre requisite
	EES651		Remote Sensing of the Environment	환경원격탐사	3-3-0	
	EES652		Machine Learning for Remote Sensing Applications	원격탐사활용을 위한 인공지능	3-3-0	
	EES653		Atmospheric Radiation	대기복사론	3-3-0	
	EES680		Special Topics in Earth and Environmental Sciences Ⅰ	지구환경과학 특강 Ⅰ	3-3-0	
	EES681		Special Topics in Earth and Environmental Sciences Ⅱ	지구환경과학 특강 Ⅱ	3-3-0	
	EES682		Special Topics in Earth and Environmental Sciences Ⅲ	지구환경과학 특강 Ⅲ	3-3-0	
	EES803		Current Topics in Carbon Dioxide Capture and Storage	이산화탄소 회수 및 저장 특론	3-3-0	
	UIE501		Continuum Mechanics of Solids	고체연속체역학	3-3-0	
	UIE502		Structural Dynamics	구조동역학	3-3-0	
	UIE503		Earthquake Resistant Design	내진설계론	3-3-0	
	UIE504		Low-carbon Concrete	저탄소 콘크리트 공학	3-3-0	
	UIE505		Research Methods for Urban Studies	도시연구방법론	3-3-0	
	UIE507		Fine Element Method	유한요소법	3-3-0	
	UIE509		Urban Design Workshop	도시설계워크샵	3-3-0	
Elective	UIE510	Lecture	Advanced Engineering Mathematics	고급공학수학	3-3-0	
	UIE511		Mechanics of Composites and Fiber Reinforced Cement Composites	복합재료 역학 및 섬유보강 시멘트 복합재료	3-3-0	
	UIE512		Acoustics and Elastic Wave Propagation	음향학 및 탄성파이론	3-3-0	
	UIE602		Crack Analysis in Concrete	콘크리트 균열해석	3-3-0	
	UIE603		Time-Dependent Properties of Concrete	콘크리트 시간의존적 특성	3-3-0	
	UIE606		Planning for Housing	도시주택론	3-3-0	
	UIE680		Special Topics in Urban Infrastructure Engineering I	도시기반시설공학특론 I	3-3-0	
	UIE681		Special Topics in Urban Infrastructure Engineering II	도시기반시설공학특론 II	3-3-0	
	UIE682		Special Topics in Urban Infrastructure Engineering III	도시기반시설공학특론 III	3-3-0	
	UIE704		Concrete Micro-characterization	콘크리트 미세구조분석	3-1-4	
	UIE706		Urban Regeneration	도시재생	3-3-0	
	UIE707		Theory of Planning	계획이론	3-3-0	
	UIE804		Urban Modeling and Simulation	도시 시뮬레이션	3-3-0	
	DME502		Structural Reliability	구조신뢰성	3-3-0	CUEE351
	DME506		Numerical Weather Prediction	수치 예보	3-3-0	

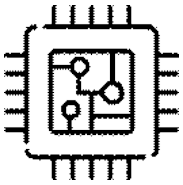
Category	Course Code	Classification	Course Title (Eng.)	Course Title (Kor.)	Cred. -Lect. -Exp.	Pre requisite
Elective	DME507	Lecture	Climate and Air Pollution : Integrated Approach	기후와 대기환경 : 통합적 접근	3-3-0	
	DME509		Geotechnical Earthquake Engineering	지반지진공학(지진학)	3-3-0	
	DME510		Structural Geology	구조지질학	3-3-0	
	DME511		Geotechnical Site Investigation	지반조사 (지구내부물리학)	3-3-0	
	DME512		Soil Dynamics	토질동역학(지반동역학)	3-3-0	
	DME513		Advanced Soil Mechanics	고급토질역학	3-3-0	
	DME514		Geosystem Modeling	지반시스템모델링	3-3-0	
	DME515		Geoenvironmental Engineering	지반환경공학	3-3-0	
	DME602		Earthquake Engineering	지진공학(내진공학)	3-3-0	UIE502
	DME603		Business impact analysis and theory of risk management	업무영향분석 및 위험평가론	3-3-0	
	DME604		Reliability of Infrastructure Systems	사회기반시설시스템의 신뢰성	3-3-0	DME502
	DME605		Disaster Law	방재법규	3-3-0	
	DME606		Disaster Theory and Practice	재난이론과 응용(재난관리론)	3-3-0	
	DME607		Disasters and Environmental Economics	재난 및 환경경제학	3-3-0	
	DME610		Micro-meteorology and Environment	환경미기상학	3-3-0	
	DME680		Special Topics in Disaster Management Engineering I	재난관리공학특론 I	3-3-0	
	DME681		Special Topics in Disaster Management Engineering II	재난관리공학특론 II	3-3-0	
	DME682		Special Topics in Disaster Management Engineering III	재난관리공학특론 III	3-3-0	
	DME702		Advanced Numerical Modeling for Weather	고급기상수치모델링	3-3-0	
	DME703		Random Vibrations	불규칙진동론	3-3-0	UIE502

3. Curriculum Change [교육과정 변경사항]

2025	→	2026
<NEW>	→	EES620 Modeling of Atmospheric Chemistry 대기화학 모델링

Graduate School of Semiconductor Materials and Devices Engineering [반도체소재·부품대학원]

■ Department Introduction [학과소개]



The Graduate School of Semiconductor Materials and Devices Engineering is a highly interdisciplinary graduate program at Ulsan National Institute of Science and Technology (UNIST) aiming at educating talents in semiconductor materials, devices, processing and equipments. As internationally recognized, UNIST has shown top-tier research capabilities in materials science and engineering, so this new graduate program will be bringing additional academic curriculum and research activities to the campus and offer the world-class research programs in the fields of 1) Next-generation semiconductor materials, 2) Future display materials, and 3) Characterization of semiconductor materials/devices.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
Semiconductor Materials and Devices Engineering 반도체소재·부품공학	Masters Program	At least 18 credits	At least 10 credits	At least 28 credits
	Doctoral Program	At least 12 credits	At least 48 credits	At least 60 credits
	Combined Master's-Doctoral Program	At least 24 credits	At least 36 credits	At least 60 credits

2. Curriculum [반도체소재부품대학원 교육과정]

Category	Course code	Classification	Course Title	Course Title (Kor.)	Cred. -Lect. -Exp.
Required	SE590	Research	The Seminar I	세미나	1-1-0
	SE690		Master's Research	석사논문연구	1~3
	SE890		Doctoral Research	박사논문연구	3~9
Elective	SE510	Lecture	Advanced Semiconductor Process: Bridging Theory and Practice	반도체 실무 공정	3-3-0
	SE511		Semiconductor Processing and Device Lab	반도체 소자 실험/실습	3-0-6
	SE520		Semiconductor Materials Procperties	반도체재료물성	3-3-0
	SE521		VLSI Processing Technology	VLSI공정기술	3-3-0
	SE522		Analytical Instrument for Semiconductor Materials	반도체소재분석기기학	3-3-0
	SE523		Synchrotron Radiation Science and Technology	방사광과학과기술	3-3-0
	SE527		Introduction to Plasma Physics	플라즈마 물리학 입문	3-3-0
	SE530		Nano Semiconductor Materials	나노반도체소재	3-3-0
	SE531		Nanoscale Electronic Materials	나노전자재료	3-3-0
	SE532		Materials for Magnetic Memory Devices	자성메모리소재	3-3-0
	SE533		Intelligent Materials and Applications	지능형전자기소재	3-3-0
	SE534		Materials for Organic Electronics : Display Materials	유기전자재료:디스플레이	3-3-0
	SE535		Special Topics in Polymer	고분자물리특론	3-3-0
	SE536		Advanced Optical Materials and Devices	고급광학소재및소자	3-3-0
	SE537		Nanomaterials for QLED	양자점디스플레이소재	3-3-0
	SE538		Advanced Polymer Chemistry Experiment in Semiconductor Device Analysis	고급고분자화학	3-3-0
	SE540		Quantum Field Theory of Electrons, Photons, Phonons in Condensed Matters	물성계의 양자장론	3-3-0
	SE550		Inorganic Materials Synthesis	무기소재합성	3-3-0
	SE551		Nanomechanics	나노역학	3-3-0
	SE577		Microelectronics Lab	전자소자실험	3-1-4
	SE578		Advanced Semiconductor Device Engineering	고급 반도체소자 공학	3-3-0
	SE581		Advanced semiconductor process and computational science	반도체 공정과 계산과학	3-3-0
	SE586		RF Microelectronics: Transistor Amplifier Design	RF능동회로: 트랜지스터증폭기설계	3-3-0
	SE610		Introduction to plasma processes in semiconductor manufacturing	플라즈마 공정 입문	3-3-0
	SE613		Advanced Quantum Physics	고급 양자물리학	3-3-0
	SE620		Experiment in Semiconductor Device Analysis	반도체소자분석	3-1-4
	SE622		X-ray Techniques of Material Analysis	X-선소재분석학	3-1-4

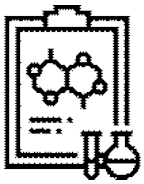
Category	Course code	Classification	Course Title	Course Title (Kor.)	Cred. -Lect. -Exp.
	SE623		Advanced Mass Spectrometry	고급질량분석학	3-3-0
	SE624		Experimental Mass Spectrometry	질량분석학	3-1-4
	SE630		Memory and Neuromorphic Device	메모리와뉴로모픽소자	3-3-0
	SE631		Semiconductor Device Physics	반도체소자물리	3-3-0
	SE632		X-ray Techniques of Material Analysis	나노반도체소자	3-3-0
	SE633		Special Topics on Lithography	리소그라피특론	3-3-0
	SE634		Thin Film Technology	박막공학	3-3-0
	SE635		Interface Physics of Electronic Devices	전자소자계면물리	3-3-0
	SE636		Introduction to Spintronics	스핀트로닉스	3-3-0
	SE637		Organic Optoelectric Materials and Devices	유기광전자재료및디바이스	3-3-0
	SE638		Wearable Displays	웨어러블디스플레이	3-3-0
	SE639		Surface and Interface Science of Nanomaterials	나노재료표면및계면	3-3-0
	SE640		Simulation of Microstructures using Monte Carlo Method	미세구조 전산모사	3-3-0
	SE641		Semiconductor Epitaxy (Experimental Mehtods in Applied Physics)	반도체에피탁시	3-3-0
	SE642		Nanochemistry for Semiconductor	반도체나노화학	3-3-0
	SE650		Amorphous Oxide Semiconductors and Devices	산화물 반도체 및 소자	3-3-0
	SE676		AI and Machine Learning for Semiconductor Materials and Devices Engineering	반도체 소자 공학을 위한 AI 이해	3-3-0
	SE681		Special Topics on Semiconductor Materials and Devices Engineering I	반도체공학특론 I	3-3-0
	SE682		Special Topics on Semiconductor Materials and Devices Engineering II	반도체공학특론 II	3-3-0
	SE683		Special Topics on Semiconductor Materials and Devices Engineering III	반도체공학특론 III	3-3-0
	SE684		Special Topics on Semiconductor Materials and Devices Engineering IV	반도체공학특론 IV	3-3-0
	SE685		Special Topics on Semiconductor Materials and Devices Engineering V	반도체공학특론 V	3-3-0
	SE734		Special Topics on Thin Films Deposition	박막공학 특론	3-3-0

3. Curriculum Change [교육과정 변경사항]

2025	→	2026
<NEW>	→	SE610 Introduction to plasma processes in semiconductor manufacturing 플라즈마 공정 입문

Department of Materials Science and Engineering [신소재공학과]

■ Department Introduction [학과소개]



The Department of Materials Science & Engineering is an interdisciplinary field which emphasizes the study on the interrelationship among processing, structure, and properties in materials. One who is in this discipline will be able to identify the key issues and strategies for any given challenges in materials development, based on deep understanding of the interrelationship. To this end, the Department of Materials Science & Engineering offers a range of subjects from fundamentals such as Thermodynamics in Materials and Crystallography to up-to-dated advanced courses covering specific topics such as next generation semiconductors, energy conversion materials, and flexible materials.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
Materials Science and Engineering 신소재공학	Masters Program	At least 18 credits	At least 10 credits	At least 28 credits
	Doctoral Program	At least 12 credits	At least 48 credits	At least 60 credits
	Combined Master's-Doctoral Program	At least 24 credits	At least 36 credits	At least 60 credits

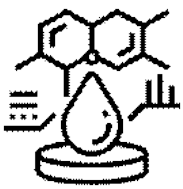
2. Curriculum [신소재공학과 교육과정]

Category	Course code	Classification	Course Title	Course Title (Kor.)	Cred. -Lect. -Exp.
Required	MSE590	Research	The Seminar I	세미나 I	1-1-0
	MSE690		Master's Research	석사논문연구	1~3
	MSE890		Doctoral Research	박사논문연구	3~9
Elective	MSE591	Research	The Seminar II	세미나 II	1-1-0
	MSE511	Lecture	Nano Mechanics	나노역학	3-3-0
	MSE520		Inorganic Materials Synthesis	무기소재합성	3-3-0
	MSE531		Light Emitting Diodes	LED공학개론	3-3-0
	MSE532		Dielectric Ceramics: From Fundamentals to Applications	유전체공학	3-3-0
	MSE540		Wearable Electronics	웨어러블 전자소자	3-3-0
	MSE541		Memory/Neuromorphic Devices and Applications	메모리및뉴로모픽소자	3-3-0
	MSE551		Surface and Interface Sciences	표면 및 계면과학	3-3-0

Category	Course code	Classification	Course Title	Course Title (Kor.)	Cred.-Lect.-Exp.
	MSE552		Characterization, Microstructure and Anisotropy of Materials	재료의 집합조직 및 이방성	3-3-0
	MSE554		Nanoscale Electronic Materials	나노전자재료	3-3-0
	MSE570		Intelligent Materials and Applications	지능형소재및시스템	3-3-0
	MSE571		Organic Optoelectric Materials and Devices	유기광전자재료 및 디바이스	3-3-0
	MSE573		Materials for Biomedical Applications	생명공학재료	3-3-0
	MSE574		Advanced Computational Materials Science	전산재료과학특론	3-3-0
	MSE580		Polymer Structures and Properties	고분자구조및물성	3-3-0
	MSE600		Electrochemical Materials and Devices	전기화학 소재 및 소자	3-3-0
	MSE602		Advanced Instrumental Analysis	고급기기분석	3-3-0
	MSE612		Alloy Design	합금설계	3-3-0
	MSE681		Special Topics on Materials Science Engineering I	신소재공학특론I	3-3-0
	MSE682		Special Topics on Materials Science Engineering II	신소재공학특론II	3-3-0
	MSE683		Special Topics on Materials Science Engineering III	신소재공학특론III	3-3-0
	MSE684		Special Topics on Materials Science Engineering IV	신소재공학특론IV	3-3-0
	MSE685		Special Topics on Materials Science Engineering V	신소재공학특론V	3-3-0
	MSE686		Special Topics on Materials Science Engineering VI	신소재공학특론VI	3-3-0
	MSE687		Special Topics on Materials Science Engineering VII	신소재공학특론VII	3-3-0
	MSE688		Special Topics on Materials Science Engineering VIII	신소재공학특론VIII	3-3-0
	MSE731		Advanced Magnetic Mateirals	자성재료특론	3-3-0
	MSE754		Advanced Semiconductor Devices	고급반도체소자론	3-3-0
	MSE755		Introduction to Spintronics	스핀트로닉스개론	3-3-0
	MSE756		Optical Properties of Semiconductors and Solids	반도체 및 고체재료의 광학적특성	3-3-0
	MSE772		Advanced Polymer Physics	고급고분자물리학	3-3-0
	MSE851		Advanced Transmission Electron Microscopy	전자현미경학특론	3-3-0

School of Energy and Chemical Engineering
[에너지화학공학과]

■ School Introduction [학과소개]



1) **Energy Engineering** provides exciting and unique opportunities that deal with production, conversion, storage, and efficiency of energy, and alternative energy technologies from a basic concept to practical technology. we combine courses from chemistry, electrochemistry, polymer, ceramics, physics, and materials engineering to create a strong knowledge base essential to success in energy-related areas. Students have the opportunity to take courses and research focused on specific energy research subjects that includes solar cell, fuel cell, battery, and other energy-related devices and materials. Along with research activities, students will be well-prepared for career focused on energy science and engineering and creatively apply their knowledge to confront the global challenges of energy supply and demand.

2) **Battery Science and Technology** provides students with a sound basic and practical engineering knowledge-base overlaid with established and emerging battery technology learning through in-depth discussions and laboratory experiments. We focus on the application of scientific principles to design and fabricate novel next generation battery system, which is a key aspect of today's green technology such as portable electronics, electric vehicles, and 'smart grid' power distribution. In order to make significant breakthrough in battery technology, we also make a good effort to understand scientific phenomena such as charge and ion transport, and crystallographic transition of materials based on the fundamental electrochemistry and solid state chemistry. Studying a graduate program of Battery Science and Technology at UNIST offers students a firm professional basis in both of academia and industry.

3) **Chemical Engineering** aims to be a world-leader. Regarded as one of the finest institution in Korea, this school provides its graduate students with a state-of-the-art research environment and facilities. We focus on the application of Chemical engineering to a variety of specific areas, including energy and the environment, catalysis, reaction engineering, systems and process design, nanotechnology, polymers and colloids and biotechnology. It is a multi-scale engineering school in which students can learn about the creative design of new Chemicals, materials, processes and systems by translating molecular level information into novel engineering principles. Faculty members are involved in cutting-edge research programs that encompasses all areas of Chemical engineering: Nanoscience, Materials Science, Catalysis, Electronic Materials and Devices, Colloidal Science and Chemical Engineering. The graduate students and post doctoral researchers will have access to state-of-the-art facilities on campus, such as the UCRF and Chemical Sciences Facility.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
Energy Engineering	Masters Program	At least 15 credits	At least 13 credits	At least 28 credits
	Doctoral Program	At least 15 credits	At least 45 credits	At least 60 credits
	Combined Master's–Doctoral Program	At least 24 credits	At least 36 credits	At least 60 credits
Battery Science and Technology	Masters Program	At least 15 credits	At least 13 credits	At least 28 credits
	Doctoral Program	At least 15 credits	At least 45 credits	At least 60 credits
	Combined Master's–Doctoral Program	At least 24 credits	At least 36 credits	At least 60 credits
Chemical Engineering	Masters Program	At least 15 credits	At least 13 credits	At least 28 credits
	Doctoral Program	At least 12 credits	At least 48 credits	At least 60 credits
	Combined Master's–Doctoral Program	At least 21 credits	At least 39 credits	At least 60 credits

2. Curriculum [에너지화학공학과 교육과정]

Category	Course Code	Classification	Course Title (Eng.)	Course Title (Kor.)	Cred. -Lect. -Exp.	Remark
Required	ECHE590	Research	Seminar	세미나	1-1-0	
	ECHE690		Master's Research	석사논문연구	Value of Credit	
	ECHE890		Doctoral Research	박사논문연구	Value of Credit	
Elective	BST510	Lecture	Solid State Batteries	전고체전지	3-3-0	
	BST511		Advanced Analysis on Batteries	이차전지 고도분석	3-3-0	
	BST512		Nanomaterials for Lithium-ion Batteries	이차전지 나노재료	3-3-0	
	BST514		Membrane Technology	멤브레인 테크놀로지	3-3-0	
	BST515		Nanomaterials for Energy Storage	에너지 저장용 나노재료	3-3-0	
	BST516		Batteries of the past, present, and future	과거,현재 및 미래의 배터리	3-3-0	
	BST517		Special Lecture on Application Technologies of Energy Devices for ESS and EV	에너지기기 응용기술 특론-ESS&EV	3-3-0	
	BST518		Special Topics on Next Generation Batteries	차세대 이차전지 특론	3-3-0	
	BST521		X-ray Powder Diffraction	X-선 분말 결정	3-3-0	
	BST522		Nanostructured Electrodes for Lithium-ion Batteries I	리튬이온전지를 위한 전극물질 I	3-3-0	
	BST523		Organic Materials for Batteries	이차전지 유기소재	3-3-0	
	BST532		Electrolytes for Lithium-ion Natteries	전해액	3-3-0	
	BST534		Special Topics on Battery Science and Technology I	배터리과학 및 기술 특론 I	3-3-0	
	BST535		Special Topics on Battery Science and Technology II	배터리과학 및 기술 특론 II	3-3-0	
	BST536		Special Topics on Battery Science and Technology III	배터리과학 및 기술 특론 III	3-3-0	
	BST537		Special Topics on Battery Science and Technology IV	배터리과학 및 기술 특론 IV	3-3-0	
	BST538		Special Topics on Battery Science and Technology V	배터리과학 및 기술 특론 V	3-3-0	
	BST539		Electrochemical System Design and Applications	전기화학시스템 아키텍처 설계 및 응용	3-3-0	
	BST540		Special Topics on Application Technologies for Power Industry	전력산업을 위한 에너지기기 응용기술 특론	3-3-0	
	BST550		Technology Commercialization for Academic Researchers	연구자를 위한 기술사업화 과정	3-3-0	
	ENE512		Advanced Electrochemistry	고급 전기화학	3-3-0	
	ENE513		Special Topics on Solar Cells	태양전지 특론	3-3-0	[IDEN] CN553
	ENE514		Organic and Nano Optoelectronic Materials	유기 및 나노 광전소재	3-3-0	[IDEN] CN550

Category	Course Code	Classification	Course Title (Eng.)	Course Title (Kor.)	Cred. -Lect. -Exp.	Remark
	ENE515		Special Topics on Solar Energy	태양에너지 특론	3-3-0	[IDEN] CN552
	ENE527		Organic Electronics	유기 일렉트로닉스	3-3-0	
	ENE532		Advance Materials Analysis	고급 재료분석	3-3-0	[IDEN] CN505
	ENE533		Principles of Device Physics	소자물리	3-3-0	[IDEN] CN551
	ENE534		Special Topics on Photovoltaic Devices	광전자소자특론	3-3-0	[IDEN] CN554
	ENE611		Advanced Polymer Materials	고급 고분자재료	3-3-0	
	ENE613		Advanced Quantum Physics I	고급 양자물리학 I	3-3-0	[IDEN] SE613
	ENE614		Nanofabrication of Materials (Nano and Porous Materials)	나노구조재료 (나노 및 다공성소재)	3-3-0	[IDEN] SE633 CN502
	ENE619		Energy Engineering I	에너지공학 특론 I	3-3-0	
	ENE629		Energy Engineering II	에너지공학 특론 II	3-3-0	
	ENE639		Energy Engineering III	에너지공학 특론 III	3-3-0	
	ACE503		Advanced Organic Chemistry	고급유기화학	3-3-0	
	ACE504		Molecular Thermodynamics	분자열역학	3-3-0	
	ACE505		Special Topics in Functional Polymers	기능성고분자특론	3-3-0	
	ACE507		Introduction to Polymer Physics and Rheology	기초 고분자물리 및 레올로지	3-3-0	
	ACE508		Advanced Nanoscience and Nanotechnology	고급나노과학기술	3-3-0	
	ACE509		Colloids and Interfaces	콜로이드와 계면	3-3-0	
	ACE510		Renewable Energy Engineering	신재생에너지공학	3-3-0	[IDEN] CN650
	ACE511		Advanced Systems Biology	시스템생물학특론	3-3-0	
	ACE603		Catalysis	촉매	3-3-0	[IDEN] CN513
	ACE605		Advanced Electrocatalysis	고급 전기화학촉매반응	3-3-0	[IDEN] CN610
	ACE607		Polymer Structures and Properties	고분자구조 및 물성	3-3-0	
	ACE608		Special Topics in Metabolic Engineering	대사공학특론	3-3-0	[IDEN] CN631
	ACE609		Current Topics of Synthetic Biology	합성생물학특론	3-3-0	[IDEN] CN630
	ACE610		Advanced Enzyme Engineering	고급효소공학	3-3-0	[IDEN] CN512
	ACE612		Advanced Biochemical Engineering	생물공학특론	3-3-0	[IDEN] CN632
	ACE613		Chemical Engineering Nanotechnology	화공나노기술	3-3-0	[IDEN] CN501
	ACE614		Techno-economic analysis	기술경제성분석	3-3-0	[IDEN] CN506
	ACE706		Synthetic organic chemistry	합성유기화학	3-3-0	

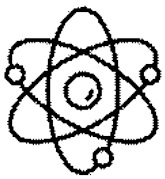
Category	Course Code	Classification	Course Title (Eng.)	Course Title (Kor.)	Cred. -Lect. -Exp.	Remark
	ACE708		Current Trends of Surface Chemistry and Catalysis	최신 표면 화학 및 촉매	3-3-0	
	ACE709		Catalysis for Energy Conversion : Production of Solar Hydrogen	에너지 변환 촉매: 태양광 수소 생산	3-3-0	[IDEN] CN651
	ACE710		Carbon Neutral and Catalyst Technology	탄소중립 촉매기술	3-3-0	[IDEN] CN701
	ACE801		Special Lectures in Applied Chemistry A	최신응용화학특론 A	3-3-0	
	ACE802		Special Lectures in Applied Chemistry B	최신응용화학특론 B	3-3-0	
	ACE803		Special Lectures in Applied Chemistry C	최신응용화학특론 C	3-3-0	
	ACE804		Special Lectures in Applied Chemistry D	최신응용화학특론 D	3-3-0	
	ACE805		Special Lectures in Applied Chemistry E	최신응용화학특론 E	3-3-0	
	ACE806		Special Lectures in Applied Chemistry F	최신응용화학특론 F	3-3-0	
	ECHE580		Technical Writing in English	영어논문작성법	3-3-0	
	SLA590		Writing in Academic Disciplines	전공영어 쓰기	3-3-0	
	SLA591		Technical Writing in English	영어논문 작성법	3-3-0	

3. Curriculum Change [교육과정 변경사항]

2025	→	2026
<NEW>	→	BST518 Special Topics on Next Generation Batteries 차세대 이차전지 특론
		BST550 Technology Commercialization for Academic Researchers 연구자를 위한 기술사업화 과정
ENE614 Nanochemistry 나노화학	→	ENE614 Nanofabrication of Materials (Nano and Porous Materials) 나노구조재료 (나노 및 다공성소재)
ACE612 Advanced Biochemical Engineering 생물공학특론	→	ACE612 Advanced Biochemical Engineering 생물공학특론 [IDEN] CN632
ACE613 Chemical Engineering Nanotechnology 화공나노기술		ACE613 Chemical Engineering Nanotechnology 화공나노기술 [IDEN] CN501
ENE514 Organic and Nano Optoelectronic Materials 유기 및 나노 광전소재		ENE514 Organic and Nano Optoelectronic Materials 유기 및 나노 광전소재 [IDEN] CN550
ACE801 Special Lectures in Applied Chemistry A 최신화학공학특론 A [IDEN] CN501	→	ACE801 Special Lectures in Applied Chemistry A 최신화학공학특론 A [IDEN] X
ENE619 Energy Engineering I 에너지공학 특론 I [IDEN] CN550		ENE619 Energy Engineering I 에너지공학 특론 I [IDEN] X

Department of Nuclear Engineering
[원자력공학과]

■ Department Introduction [학과소개]



Department of Nuclear Engineering includes the advancement of safety measures in operating nuclear power plants, the development of fourth generation (Gen-IV) reactors including ultra-long cycle fast reactor (UCFR), small and medium-sized nuclear reactors. For these, the research is focused into nuclear fuel design (metallic fuel, coated fuel, ceramic fuel, and fuel cycle), reactor design including neutron transport and diffusion, and reactor core simulator, cladding and structural materials in advanced nuclear energy systems, design of advanced nuclear systems, nuclear safety systems and engineered features, advanced liquid metal transportation for fast reactors and nuclear fusion reactors, advanced nuclear radiation protection and detections, nanofluids and nanocomposites for advanced nuclear coolants and nuclear fuel. Also, we are researching Medical radiation science with artificial intelligence(AI) and utilizing radiation in medicine. Furthermore, included are UniST Advanced Research Reactor (USTAR), avanced safety systems and molten core cooling systems for I-Power reactor, spent fuel storage, liquid metal MHD generation, accelerator physics, neutron science, nuclear data, and fundamentals of nuclear fusion for the future energy development.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
Nuclear Engineering 원자력공학	Masters Program	At least 18 credits	At least 10 credits	At least 28 credits
	Doctoral Program	At least 24 credits	At least 36 credits	At least 60 credits
	Combined Master's-Doctoral Program	At least 33 credits	At least 27 credits	At least 60 credits

2. Curriculum [원자력공학과 교육과정]

Category	Course Code	Classification	Course Title	Course Title (Kor.)	Cred. -Lect. -Exp.	Pre requisite	Remark
Required	NE590	Research	The Seminars	세미나	1-1-0		
	NE690	Research	Master's Research	석사논문연구	Value of Credit		
	NE890		Doctoral Research	박사논문연구	Value of Credit		
Elective	NE501	Lecture	Structural Mechanics in Energy Systems	에너지 시스템 구조 역학	3-3-0		
	NE502		Engineering of Nuclear Energy System	원자력 시스템 공학 특론	3-3-0		
	NE503		Special Topics in Structural Materials in Energy Systems	에너지 구조 재료 공학 특론	3-3-0		
	NE504		Advanced Energy Conversion	에너지 변환 공학 특론	3-3-0		
	NE505		Modeling and Simulation in Energy System	에너지 전산 모사	3-3-0		
	NE507		Nuclear Reactor Dynamics	원자로 동력학	3-3-0		
	NE508		Radionuclide transport in hydro-environment	방사성핵종 수환경 이동	3-3-0		
	NE509		Chemical Principles of Nuclear Fuel Reprocessing	사용후핵연료 재처리 화학적 원리	3-3-0		
	NE510		Nuclear Reactor Core Design and Engineering	원자로심설계공학	3-3-0		
	NE511		Nuclear Fuel Engineering	핵연료공학	3-3-0		
	NE512		Radiation Measurement System	방사선계측	3-3-0		
	NE513		Nuclear Reactor Core Analysis Ⅰ	원자로심해석 Ⅰ	3-3-0		
	NE514		Nuclear Reactor Core Analysis Ⅱ	원자로심해석 Ⅱ	3-3-0		
	NE515		Applied Magnetohydrodynamics	응용 자기유체역학	3-3-0		
	NE517		Nuclear Reactor Theory	원자로 이론	3-3-0		
	NE519		Nuclear Safety	원자력 안전	3-3-0		
	NE520		Nuclear Safety System Design and Lab	원전안전계통 설계실습	3-3-0		
	NE522		Special Topics on Advanced Nuclear Design Engineering	첨단 원자력 설계 공학 특론	3-3-0		
	NE523		Nuclear Safety and Convergence Technology	원자력 안전 및 융합 기술	3-3-0		
	NE525		Spent Nuclear Fuel Engineering	사용후핵연료공학	3-3-0		
	NE526		Chemistry of Actinide and Fission Product	악티나이트화학	3-3-0		
	NE527		Nuclear Material Safeguards and Non-Proliferation	핵물질안전조치 및 핵비확산	3-3-0		
	NE529		Radiation Materials Engineering	방사선재료공학	3-3-0		
	NE531		Probabilistic Safety Assessment	확률론적 안전성평가	3-3-0		
	NE532		Application of Probabilistic Safety Assessment	확률론적안전성 평가응용	3-3-0	NE531	

Category	Course Code	Classification	Course Title	Course Title (Kor.)	Cred. -Lect. -Exp.	Pre requisite	Remark
	NE533		Nuclear Safety Policy	원자력 안전정책	3-3-0		
	NE534		Nuclear Reactor Operation	원자로 운전 및 시뮬레이터 실습	3-3-0		
	NE540		Advanced Deep Learning Project	딥러닝융합프로젝트	3-3-0		
	NE556		Advanced Nuclear Reactors: Intellectual Property Laws	차세대원자력:지식재산권 개론	3-3-0		
	NE557		Severe Accidents: How, What, When, Where, and Why	중대사고: 어떻게, 무엇을, 언제, 어디서, 왜	3-3-0		
	NE558		Nuclear Applications of Deuterium and the Light Isotopes	중수소 및 경량 동위 원소의 원자력 응용	3-3-0		
	NE559		Regression for Scientists and Engineers	회귀 분석	3-3-0		
	NE580		Technical Writing in English	영어논문작성법	3-3-0		
	NE601		Mathematics in Plasma Physics	플라즈마 물리수학	3-3-0		
	NE602		Advanced Plasma Physics	플라즈마 물리학 고급	3-3-0	NE350	[IDEN] PHY762[1)]
	NE603		Plasma Transport Theory	플라즈마 수송이론	3-3-0		
	NE619		Special topics in Nuclear Engineering Ⅰ	원자력공학특론 Ⅰ	3-3-0		
	NE629		Special topics in Nuclear Engineering Ⅱ	원자력공학특론 Ⅱ	3-3-0		
	NE639		Special topics in Nuclear Engineering Ⅲ	원자력공학특론 Ⅲ	3-3-0		
	NE649		Special Topics in Nuclear Engineering Ⅳ	원자력공학특론 Ⅳ	3-3-0		
	NE659		Special Topics in Nuclear Engineering Ⅴ	원자력공학특론 Ⅴ	3-3-0		
	NE719		Special topics in Nuclear Engineering Ⅵ	원자력공학특론 Ⅵ	3-3-0		
	NE729		Special topics in Nuclear Engineering Ⅶ	원자력공학특론 Ⅶ	3-3-0		
	SLA590		Writing in Academic Disciplines	전공영어 쓰기	3-3-0		
	SLA591		Technical Writing in English	영어논문 작성법	3-3-0		

1) Identical course: NE602 Advanced Plasma Physics ↔ PHY762 Advanced Plasma Physics,
동일과목 지정: NE602 플라즈마 물리학 고급 ↔ PHY762 고급 플라즈마 물리

3. Curriculum Change [교육과정 변경사항]

2025	→	2026
<NEW>		NE508 Radionuclide transport in hydro-environment 방사성핵종 수환경 이동
<NEW>		NE509 Chemical Principles of Nuclear Fuel Reprocessing 사용후핵연료 재처리 화학적 원리
NE559 Advanced Statistical and Regression Methods for Uncertainty Analysis 불확도 분석을 위한 고급통계 및 회귀 분석 방법론		NE559 Regression for Scientists and Engineers 회귀 분석

Graduate School of Carbon Neutrality
[탄소중립대학원]

■ Department Introduction [학과소개]

UNIST Graduate School of Carbon Neutrality sets its sights on developing standard model of carbon neutral education in order to proactively respond to be in line with the rise of the global new paradigm, 2050 carbon neutrality and training scientifically and technologically talented human resources, who have high-quality of professionalism and understanding regarding carbon neutral technology and relevant policy. UNIST Graduate School of Carbon Neutrality will educate and research focusing on 4 topics; carbon dioxide capture·utilization·storage, hydrogen production·transportation·storage, renewable energy including solar cell, and environmental managing policy including ESG. Through newly innovative educational and research program for training convergent talents, students will grow as global experts and play a leading role in the carbon neutral research field at home and abroad. Especially, UNIST Graduate School of Carbon Neutrality which is placed in Ulsan, the city where carbon dioxide emitting industries such as petrochemicals, oil refining, and shipbuilding, etc. are concentrated, is the best venue for developing carbon neutral research and demonstration. Therefore, we will definitely take the lead on accelerating to carbon neutral society by producing outstanding individuals through not only scientific and technological world but also industrial world.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
Carbon Neutrality (Energy Engineering) (Chemical Engineering) (Environment) 탄소중립융합 (에너지공학) (화학공학) (환경)	Masters Program	At least 18 credits	At least 10 credits	At least 28 credits
	Doctoral Program	At least 15 credits	At least 45 credits	At least 60 credits
	Combined Master's-Doctoral Program	At least 24 credits	At least 36 credits	At least 60 credits

2. Curriculum [탄소중립대학원 교육과정]

Category	Course Code	Classification	Course Title (Eng.)	Course Title (Kor.)	Cred.-Lect.-Exp.	Remark
Required	CN690	Research	Master's Research	석사논문연구	Value of Credit	
	CN890		Doctoral Research	박사논문연구	Value of Credit	
	CN590		Seminar	세미나	1-1-0	
	CN510	Lecture	Advanced Carbon Neutral Technologies	고급탄소중립기술	3-3-0	
	CN520		Advanced Carbon Neutral Policy	고급탄소중립정책	3-3-0	
Elective	CN500	Lecture	Organic Synthesis	유기합성	3-3-0	[IDEN] CHM523
	CN501		Chemical Engineering Nanotechnology	화공나노기술	3-3-0	[IDEN] ACE613

Category	Course Code	Classification	Course Title (Eng.)	Course Title (Kor.)	Cred. -Lect. -Exp.	Remark
	CN502		Nanofabrication of Materials (Nano and Porous Materials)	나노구조재료 (나노 및 다공성 소재)	3-3-0	[IDEN] ENE614
	CN503		Solid State Chemistry	고급 고체화학	3-3-0	
	CN504		Advanced Materials Science	고급재료과학	3-3-0	
	CN505		Advanced Materials Analysis	고급재료분석	3-3-0	
	CN506		Techno-economic Analysis	기술경제성 분석	3-3-0	[IDEN] ACE614
	CN507		Introduction to Environmental Analysis	환경분석개론	3-3-0	[IDEN] EES502
	CN508		Environmental Data Mining	환경데이터마이닝기법	3-3-0	
	CN509		Introduction to Energy Science and Engineering	에너지과학개론:열역학 및 에너지기술개론	3-3-0	
	CN512		Advanced Enzyme Engineering	고급효소공학	3-3-0	[IDEN] ACE610
	CN513		Catalysis	촉매	3-3-0	[IDEN] ACE603
	CN514		Advanced Electrochemistry	고급전기화학	3-3-0	
	CN521		Carbon Neutrality and Social Transformation	탄소중립과 사회전환	3-3-0	
	CN530		Biomass Utilization Technology	바이오매스 활용 기술	3-3-0	
	CN531		Introduction to Membrane Technology to Water/Wastewater Treatment	수처리/폐수처리 분리막개론	3-3-0	[IDEN] ENV706
	CN532		Inorganic Chemistry	무기화학	3-3-0	
	CN533		Chemical Reaction Engineering	반응공학	3-3-0	
	CN534		Materials for Organic Electronics	유기전자재료	3-3-0	[IDEN] CHM534
	CN535		Solid-State Hydrogen Storage: Materials and Chemistry	수소저장시스템	3-3-0	[IDEN] CHM583
	CN536		Physics of Organic Semiconductors	유기반도체물리	3-3-0	
	CN537		Characterization of Porous Materials	다공성 소재 특성 분석	3-3-0	[IDEN] CHM541
	CN540		Climate and Air Pollution : Integrated Approach	기후와 대기환경	3-3-0	[IDEN] DME507
	CN550		Organic and Nano Optoelectronic Materials	유기 및 나노 광전소재	3-3-0	[IDEN] ENE514
	CN551		Principles of Device Physics	소자물리	3-3-0	[IDEN] ENE533
	CN552		Special Topics on Solar Energy	태양에너지특론	3-3-0	[IDEN] ENE515
	CN553		Special Topics on Solar Cells	태양전지특론	3-3-0	[IDEN] ENE513
	CN554		Special Topics on Photovoltaic Devices	광전자소자특론	3-3-0	[IDEN] ENE534
	CN600		Special Topics on Carbon Neutral I	탄소중립 특론 I	3-3-0	
	CN601		Special Topics on Carbon Neutral II	탄소중립 특론 II	3-3-0	

Category	Course Code	Classification	Course Title (Eng.)	Course Title (Kor.)	Cred. -Lect. -Exp.	Remark
	CN602		Special Topics on Carbon Neutral III	탄소중립 특론 III	3-3-0	
	CN610		Advanced Electrocatalysis	고급 전기화학 촉매반응	3-3-0	[IDEN] ACE605
	CN611		Gas Hydrates and Climate Change	가스하이드레이트와 기후변화	3-3-0	[IDEN] EES602
	CN612		Air Pollution Management	대기오염관리	3-3-0	[IDEN] EES605
	CN614		Environmental Biotechnology	환경생명공학기술	3-3-0	[IDEN] ENV707
	CN615		Carbon Capture and Storage Technology	탄소 포집 및 저장 기술	3-3-0	
	CN630		Current Topics of Synthetic Biology	합성생물학 특론	3-3-0	[IDEN] ACE609
	CN631		Special Topics in Metabolic Engineering	대사공학특론	3-3-0	[IDEN] ACE608
	CN632		Advanced Biochemical Engineering	생물공학특론	3-3-0	[IDEN] ACE612
	CN640		Climate-Environment Modeling	기후환경모델링	3-3-0	[IDEN] EES611
	CN650		Renewable Energy Engineering (Energy Conversion Devices)	신재생에너지공학 (에너지 변환 소자)	3-3-0	[IDEN] ACE510
	CN651		Catalysis for Energy Conversion : Production of Solar Hydrogen	에너지변환촉매: 태양광 수소 생산	3-3-0	[IDEN] ACE709
	CN652		Urban Photovoltaic Systems	도심형 태양광발전 시스템	3-3-0	
	CN653		Photovoltaics and Zero Energy Buildings	태양전지와 제로 에너지 빌딩	3-3-0	
	CN660		Introduction to Hydrogen Technology	수소 전주기 개론	3-3-0	
	CN661		Hydrogen Safety	수소안전	3-3-0	
	CN662		Hydrogen Policy	수소정책	3-3-0	
	CN701		Carbon Neutral and Catalyst Technology	탄소중립 촉매기술	3-3-0	[IDEN] ACE710

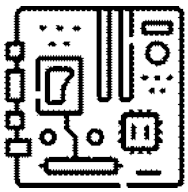
3. Curriculum Change [교육과정 변경사항]

2025	→	2026
<NEW>	→	CN632 Advanced Biochemical Engineering 생물공학특론 [IDEN] ACE612
CN501 Chemical Engineering Nanotechnology 화공나노기술	→	CN501 Chemical Engineering Nanotechnology 화공나노기술 [IDEN] ACE801 → ACE613
CN502 Nanochemistry (Nano and Porous Materials) 나노화학(나노 및 다공성소재)	→	CN502 Nanofabrication of Materials(Nano and Porous Materials) 나노구조재료 (나노 및 다공성 소재) [IDEN] ENE614
CN550 Organic and Nano Optoelectronic Materials 유기 및 나노 광전소재	→	CN550 Organic and Nano Optoelectronic Materials 유기 및 나노 광전소재 [IDEN] ENE619 → ENE514

College of Information and Biotechnology

ICT Convergence Master's Program
[ICT 융합석사 프로그램]

■ Program Introduction [프로그램 소개]



The ICT Convergence Master's Program targets local employees with a high field understanding and aims to cultivate master's convergence-practical professionals in the field through innovative education and research.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
ICT Convergence	Masters Program	At least 18 credits	At least 12 credits	At least 30 credits

2. Curriculum [ICT 융합석사프로그램 인정 교과목]

Category	Classification	Course Code	Course Title	Course Title(Kor.)	Cred. -Lect. -Exp.	Remark
Required	EE590	Research	EE Graduate Seminar	EE 대학원 세미나	1-1-0	
	EE690		Master's Research	석사논문연구	1~3	
	EE890		Doctoral's Research	박사논문연구	3~9	
Elective	EE506	Lecture	Introduction to Optimization	최적화 이론	3-3-0	[PRE] EE533
	CSE512		Graph Theory	그래프 이론	3-3-0	
	EE530		Image Processing	영상처리	3-3-0	
	EE532		Linear System Theory	선형시스템이론	3-3-0	
	EE533		Advanced Linear Algebra	고급선형대수학	3-3-0	
	EE534		Modern Digital Communication Theory	디지털 통신 이론	3-3-0	
	EE535		Robotics	로봇공학	3-3-0	[IDEN] AI535
	EE536		3D Visual Processing	3차원 영상처리	3-3-0	
	EE537		Advanced Wireless Communication Theory	고급 무선 통신 이론	3-3-0	[PRE] EE534

Category	Classification	Course Code	Course Title	Course Title(Kor.)	Cred. -Lect. -Exp.	Remark
	EE538		Data Communication Networks	데이터 통신망	3-3-0	
	EE539		Advanced Control Techniques	최신제어기법	3-3-0	
	EE540		Stochastic Optimization	스토캐스틱 최적화	3-3-0	
	EE541		Modern Probability Theory and Stochastic Processes	확률신호론	3-3-0	
	EE542		Introduction to Medical Image Processing	의료영상처리의 기초	3-3-0	
	EE543		Computer Vision	컴퓨터 비전	3-3-0	
	EE551		Analog Filters	아날로그 필터	3-3-0	
	EE553		Digital Integrated Circuits	디지털 집적회로	3-3-0	
	EE554		Electronic Packaging Design	전자패키징설계	3-3-0	
	EE555		Advanced Power Electronics	고급 전력전자 공학	3-3-0	
	EE556		Antenna Engineering	안테나 공학	3-3-0	
	EE557		Data Converter Circuits	데이터 변환기 회로	3-3-0	
	EE558		Advanced Analog IC Design	고급 아날로그 IC 디자인	3-3-0	
	EE559		Wireless IC Design	무선 IC 디자인	3-3-0	
	EE560		Power Systems	전력 시스템	3-3-0	
	EE571		Advanced Electromagnetics	고급전자기학	3-3-0	
	EE572		Optical Communication Systems	광통신 시스템	3-3-0	NEW
	EE575		Modern RF Engineering	현대초고주파공학	3-3-0	
	EE576		Advanced Photonics	고급 광자학	3-3-0	
	EE577		Microelectronics Lab	전자소자실험	3-1-4	
	EE578		Advanced Semiconductor Device Engineering	고급 반도체소자 공학	3-3-0	
	EE579		Advanced Optoelectronics	고급 광전자공학	3-3-0	
	EE580		Automotive Elective System Design	융합전자시스템설계	3-3-0	
	EE581		Automotive Electronics I	자동차 반도체 설계 I	3-3-0	
	EE584		CAD Algorithms for Digital Systems	디지털 시스템을 위한 컴퓨터 이용 설계 알고리즘	3-3-0	
	EE585		Artificial Intelligence System	인공지능 시스템	3-3-0	
	EE586		Pattern Recognition and Machine Learning	패턴인식	3-3-0	
	EE587		RF Microelectronics: Transistor Amplifier Design	RF능동회로: 트랜지스터증폭기설계	3-3-0	[IDEN] SE586

Category	Classification	Course Code	Course Title	Course Title(Kor.)	Cred. -Lect. -Exp.	Remark
	EE630		Special Topics in Communication, Control, and Signal Processing I	통신, 제어 및 신호처리 특수토픽 I	3-3-0	
	EE631		Special Topics in Communication, Control, and Signal Processing II	통신, 제어 및 신호처리 특수토픽 II	3-3-0	
	EE632		Special Topics in Communication, Control, and Signal Processing III	통신, 제어 및 신호처리 특수토픽 III	3-3-0	
	EE633		Special Topics in Communication, Control, and Signal Processing Ⅳ	통신, 제어 및 신호처리 특수토픽 Ⅳ	3-3-0	
	EE634		Special Topics in Communication, Control, and Signal Processing Ⅴ	통신, 제어 및 신호처리 특수토픽 Ⅴ	3-3-0	
	EE635		Special Topics in Electronic Design and Applications I	전자회로 설계 및 응용 특수토픽 I	3-3-0	
	EE636		Special Topics in Electronic Design and Applications II	전자회로 설계 및 응용 특수토픽 II	3-3-0	
	EE637		Special Topics in Electronic Design and Applications III	전자회로 설계 및 응용 특수토픽 III	3-3-0	
	EE638		Special Topics in Electronic Design and Applications Ⅳ	전자회로 설계 및 응용 특수토픽 Ⅳ	3-3-0	
	EE639		Special Topics in Electronic Design and Applications Ⅴ	전자회로 설계 및 응용 특수토픽 Ⅴ	3-3-0	
	EE640		Special Topics in Device Physics I	소자물리 특수토픽 I	3-3-0	
	EE641		Special Topics in Device Physics II	소자물리 특수토픽 II	3-3-0	
	EE650		Special Topics in EM I	전자기 특수토픽 I	3-3-0	
	EE651		Special Topics in EM II	전자기 특수토픽 II	3-3-0	
	EE652		Special Topics in EM III	전자기 특수토픽 III	3-3-0	
	EE731		Information Theory	정보이론	3-3-0	[PRE] EE541
	EE733		Optimal Control Theory	최적 제어 이론	3-3-0	[PRE] EE532
	EE734		Estimation & Decision Theory	추론 및 의사결정 이론	3-3-0	[PRE] EE541
	EE736		Channel Coding Theory	채널코딩 이론	3-3-0	[PRE] EE541
	EE737		Data Compression	데이터 압축	3-3-0	[PRE] EE541
	EE751		Electronic Design Automation and Its Applications in Research	전자설계자동화 및 연구 응용	3-3-0	NEW
	EE752		Analog Integrated System Design	아날로그 시스템 디자인	3-3-0	
	EE753		Advanced Digital IC Design	고급 디지털 회로 설계	3-3-0	[IDEN] AI551
	EE754		Low Noise Electronic System Design	저잡음 전자시스템 디자인	3-3-0	
	EE755		Frequency Synthesizers	주파수 발생기 이론	3-3-0	
	EE756		Electronic Oscillators	전자 발진기 이론	3-3-0	

Category	Classification	Course Code	Course Title	Course Title(Kor.)	Cred. -Lect. -Exp.	Remark
	EE759		Intelligent Power Interface	지능형 전력 인터페이스	3-3-0	
	EE772		Nanoscale Electronic Devices	나노전자소자	3-3-0	
	EE773		Compound Semiconductor Devices	화합물 반도체 소자	3-3-0	
	EE774		Plasma in Device Manufacturing	플라즈마공정	3-3-0	
	EE775		Electromagnetic compatibility	전자파 적합성	3-3-0	
	EE776		Optical Neural Network	광인공지능	3-3-0	NEW
	EE778		Electronic Carrier Transport Physics	전하 수송 물리	3-3-0	
	EE779		Nonlinear Optics	비선형광학	3-3-0	
	EE782		Nanophotonics	나노광자학	3-3-0	
	EE783		Sensor Interface Circuits Design	센서 인터페이스 회로 설계	3-3-0	
	EE784		Analog-to-Digital Converter Design	아날로그 디지털 변환기 설계	3-3-0	
	EE830		Advanced Topics in Communication, Control, and Signal Processing I	통신, 제어 및 신호처리 고급토픽 I	3-3-0	
	EE831		Advanced Topics in Communication, Control, and Signal Processing II	통신, 제어 및 신호처리 고급토픽 II	3-3-0	
	EE832		Advanced Topics in Communication, Control, and Signal Processing III	통신, 제어 및 신호처리 고급토픽 III	3-3-0	
	EE833		Advanced Topics in Communication, Control, and Signal Processing IV	통신, 제어 및 신호처리 고급토픽 IV	3-3-0	
	EE834		Advanced Topics in Communication, Control, and Signal Processing V	통신, 제어 및 신호처리 고급토픽 V	3-3-0	
	EE835		Advanced Topics in Electronic Design and Applications I	전자회로 설계 및 응용 고급토픽 I	3-3-0	
	EE836		Advanced Topics in Electronic Design and Applications II	전자회로 설계 및 응용 고급토픽 II	3-3-0	
	EE837		Advanced Topics in Electronic Design and Applications III	전자회로 설계 및 응용 고급토픽 III	3-3-0	
	EE838		Advanced Topics in Electronic Design and Applications IV	전자회로 설계 및 응용 고급토픽 IV	3-3-0	
	EE839		Advanced Topics in Electronic Design and Applications V	전자회로 설계 및 응용 고급토픽 V	3-3-0	
	EE840		Advanced Topics in Device Physics I	소자물리 고급토픽 I	3-3-0	
	EE841		Advanced Topics in Device Physics II	소자물리 고급토픽 II	3-3-0	
	EE850		Advanced Topics in EM I	전자기 고급토픽 I	3-3-0	
	EE851		Advanced Topics in EM II	전자기 고급토픽 II	3-3-0	
	EE852		Advanced Topics in EM III	전자기 고급토픽 III	3-3-0	
	PHY503		Electrodynamics I	전기역학 I	3-3-0	
	PHY505		Quantum Mechanics I	양자역학 I	3-3-0	

Category	Classification	Course Code	Course Title	Course Title(Kor.)	Cred. -Lect. -Exp.	Remark
	PHY561		Plasma Physics	플라즈마 물리	3-3-0	
	PHY723		Interface Physics of Electronic Devices	전자소자 계면물리	3-3-0	
	PHY763		Laser-Plasma Physics	레이저-플라즈마 물리	3-3-0	
	PHY765		Fusion Plasma Physics	핵융합 플라즈마 물리	3-3-0	
	ENE527		Organic Electronics	유기일렉트로닉스	3-3-0	

* [PRE]: Prerequisite(선이수 과목), [IDEN]: Identical(동일 과목)

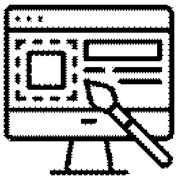
3. Curriculum Change [교육과정 변경사항]

2025	→	2026
NEW	→	EE572 Optical Communication Systems 광통신 시스템
NEW		EE751 Electronic Design Automation and Its Applications in Research 전자설계자동화 및 연구 응용
NEW		EE776 Optical Neural Network 광인공지능
CHANGE EE738 Advanced Wireless Communication Theory 고급 무선 통신 이론		EE537 Advanced Wireless Communication Theory 고급 무선 통신 이론

* 학사과정 선이수 과목 삭제, 대학원과정 선이수 과목만 유지
* Undergraduate prerequisites deleted; only graduate-level courses retained

Department of Design
[디자인학과]

■ Department Introduction [학과소개]



The goal of the Department of Design is to foster creative designers who can lead the innovative design of product and product-service systems. We will provide interdisciplinary courses on design knowledge, methods and techniques, including problem definition, user and market analysis, needs finding, creative idea generation, form and function development, design engineering, prototyping and business start-up. Students majoring in Design will play an essential role as integrative design thinkers and practitioners in future society, leading positive and innovative change in our society by employing user-centered design and research methods to drive the design and development of innovative design interventions.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
Design	Masters Program	At least 15 credits	At least 13 credits	At least 28 credits
	Doctoral Program	At least 12 credits	At least 48 credits	At least 60 credits
	Combined Master's-Doctoral Program	At least 24 credits	At least 36 credits	At least 60 credits

2. Curriculum [디자인학과 교육과정]

Category	Classification	Course Code	Course Title	Course Title (Kor.)	Cred. -Lect. -Exp.	Remark
Required	Research	DES590	The Seminars	세미나	1-1-0	
		DES691	Master Graduation Project	석사졸업과제	Value of credit	
		DES891	Doctoral Research	박사논문연구	Value of credit	
Elective	Lecture	DES503	Design Innovation	디자인 주도 혁신	3-3-0	DES415 [Iden.]
		DES505	Product Understanding, Use and Experience	제품의 이해, 사용과 경험	3-3-0	DES403 [Iden.]
		DES506	Computational Interaction Design	컴퓨테이셔널 인터랙션 디자인	3-3-0	
		DES507	Designing Ambient Things	앰비언트한 것들의 디자인	3-2-2	DES417 [Iden.]
		DES508	UI Design Fundamentals	사용자 인터페이스 기초	3-2-2	DES418 [Iden.]
		DES510	Design for Sustainability	지속가능성을 위한 디자인	3-3-0	DES419 [Iden.]

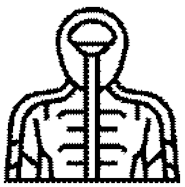
Category	Classification	Course Code	Course Title	Course Title (Kor.)	Cred. -Lect. -Exp.	Remark
		DES513	Design for Responsible AI Development	책임있는 AI 개발을 위한 디자인	3-2-2	DES412 [Iden.]
		DES517	Inventive Design	발명적 디자인	3-2-2	DES409 [Iden.]
		DES591	Special Topics in Design Ⅰ	디자인 특론 Ⅰ	3-3-0	
		DES592	Special Topics in Design Ⅱ	디자인 특론 Ⅱ	3-3-0	
		DES593	SpecialTopics in DesignⅢ	디자인 특론Ⅲ	3-3-0	
		DES601	Empirical Research Methods in Design	디자인 실증 연구 방법	3-3-0	
		DES603	Everyday Interaction with Personal Data	개인 데이터와 일상적 인터랙션	3-2-2	
		DES604	Embeded Systems for HRI/HMI	HRI/HMI를 위한 임베디드 시스템	3-2-2	DES442 [Iden.]
		DES605	Human-Centered AI and Design	인간중심 AI 및 디자인	3-3-0	DES404 [Iden.]
		DES609	Historical Studies in Design	디자인 역사 연구	3-3-0	DES411 [Iden.]
		DES611	Design Portfolio & Presentation	디자인 포트폴리오와 프리젠테이션	3-2-2	DES405 [Iden.]
		DES612	Design for Manufacture	양산을 위한 디자인	3-3-0	DES414 [Iden.]
		DES614	Design Provocation	디자인을 통한 도발	3-2-2	DES416 [Iden.]
		DES615	Systems thinking for Designers	디자이너를 위한 시스템 사고	3-2-2	DES407 [Iden.]
		DES616	Design Process & Methodology	디자인 과정과 방법론	3-3-0	DES413 [Iden.]
		SLA590	Writing in Academic Disciplines	전공영어 쓰기	3-3-0	
		SLA591	Technical Writing in English	영어논문 작성법	3-3-0	

3. Curriculum Change [교육과정 변경사항]

2025	→	2026
Elective DES513 Design for Responsible AI Development 책임있는 AI 개발을 위한 디자인 3-3-0	→	Elective DES513 Design for Responsible AI Development 책임있는 AI 개발을 위한 디자인 3-2-2
Elective DES614 Design Provocation 디자인을 통한 도발 3-3-0		Elective DES614 Design Provocation 디자인을 통한 도발 3-2-2

Department of Biomedical Engineering
[바이오메디컬공학과]

■ Department Introduction [학과소개]



The graduate program of biomedical engineering offers multidisciplinary research and education at the intersection of engineering, medicine, and the biological sciences to improve health and quality of life and to solve realworld problems in bio and medical fields. Research in the graduate program of biomedical engineering covers the application of engineering principles to design and manipulate biological systems as well as to analyze and understand biological phenomena contributing to the leading-edge technologies. In particular, research activity of BME focuses on selected areas which include (1) Multi-scale bio-imaging and bio-sensing device covering molecule, cell and tissue, (2) genorm analysis and editing for personalized theraphy, (3) rehabilitation and regenerative medicine using stem cell and bioprinting technique, and (4) neuronal engineering. This graduate program also offers a number of pertinent courses providing the students with the know-how and practical experience needed, through in-depth discussions and laboratory experiments. Education in the biomedical engineering graduate program leads the students to become leading researchers and experts within their area as well as creative leaders for both academia and industry.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
Biomedical Engineering 바이오메디컬공학	Masters Program	At least 15 credits	At least 4 credits	At least 28 credits
	Doctoral Program	At least 12 credits	At least 14 credits	At least 60 credits
	Combined Master's-Doctoral Program	At least 21 credits	At least 18 credits	At least 60 credits

2. Curriculum [바이오메디컬공학과 교육과정]

Category	Course Code	Classification	Course Title	Course Title (Kor.)	Cred.-Lect.-Exp.
Required	BME590	Research	Seminar	세미나	1-1-0
	BME690		Master's Research	석사논문연구	1~3
	BME890		Doctoral Research	박사논문연구	3~9
Elective	BME501	Lecture	Biology and Micro/Nanotechnology	생물학과 마이크로/나노공학	3-3-0
	BME502		Advanced Biomedical Engineering	고급생명공학	3-3-0
	BME503		Multiscale Imaging	첨단분광학 및 영상학	3-3-0
	BME506		Advanced Gerontology	고급 노화학	3-3-0
	BME507		Advanced Genome Engineering	고급게놈공학	3-3-0

Category	Course Code	Classification	Course Title	Course Title (Kor.)	Cred. -Lect. -Exp.
	BME511		Presentation Skills for Biomedical Engineers	생명공학 프리젠테이션	3-3-0
	BME512		Advanced Stem Cell Engineering	최신줄기세포공학	3-3-0
	BME514		Advanced Nanobiotechnology	나노바이오공학특론	3-3-0
	BME540		Advanced Biophotonics	고급 바이오광학	3-3-0
	BME541		Biostatics for Engineers	공학통계	3-3-0
	BME542		Experimental Design	실험계획법	3-3-0
	BME543		Advanced Biomedical Instruments	최신의료기기	3-3-0
	BME544		Nano-Bioengineering	나노바이오공학	3-3-0
	BME545		Advanced Proteomics	고급 단백질체학	3-3-0
	BME546		Animal Cell Biotechnology	동물세포공학	3-3-0
	BME547		AI-based Neural Data Science	AI 기반 뇌과학 데이터 사이언스	3-3-0
	BME550		Rehabilitation Engineering	재활공학	3-3-0
	BME561		Psychophysics	정신물리학	3-3-0
	BME562		Machine Learning Methods for Neuroengineering	뇌공학을 위한 기계학습 방법론	3-3-0
	BME581		Special Topics in Biomedical Engineering 1	바이오메디컬특론 1	3-3-0
	BME582		Special Topics in Biomedical Engineering 2	바이오메디컬특론 2	3-3-0
	BME583		Special Topics in Biomedical Engineering 3	바이오메디컬특론 3	3-3-0
	BME602		Biofabrication	바이오가공	3-3-0
	BME606		Biomedical Research with Model Organisms	모델 생물을 이용한 생명공학 연구	3-3-0
	BME608		Light-tissue interaction	광-조직 상호작용	3-3-0
	BME609		Wave optics	파동광학	3-3-0
	BME610		Advanced Cancer Genomics	고급암유전체학	3-3-0
	BME610		Biomedical Photoacoustic Imaging	광음향 영상 기술	3-3-0
	BME700		Technical Writing in English	영어논문작성법	3-3-0
	BME704		Spatial Aspects of Magnetic Resonance	공간자기공명학	3-3-0
	BME705		Single molecule Biophysics	단분자 생물물리학	3-3-0
	BME706		Frontiers of Biomedical Engineering	최신의생명공학특론	3-3-0
	BME707		Inventions and Patents	발명과특허	3-3-0

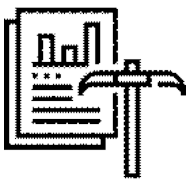
Category	Course Code	Classification	Course Title	Course Title (Kor.)	Cred. -Lect. -Exp.
	BME709		Ultrasound Imaging Technology in Biomedicine	바이오메디컬 초음파 영상기술	3-3-0
	BME740		Social, Cognitive, and Affective Neuroscience	사회인지감성 신경과학	3-3-0
	BME761		Human Vision	인간시각	3-3-0
	BME762		Advanced Color Science	고급색채과학	3-3-0
	BME801		Special Lectures in Biomedical Engineering A	최신바이오메디컬공학특론 A	3-3-0
	BME802		Special Lectures in Biomedical Engineering B	최신바이오메디컬공학특론 B	3-3-0
	BME803		Special Lectures in Biomedical Engineering C	최신바이오메디컬공학특론 C	3-3-0
	BME804		Special Lectures in Biomedical Engineering D	최신바이오메디컬공학특론 D	3-3-0
	BME805		Special Lectures in Biomedical Engineering E	최신바이오메디컬공학특론 E	3-3-0
	BME806		Special Lectures in Biomedical Engineering F	최신바이오메디컬공학특론 F	3-3-0
	BME807		Special Lectures in Biomedical Engineering G	최신바이오메디컬공학특론 G	3-3-0
	BME808		Special Lectures in Biomedical Engineering H	최신바이오메디컬공학특론 H	3-3-0
	BME809		Special Lectures in Biomedical Engineering I	최신바이오메디컬공학특론 I	3-3-0
	BME810		Special Lectures in Biomedical Engineering J	최신바이오메디컬공학특론 J	3-3-0
	SLA590		Writing in Academic Disciplines	전공영어 쓰기	3-3-0
	SLA591		Technical Writing in English	영어논문 작성법	3-3-0

3. Curriculum Change [교육과정 변경사항]

2025	→	2026
<NEW>	→	BME581 바이오메디컬특론 1 Special Topics in Biomedical Engineering 1
<NEW>	→	BME582 바이오메디컬특론 2 Special Topics in Biomedical Engineering 2
<NEW>	→	BME583 바이오메디컬특론 3 Special Topics in Biomedical Engineering 3

Department of Industrial Engineering
[산업공학과]

■ Department Introduction [학과소개]



The department of Industrial Engineering (IE) pursues state-of-the-art research and education in order to nurture data scientists who can contribute to the development of problem-solving methodologies and advancement of their applications. Under the vision of "Data-Driven Convergence," the department of Industrial Engineering (IE) focuses on research into quantitative data analysis techniques such as statistics, optimization, data mining, artificial intelligence, process mining, and financial engineering.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
Industrial Engineering 산업공학	Masters Program	At least 21 credits	At least 7 credits	At least 28 credits
	Doctoral Program	At least 15 credits	At least 15 credits	At least 60 credits
	Combined Master's-Doctoral Program	At least 24 credits	At least 21 credits	At least 60 credits

2. Curriculum [산업공학과 교육과정]

Category	Course Code	Classifi-cation	Course Title (ENG)	Course Title (KOR)	Cred.-Lect.-Exp	Remark
Required	IE690	Research	Master's Research	석사논문연구	1~3	
	IE890		Doctoral's Research	박사논문연구	3~9	
Elective	IE502	Lecture	Statistical Inference	통계적 추론	3-3-0	
	IE503		Pattern Recognition and Machine Learning	패턴인식 및 기계학습	3-3-0	[IDEN] AI520
	IE505		Linear Programming	선형계획법	3-3-0	
	IE506		Supply Chain Management	공급망관리	3-3-0	
	IE507		Convex Optimization	컨벡스 최적화	3-3-0	
	IE508		Knowledge Service Engineering	지식서비스공학	3-3-0	
	IE509		Advanced Quality Control	고급 품질관리	3-3-0	[IDEN] AI533
	IE510		Smart Factory & Advanced Manufacturing	스마트공장 및 고급 제조업	3-3-0	

Category	Course Code	Classifi-cation	Course Title (ENG)	Course Title (KOR)	Cred.-Lect.-Exp	Remark
	IE511		Introduction to Deep Learning	딥러닝개론	3-3-0	
	IE512		Technology Management	기술경영	3-3-0	
	IE513		Neural Network Learning Theory	신경망 학습이론	3-3-0	
	IE514		Dynamic Programming and Reinforcement Learning	동적 계획법과 강화학습	3-3-0	[IDEN] AI512
	IE515		Causal Learning & Explainable AI	인과학습 & 설명가능 AI	3-3-0	
	IE516		Predictive Process Analytics	예측 프로세스 분석	3-3-0	
	IE517		Manufacturing System Design & Simulation	생산시스템 설계 및 시뮬레이션	3-3-0	
	IE518		3D Printing	3D 프린팅	3-3-0	
	IE519		Game Theory and Multi-Agent Reinforcement Learning	게임 이론과 다중 에이전트 강화 학습	3-3-0	
	IE551		Special Topics in IE I	IE 특론 I	3-3-0	
	IE552		Special Topics in IE II	IE 특론 II	3-3-0	
	IE553		Special Topics in IE III	IE 특론 III	3-3-0	
	IE554		Special Topics in IE Ⅳ	IE 특론 Ⅳ	3-3-0	
	IE555		Special Topics in IE Ⅴ	IE 특론 Ⅴ	3-3-0	
	IE556		Technical Writing in English	영어논문작성법	3-3-0	
	SLA590		Writing in Academic Disciplines	전공영어쓰기	3-3-0	
	SLA591		Technical Writing in English	영어논문작성법	3-3-0	

3. Curriculum Change [교육과정 변경사항]

2025	→	2026
IE514 Reinforcement Learning 강화학습	→	IE514 Dynamic Programming and Reinforcement Learning 동적 계획법과 강화학습
<NEW>	→	IE519 Game Theory and Multi-Agent Reinforcement Learning 게임 이론과 다중 에이전트 강화 학습

Department of Biological Sciences
[생명과학과]

■ Department Introduction [학과소개]

Biological Sciences have taken the center stage of science, technology, and industry. Biomedical healthcare industry is the biggest industry; it is more than three times the information-communication industry and the automobile industry combined. All areas of basic science and engineering are focused on Biology. For example, bioinformatics, biomechanics, and biochemical engineering are "hot" areas. Infectious diseases such as the pandemic coronavirus are accelerating this trend even further. The 21 faculty members at the Department of Biological Sciences at UNIST study diseases like cancer, diabetes, and neurodegenerative disease as well as basic biology such as neuroscience, development, and microbes including viruses. They are internationally recognized for their high impact papers published and prestigious research funds obtained. UNIST Biological Sciences will open doors to a bright future.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
Biological Sciences 생명과학	Masters Program	At least 21 credits	At least 7 credits	At least 28 credits
	Doctoral Program	At least 15 credits	At least 17 credits	At least 60 credits
	Combined Master's-Doctoral Program	At least 30 credits	At least 24 credits	At least 60 credits

2. Curriculum [생명과학과 교육과정]

Category	Course Code	Classifi-cation	Course Title	Course Title (Kor.)	Cred. -Lect. -Exp.	Remark
Required	BIO690	Research	Master's Research	석사논문연구	Value of Credit	
	BIO890		Doctoral Research	박사논문연구	Value of Credit	
	BIO590		Seminar	세미나	1-1-0	
*Required (Selective)	BIO501	Lecture	Advanced Biochemistry	고급생화학	3-3-0	Core Subject
	BIO502		Advanced Molecular Biology	고급분자생물학	3-3-0	Core Subject
	BIO503		Advanced Cell Biology	고급세포생물학	3-3-0	Core Subject
Elective	BIO505	Lecture	m Cancer Biology	암생물학	3-3-0	
	BIO506		Biochemistry of Diseases	질환생화학	3-3-0	
	BIO507		Biomolecular Network	생분자네트워크	3-3-0	
	BIO508		Structural Biology	구조생물학	3-3-0	
	BIO509		Protein Engineering	단백질공학	3-3-0	
	BIO510		Current Topics in Tumor Microenvironment	종양미세환경특론	3-3-0	
	BIO511		Introduction to Biological Physics	기초생물물리학	3-3-0	
	BIO513		Metabolomics: Understanding Metabolism	대사체학	3-3-0	
	BIO515		Immunology and Human Diseases	면역학 및 인간질병	3-3-0	
	BIO516		Immunotherapy of immune cells	면역세포치료학	3-3-0	
	BIO601		Protein Crystallography	단백질결정학	3-3-0	
	BIO602		Signal Transduction in Cells	세포신호전달학	3-3-0	
	BIO603		Current topics in Immunology I	면역학특론 I	3-3-0	
	BIO606		Analytical Chemistry of Biomolecules	생물분자분석특론	3-3-0	[IDEN] HST662
	BIO607		Advanced Microbial Physiology	고급미생물생리학	3-3-0	
	BIO608		Advanced Endocrinology and Metabolism	고급 내분비 및 대사학	3-3-0	
	BIO610		Trends in Biological Research	생명과학 연구동향	3-3-0	
	BIO701		Molecular Physiology	분자생리학	3-3-0	
	BIO703		Topics in Genome Data Analysis	유전체데이터분석특론	3-3-0	
	BIO704		Current protocols of molecular and cellular biology	최신분자세포생물학기법	3-3-0	

Category	Course Code	Classifi-cation	Course Title	Course Title (Kor.)	Cred. -Lect. -Exp.	Remark
Elective	BIO705	Lecture	Mitochondria Biology	미토콘드리아생물학	3-3-0	
	BIO707		Advanced Structural Biology	구조생물학특론	3-3-0	
	BIO708		Current Topics in Protein Engineering	최신단백질공학특론	3-3-0	
	BIO709		Current topics in molecular and cellular biology	최신분자세포특론	3-3-0	
	BIO710		Current Topics in Developmental Biology	최신발생생물학특론	3-3-0	
	BIO711		Current Topics in Molecular Medicine	최신분자의학특론	3-3-0	
	BIO713		Patho-biotechnology	병리-바이오테크놀로지	3-3-0	
	BIO714		Techniques in Modern Life Sciences	Techniques in Modern Life Sciences	3-3-0	
	BIO801		Special Lectures in Biological Sciences A	최신생명과학특론A	3-3-0	
	BIO802		Special Lectures in Biological Sciences B	최신생명과학특론B	3-3-0	
	BIO803		Special Lectures in Biological Sciences C	최신생명과학특론C	3-3-0	
	BIO804		Special Lectures in Biological Sciences D	최신생명과학특론D	3-3-0	
	BIO805		Special Lectures in Biological Sciences E	최신생명과학특론E	3-3-0	
	BIO806		Special Lectures in Biological Sciences F	최신생명과학특론F	3-3-0	
	BIO807		Special Lectures in Biological Sciences G	최신생명과학특론G	3-3-0	
	BIO808		Special Lectures in Biological Sciences H	최신생명과학특론H	3-3-0	
	BIO809		Special Lectures in Biological Sciences I	최신생명과학특론I	3-3-0	
	BIO810		Special Lectures in Biological Sciences J	최신생명과학특론J	3-3-0	

※ Select 2 courses in Required(Selective) among 3 courses (BIO501, BIO502, BIO503)

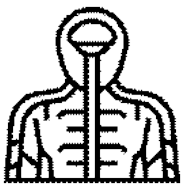
[PRE]: Prerequisite 선이수, [IDEN]: Identical 동일지정교과

3. Curriculum Change [교육과정 변경사항]

2025	→	2026
<NEW>		BIO515 Immunology and Human Diseases 면역학 및 인간질병
<NEW>		BIO516 Immunotherapy of immune cells 면역세포치료학

Graduate School of Health Science and Technology [의과학대학원]

■ Department Introduction [학과소개]



Medicine, traditionally based on the life sciences, is progressively integrating with artificial intelligence, data science, biomedical engineering, and others, moving towards the era of smart precision medicine. The Graduate School of Health Science and Technology is planning research in sync with these changes in collaboration with various departments within the College of Information and Biotechnology and, more broadly, within UNIST to create a healthier life for humanity. By utilizing networks with large domestic hospitals, medical schools, and international collaborations, we carry out educational programs and research projects that were impossible under the previous system to promote applications in health practice and industry by building an innovative environment. We envision a future where ideas from medicine, engineering, and science converge in this integrated environment via dynamic interactions between doctors who understand engineering and engineers who understand medicine, leading to new research sprouting and eventually being practical and industrialized.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
Health Science and Technology 의과학	Masters Program	At least 15 credits	At least 4 credits	At least 28 credits
	Doctoral Program	At least 12 credits	At least 14 credits	At least 60 credits
	Combined Master's–Doctoral Program	At least 21 credits	At least 18 credits	At least 60 credits
Health Innovation and Entrepreneurship 혁신의학	Masters Program	At Least 15 credits	At least 14 credits	At least 29 credits

2. Curriculum [의과학대학원 교육과정]

Category	Course Code	Classification	Course Title	Course Title (Kor.)	Cred. -Lect. -Exp.
Required * (Selective)	BIO590	Research	Seminar	세미나	1-1-0
	BME590		Seminar	세미나	1-1-0
	HST590		Seminars in Translational Research	중개연구 세미나	1-1-0
Required** (HIE, Selective)	HST601	Lecture	Capstone Design in Translational Medicine	중개의료 캡스톤 디자인	3-2-2
	HST602		Industrial Internship	산업체 인턴십	3-2-2
Required	HST690	Research	Master's Research	석사논문연구	value of credit
	HST890		Doctoral Research	박사논문연구	value of credit
Required*** (HIE, Selective) Elective (HST)	HST501	Lecture	Clinical Trials	발명과 임상시험	3-3-0
	HST502		Data Analysis in Medical Research	의학 연구 데이터 분석	3-3-0
Elective	HST500	Lecture	Field Practice of Translational Research	중개연구 현장 실습	3-2-2
	HST503		Medical Informatics System	의료 정보 시스템	3-3-0
	HST504		Introduction to Deep Learning in Medicine	의료 인공지능 개론	3-3-0
	HST505		Introduction to Smart Healthcare	스마트 헬스케어 개론	3-3-0
	HST506		Clinical Genomics	임상 유전체학	3-3-0
	HST507		Translational Research in Molecular Diagnostics	분자 진단 중개 연구	3-3-0
	HST508		Translational Research in Rehabilitation	재활 중개 연구	3-3-0
	HST509		Translational Research in Tissue Engineering	조직 공학 중개 연구	3-3-0
	HST510		Biomarkers in drug development	바이오마커 발굴과 신약 개발	3-3-0
	HST511		Evaluation Techniques of Advanced Biopharmaceuticals	첨단 바이오의약품 평가 기법 특론	3-3-0
	HST512		Business Development in Translational Medicine	중개의료 사업 개발	3-3-0
	HST513		Medical Physics	의학물리학	3-3-0
	HST561		Animal Cell Biotechnology	동물세포공학	3-3-0
	HST562		Advanced Genomics	고급게놈학	3-3-0
	HST563		Advanced Engineering Physiology	고급공학생리학	3-3-0

Category	Course Code	Classification	Course Title	Course Title (Kor.)	Cred. -Lect. -Exp.
Elective	HST564	Lecture	Advanced Stem Cell Engineering	최신줄기세포공학	3-3-0
	HST565		Machine Learning Methods for Neuroengineering	뇌공학을 위한 기계학습 방법론	3-3-0
	HST661		Biofabrication	바이오가공	3-3-0
	HST761		Spatial Aspects of Magnetic Resonance	공간자기공명학	3-3-0
	HST566		Cancer Biology	암생물학	3-3-0
	HST567		Current Topics in Tumor Microenvironment	종양미세환경특론	3-3-0
	HST662		Analytical Chemistry of Biomolecules	생물분자분석특론	3-3-0
	HST763		Molecular Physiology	분자생리학	3-3-0
	HST764		Mitochondria Biology	미토콘드리아생물학	3-3-0
	HST568		Linear Programming	선형계획법	3-3-0
	HST569		Neural Network Learning Theory	신경망 학습이론	3-3-0
	HST570		Predictive Process Analytics	예측 프로세스 분석	3-3-0
	HST571		Materials for Biomedical Applications	생명공학재료	3-3-0
	HST580		Tech for Impact in Healthcare	테크포임팩트 헬스케어	3-3-0
	HST581		Special Topics in Health Science and Technology I	의과학특론 I	3-3-0
	HST582		Special Topics in Health Science and Technology II	의과학특론 II	3-3-0
	HST583		Special Topics in Health Science and Technology III	의과학특론 III	3-3-0
	HST584		Special Topics in Health Science and Technology IV	의과학특론 IV	3-3-0
	HST801		Special Topics in Health Science and Technology A	의과학특론 A	3-3-0
	HST802		Special Topics in Health Science and Technology B	의과학특론 B	3-3-0
	HST803		Special Topics in Health Science and Technology C	의과학특론 C	3-3-0
	HST804		Special Topics in Health Science and Technology D	의과학특론 D	3-3-0

※ HST/HIE should select 2 courese in Required(Selective) among 3 courses (BIO590, BME590, HST590)

※ For HIE students: select and complete 1 courses in Required(Selective) among 2 courses (HST501, HST502) and 1 courses in Required(Selective) among 2 courses (HST601, HST602)

※ For HST students: HST501 and HST502 are now elective (previously required).

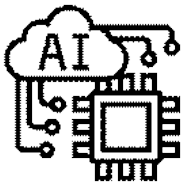
※ These changes will take effect from the 2026 academic year and will also be applied retroactively to current enrolled and leave-of-absence students.

3. Curriculum Change [교육과정 변경사항]

2025	→	2026
HST501 Clinical Trials 발명과 임상시험 [Required/전공필수]	→	HST501 Clinical Trials 발명과 임상시험 [Required(HIE)/전공필수] [Elective(HST)/전공선택]
HST502 Data Analysis in Medical Research 의학 연구 데이터 분석 [Required/전공필수]	→	HST502 Data Analysis in Medical Research 의학 연구 데이터 분석 [Required(HIE)/전공필수] [Elective(HST)/전공선택]
HST601 Capstone Design in Translational Medicine 중개의료 캡스톤 디자인 [Research/연구]	→	HST601 Capstone Design in Translational Medicine 중개의료 캡스톤 디자인 [Lecure/교과]
HST602 Industrial Internship 산업체 인턴십 [Research/연구]	→	HST602 Industrial Internship 산업체 인턴십 [Lecure/교과]
New Courses 신설	→	HST580 Tech for Impact in Healthcare 테크포임팩트 헬스케어
	→	HST581~584 Special Topics in Health Science and Technology I/ II/ III/ IV 의과학특론 I/ II/ III/ IV
	→	HST801~804 Special Topics in Health Science and Technology A/ B/ C/ D 의과학특론 A/ B/ C/ D

Graduate School of Artificial Intelligence
[인공지능대학원]

■ Department Introduction [학과소개]



The Graduate School of Artificial Intelligence (AI) offers an AI-specialized curriculum for the master's and doctoral degree programs in the fields of general theory of AI (AI Core), R&D and utilization of AI (AI System), and AI-based convergence (AI+X). We aim to study all aspects of intelligent machines and build intelligent systems for all kinds of applications. Our research topics include the architecture of intelligent agents, gameplaying programs, knowledge representation and automated reasoning, planning and acting in the real world, machine learning, natural language processing, computer vision and robotics.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
Artificial Intelligence 인공지능학	Masters Program	At least 21 credits	At least 7 credits[1)]	At least 28 credits
	Doctoral Program	At least 15 credits	At least 45 credits[2)]	At least 60 credits
	Combined Master's-Doctoral Program	At least 30 credits	At least 30 credits[3)]	At least 60 credits

1) MS: at least 1 credit from the seminar, and at least 6 credits from Master's Research
2) Ph.D.: at least 1 credits from the seminar, and at least 44 credits from Doctoral Research
3) MS-Ph.D.: at least 2 credits from the seminar, and at least 28 credits for Doctoral Research

2. Curriculum [인공지능대학원 교육과정]

Category	Classification	Course Code	Course Title	Course Title(Kor.)	Cred. -Lect. -Exp.	Remark
Required	Research	AI590	AI Graduate Seminar	세미나	1-1-0	
		AI690	Master's Research	석사논문연구	Value of credit	
		AI890	Doctoral Research	박사논문연구	Value of credit	
	Lecture	AI501	Introduction to AI	인공지능학 개론	3-3-0	
		AI502	Principles of Deep Learning	딥러닝 원론	3-3-0	
		AI503	AI Toolkits	AI 툴킷	3-3-0	
Elective	Lecture	AI511	Optimization for AI	인공지능 최적화	3-3-0	
		AI512	Reinforcement Learning	강화학습	3-3-0	IE514 [Iden.]
		AI513	Learning Theory	학습 이론	3-3-0	
		AI514	Big Data Analysis	빅데이터 분석	3-3-0	CSE554 [Iden.]
		AI515	Distributed Learning	분산학습	3-3-0	
		AI516	Computer Vision	컴퓨터 비전	3-3-0	CSE545 [Iden.]
		AI517	Deep Learning for NLP/NLU	NLP/NLU 딥 러닝	3-3-0	CSE710 [Iden.]
		AI518	Deep Generative Models	심층 생성 모델	3-3-0	
		AI519	Advanced Machine Learning Topics	고급 기계학습 주제	3-3-0	CSE544 [Iden.]
		AI520	Machine Learning Fundamentals	기계학습 기본원리	3-3-0	IE503 [Iden.]
		AI531	Knowledge Service Engineering	지식 서비스 공학	3-3-0	
		AI532	Advanced Information Visualization	고급 정보 시각화	3-3-0	CSE522 [Iden.]
		AI533	Advanced Quality Control	고급 품질 제어	3-3-0	IE509 [Iden.]
		AI534	Advanced Additive Manufacturing	고등 적층 제조	3-3-0	MEN559 [Iden.]
		AI535	Robotics	로봇학	3-3-0	EE535 [Iden.]
Elective	Lecture	AI536	Deep Learning in Medical Imaging	의료영상과 딥러닝	3-3-0	
		AI537	Smart Factory and Advanced Manufacturing	스마트 공장 및 고급 제조업	3-3-0	
		AI551	AI accelerator architectures	AI 가속기 아키텍처	3-3-0	EE753 [Iden.]

Category	Classification	Course Code	Course Title	Course Title(Kor.)	Cred. -Lect. -Exp.	Remark
		AI552	AI Framework Design and Implementation	AI 프레임 워크 설계 및 구현	3-3-0	
		AI553	AI-based computer system optimization	AI 기반 컴퓨터 시스템 최적화	3-3-0	
		AI554	Semiconductor Devices for AI System	AI 시스템용 반도체 장치	3-3-0	
		AI555	Optimizations for AI Systems	AI 시스템 최적화	3-3-0	
		AI601	Special Topics in AI I	인공지능학특론 I	3-3-0	
		AI602	Special Topics in AI II	인공지능학특론 II	3-3-0	
		AI603	Special Topics in AI III	인공지능학특론 III	3-3-0	
		AI604	Special Topics in AI IV	인공지능학특론 IV	3-3-0	
		AI605	Special Topics in AI V	인공지능학특론 V	3-3-0	
		AI701	Probabilistic Graphical Model	확률적 그래픽 모델	3-3-0	
		AI702	Meta & Multi-task Learning	메타 및 다중 작업 학습	3-3-0	
		AI703	Theory of Deep Learning	딥 러닝 이론	3-3-0	
		AI704	Machine Learning under Uncertainty	불확실에 기반한 기계 학습	3-3-0	
		AI705	Non-parametric Bayesian	비모수 베이지안	3-3-0	
		AI706	3D Vision and Machine Perception	3D 비전 및 기계 인지	3-3-0	
		AI707	Deep Reinforcement Learning	심층 강화학습	3-3-0	
		AI708	Multimodal Machine Learning	멀티모달 기계학습	3-3-0	
		AI721	Automated Machine Learning	자동화 기계학습	3-3-0	
		AI722	Causal Learning & Explainable AI	인과학습 및 설명 가능한 AI	3-3-0	
		AI723	Deep Learning Research	딥 러닝 연구	3-3-0	

※ Students can take other departments courses to their own credits as below;
- MS/Ph.D: Max. 6 credits
- Combined MS-Ph.D: Max. 9 credits

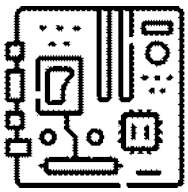
※ [Iden.]: Identical(동일지정교과)

3. Curriculum Change [교육과정 변경사항]

2025	→	2026
<New>	→	AI708 멀티모달 기계학습 Multimodal Machine Learning

Department of Electrical Engineering
[전기전자공학과]

■ Department Introduction [학과소개]



Electrical Engineering (EE) is the field of study that deals with everything from solid-state devices and designing integrated circuits to developing information, communication and control systems. Over 22 faculty members are committed to the EE program while actively contributing in various research groups - Image Processing and Computer Vision Research Group, Information & Networks Research Group, Semiconductor Device &Circuit Design Research Group, EM &Wireless Power Transfer Research Group. The EE program is firmly committed to sustaining excellence in traditional areas of strength while venturing into areas of opportunity. Research and education in the EE program includes the area of Communication, Control, Signal Processing; Analog, Digital, RF and Power Circuit Design; Power Electronics and Systems; Electronic Devices and Materials; and Photonics.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
Electrical Engineering	Masters Program	At least 21 credits	At least 7 credits	At least 28 credits
	Doctoral Program	At least 18 credits	At least 42 credits	At least 60 credits
	Combined Master's-Doctoral Program	At least 33 credits	At least 27 credits	At least 60 credits

2. Curriculum [전기전자공학과 교육과정]

Category	Classification	Course Code	Course Title	Course Title(Kor.)	Cred. -Lect. -Exp.	Remark
Required	EE590	Research	EE Graduate Seminar	EE 대학원 세미나	1-1-0	
	EE690		Master's Research	석사논문연구	1~3	
	EE890		Doctoral's Research	박사논문연구	3~9	
Elective	EE506	Lecture	Introduction to Optimization	최적화 이론	3-3-0	[PRE] EE533
	CSE512		Graph Theory	그래프 이론	3-3-0	
	EE530		Image Processing	영상처리	3-3-0	
	EE532		Linear System Theory	선형시스템이론	3-3-0	
	EE533		Advanced Linear Algebra	고급선형대수학	3-3-0	
	EE534		Modern Digital Communication Theory	디지털 통신 이론	3-3-0	
	EE535		Robotics	로봇공학	3-3-0	[IDEN] AI535
	EE536		3D Visual Processing	3차원 영상처리	3-3-0	
	EE537		Advanced Wireless Communication Theory	고급 무선 통신 이론	3-3-0	[PRE] EE534
	EE538		Data Communication Networks	데이터 통신망	3-3-0	
	EE539		Advanced Control Techniques	최신제어기법	3-3-0	
	EE540		Stochastic Optimization	스토캐스틱 최적화	3-3-0	
	EE541		Modern Probability Theory and Stochastic Processes	확률신호론	3-3-0	
	EE542		Introduction to Medical Image Processing	의료영상처리의 기초	3-3-0	
	EE543		Computer Vision	컴퓨터 비전	3-3-0	
	EE551		Analog Filters	아날로그 필터	3-3-0	
	EE553		Digital Integrated Circuits	디지털 집적회로	3-3-0	
	EE554		Electronic Packaging Design	전자패키징설계	3-3-0	
	EE555		Advanced Power Electronics	고급 전력전자 공학	3-3-0	
	EE556		Antenna Engineering	안테나 공학	3-3-0	
	EE557		Data Converter Circuits	데이터 변환기 회로	3-3-0	
	EE558		Advanced Analog IC Design	고급 아날로그 IC 디자인	3-3-0	
	EE559		Wireless IC Design	무선 IC 디자인	3-3-0	
	EE560		Power Systems	전력 시스템	3-3-0	
	EE571		Advanced Electromagnetics	고급전자기학	3-3-0	

Category	Classification	Course Code	Course Title	Course Title(Kor.)	Cred. -Lect. -Exp.	Remark
	EE572		Optical Communication Systems	광통신 시스템	3-3-0	NEW
	EE575		Modern RF Engineering	현대초고주파공학	3-3-0	
	EE576		Advanced Photonics	고급 광자학	3-3-0	
	EE577		Microelectronics Lab	전자소자실험	3-1-4	
	EE578		Advanced Semiconductor Device Engineering	고급 반도체소자 공학	3-3-0	
	EE579		Advanced Optoelectronics	고급 광전자공학	3-3-0	
	EE580		Automotive Elective System Design	융합전자시스템설계	3-3-0	
	EE581		Automotive Electronics I	자동차 반도체 설계 I	3-3-0	
	EE584		CAD Algorithms for Digital Systems	디지털 시스템을 위한 컴퓨터 이용 설계 알고리즘	3-3-0	
	EE585		Artificial Intelligence System	인공지능 시스템	3-3-0	
	EE586		Pattern Recognition and Machine Learning	패턴인식	3-3-0	
	EE587		RF Microelectronics: Transistor Amplifier Design	RF능동회로: 트랜지스터증폭기설계	3-3-0	[IDEN] SE586
	EE630		Special Topics in Communication, Control, and Signal Processing I	통신, 제어 및 신호처리 특수토픽 I	3-3-0	
	EE631		Special Topics in Communication, Control, and Signal Processing II	통신, 제어 및 신호처리 특수토픽 II	3-3-0	
	EE632		Special Topics in Communication, Control, and Signal Processing III	통신, 제어 및 신호처리 특수토픽 III	3-3-0	
	EE633		Special Topics in Communication, Control, and Signal Processing Ⅳ	통신, 제어 및 신호처리 특수토픽 Ⅳ	3-3-0	
	EE634		Special Topics in Communication, Control, and Signal Processing Ⅴ	통신, 제어 및 신호처리 특수토픽 Ⅴ	3-3-0	
	EE635		Special Topics in Electronic Design and Applications I	전자회로 설계 및 응용 특수토픽 I	3-3-0	
	EE636		Special Topics in Electronic Design and Applications II	전자회로 설계 및 응용 특수토픽 II	3-3-0	
	EE637		Special Topics in Electronic Design and Applications III	전자회로 설계 및 응용 특수토픽 III	3-3-0	
	EE638		Special Topics in Electronic Design and Applications Ⅳ	전자회로 설계 및 응용 특수토픽 Ⅳ	3-3-0	
	EE639		Special Topics in Electronic Design and Applications Ⅴ	전자회로 설계 및 응용 특수토픽 Ⅴ	3-3-0	
	EE640		Special Topics in Device Physics I	소자물리 특수토픽 I	3-3-0	
	EE641		Special Topics in Device Physics II	소자물리 특수토픽 II	3-3-0	
	EE650		Special Topics in EM I	전자기 특수토픽 I	3-3-0	
	EE651		Special Topics in EM II	전자기 특수토픽 II	3-3-0	
	EE652		Special Topics in EM III	전자기 특수토픽 III	3-3-0	

Category	Classification	Course Code	Course Title	Course Title(Kor.)	Cred. -Lect. -Exp.	Remark
	EE731		Information Theory	정보이론	3-3-0	[PRE] EE541
	EE733		Optimal Control Theory	최적 제어 이론	3-3-0	[PRE] EE532
	EE734		Estimation & Decision Theory	추론 및 의사결정 이론	3-3-0	[PRE] EE541
	EE736		Channel Coding Theory	채널코딩 이론	3-3-0	[PRE] EE541
	EE737		Data Compression	데이터 압축	3-3-0	[PRE] EE541
	EE751		Electronic Design Automation and Its Applications in Research	전자설계자동화 및 연구 응용	3-3-0	NEW
	EE752		Analog Integrated System Design	아날로그 시스템 디자인	3-3-0	
	EE753		Advanced Digital IC Design	고급 디지털 회로 설계	3-3-0	[IDEN] AI551
	EE754		Low Noise Electronic System Design	저잡음 전자시스템 디자인	3-3-0	
	EE755		Frequency Synthesizers	주파수 발생기 이론	3-3-0	
	EE756		Electronic Oscillators	전자 발진기 이론	3-3-0	
	EE759		Intelligent Power Interface	지능형 전력 인터페이스	3-3-0	
	EE772		Nanoscale Electronic Devices	나노전자소자	3-3-0	
	EE773		Compound Semiconductor Devices	화합물 반도체 소자	3-3-0	
	EE774		Plasma in Device Manufacturing	플라즈마공정	3-3-0	
	EE775		Electromagnetic compatibility	전자파 적합성	3-3-0	
	EE776		Optical Neural Network	광인공지능	3-3-0	NEW
	EE778		Electronic Carrier Transport Physics	전하 수송 물리	3-3-0	
	EE779		Nonlinear Optics	비선형광학	3-3-0	
	EE782		Nanophotonics	나노광자학	3-3-0	
	EE783		Sensor Interface Circuits Design	센서 인터페이스 회로 설계	3-3-0	
	EE784		Analog-to-Digital Converter Design	아날로그 디지털 변환기 설계	3-3-0	
	EE830		Advanced Topics in Communication, Control, and Signal Processing I	통신, 제어 및 신호처리 고급토픽 I	3-3-0	
	EE831		Advanced Topics in Communication, Control, and Signal Processing II	통신, 제어 및 신호처리 고급토픽 II	3-3-0	
	EE832		Advanced Topics in Communication, Control, and Signal Processing III	통신, 제어 및 신호처리 고급토픽 III	3-3-0	
	EE833		Advanced Topics in Communication, Control, and Signal Processing Ⅳ	통신, 제어 및 신호처리 고급토픽 Ⅳ	3-3-0	
	EE834		Advanced Topics in Communication, Control, and Signal Processing Ⅴ	통신, 제어 및 신호처리 고급토픽Ⅴ	3-3-0	

Category	Classification	Course Code	Course Title	Course Title(Kor.)	Cred. -Lect. -Exp.	Remark
	EE835		Advanced Topics in Electronic Design and Applications I	전자회로 설계 및 응용 고급토픽 I	3-3-0	
	EE836		Advanced Topics in Electronic Design and Applications II	전자회로 설계 및 응용 고급토픽 II	3-3-0	
	EE837		Advanced Topics in Electronic Design and Applications III	전자회로 설계 및 응용 고급토픽 III	3-3-0	
	EE838		Advanced Topics in Electronic Design and Applications IV	전자회로 설계 및 응용 고급토픽 IV	3-3-0	
	EE839		Advanced Topics in Electronic Design and Applications V	전자회로 설계 및 응용 고급토픽 V	3-3-0	
	EE840		Advanced Topics in Device Physics I	소자물리 고급토픽 I	3-3-0	
	EE841		Advanced Topics in Device Physics II	소자물리 고급토픽 II	3-3-0	
	EE850		Advanced Topics in EM I	전자기 고급토픽 I	3-3-0	
	EE851		Advanced Topics in EM II	전자기 고급토픽 II	3-3-0	
	EE852		Advanced Topics in EM III	전자기 고급토픽 III	3-3-0	
	PHY503		Electrodynamics I	전기역학 I	3-3-0	
	PHY505		Quantum Mechanics I	양자역학 I	3-3-0	
	PHY561		Plasma Physics	플라즈마 물리	3-3-0	
	PHY723		Interface Physics of Electronic Devices	전자소자 계면물리	3-3-0	
	PHY763		Laser-Plasma Physics	레이저-플라즈마 물리	3-3-0	
	PHY765		Fusion Plasma Physics	핵융합 플라즈마 물리	3-3-0	
	ENE527		Organic Electronics	유기일렉트로닉스	3-3-0	

* [PRE]: Prerequisite(선이수 과목), [IDEN]: Identical(동일 과목)

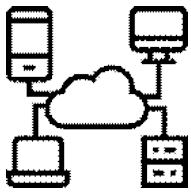
3. Curriculum Change [교육과정 변경사항]

2025	→	2026
NEW	→	EE572 Optical Communication Systems 광통신 시스템
NEW		EE751 Electronic Design Automation and Its Applications in Research 전자설계자동화 및 연구 응용
NEW		EE776 Optical Neural Network 광인공지능
CHANGE EE738 Advanced Wireless Communication Theory 고급 무선 통신 이론		EE537 Advanced Wireless Communication Theory 고급 무선 통신 이론

* 학사과정 선이수 과목 삭제, 대학원과정 선이수 과목만 유지
* Undergraduate prerequisites deleted; only graduate-level courses retained

Department of Computer Science and Engineering [컴퓨터공학과]

■ Department Introduction [학과소개]



Computer Science and Engineering (CSE) is the field of study that blends principles, theories, and applications of computer technologies that improve access to information. It encompasses computer programming, theoretical computer science, operating systems, databases, computer architecture, artificial intelligence, computer graphics, and human computer interaction just to name a few. Computer science and engineering is not just about how to write computer programs or how to use them, but it tries to tackle the fundamental question – how and what computation can be efficiently automated and implemented.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
Computer Science and Engineering 컴퓨터공학	Masters Program	At least 18 credits	At least 7 credits	At least 28 credits
	Doctoral Program	At least 15 credits	At least 42 credits	At least 60 credits
	Combined Master's–Doctoral Program	At least 30 credits	At least 24 credits	At least 60 credits

2. Curriculum [컴퓨터공학과 교육과정]

Category	Classification	Course Code	Course Title	Course Title(Kor.)	Cred. -Lect. -Exp.	Remark
Required	Research	CSE590	CSE Graduate Seminar	CSE 대학원 세미나	1-1-0	
		CSE690	Master's Research	석사논문연구	Value of credit	
		CSE890	Doctoral Research	박사논문연구	Value of credit	
Elective	Lecture	CSE511	Advanced Computer Architecture	고급 컴퓨터 구조	3-3-0	
		CSE513	Formal Languages and Automata	형식언어 및 오토마타	3-3-0	
		CSE514	Advanced Operating Systems	고급 운영체제	3-3-0	
		CSE515	Advanced Algorithms	고급 알고리즘	3-3-0	
		CSE516	Advanced Compilers	고급 컴파일러	3-3-0	
		CSE518	Modern Cryptography	현대암호학	3-3-0	
		CSE520	Computational Geometry	계산기하학	3-3-0	
		CSE522	Advanced Information Visualization	고급 정보 시각화	3-3-0	AI532 [Iden.]
		CSE523	Advanced Human Computer Interaction	고급 인간 컴퓨터 인터랙션	3-3-0	
		CSE524	Advanced Software Engineering	고급 소프트웨어 공학	3-3-0	
		CSE525	Parallel Computing	병렬컴퓨팅	3-3-0	
		CSE526	Programming Language Design	프로그래밍 언어 설계	3-3-0	
		CSE528	Cloud Computing	클라우드 컴퓨팅	3-3-0	
		CSE529	Autonomous Robots	자율로봇	3-3-0	
		CSE539	Advanced Computer Networks	고급 컴퓨터 네트워크	3-3-0	
		CSE544	Advanced Machine Learning	고급기계학습	3-3-0	AI519 [Iden.]
		CSE545	Advanced Computer Vision	고급 컴퓨터 비전	3-3-0	AI516 [Iden.]
		CSE551	Advanced Computer Security	고급 컴퓨터 보안	3-3-0	
		CSE552	Program Analysis	프로그램 분석	3-3-0	
		CSE553	Distributed Systems	분산 시스템	3-3-0	
		CSE554	Advanced Data Mining	고급 데이터 마이닝	3-3-0	AI514 [Iden.]
		CSE610	Special Topics in Computer Engineering I	컴퓨터공학 스페셜 토픽 I	3-3-0	

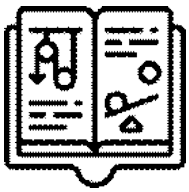
Category	Classification	Course Code	Course Title	Course Title(Kor.)	Cred. -Lect. -Exp.	Remark
Elective	Lecture	CSE611	Special Topics in Computer Engineering Ⅱ	컴퓨터공학 스페셜 토픽Ⅱ	3-3-0	
		CSE612	Special Topics in Computer EngineeringⅢ	컴퓨터공학 스페셜 토픽Ⅲ	3-3-0	
		CSE613	Special Topics in Computer EngineeringⅣ	컴퓨터공학 스페셜 토픽Ⅳ	3-3-0	
		CSE614	Special Topics in Computer Engineering Ⅴ	컴퓨터공학 스페셜 토픽Ⅴ	3-3-0	
		CSE710	Natural Language Processing	자연언어처리	3-3-0	AI517 [Iden.]
		CSE714	Artificial Intelligence	고급인공지능	3-3-0	
		CSE717	Computational Complexity	계산복잡도 이론	3-3-0	
		CSE719	Information Retrieval	정보 검색	3-3-0	
		CSE721	Bioinformatics	바이오 인포매틱스	3-3-0	
		CSE723	Big Data Systems	빅데이터 시스템	3-3-0	
		CSE810	Advanced Topics in Computer Engineering Ⅰ	컴퓨터공학 고급 토픽Ⅰ	3-3-0	
		CSE811	Advanced Topics in Computer Engineering Ⅱ	컴퓨터공학 고급 토픽Ⅱ	3-3-0	
		CSE812	Advanced Topics in Computer EngineeringⅢ	컴퓨터공학 고급 토픽Ⅲ	3-3-0	
		CSE813	Advanced Topics in Computer EngineeringⅣ	컴퓨터공학 고급 토픽Ⅳ	3-3-0	
		CSE814	Advanced Topics in Computer Engineering Ⅴ	컴퓨터공학 고급 토픽Ⅴ	3-3-0	

※ [Iden.]: Identical(동일지정교과)

College of Natural Sciences

Department of Physics
[물리학과]

■ Department Introduction [학과소개]



Physics forms a fundamental knowledge system on nature and a framework of 'thinking' for almost every other contemporary science and technology. The physics department at UNIST aims to perform cutting-edge fundamental research in the field of physical sciences and to provide ground basis for the development of next generation technologies. The department focuses on the three main research areas including plasma and beam physics, quantum materials and optical physics, and soft matter and biological physics. The department provides graduate students with the deepest level of courses in physics and educates them to become world-leading physicists.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
Physics 물리학	Masters Program	At least 21 credits	At least 4 credits	At least 28 credits
	Doctoral Program	At least 12 credits	At least 34 credits	At least 60 credits
	Combined Master's-Doctoral Program	At least 27 credits	At least 28 credits	At least 60 credits
Applied Physics 응용물리	Masters Program	At least 15 credits	At least 8 credits	At least 28 credits
	Doctoral Program	At least 12 credits	At least 35 credits	At least 60 credits
	Combined Master's-Doctoral Program	At least 21 credits	At least 34 credits	At least 60 credits

2. Curriculum [물리학과 교육과정]

Category	Course Code	Classi-fication	Course Title	Course Title(Kor)	Cred. -Lect. -Exp.	Pre-requisite
Required	PHY501	Lecture	Classical Mechanics	고전역학	3-3-0	
	PHY503		Electrodynamics I	전기역학 I	3-3-0	
	PHY505		Quantum Mechanics I	양자역학 I	3-3-0	
	PHY507		Statistical Mechanics	통계역학	3-3-0	
Required	PHY590	Research	The Seminars	세미나	1-1-0	
	PHY690		Master's Research	석사논문연구	Value of Credit	
	PHY890		Doctoral Research	박사논문연구	Value of Credit	
Elective	PHY504	Lecture	Electrodynamics II	전기역학 II	3-3-0	
	PHY506		Quantum Mechanics II	양자역학 II	3-3-0	
	PHY509		Technical Writing in English	영어논문작성법	3-3-0	
	PHY511		Quantum Optics and Quantum Dynamics	양자광학 및 양자동역학	3-3-0	
	PHY512		Quantum Modeling and Simulation of Light-Matter Interaction	양자 물리계 모델링 및 시뮬레이션	3-2-2	
	PHY513		Fundamentals of Quantum Information	양자정보기초	3-3-0	
	PHY514		Quantum Computing Hardware	양자컴퓨팅 하드웨어	3-3-0	
	PHY521		Condensed Matter Physics I	응집물질물리 I	3-3-0	
	PHY522		Condensed Matter Physics II	응집물질물리 II	3-3-0	
	PHY531		Introduction to Soft Matter Physics	연성물질물리학입문	3-3-0	
	PHY541		Computational Physics	전산물리	3-3-0	
	PHY551		Introductory Astrophysics	천체물리개론	3-3-0	
	PHY552		General Relativity and Cosmology	일반상대론 및 우주론	3-3-0	
	PHY553		Stars and Nuclear Astrophysics	항성과 핵천체물리학	3-3-0	
	PHY554		Observational Astrophysics	관측천체물리학	3-3-0	
	PHY562		Advanced Plasma Physics	고급 플라즈마 물리	3-3-0	
	PHY564		Accelerator Physics	가속기물리	3-3-0	
	PHY566		Plasma Diagnostics	플라즈마 진단	3-3-0	
	PHY571		Experimental Methods in Applied Physics	응용물리 실험기법	3-3-0	[IDEN] SE641
	PHY572		Electronics for Physical Measurements	전자학 및 물리계측	3-1-4	
	PHY611		Advanced Quantum Information	양자정보심화	3-3-0	

Category	Course Code	Classi-fication	Course Title	Course Title(Kor)	Cred. -Lect. -Exp.	Pre-requisite
	PHY612		Quantum Mechanics, Quantum Information, and Decoherence	양자역학과 양자정보의 결잃음 동역학	3-3-0	
	PHY681		Special Topics in Condensed Matter Physics	고체물리특론	3-3-0	
	PHY682		Special Topics in Plasma and Beam Physics	플라즈마 및 빔물리 특론	3-3-0	
	PHY684		Mathematical Concepts for Physics and Engineering	이론물리특론: 물리학, 공학에서 수리적 개념	3-3-0	
	PHY685		Special Topics in Astrophysics and Cosmology	천체물리 및 우주론 특론	3-3-0	
	PHY687		Special Topics in Atomic, Molecular and Optical Physics	원자분자광물리특론	3-3-0	
	PHY688		Special Topics in Computational Physics	전산물리특론	3-3-0	
	PHY689		Special Topics in Soft Matter Physics	연성물질물리특론	3-3-0	
	PHY692		Financial Econo-Physics	금융 경제 물리학	3-3-0	
	PHY711		Quantum Field Theory	양자장론	3-3-0	
	PHY723		Interface Physics of Electronic Devices	전자소자 계면물리	3-3-0	[IDEN] SE635
	PHY731		Phase Transition and Critical Phenomena	상전이와 임계현상	3-3-0	
	PHY741		Advanced Nuclear Astrophysics	고급핵천체물리	3-3-0	
	PHY763		Laser-Plasma Physics	레이저-플라즈마 물리	3-3-0	PHY427
	PHY765		Fusion Plasma Physics	핵융합 플라즈마 물리	3-3-0	
	PHY881		Advanced Topics in Theoretical Physics	이론물리 고등논제	3-3-0	
	PHY882		Advanced Topics in Experimental Physics	실험물리 고등논제	3-3-0	
	SLA590		Writing in Academic Disciplines	전공영어 쓰기	3-3-0	
	SLA591		Technical Writing in English	영어논문 작성법	3-3-0	

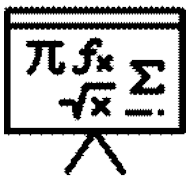
* PHY501, PHY503, PHY505, and PHY507 courses are required only for students in the Physics M.S. and combined M.S.-Ph.D. programs.

3. Curriculum Change [교육과정 변경사항]

2025	→	2026
<New>	→	PHY612 Quantum Mechanics, Quantum Information, and Decoherence 양자역학과 양자정보의 결잃음 동역학
		PHY692 Financial Econo-Physics 금융 경제 물리학

Department of Mathematical Sciences
[수리과학과]

■ Department Introduction [학과소개]



Department of Mathematical Science explores the connections between mathematics and its applications at both the research and educational levels. In addition to focusing on a traditional study in pure mathematics, our research at UNIST is devoted to encompass some of the most diverse and interdisciplinary research in the physical, business, economics, engineering, and biological sciences. The department provides a dynamic and engaging research environment in scientific computing, mathematical biology, finance, dynamical systems, image processing, number theory and analysis in PDEs. The undergraduate and graduate curriculum is planned with the following varied objectives: (1) to offer students an introduction to the fundamental study of quantity, structure, space, and change; (2) to prepare students for graduate study in pure or applied mathematics; (3) to serve the needs of students in fields that rely substantially on mathematics, such as the physics, biology, engineering, business and economics.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
Mathematical Sciences	Masters Program	At least 15 credits	At least 6 credits	At least 28 credits
	Doctoral Program	At least 15 credits	At least 15 credits	At least 60 credits
	Combined Master's–Doctoral Program	At least 27 credits	At least 21 credits	At least 60 credits

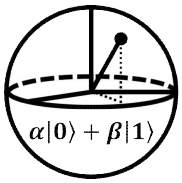
2. Curriculum [수리과학과 교육과정]

Category	Course Code	Classification	Course Title (Eng)	Course Title (Kor)	Cred.-Lect.-Exp.
Required	MTH590	Research	Seminar	세미나	1-1-0
	MTH690		Master's Research	석사논문연구	1~3
	MTH890		Doctoral Research	박사논문연구	3~9
Elective	MTH501	Lecture	Real Analysis	실해석학	3-3-0
	MTH502		Functional Analysis	함수해석학	3-3-0
	MTH503		Probability and Stochastic Processes	확률 및 확률 과정론	3-3-0
	MTH505		Numerical Analysis and Applications	수치해석 및 응용	3-3-0
	MTH507		Numerical Linear Algebra	수치선형대수	3-3-0
	MTH509		Partial Differential Equations	편미분방정식	3-3-0
	MTH510		Nonlinear Partial Differential Equations	비선형 편미분방정식	3-3-0
	MTH511		Numerical Methods for Partial Differential Equations I	편미분방정식의 수치방법 I	3-3-0
	MTH512		Numerical Methods for Partial Differential Equations II	편미분방정식의 수치방법 II	3-3-0
	MTH513		Dynamical Systems	동적 시스템	3-3-0
	MTH515		Mathematical Methods for Engineers	공학자를 위한 수학방법	3-3-0
	MTH517		Stochastic Calculus and applications	확률 미적분과 응용	3-3-0
	MTH520		Fourier Analysis	푸리에 해석학	3-3-0
	MTH522		Introduction to Partial Differential Equations	편미분방정식개론	3-3-0
	MTH531		Scientific Computing	과학계산	3-3-0
	MTH532		Algebraic Topology	대수적 위상수학	3-3-0
	MTH533		Information Theoretical Approach to A.I	정보이론과 인공지능	3-3-0
	MTH551		Algebra I	대수학 I	3-3-0
	MTH552		Algebra II	대수학 II	3-3-0
	MTH553		Commutative Algebra	가환대수	3-3-0
	MTH554		Algebraic Number theory	대수적 정수론	3-3-0
	MTH555		Analytic Number theory	해석적 정수론	3-3-0

Category	Course Code	Classification	Course Title (Eng)	Course Title (Kor)	Cred.-Lect.-Exp.
	MTH559		Homological Algebra	호몰로지 대수	3-3-0
	MTH560		Representation Theory and Applications	표현론 및 응용	3-3-0
	MTH561		Differentiable Manifolds	미분다양체	3-3-0
	MTH563		Differential Geometry	미분기하학	3-3-0
	MTH566		Algebraic Geometry I	대수적 기하학 I	3-3-0
	MTH567		Algebraic Geometry II	대수적 기하학 II	3-3-0
	MTH568		Modern Mathematical Physics	현대수리물리학	3-3-0
	MTH570		Advanced Algebra	고급 대수학	3-3-0
	MTH711		Selected Topics in Computational Mathematics I	계산수학 특론 I	3-3-0
	MTH712		Selected Topics in Computational Mathematics II	계산수학 특론 II	3-3-0
	MTH721		Selected Topics in Partial Differential Equations I	편미분방정식 특론 I	3-3-0
	MTH722		Selected Topics in Partial Differential Equations II	편미분방정식 특론 II	3-3-0
	MTH731		Selected Topics in Mathematical Biology I	생물수학 특론 I	3-3-0
	MTH732		Selected Topics in Mathematical Biology II	생물수학 특론 II	3-3-0
	MTH741		Selected Topics in Probability and Statistics I	확률과 통계 특론 I	3-3-0
	MTH742		Selected Topics in Probability and Statistics II	확률과 통계 특론 II	3-3-0
	MTH751		Selected Topics in Image Processing I	이미지 프로세싱 특론 I	3-3-0
	MTH752		Selected Topics in Image Processing II	이미지 프로세싱 특론 II	3-3-0
	MTH761		Selected Topics in Number Theory I	정수론 특론 I	3-3-0
	MTH762		Selected Topics in Number Theory II	정수론 특론 II	3-3-0
	MTH791		Selected Topics in Mathematics I	수학 특론 I	3-3-0
	MTH792		Selected Topics in Mathematics II	수학 특론 II	3-3-0
	MTH793		Selected Topics in Applied Mathematics I	응용수학 특론 I	3-3-0
	MTH794		Selected Topics in Applied Mathematics II	응용수학 특론 II	3-3-0

Graduate School of Quantum Science and Technology [양자대학원]

■ Department Introduction [학과소개]



The Graduate School of Quantum Science and Technology (QST) is a highly interdisciplinary graduate program at Ulsan National Institute of Science and Technology (UNIST) aiming at cultivating talented professionals in both fundamental science and practical application aspects of QST. UNIST is widely known to produce world-class research outcomes in the key fields of QST such as quantum computing, quantum communication, quantum sensing, and quantum algorithms. More specifically, the research activities are focused on 1) quantum information theory & experiment, 2) quantum sensing & quatum network, and 3) quantum computing hardware & algorithm. With the aid of state-of-the-art research and educational infrastructures including a quantum nanofabrication facility (Quantum-Nano FAB), UNIST is growing as a leading institution of QST in Korea and also internationally.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
Quantum Science and Technology 양자과학기술	Masters Program	At least 18 credits	At least 10 credits	At least 28 credits
	Doctoral Program	At least 12 credits	At least 48 credits	At least 60 credits
	Combined Master's-Doctoral Program	At least 24 credits	At least 36 credits	At least 60 credits

2. Curriculum [양자대학원 교육과정]

Category	Course Code	Classification	Course Title (Eng.)	Course Title (Kor.)	Cred. -Lect. -Exp.	Remark
Required	QST501	Lecture	Quantum Mechanics 1	양자역학 1	3-3-0	[IDEN] PHY505
	QST502		Quantum Mechanics 2	양자역학 2	3-3-0	[IDEN] PHY506
	QST505		Fundamentals of Quantum Information	양자정보기초	3-3-0	[IDEN] PHY513
	TBD		Advanced Quantum Information Theory	양자정보심화	3-3-0	
	QST590	Research	The Seminars	세미나	1-1-0	
	QST690		Master's Research	석사논문연구	Value of Credit	
	QST890		Doctoral Research	박사논문연구	Value of Credit	
Elective	QST511	Lecture	Quantum Computing Hardware	양자컴퓨팅 하드웨어	3-3-0	[IDEN] PHY514
	QST513		Quantum Modeling and Simulation of Light-Matter Interaction	양자 물리계 모델링 및 시뮬레이션	3-2-2	[IDEN] PHY512
	TBD		Quantum Technology Lab	양자기술 프로젝트	3-1-4	
	QST521		Quantum Optics and Quantum Dynamics	양자광학 및 양자동역학	3-3-0	[IDEN] PHY511
	QST523		Atomic and Molecular Physics	원자 및 분자물리학	3-3-0	[IDEN] PHY687
	QST525		Experimental Methods in Applied Physics	응용물리 실험기법	3-3-0	[IDEN] PHY571
	QST531		Advanced Optoelectronics	고급광전자 공학	3-3-0	[IDEN] EE579
	QST611		Quantum Mechanics, Quantum Information, and Decoherence	양자역학, 양자정보, 그리고 결잃음	3-3-0	[IDEN] PHY612
	QST613		Special Topics in Condensed Matter Physics	고체물리특론	3-3-0	[IDEN] PHY681
	TBD		Quantum Fab Workshop	양자팹 실습	3-1-4	

Department of Chemistry
[화학과]

■ Department Introduction [학과소개]

Chemistry is a central science that seeks to understand the interactions between atoms and molecules coupled with their applications. The Department of Chemistry at UNIST provides opportunities for students to obtain a deep fundamental knowledge in the field of chemistry including its sub-disciplines. In addition, students are encouraged to engage in research as such experiences are considered to be an essential educational tool. Research projects that utilize state-of-the-art facilities under the mentorship of world-class researchers are available to all students and set in collaborative environments. The primary goal of the department is to educate the next-generation of chemists and to provide them with the technical and leadership skills sets needed to contribute to society and to humankind.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
Chemistry 화학	Masters Program	At least 15 credits	At least 13 credits	At least 28 credits
	Doctoral Program	At least 12 credits	At least 20 credits	At least 60 credits
	Combined Master's-Doctoral Program	At least 21 credits	At least 33 credits	At least 60 credits

2. Curriculum [화학과 교육과정]

Category	Course Code	Classifi-cation	Course Title	Course Title(Kor)	Cred.-Lect.-Exp.	Remarks
Required	CHM590	Research	Seminar	세미나	1-1-0	
	CHM690		Master's Research	석사논문연구	Value of Credit	
	CHM890		Doctoral Research	박사논문연구	Value of Credit	
Elective	CHM511	Lecture	Advanced Organic Chemistry	고급유기화학	3-3-0	Core Subject
	CHM521		Frontiers in Chemical Biology	고급화학생물학	3-3-0	Core Subject
	CHM522		Supramolecular Chemistry	초분자화학	3-3-0	*CHM422
	CHM523		Organic Synthesis	유기합성	3-3-0	
	CHM524		Modern Organic Chemistry	현대유기화학	3-3-0	Core Subject
	CHM531		Introduction to Molecular Spectroscopy	기초분자분광학	3-3-0	*CHM431
	CHM532		Statistical Mechanics	통계역학	3-3-0	Core Subject
	CHM534		Materials for Organic Electronics	유기전자재료	3-3-0	Core Subject
	CHM535		Physical Organic Chemistry	물리유기화학	3-3-0	Core Subject
	CHM541		Inorganic Materials Analysis	무기재료분석	3-3-0	Core Subject *CHM451
	CHM542		Advanced Quantum Chemistry	고급양자화학	3-3-0	Core Subject
	CHM552		Organometallic Chemistry	유기금속화학	3-3-0	Core Subject
	CHM553		Bioinorganic Chemistry	생무기화학	3-3-0	Core Subject *CHM453
	CHM554		Solid State Chemistry	고체화학	3-3-0	*CHM454
	CHM555		Crystallography	결정학	3-3-0	
	CHM561		Advanced Inorganic Chemistry	고급무기화학	3-3-0	Core Subject
	CHM572		Advanced Polymer Chemistry	고급고분자화학	3-3-0	Core Subject *CHM474
	CHM580		Becoming a Researcher: Thinking, Building, and Leading in Science	연구자의 길	2-2-0	S/U
	CHM582		Nanochemistry	나노화학	3-3-0	Core Subject
	CHM583		Solid-State Hydrogen Storage: Materials and Chemistry	수소저장재료	3-3-0	
	CHM622		Nanomedicine	나노의학	3-3-0	
	CHM624		Advanced Protein Chemistry	고급단백질화학	3-3-0	Core Subject

Category	Course Code	Classifi-cation	Course Title	Course Title(Kor)	Cred.-Lect.-Exp.	Remarks
Elective	CHM643	Lecture	Molecular Spectroscopy	분자분광학	3-3-0	Core Subject
	CHM644		Chemical Kinetics	반응속도론	3-3-0	
	CHM645		Chemical Physics	화학물리학	3-3-0	
	CHM646		Molecular Physics	분자물리학	3-3-0	
	CHM651		Inorganic Supramolecules /Metal-Organic Frameworks	무기초분자 및 금속유기 얼개	3-3-0	
	CHM681		Advanced Instrumental Analysis	고급기기분석	3-3-0	
	CHM682		Organic Chemistry for Materials	재료유기화학	3-3-0	
	CHM683		Advanced Materials Chemistry	고급재료화학	3-3-0	Core Subject
	CHM771		Energy Conversion Catalytic Chemistry	에너지변환촉매화학	3-3-0	
	CHM810		Special Topics in Organic Chemistry I	유기화학특론1	3-3-0	
	CHM811		Special Topics in Organic Chemistry II	유기화학특론2	3-3-0	
	CHM812		Special Topics in Biochemistry and Chemical Biology	생화학 /화학생물학특론	3-3-0	
	CHM831		Special Topics in Physical Chemistry	물리화학특론	3-3-0	
	CHM832		Special Topics in Chemical Physics	화학물리학특론	3-3-0	
	CHM833		Special Topics in Theoretical Chemistry	이론화학특론	3-3-0	
	CHM834		Special Topics in Computational Chemistry	계산화학특론	3-3-0	
	CHM851		Special Topics in Inorganic Chemistry I	무기화학특론 I	3-3-0	
	CHM852		Special Topics in Inorganic Chemistry II	무기화학특론 II	3-3-0	
	CHM871		Special Topics in Polymer Chemistry	고분자화학특론	3-3-0	
	CHM872		Special Topics in Polymer Physics	고분자물리특론	3-3-0	
	CHM873		Special Topics in Materials Chemistry	재료화학특론	3-3-0	
	CHM874		Special Topics in Nanoscience	나노과학특론	3-3-0	

Category	Course Code	Classifi-cation	Course Title	Course Title(Kor)	Cred. -Lect. -Exp.	Remarks
Elective	CHM875	Lecture	Special Topics in Interdisciplinary Research on Carbon Materials	탄소재료연구특론	3-3-0	
	CHM892		Technical Writing in English	영어논문작성법	3-3-0	
	SLA590		Writing in Academic Disciplines	전공영어 쓰기	3-3-0	
	SLA591		Technical Writing in English	영어논문 작성법	3-3-0	

* Both undergraduate and first-year graduate students can take the courses marked with an asterisk(*) and earn credits.

3. Curriculum Change [교육과정 변경사항]

2025	→	2026
<New>	→	CHM580 Becoming a Researcher: Thinking, Building, and Leading in Science 연구자의 길

School of Business Administration

School of Business Administration
[경영과학부]

■ Department Introduction [학과소개]

The mission of the Master's/Ph.D. program in the School of Business Administration(SBA) is to educate intellectual, innovative, and analytically-minded scholars, who will contribute to the advancement of business education and research. The graduate program curriculum is designed to be extensive, flexible, personalized, and conducted in the self-directed research environment. Our research tracks include strategic management (entrepreneurship, technology management), organizational behavior, marketing, management information systems, finance, financial engineering, accounting, economics, operations management and decision making, and business analytics. In the UNIST SBA, the graduate students are strongly encouraged to apply the latest research methodologies in the field of Big Data and AI to a variety of management research.

1. Graduation Requirement [졸업 이수요건]

Major	Program	Course Credit	Research Credit	Total Credits
Management Engineering	Masters Program	At least 15 credits	At least 4 credits	At least 28 credits
	Doctoral Program	At least 12 credits	At least 14 credits	At least 60 credits
	Combined Master's-Doctoral Program	At least 21 credits	At least 18 credits	At least 60 credits

2. Curriculum [경영과학부 교육과정]

Category	Course Code	Classification	Course Title	Course Title (Kor.)	Cred. -Lect. -Exp	Prerequisite
Required	MGT690	Research	Master's Research	석사연구	Value of Credit	
	MGT890		Doctoral's Research	박사 연구	Value of Credit	
Elective	MGT590	Research	Seminars	세미나	1-1-0	
	MGT501	Lecture	Microeconomic Theory	미시경제이론	3-3-0	
	MGT502		Macroeconomic Theory	거시경제이론	3-3-0	
	MGT511		Research Methodology	연구방법론	3-3-0	
	MGT512		Econometrics	계량경제학	3-3-0	
	MGT513		Multivariate Analysis	다변량 분석	3-3-0	
	MGT515		Probability Models with Applications	확률모형론	3-3-0	
	MGT521		Business Ethics	기업윤리	1-1-0	
	MGT540		Special Topics in General Management I	GM 특론 I	3-3-0	
	MGT541		Special Topics in General Management II	GM 특론 II	3-3-0	
	MGT542		Special Topics in General Management III	GM 특론 III	3-3-0	
	MGT543		Special Topics in General Management IV	GM 특론 IV	3-3-0	
	MGT544		Special Topics in General Management V	GM 특론 V	3-3-0	
	MGT591		Independent Study	개별연구	3-3-0	
	MOT501		Theories & Practices in Technology Management	기술경영 이론과 사례	3-3-0	
	MOT502		Organizational Change & Innovation Management	조직변화와 혁신경영	3-3-0	
	MOT503		Entrepreneurship and Strategy	기업가 정신과 전략	3-3-0	
	MOT504		Organization Theory Seminar	조직이론 세미나	3-3-0	
	MOT511		Organizational Behavior Theory	조직행위	3-3-0	
	MOT512		Strategic Management Theory	경영전략	3-3-0	
	MOT514		Intellectual Property Management	지적재산권 경영	3-3-0	
	MOT515		Institutions, rganizations, and Technology	인스티튜션,조직과 기술	3-3-0	
	MIS501		IT for Networked Organizations	기업과 정보기술	3-3-0	

Category	Course Code	Classification	Course Title	Course Title (Kor.)	Cred.-Lect.-Exp	Prerequisite
	MIS502		Data Mining	데이터마이닝	3-3-0	
	MIS511		IT Economics	IT 이코노믹스	3-3-0	
	MIS513		IT Strategy	IT 전략	3-3-0	
	MKT501		Marketing Research & Analysis	마케팅 조사와 분석	3-3-0	
	MKT502		Research Seminar in Consumer Behavior	소비자행동 세미나	3-3-0	
	MKT503		Marketing Strategy	마케팅 전략	3-3-0	
	MKT504		Strategic Marketing and Firm Value and Risk	전략적 마케팅과 기업가치 및 리스크	3-3-0	
	MKT513		Research Seminar in International Business	국제경영 세미나	3-3-0	
	FIN501		Corporate Finance	기업재무론	3-3-0	
	FIN502		Derivative Securities	파생상품론	3-3-0	
	FIN503		Investments	투자론	3-3-0	
	FIN504		Corporate Governance	기업지배구조	3-3-0	
	FIN505		Applied Portfolio Management	포트폴리오 관리론	3-3-0	
Elective	FIN512	Lecture	Financial Risk Management	금융위험 관리론	3-3-0	
	FIN513		Asset Pricing Theory	자산가격 이론	3-3-0	
	FIN514		Empirical Methods in Finance	재무실증 연구	3-3-0	
	FIN515		Financial Engineering	금융공학	3-3-0	
	FIN517		Empirical Asset Pricing	자산가격 실증연구	3-3-0	
	FIN518		Market Microstructure	시장미시구조론	3-3-0	
	FIN519		Mergers and Acquisitions	기업인수합병	3-3-0	
	FIN520		Venture Capital and Private Equity	밴처캐피탈 및 사모투자	3-3-0	
	FIN521		Energy Markets	에너지 마켓	3-3-0	
	FIN522		Energy Trading	에너지 트레이딩	3-3-0	
	FIN523		Time-Series Analysis	시계열분석	3-3-0	
	FIN551		Special Topics in FIA I	FIA 특론 I	3-3-0	
	FIN552		Special Topics in FIA II	FIA 특론 II	3-3-0	
	ACT501		Financial Accounting and Reporting Theory	재무회계 이론	3-3-0	

Category	Course Code	Classification	Course Title	Course Title (Kor.)	Cred. -Lect. -Exp	Prerequisite
Elective	ACT502	Lecture	Special Topics in FIA III	FIA 특론 III	3-3-0	
	ACT503		Auditing Theory & Practice	회계 감사 이론과 실제	3-3-0	
	ACT504		Contemporary Issues in Accounting	현대회계이론	3-3-0	
	ACT511		Special Topics in FIA Ⅳ	FIA 특론 Ⅳ	3-3-0	
	ACT513		Research Methodology in Accounting	재무회계 연구방법론	3-3-0	
	ACT551		Special Topics in FIA V	FIA 특론 V	3-3-0	

3. Curriculum Change [교육과정 변경사항]

2025	→	2026
<New>	→	MKT504 Strategic Marketing and Firm Value and Risk 전략적 마케팅과 기업가치 및 리스크

2026 Graduate Course Catalog

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