

2024

Graduate

Course Catalog



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Graduate Program

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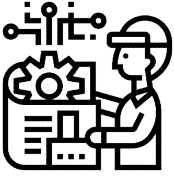
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College of Engineering

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 | Classification | 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 |
| | 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 | |
| | 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 | |
| | 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 | | | |

| Category | Course Code | Classification | Course Title (Eng.) | Course Title (Kor.) | Cred. -Lect. -Exp. | Pre-requisite |
|----------|-------------|----------------|--|---------------------|--------------------|---------------|
| Elective | MEN552 | Lecture | 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 | |
| | MEN601 | | Introduction to Optimization | 최적화개론 | 3-3-0 | |
| | 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 가공 II | 3-3-0 | |
| | MEN670 | | Autonomous Unmanned Vehicles | 자율무인이동체 | 3-3-0 | MEN577 |
| | 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 | 고급제어 II | 3-3-0 | MEN573 |
| | MEN774 | | System Identification and Adaptive Control | 시스템식별 및 적응제어 | 3-3-0 | |
| | MEN791 | | Special Topic I | 기계공학특론 I | 3-3-0 | |
| | MEN792 | | Special Topic II | 기계공학특론 II | 3-3-0 | |
| | MEN793 | | Special Topic III | 기계공학특론 III | 3-3-0 | |

| Category | Course Code | Classification | Course Title (Eng.) | Course Title (Kor.) | Cred. -Lect. -Exp. | Pre-requisite |
|----------|-------------|----------------|---------------------|---------------------|--------------------|---------------|
| Elective | MEN794 | Lecture | Special Topic IV | 기계공학특론 IV | 3-3-0 | |
| | MEN795 | | Special Topic V | 기계공학특론 V | 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*: Dynamics / Control / Robotics

3. Curriculum Change [교육과정 변경사항]

| 2023 | → | 2024 |
|--|---|---|
| MEN525 Turbulence 난류 특론 | → | MEN525 Turbulence 난류유동 |
| MEN624 Aerosol Technology 에어로졸특론 | | MEN624 Aerosol Technology 에어로졸특론 [PRE: MEN523] |
| MEN572 Nonlinear Systems 비선형 시스템 | | MEN672 Nonlinear Systems 비선형 시스템 [PRE: MEN573] |
| MEN773 Advanced Control Systems II 고급제어 II | | MEN773 Advanced Control Systems II 고급제어 II [PRE: MEN573] |

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 Civil, Urban, Earth, and 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 | Masters Program | At least 24 credits | At least 4 credits | At least 28 credits |
| Disaster Management Engineering 재난관리공학 | Doctoral Program | At least 18 credits | At least 42 credits | At least 60 credits |
| Environmental Science and Engineering 환경과학공학 | | At least 36 credits | At least 24 credits | At least 60 credits |
| Water-Energy Nexus 물-에너지 융합 | Combined Master's-Doctoral Program | At least 36 credits | At least 24 credits | At least 60 credits |

2. Curriculum [도시환경공학과 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 | |
| | EES590 | | Seminar | 세미나 | 1-1-0 | |
| | UIE590 | | Seminar | 세미나 | 1-1-0 | |
| Elective | 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 | | | |

Department of Urban and Environmental Engineering

| Category | Course Code | Classification | Course Title (Eng.) | Course Title (Kor.) | Cred. -Lect. -Exp. | Pre requisite |
|----------|-------------|----------------|--|-------------------------|--------------------|---------------|
| Elective | EES651 | Lecture | 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 | |
| | UIE510 | | 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 | |

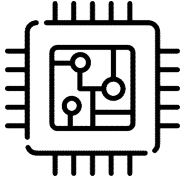
| Category | Course Code | Classification | Course Title (Eng.) | Course Title (Kor.) | Cred. -Lect. -Exp. | Pre requisite |
|----------|-------------|----------------|--|---------------------|--------------------|---------------|
| Elective | DME507 | Lecture | Climate and Air Pollution : Integrated 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 | |
| | 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 | UEE451 |
| | DME703 | | Random Vibrations | 불규칙진동론 | 3-3-0 | UIE502 |

3. Curriculum Change [교육과정 변경사항]

| 2023 | → | 2024 |
|--|---|---|
| UEE690 Master's Research 석사논문연구 | → | CUEE690 Master's Research 석사논문연구 |
| UEE890 Doctoral Research 박사논문연구 | | CUEE890 Doctoral Research 박사논문연구 |
| UIE501 Continuum Mechanics of Solids 고급연속체역학 | | UIE501 Continuum Mechanics of Solids 고체연속체역학 |
| <NEW> | | ENV708 Electrochemical Engineering for Environmental Applications 환경응용을 위한 전기화학공학 |

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 |
| | 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 |
| Elective | SE520 | Lecture | Semiconductor Materials Properties | 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 |
| | SE551 | | Nanomechanics | 나노역학 | 3-3-0 |
| | SE577 | | Microelectronics Lab | 전자소자실험 | 3-1-4 |
| | SE578 | | Advanced Semiconductor Device Engineering | 고급 반도체소자 공학 | 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 | | |

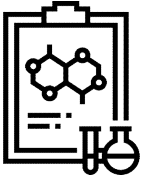
| Category | Course code | Classification | Course Title | Course Title (Kor.) | Cred. -Lect. -Exp. |
|----------|--|----------------|---|---------------------|--------------------|
| Elective | SE623 | Lecture | Advanced Mass Spectrometry | 고급질량분석학 | 3-3-0 |
| | SE624 | | Experimental Mass Spectrometry | 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 | 리소그래피특론 | 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 Methods in Applied Physics) | 반도체에피택시 | 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]

| 2023 | → | 2024 |
|--|---|---|
| SE510 Field Experience based Semiconductor Process 반도체 실무 공정 | | SE681 Advanced Semiconductor Process: Bridging Theory and Practice 반도체 실무 공정 |
| 〈NEW〉 | | SE527 Introduction to Plasma Physics 플라즈마 물리학 입문 |
| | | SE540 Quantum Field Theory of Electrons, Photons, Phonons in Condensed Matters 물성계의 양자장론 |
| | | SE551 Nanomechanics 나노역학 |
| | | SE577 Microelectronics Lab 전자소자실험 |
| | → | SE578 Advanced Semiconductor Device Engineering 고급 반도체소자 공학 |
| | | SE613 Advanced Quantum Physics 고급 양자물리학 |
| | | SE650 Amorphous Oxide Semiconductors and Devices 산화물 반도체 및 소자 |
| | | SE676 AI and Machine Learning for Semiconductor Materials and Devices Engineering 반도체 소자 공학을 위한 AI 이해 |
| | | SE734 Special Topics on Thin Films Deposition 박막공학 특론 |

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 |
| | 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 |
| | MSE580 | | Polymer Structures and Properties | 고분자구조및물성 | 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 | |

Department of Materials Science and Engineering

| Category | Course code | Classification | Course Title | Course Title (Kor.) | Cred. -Lect. -Exp. |
|----------|-------------|----------------|--|---------------------|--------------------|
| Elective | MSE686 | Lecture | 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 Materials | 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 |

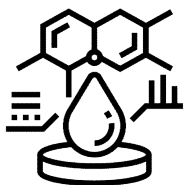
3. Curriculum Change [교육과정 변경사항]

| 2023 | → | 2024 |
|---|---|--|
| <NEW> | → | MSE602 Advanced Instrumental Analysis 고급기기분석 |
| MSE753 Nano Convergent Energy Devices 나노융합에너지소자 | | <Closed> |
| MSE557 Principles of Device Physics 소자물리 | | |

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. | Pre requisite |
|----------|-------------------------------|----------------|--|------------------------|--------------------|---------------|
| 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 | |
| | 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 Batteries | 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 | |
| | ENE511 | | Solid State Chemistry | 고급 고체화학 | 3-3-0 | |
| | ENE512 | | Advanced Electrochemistry | 고급 전기화학 | 3-3-0 | |
| ENE513 | Special Topics on Solar Cells | 태양전지 특론 | 3-3-0 | | | |

School of Energy and Chemical Engineering

| Category | Course Code | Classification | Course Title (Eng.) | Course Title (Kor.) | Cred. -Lect. -Exp. | Pre requisite |
|----------|---|----------------|--|---------------------|--------------------|---------------|
| Elective | ENE514 | Lecture | Organic and Nano Optoelectronic Materials | 유기 및 나노 광전소재 | 3-3-0 | |
| | ENE515 | | Special Topics on Solar Energy | 태양에너지 특론 | 3-3-0 | |
| | ENE527 | | Organic Electronics | 유기 일렉트로닉스 | 3-3-0 | |
| | ENE532 | | Advance Materials Analysis | 고급 재료분석 | 3-3-0 | |
| | ENE533 | | Principles of Device Physics | 소자물리 | 3-3-0 | |
| | ENE611 | | Advanced Polymer Materials | 고급 고분자재료 | 3-3-0 | |
| | ENE613 | | Advanced Quantum Physics I | 고급 양자물리학 I | 3-3-0 | |
| | ENE614 | | Nanochemistry | 나노화학 | 3-3-0 | |
| | 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 | |
| | ENE600 | | Research Trends in Green Energy I | 친환경에너지연구동향 I | 3-3-0 | |
| | ENE790 | Research | Research Trends in Green Energy II | 친환경에너지연구동향 II | 2-2-0 | |
| | ACE503 | Lecture | 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 | |
| | ACE511 | | Advanced Systems Biology | 시스템생물학특론 | 3-3-0 | |
| | ACE603 | | Catalysis | 촉매 | 3-3-0 | |
| ACE605 | Advanced Electrocatalysis | | 고급 전기화학촉매반응 | 3-3-0 | | |
| ACE607 | Polymer Structures and Properties | | 고분자구조 및 물성 | 3-3-0 | | |
| ACE608 | Special Topics in Metabolic Engineering | | 대사공학특론 | 3-3-0 | | |

| Category | Course Code | Classification | Course Title (Eng.) | Course Title (Kor.) | Cred.-Lect.-Exp. | Pre requisite |
|----------|-------------|----------------|--|----------------------|------------------|---------------|
| Elective | ACE609 | Lecture | Current Topics of Synthetic Biology | 합성생물학특론 | 3-3-0 | |
| | ACE610 | | Advanced Enzyme Engineering | 고급효소공학 | 3-3-0 | |
| | ACE612 | | Advanced Biochemical Engineering | 생물공학특론 | 3-3-0 | |
| | ACE613 | | Chemical Engineering Nanotechnology | 화공나노기술 | 3-3-0 | |
| | ACE614 | | Techno-economic analysis | 기술경제성분석 | 3-3-0 | |
| | ACE706 | | Synthetic organic chemistry | 합성유기화학 | 3-3-0 | |
| | 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 | |
| | ACE710 | | Carbon Neutral and Catalyst Technology | 탄소중립 촉매기술 | 3-3-0 | |
| | 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 | |

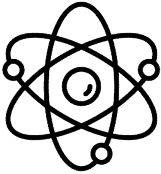
3. Curriculum Change [교육과정 변경사항]

| 2023 | → | 2024 |
|-------|---|---|
| (NEW) | → | BST523 Organic Materials for Batteries 이차전지 유기소재 |
| | | ACE710 Carbon Neutral and Catalyst Technology 탄소중립 촉매기술 |

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), advanced 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 | | |
| Elective | NE503 | Lecture | 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 동역학 | 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 | 악티나이드화학 | 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 | | |

| Category | Course Code | Classification | Course Title | Course Title (Kor.) | Cred. -Lect. -Exp. | Pre requisite | Remark |
|----------|-------------|----------------|--|-----------------------------|--------------------|---------------|-----------------------------|
| Elective | NE532 | Lecture | Application of Probabilistic Safety Assessment | 확률론적안전성 평가응용 | 3-3-0 | NE531 | |
| | 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 | | |
| | 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 | | Advanced Statistical and Regression Methods for Uncertainty Analysis | 불확도 분석을 위한 고급통계 및 회귀 분석 방법론 | 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 VI | 원자력공학특론 VI | 3-3-0 | | |
| | NE659 | | Special Topics in Nuclear Engineering VII | 원자력공학특론 VII | 3-3-0 | | |
| | NE719 | | Special topics in Nuclear Engineering IV | 원자력공학특론 IV | 3-3-0 | | |
| | NE729 | | Special topics in Nuclear Engineering V | 원자력공학특론 V | 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]

| 2023 | → | 2024 |
|--|---|--|
| NE559 Advanced Statistical and Regression Methods for Uncertainty Analysis 불확도 분석을 위한 고급통계 및 회귀 분석 방법론 | → | NE559 Regression for Scientists and Engineers 과학기술자를 위한 회귀분석 |
| <NEW> | | NE601 Mathematics in Plasma Physics 플라즈마 물리수학 |

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 (Chemical Eng.) (Energy Eng.) (Environmental Eng.) 탄소중립융합 (화학공학) (에너지공학) (환경과학공학) | 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. | Pre requisite |
|----------|---|----------------|---|-----------------------|------------------|---------------|
| Required | CN690 | Research | Master's Research | 석사논문연구 | Value of Credit | |
| | CN890 | | Doctoral Research | 박사논문연구 | Value of Credit | |
| | CN590 | | Seminar | 세미나 | 1-1-0 | |
| Elective | CN500 | Lecture | Special Topics in Organic Chemistry I | 유기화학특론 | 3-3-0 | |
| | CN501 | | Chemical Engineering Nanotechnology | 화학나노기술 | 3-3-0 | |
| | CN502 | | Nanochemistry (Nano and Porous Materials) | 나노화학 (나노 및 다공성소재) | 3-3-0 | |
| | 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 | |
| | CN507 | | Introduction to Environmental Analysis | 환경분석개론 | 3-3-0 | |
| | CN508 | | Environmental Data Mining | 환경데이터마이닝기법 | 3-3-0 | |
| | CN509 | | Introduction to Energy Science and Engineering | 에너지과학개론:열역학 및 에너지기술개론 | 3-3-0 | |
| | CN510 | | Advanced Carbon Neutral Technologies | 고급탄소중립기술 | 3-3-0 | |
| | CN512 | | Advanced Enzyme Engineering | 고급효소공학 | 3-3-0 | |
| | CN513 | | Catalysis | 촉매 | 3-3-0 | |
| | CN514 | | Advanced Electrochemistry | 고급전기화학 | 3-3-0 | |
| | CN520 | | Advanced Carbon Neutral Policy | 고급탄소중립정책 | 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 | |
| | CN532 | | Inorganic Chemistry | 무기화학 | 3-3-0 | |
| | CN533 | | Chemical Reaction Engineering | 반응공학 | 3-3-0 | |
| CN534 | Materials for Organic Electronics | 유기전자재료 | 3-3-0 | | | |
| CN535 | Solid-State Hydrogen Storage: Materials and Chemistry | 수소저장시스템 | 3-3-0 | | | |

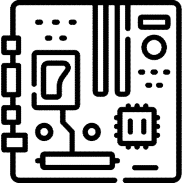
| Category | Course Code | Classification | Course Title (Eng.) | Course Title (Kor.) | Cred.-Lect.-Exp. | Prerequisite |
|----------|-------------|----------------|--|----------------------|------------------|--------------|
| Elective | CN536 | Lecture | Physics of Organic Semiconductors | 유기반도체물리 | 3-3-0 | |
| | CN540 | | Climate and Air Pollution : Integrated Approach | 기후와 대기환경 | 3-3-0 | |
| | CN550 | | Organic and Nano Optoelectronic Materials | 유기 및 나노 광전소재 | 3-3-0 | |
| | CN551 | | Principles of Device Physics | 소자물리 | 3-3-0 | |
| | CN552 | | Special Topics on Solar Energy | 태양에너지특론 | 3-3-0 | |
| | CN553 | | Special Topics on Solar Cells | 태양전지특론 | 3-3-0 | |
| | 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 | |
| | CN602 | | Special Topics on Carbon Neutral III | 탄소중립 특론 III | 3-3-0 | |
| | CN610 | | Advanced Electrocatalysis | 고급 전기화학 촉매반응 | 3-3-0 | |
| | CN611 | | Gas Hydrates and Climate Change | 가스하이드레이트와 기후변화 | 3-3-0 | |
| | CN612 | | Air Pollution Management | 대기오염관리 | 3-3-0 | |
| | CN614 | | Environmental Biotechnology | 환경생명공학기술 | 3-3-0 | |
| | 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 | |
| | CN640 | | Climate-Environment Modeling | 기후환경모델링 | 3-3-0 | |
| | CN650 | | Renewable Energy Engineering (Energy Conversion Devices) | 신재생에너지공학 (에너지 변환 소자) | 3-3-0 | |
| | CN651 | | Catalysis for Energy Conversion : Production of Solar Hydrogen | 에너지변환촉매: 태양광 수소 생산 | 3-3-0 | |
| | 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 | |

**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 | Course Code | Classification | Course Title | Course Title (Kor.) | Cred.-Lec.-Exp. | Prerequisite |
|----------|---------------------------|----------------|--|---------------------|-----------------|------------------------|
| Required | EE590 | Research | EE Graduate Seminar | EE 대학원 세미나 | 1-1-0 | |
| | EE690 | | Master's Research | 석사논문연구 | 1-3 | |
| Elective | EE506 | Lecture | Introduction to Optimization | 최적화 이론 | 3-3-0 | EE533 |
| | CSE512 | | Graph Theory | 그래프 이론 | 3-3-0 | |
| | EE530 | | Image Processing | 영상처리 | 3-3-0 | ITP111, EEE205 |
| | EE532 | | Linear System Theory | 선형시스템이론 | 3-3-0 | ITP111, EEE205, EEE351 |
| | EE533 | | Advanced Linear Algebra | 고급선형대수학 | 3-3-0 | ITP111, EEE205 |
| | EE534 | | Modern Digital Communication Theory | 디지털 통신 이론 | 3-3-0 | EE412 (Closed) |
| | EE535 | | Robotics | 로봇공학 | 3-3-0 | ITP111, EEE205, EEE351 |
| | EE536 | | 3D Visual Processing | 3차원 영상처리 | 3-3-0 | ITP111, EEE205 |
| | EE538 | | Data Communication Networks | 데이터 통신망 | 3-3-0 | ITP111 |
| | EE539 | | Advanced Control Techniques | 최신제어기법 | 3-3-0 | EEE351 |
| | EE540 | | Stochastic Optimization | 스토캐스틱 최적화 | 3-3-0 | ITP111 |
| | EE541 | | Modern Probability Theory and Stochastic Processes | 확률신호론 | 3-3-0 | ITP111, EEE205 |
| | EE542 | | Introduction to Medical Image Processing | 의료영상처리의 기초 | 3-3-0 | EEE205 |
| | EE543 | | Computer Vision | 컴퓨터 비전 | 3-3-0 | |
| | EE551 | | Analog Filters | 아날로그 필터 | 3-3-0 | EEE303 |
| | EE553 | | Digital Integrated Circuits | 디지털 집적회로 | 3-3-0 | EEE303 |
| | EE554 | | Electronic Packaging Design | 전자패키징설계 | 3-3-0 | EEE204 |
| | EE555 | | Advanced Power Electronics | 고급 전력전자 공학 | 3-3-0 | EEE431 |
| | EE556 | | Antenna Engineering | 안테나 공학 | 3-3-0 | EEE204, EEE231 |
| | EE557 | | Data Converter Circuits | 데이터 변환기 회로 | 3-3-0 | EEE303 |
| EE558 | Advanced Analog IC Design | 고급 아날로그 IC 디자인 | 3-3-0 | EEE303, EEE311 | | |

| Category | Course Code | Classification | Course Title | Course Title (Kor.) | Cred. -Lec. -Exp. | Prerequisite |
|----------|-------------|----------------|---|----------------------------|-------------------------|----------------|
| Elective | EE559 | Lecture | Wireless IC Design | 무선 IC 디자인 | 3-3-0 | EEE303, EEE311 |
| | EE560 | | Power Systems | 전력 시스템 | 3-3-0 | EEE302 |
| | EE571 | | Advanced Electromagnetics | 고급전자기학 | 3-3-0 | EEE204, EEE231 |
| | EE575 | | Modern RF Engineering | 현대초고주파공학 | 3-3-0 | EEE204, EEE231 |
| | EE576 | | Advanced Photonics | 고급 광자학 | 3-3-0 | EEE204, EEE231 |
| | EE577 | | Microelectronics Lab | 전자소자실험 | 3-1-4 | EEE304 |
| | 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 | EEE431 |
| | EE581 | | Automotive Electronics I | 자동차 반도체 설계 I | 3-3-0 | EEE431 |
| | 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 | |
| | EE585 | | Pattern Recognition and Machine Learning | 패턴인식 | 3-3-0 | |
| | 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 | |

| Category | Course Code | Classification | Course Title | Course Title (Kor.) | Cred. -Lec. -Exp. | Prerequisite |
|----------|-------------|----------------|--|--------------------------|-------------------|-------------------------------|
| Elective | EE650 | Lecture | 전자기 특수토픽 I | Special Topics in EM I | 3-3-0 | |
| | EE651 | | 전자기 특수토픽 II | Special Topics in EM II | 3-3-0 | |
| | EE652 | | 전자기 특수토픽 III | Special Topics in EM III | 3-3-0 | |
| | EE731 | | Information Theory | 정보이론 | 3-3-0 | ITP111, EEE205, EEE301, EE541 |
| | EE733 | | Optimal Control Theory | 최적 제어 이론 | 3-3-0 | ITP111, EEE205, EE532 |
| | EE734 | | Estimation & Decision Theory | 추론 및 의사결정 이론 | 3-3-0 | ITP111, EEE205, EEE352, EE541 |
| | EE736 | | Channel Coding Theory | 채널코딩 이론 | 3-3-0 | ITP111, EEE205, EEE301, EE541 |
| | EE737 | | Data Compression | 데이터 압축 | 3-3-0 | ITP111, EEE205, EE541 |
| | EE738 | | Advanced Wireless Communication Theory | 고급 무선 통신 이론 | 3-3-0 | EE412(Closed), EE534 |
| | EE752 | | Analog Integrated System Design | 아날로그 시스템 디자인 | 3-3-0 | EEE303, EEE311 |
| | EE753 | | Advanced Digital IC Design | 고급 디지털 회로 설계 | 3-3-0 | EEE201, EEE303 |
| | EE754 | | Low Noise Electronic System Design | 저잡음 전자시스템 디자인 | 3-3-0 | EEE303, EEE311 |
| | EE755 | | Frequency Synthesizers | 주파수 발생기 이론 | 3-3-0 | EEE303, EEE311 |
| | EE756 | | Electronic Oscillators | 전자 발진기 이론 | 3-3-0 | EEE303, EEE311 |
| | EE759 | | Intelligent Power Interface | 지능형 전력 인터페이스 | 3-3-0 | EEE431 |
| | EE772 | | Nanoscale Electronic Devices | 나노전자소자 | 3-3-0 | PHY315 |
| | EE773 | | Compound Semiconductor Devices | 화합물 반도체 소자 | 3-3-0 | PHY315 |
| | EE774 | | Plasma in Device Manufacturing | 플라즈마공정 | 3-3-0 | EEE204, PHY204 |
| | EE775 | | Electromagnetic compatibility | 전자파 적합성 | 3-3-0 | |
| | 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 | |

| Category | Course Code | Classification | Course Title | Course Title (Kor.) | Cred.-Lec.-Exp. | Prerequisite |
|----------|---------------------|----------------|--|-----------------------|-----------------|------------------------|
| Elective | EE831 | Lecture | 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 | |
| | PHY561 | | Plasma Physics | 플라즈마 물리 | 3-3-0 | EEE204, PHY203, PHY204 |
| | PHY723 | | Interface Physics of Electronic Devices | 전자소자 계면물리 | 3-3-0 | EEE304 |
| | PHY763 | | Laser-Plasma Physics | 레이저-플라즈마 물리 | 3-3-0 | PHY427 |
| | PHY765 | | Fusion Plasma Physics | 핵융합 플라즈마 물리 | 3-3-0 | |
| ENE527 | Organic Electronics | 유기일렉트로닉스 | 3-3-0 | | | |

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 | Course Code | Classification | Course Title | Course Title (Kor.) | Cred.-Lect.-Exp. | Remark |
|----------|-------------------|----------------|---|----------------------|------------------|--------|
| Required | DES590 | Research | The Seminars ¹⁾ | 세미나 ¹⁾ | 1-1-0 | |
| | DES691 | | Master Graduation Project (MGP) ²⁾ | 석사졸업과제 ²⁾ | Value of credit | |
| | DES891 | | Doctoral Research ²⁾ | 박사논문연구 ²⁾ | Value of Credit | |
| Elective | DES501 | Lecture | Tangible Interaction and Interfaces | 탠저블 인터랙션 및 인터페이스 | 3-3-0 | |
| | DES504 | | Human-Centered AI and Design | 인간중심 AI 및 디자인 | 3-2-2 | |
| | DES506 | | Computational Interaction Design | 컴퓨터이셔널 인터랙션 디자인 | 3-2-2 | |
| | DES515 | | Systems thinking for Designers | 디자이너를 위한 시스템 사고 | 3-0-0 | |
| | DES601 | | Professional Design Practice | 디자인실무 | 3-2-2 | |
| | DES602 | | Contemporary Design Discourse Research | 현대 디자인 담론 연구 | 3-2-2 | |
| | DES603 | | Everyday Interaction with Personal Data | 개인 데이터와의 일상적 인터랙션 | 3-2-2 | |
| | DES604 | | Embedded System for HRI | HRI를 위한 임베디드 시스템 | 3-2-2 | |
| | DES703 | | Design Driven Innovation | 디자인 주도 혁신 | 3-3-0 | |
| | DES707 | | Product Understanding Use and Experience | 제품의 이해-사용과 경험 | 3-3-0 | |
| | DES708 | | Research Topics in Human-Computer Interaction | HCI 연구주제 | 3-0-0 | |
| | DES901 | | Special Topics in Design 1 | 디자인 특론 1 | 3-3-0 | |
| | DES902 | | Special Topics in Design 2 | 디자인 특론 2 | 3-3-0 | |
| | DES903 | | Special Topics in Design 3 | 디자인 특론 3 | 3-3-0 | |
| | DES904 | | Special Topics in Design 4 | 디자인 특론 4 | 3-3-0 | |
| | DES905 | | Special Topics in Design 5 | 디자인 특론 5 | 3-3-0 | |
| | DES906 | | Special Topics in Design 6 | 디자인 특론 6 | 3-2-2 | |
| | DES910 | | Industry Internship | 산업체 인턴십 | - | |
| DES911 | Start-up training | 창업 훈련 | - | | | |

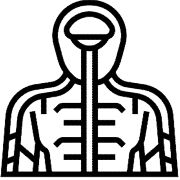
1) 'DES590' has been integrated with 'DES790'

2) MGP & Doctoral Research are available from 3 to 9 credits in each semester

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 therapy, (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 Genomics | 고급게놈학 | 3-3-0 |
| | BME507 | | Advanced Genome Engineering | 고급게놈공학 | 3-3-0 |
| | 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 | | Biostatistics 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 |
| | 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 |

Department of Biomedical Engineering

| Category | Course Code | Classification | Course Title | Course Title (Kor.) | Cred. -Lect. -Exp. |
|----------|--|----------------|---|---------------------|--------------------|
| Elective | BME610 | Lecture | 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 | 발명특허 | 3-3-0 |
| | 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]

| 2023 | → | 2024 |
|---|---|---|
| BME606 Biomedical Research with Model Organisms 모델 동물을 이용한 생명공학 | → | BME606 Biomedical Research with Model Organisms 모델 생물을 이용한 생명공학 |

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 |

Department of Industrial Engineering

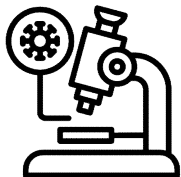
2. Curriculum [산업공학과 교육과정]

| Category | Course Code | Classification | Course Title | Course Title (Kor.) | Cred. -Lect. -Exp | Pre requisite |
|----------|---------------------------------|----------------|--|---------------------|-------------------|---------------|
| Required | IE690 | Research | Master's Research | 석사 연구 | 1~3 | |
| | IE890 | | Doctoral's Research | 박사 연구 | 3~9 | |
| Elective | IE502 | Lecture | Statistical Inference | 통계적 추론 | 3-3-0 | |
| | IE503 | | Pattern Recognition and Machine Learning | 패턴인식 및 기계학습 | 3-3-0 | |
| | 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 | |
| | IE510 | | Smart Factory & Advanced Manufacturing | 스마트 공장 및 고급 제조업 | 3-3-0 | |
| | 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 | | Reinforcement Learning | 강화학습 | 3-3-0 | |
| | 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 | 생산 시스템 설계 및 시뮬레이션 | 3-3-0 | |
| | IE518 | | 3D Printing | 3D 프린팅 | 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 | 전공영어 쓰기 | 3-3-0 | | | |
| SLA591 | Technical Writing in English | 영어논문작성법 | 3-3-0 | | | |

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 |

Department of Biological Sciences

2. Curriculum [생명과학과 교육과정]

| Category | Course Code | Classification | 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 | BIO504 | Lecture | Stem Cell Engineering | 줄기세포공학 | 3-3-0 | |
| | BIO505 | | 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 | |
| | BIO512 | | Emerging Principles of Gene Expression | 유전자 발현의 이해 | 3-3-0 | |
| | BIO513 | | Metabolomics: Understanding Metabolism | 대사체학 | 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 | |
| | 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 | Classification | 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)

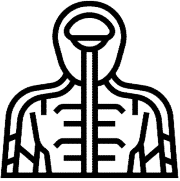
3. Curriculum Change [교육과정 변경사항]

| 2023 | → | 2024 |
|--|---|--|
| <NEW> | | BIO513 Metabolomics: Understanding Metabolism 대사체학 |
| BIO504 Stem Cell Engineering 줄기세포공학 | → | <Closed> |
| BIO512 Emerging Principles of Gene Expression 유전자 발현의 이해 | | |

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 (HST) | BIO590 | Research | Seminar | 세미나 | 1-1-0 | |
| | BME590 | | Seminar | 세미나 | 1-1-0 | |
| Required (HIE) | HST601 | | Capstone Design in Translational Medicine | 중개의료 캡스톤 디자인 | 3-2-2 | |
| | HST602 | | Industrial Internship | 산업체 인턴십 | 3-2-2 | |
| | HST590 | | Seminars in Translational Research | 중개연구 세미나 | 1-1-0 | |
| Required | HST690 | | Master's Research | 석사논문연구 | value of credit | |
| | HST890 | | Doctoral Research | 박사논문연구 | value of credit | |
| | HST501 | | Lecture | Clinical Trials | 발명과 임상시험 | 3-3-0 |
| | HST502 | | | Data Analysis in Medical Research | 의학 연구 데이터 분석 | 3-3-0 |
| Elective | HST603 | | 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 | 바이오파브 | 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 |

※ HST Major should select one of among HST590, BME590, or BIO590 for their seminar requirement

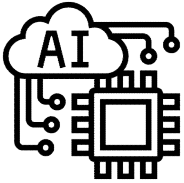
3. Curriculum Change [교육과정 변경사항]

| 2023 | → | 2024 |
|--|---|--|
| HST603 Field Practice of Translational Research 중개연구 현장 실습 | → | HST500 Field Practice of Translational Research 중개연구 현장 실습 |
| HST501 Clinical Trials 발명과 임상시험 | | HST501 Clinical Trials 발명과 임상시험 |

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 | 인공지능학개론 | 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 | |
| | | AI513 | Learning Theory | 학습 이론 | 3-3-0 | |
| | | AI514 | Big Data Analysis | 빅데이터 분석 | 3-3-0 | |
| | | AI515 | Distributed Learning | 분산학습 | 3-3-0 | |
| | | AI516 | Computer Vision | 컴퓨터 비전 | 3-3-0 | |
| | | AI517 | Deep Learning for NLP/NLU | NLP/NLU 딥 러닝 | 3-3-0 | |
| | | AI518 | Deep Generative Models | 심층 생성 모델 | 3-3-0 | |
| | | AI519 | Advanced Machine Learning Topics | 고급 기계학습 주제 | 3-3-0 | |
| | | AI520 | Machine Learning Fundamentals | 기계학습 기본원리 | 3-3-0 | |
| | | AI531 | Knowledge Service Engineering | 지식 서비스 공학 | 3-3-0 | |
| | | AI532 | Advanced Information Visualization | 고급 정보 시각화 | 3-3-0 | |
| | | AI533 | Advanced Quality Control | 고급 품질 제어 | 3-3-0 | |
| | | AI534 | Advanced Additive Manufacturing | 고등 적층 제조 | 3-3-0 | |
| | | AI535 | Robotics | 로봇학 | 3-3-0 | |
| | | 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 | |
| AI552 | AI Framework Design and Implementation | AI 프레임 워크 설계 및 구현 | 3-3-0 | | | |

| Category | Classification | Course Code | Course Title | Course Title (Kor) | Cred.-Lect.-Exp. | Remark |
|----------|----------------|-------------|---------------------------------------|--------------------|------------------|--------|
| Elective | Lecture | 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 | Nonparametric 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 | |
| | | 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

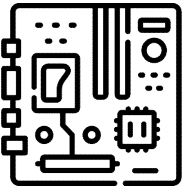
3. Curriculum Change [교육과정 변경사항]

| 2024 | → | 2024 |
|---|---|--|
| (NEW) | | AI537 Smart Factory and Advanced Manufacturing 스마트 공장 및 고급 제조업 |
| AI501 Introduction to AI 인공지능학개론 [Grading: Letter Grade] | → | AI501 Introduction to AI 인공지능학개론 [Grading: S/U] |

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 | Course Code | Classification | Course Title | Course Title (Kor.) | Cred. -Lec. -Exp. | Prerequisite |
|----------|---------------------------|----------------|--|---------------------|-------------------------|------------------------|
| Required | EE590 | Research | EE Graduate Seminar | EE 대학원 세미나 | 1-1-0 | |
| | EE690 | | Master's Research | 석사논문연구 | 가변학점 | |
| | EE890 | | Doctoral Research | 박사논문연구 | 가변학점 | |
| Elective | EE506 | Lecture | Introduction to Optimization | 최적화 이론 | 3-3-0 | EE533 |
| | CSE512 | | Graph Theory | 그래프 이론 | 3-3-0 | |
| | EE530 | | Image Processing | 영상처리 | 3-3-0 | ITP111, EEE205 |
| | EE532 | | Linear System Theory | 선형시스템이론 | 3-3-0 | ITP111, EEE205, EEE351 |
| | EE533 | | Advanced Linear Algebra | 고급선형대수학 | 3-3-0 | ITP111, EEE205 |
| | EE534 | | Modern Digital Communication Theory | 디지털 통신 이론 | 3-3-0 | EE412 (Closed) |
| | EE535 | | Robotics | 로봇공학 | 3-3-0 | ITP111, EEE205, EEE351 |
| | EE536 | | 3D Visual Processing | 3차원 영상처리 | 3-3-0 | ITP111, EEE205 |
| | EE538 | | Data Communication Networks | 데이터 통신망 | 3-3-0 | ITP111 |
| | EE539 | | Advanced Control Techniques | 최신제어기법 | 3-3-0 | EEE351 |
| | EE540 | | Stochastic Optimization | 스토캐스틱 최적화 | 3-3-0 | ITP111 |
| | EE541 | | Modern Probability Theory and Stochastic Processes | 확률신호론 | 3-3-0 | ITP111, EEE205 |
| | EE542 | | Introduction to Medical Image Processing | 의료영상처리의 기초 | 3-3-0 | EEE205 |
| | EE543 | | Computer Vision | 컴퓨터 비전 | 3-3-0 | |
| | EE551 | | Analog Filters | 아날로그 필터 | 3-3-0 | EEE303 |
| | EE553 | | Digital Integrated Circuits | 디지털 집적회로 | 3-3-0 | EEE303 |
| | EE554 | | Electronic Packaging Design | 전자패키징설계 | 3-3-0 | EEE204 |
| | EE555 | | Advanced Power Electronics | 고급 전력전자 공학 | 3-3-0 | EEE431 |
| | EE556 | | Antenna Engineering | 안테나 공학 | 3-3-0 | EEE204, EEE231 |
| | EE557 | | Data Converter Circuits | 데이터 변환기 회로 | 3-3-0 | EEE303 |
| EE558 | Advanced Analog IC Design | 고급 아날로그 IC 디자인 | 3-3-0 | EEE303, EEE311 | | |

Department of Electrical Engineering

| Category | Course Code | Classification | Course Title | Course Title (Kor.) | Cred. -Lec. -Exp. | Prerequisite |
|----------|-------------|----------------|---|----------------------------|-------------------------|----------------|
| Elective | EE559 | Lecture | Wireless IC Design | 무선 IC 디자인 | 3-3-0 | EEE303, EEE311 |
| | EE560 | | Power Systems | 전력 시스템 | 3-3-0 | EEE302 |
| | EE571 | | Advanced Electromagnetics | 고급전자기학 | 3-3-0 | EEE204, EEE231 |
| | EE575 | | Modern RF Engineering | 현대초고주파공학 | 3-3-0 | EEE204, EEE231 |
| | EE576 | | Advanced Photonics | 고급 광자학 | 3-3-0 | EEE204, EEE231 |
| | EE577 | | Microelectronics Lab | 전자소자실험 | 3-1-4 | EEE304 |
| | 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 | EEE431 |
| | EE581 | | Automotive Electronics I | 자동차 반도체 설계 I | 3-3-0 | EEE431 |
| | 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 | |
| | EE585 | | Pattern Recognition and Machine Learning | 패턴인식 | 3-3-0 | |
| | 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 | |

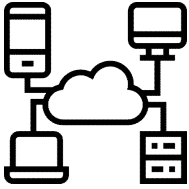
| Category | Course Code | Classification | Course Title | Course Title (Kor.) | Cred. -Lec. -Exp. | Prerequisite |
|----------|-------------|----------------|--|--------------------------|-------------------------|-------------------------------|
| Elective | EE650 | Lecture | 전자기 특수토픽 I | Special Topics in EM I | 3-3-0 | |
| | EE651 | | 전자기 특수토픽 II | Special Topics in EM II | 3-3-0 | |
| | EE652 | | 전자기 특수토픽 III | Special Topics in EM III | 3-3-0 | |
| | EE731 | | Information Theory | 정보이론 | 3-3-0 | ITP111, EEE205, EEE301, EE541 |
| | EE733 | | Optimal Control Theory | 최적 제어 이론 | 3-3-0 | ITP111, EEE205, EE532 |
| | EE734 | | Estimation & Decision Theory | 추론 및 의사결정 이론 | 3-3-0 | ITP111, EEE205, EEE352, EE541 |
| | EE736 | | Channel Coding Theory | 채널코딩 이론 | 3-3-0 | ITP111, EEE205, EEE301, EE541 |
| | EE737 | | Data Compression | 데이터 압축 | 3-3-0 | ITP111, EEE205, EE541 |
| | EE738 | | Advanced Wireless Communication Theory | 고급 무선 통신 이론 | 3-3-0 | EE412(Closed), EE534 |
| | EE752 | | Analog Integrated System Design | 아날로그 시스템 디자인 | 3-3-0 | EEE303, EEE311 |
| | EE753 | | Advanced Digital IC Design | 고급 디지털 회로 설계 | 3-3-0 | EEE201, EEE303 |
| | EE754 | | Low Noise Electronic System Design | 저잡음 전자시스템 디자인 | 3-3-0 | EEE303, EEE311 |
| | EE755 | | Frequency Synthesizers | 주파수 발생기 이론 | 3-3-0 | EEE303, EEE311 |
| | EE756 | | Electronic Oscillators | 전자 발진기 이론 | 3-3-0 | EEE303, EEE311 |
| | EE759 | | Intelligent Power Interface | 지능형 전력 인터페이스 | 3-3-0 | EEE431 |
| | EE772 | | Nanoscale Electronic Devices | 나노전자소자 | 3-3-0 | PHY315 |
| | EE773 | | Compound Semiconductor Devices | 화합물 반도체 소자 | 3-3-0 | PHY315 |
| | EE774 | | Plasma in Device Manufacturing | 플라즈마공정 | 3-3-0 | EEE204, PHY204 |
| | EE775 | | Electromagnetic compatibility | 전자파 적합성 | 3-3-0 | |
| | 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 | |

Department of Electrical Engineering

| Category | Course Code | Classification | Course Title | Course Title (Kor.) | Cred. -Lec. -Exp. | Prerequisite |
|----------|---------------------|----------------|--|-----------------------|-------------------|------------------------|
| Elective | EE831 | Lecture | 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 | |
| | PHY561 | | Plasma Physics | 플라즈마 물리 | 3-3-0 | EEE204, PHY203, PHY204 |
| | PHY723 | | Interface Physics of Electronic Devices | 전자소자 계면물리 | 3-3-0 | EEE304 |
| | PHY763 | | Laser-Plasma Physics | 레이저-플라즈마 물리 | 3-3-0 | PHY427 |
| | PHY765 | | Fusion Plasma Physics | 핵융합 플라즈마 물리 | 3-3-0 | |
| ENE527 | Organic Electronics | 유기일렉트로닉스 | 3-3-0 | | | |

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. |
|----------|--|----------------|-------------------------------------|-------------------|--------------------|
| 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 |
| | | 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 |
| | | CSE545 | Advanced Computer Vision | 고급 컴퓨터 비전 | 3-3-0 |
| | | 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 | | |
| CSE610 | Special Topics in Computer Engineering I | 컴퓨터공학 스페셜 토픽 I | 3-3-0 | | |

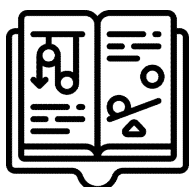
| Category | Classification | Course Code | Course Title | Course Title(Kor) | Cred. -Lect. -Exp. |
|----------|----------------|-------------|---|-------------------|--------------------------|
| Elective | Lecture | CSE611 | Special Topics in Computer Engineering II | 컴퓨터공학 스페셜 토픽 II | 3-3-0 |
| | | CSE612 | Special Topics in Computer Engineering III | 컴퓨터공학 스페셜 토픽 III | 3-3-0 |
| | | CSE613 | Special Topics in Computer Engineering IV | 컴퓨터공학 스페셜 토픽 IV | 3-3-0 |
| | | CSE614 | Special Topics in Computer Engineering V | 컴퓨터공학 스페셜 토픽 V | 3-3-0 |
| | | CSE710 | Natural Language Processing | 자연언어처리 | 3-3-0 |
| | | 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 토픽 I | 3-3-0 |
| | | CSE811 | Advanced Topics in Computer Engineering II | 컴퓨터공학 고급 토픽 II | 3-3-0 |
| | | CSE812 | Advanced Topics in Computer Engineering III | 컴퓨터공학 고급 토픽 III | 3-3-0 |
| | | CSE813 | Advanced Topics in Computer Engineering IV | 컴퓨터공학 고급 토픽 IV | 3-3-0 |
| | | CSE814 | Advanced Topics in Computer Engineering V | 컴퓨터공학 고급 토픽 V | 3-3-0 |

**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 |

Department of Computer Science and Engineering

2. Curriculum [물리학과 교육과정]

| Category | Course Code | Classification | 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 | |
| | 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 | |
| | 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 | |
| | 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 | |

| Category | Course Code | Classification | Course Title | Course Title(Kor) | Cred.-Lect.-Exp. | Pre-requisite |
|----------|-------------|----------------|---|--------------------------|------------------|---------------|
| Elective | PHY684 | Lecture | 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 | |
| | PHY711 | | Quantum Field Theory | 양자장론 | 3-3-0 | |
| | PHY723 | | Interface Physics of Electronic Devices | 전자소자 계면물리 | 3-3-0 | |
| | PHY731 | | Phase Transition and Critical Phenomena | 상전이와 임계현상 | 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 | |

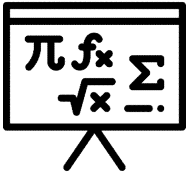
* PHY501, PHY503, PHY505, and PHY507 courses are required only for Master's and combined Master's-Doctoral program students.

* PHY562 Advanced Plasma Physics course is identical to NE602 Advanced Plasma Physics course.

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. | Pre requisite | Remarks |
|----------|-------------------------|----------------|---|--------------------|--------------------|------------------|---|
| 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 | MTH251 MTH351 | **MTH401 |
| | MTH502 | | Functional Analysis | 함수해석학 | 3-3-0 | MTH501 | |
| | MTH503 | | Probability and Stochastic Processes | 확률 및 확률 과정론 | 3-3-0 | MTH251 MTH342 | **MTH403 |
| | MTH505 | | Numerical Analysis and Applications | 수치해석 및 응용 | 3-3-0 | | **MTH405 |
| | 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 | | **MTH411 |
| | MTH512 | | Numerical Methods for Partial Differential Equations II | 편미분방정식의 수치방법 II | 3-3-0 | MTH511 | |
| | MTH513 | | Dynamical Systems | 동적 시스템 | 3-3-0 | | **MTH412 |
| | MTH515 | | Mathematical Methods for Engineers | 공학자를 위한 수학방법 | 3-3-0 | | |
| | MTH517 | | Stochastic Calculus and applications | 확률 미적분과 응용 | 3-3-0 | | Recommended Course*: MTH503 |
| | MTH520 | | Fourier Analysis | 푸리에 해석학 | 3-3-0 | MTH251 | **MTH420 |
| | MTH521 | | Introduction to Partial Differential Equations | 편미분방정식개론 | 3-3-0 | MTH201 MTH203 | Recommended Course*: MTH315, MTH251 **MTH421 |
| | MTH531 | | Scientific Computing | 과학계산 | 3-3-0 | | |
| | MTH532 | | Algebraic Topology | 대수적 위상수학 | 3-3-0 | MTH112 MTH351 | **MTH432 |
| | MTH533 | | Information Theoretical Approach to A.I | 정보이론과 인공지능 | 3-3-0 | MTH251 | Recommended Course*: MTH342, MTH403 **MTH433 |
| | MTH551 | | Algebra I | 대수학 I | 3-3-0 | | **MTH302 |
| | MTH552 | | Algebra II | 대수학 II | 3-3-0 | MTH551 | **MTH303 |
| | MTH553 | | Commutative Algebra | 가환대수 | 3-3-0 | | |
| MTH554 | Algebraic Number theory | 대수적 정수론 | 3-3-0 | | | | |

Department of Mathematical Sciences

| Category | Course Code | Classi- fication | Course Title (Eng) | Course Title (Kor) | Cred. -Lect. -Exp. | Pre requisite | Remarks |
|----------|---|---------------------|--|--------------------|--------------------------|------------------|---------|
| Elective | MTH555 | Lecture | Analytic Number theory | 해석적 정수론 | 3-3-0 | | |
| | 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 | MTH566 | |
| | MTH568 | | Modern Mathematical Physics | 현대수리물리학 | 3-3-0 | | |
| | MTH570 | | Advanced Algebra | 고급 대수학 | 3-3-0 | MTH551 MTH552 | |
| | 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 | MTH501 MTH505 | |
| | MTH752 | | Selected Topics in Image Processing II | 이미지 프로세싱 특론 II | 3-3-0 | MTH501 MTH505 | |
| | 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 | | | | |

* It is highly recommended to register the subject related to academic connectivity.

** Courses are designed for both advanced undergraduate students and first-year graduate students. These courses may be taken for either undergraduate or graduate credit.

3. Curriculum Change [교육과정 변경사항]

| 2023 | → | 2024 |
|--|---|--|
| MTH532 Introduction to Algebraic Topology 대수위상 | → | MTH532 Algebraic Topology 대수적 위상수학 |
| MTH560 Representation Theory 표현론 | | MTH560 표현론 및 응용 Representation Theory and Applications |

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 | Classification | 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 |
| | 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 |
| | 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 |
| | CHM643 | | Molecular Spectroscopy | 분자분광학 | 3-3-0 | Core Subject |
| CHM644 | Chemical Kinetics | 반응속도론 | 3-3-0 | | | |

Department of Chemistry

| Category | Course Code | Classification | Course Title | Course Title(Kor) | Cred. -Lect. -Exp. | Remarks |
|----------|------------------------------|----------------|--|-------------------|--------------------|--------------|
| Elective | CHM645 | Lecture | Chemical Physics | 화학물리학 | 3-3-0 | |
| | CHM646 | | Molecular Physics | 분자물리학 | 3-3-0 | |
| | CHM651 | | Inorganic Supramolecules /Metal-Organic Frameworks | 무기초분자 및 금속유기 열개 | 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 | 에너지변환 촉매화학 | 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 | |
| | CHM875 | | 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 | | | |

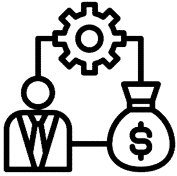
* Both undergraduate and first-year graduate students can take the courses marked with an asterisk(*) and earn credits.

**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 | Pre-requisite |
|----------|-------------|----------------|---|---------------------|-------------------|---------------|
| 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 | |

School of Business Administration

| Category | Course Code | Classification | Course Title | Course Title (Kor.) | Cred.-Lect.-Exp | Pre-requisite |
|----------|-------------|----------------|--|---------------------|-----------------|---------------|
| Elective | MIS502 | Lecture | 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 | |
| | 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 | |
| | FIN512 | | 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 | 벤처캐피탈 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 | Pre-requisite |
|----------|-------------|----------------|------------------------------------|---------------------|-----------------|---------------|
| 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 | |

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