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2024
Undergraduate Course Catalog

ULSAN NATIONAL INSTITUTE OF SCIENCE AND TECHNOLOGY

Undergraduate Program

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Definitions [용어정의]

Terms/용어	Definition/정의
Curriculum Year [교육과정 적용연도]	In principle, students should refer to their entrance year curriculum. However, the new curriculum can also be counted accordingly. Students who have changed their following curriculum from track-based to department-based should follow 2021 curriculum in principle. 원칙적으로, 본인의 입학년도 교육과정을 따라야 하나, 이후 교육과정 또한 참고하여 이수할 수 있으며 해당 교육과정상 이수구분에 따라 인정받을 수 있습니다. 트랙제 → 학과제 변경학생은 2021학년도 교육과정 이수를 원칙으로 합니다.
Basic [기초]	Formerly 'Fundamental' courses. Each field has [Required] basic courses and [Elective] courses. Basic [Elective] requirements are designated by each department(school). 구) 계열기초 교과. 각 계열별 [기초필수] 교과와 [기초선택] 교과가 있습니다. [기초선택] 교과는 각 학과(부)별 요건이 별도로 지정되어 있습니다.
Liberal Arts [교양]	In Liberal Arts, there are ① English ② Language ③ Liberal Arts courses, and each section has separate requirements. 교양 영역에는 ① 영어 ② 언어(제2외국어) ③ Liberal Arts(교양) 세가지 분야가 있고, 각 분야별 별도의 학점이 설정되어 있습니다.
Major [전공] Double Major [복수전공] Minor [부전공]	All students must have one major from sophomore. However, students can have double major and minor and they are optional. 모든 학생은 2학년부터 주전공을 필수적으로 선택하게 되어 있고, 복수전공과 부전공은 선택사항입니다.
Prerequisite [선이수] Identical [동일교과]	**[Prerequisite]** If course A has prerequisite course B, course B should be completed before taking course A. **[Identical]** If course C and course D is identical, taking course C will be regarded as taking course D **[선이수교과]** A 교과의 선이수 교과가 B인 경우, A 교과를 이수하기 위해서는 B 교과를 이수 완료하여야 합니다. **[동일교과]** C 교과와 D 교과가 동일교과인 경우, C 교과를 이수하면 D 교과를 이수한 것으로 간주됩니다.
Minimum credits [최소학점]	All credit requirements in each category is minimum credits. Each department(school) has own graduation requirements so you should carefully confirm your major graduation requirements. 각 영역별로 학교에서 정한 최소 학점이 설정되어 있고, 각 학과(부)에서 영역별로 졸업요건을 별도로 설정했습니다. 반드시 각 학과(부)별 졸업요건을 확인해주세요.
Free Elective [자유선택]	All courses that are not counted in [Basic], [Liberal Arts], [Major/Double Major/Minor] will be counted in [Free elective] courses. [기초], [교양], [전공/복수전공/부전공]으로 인정되지 않은 학점은 [자유선택]으로 인정됩니다.
Semester [개설학기]	Semester offered in each page is plan of each department(school). Course opening semester is subject to change according to various circumstances. 각 페이지에 있는 개설학기는 각 학과(부)의 개설 '계획'입니다. 개설학기는 여러 상황에 따라 변경될 수 있습니다.

2024 Course Catalog

Instructions [교육과정 설명서]

1. Graduation Requirement [졸업 이수요건]

Category 구분		Credits 이수학점	Remarks 비고	Subtotal 소계
Basic 기초	Required 필수	17	Calculus I(3), General Physics I(3), General Chemistry I(3), General Biology(3), Introduction to AI Programming I(3), General Chemistry Lab I(1), General Physics Lab I(1) (Total 17 credits)	At least 30 Credits
	Elective 선택(학과 지정)	13	Complete basic elective courses at least 13 credits including Applied Linear Algebra(3) and Differential Equations(3)	
Major 전공	Required 필수	27	Refer to Required course list below	At least 48 Credits
	Elective 선택	21	Refer to Elective course list below	
	Internship 인턴십	3	Internship (Choose one among Research, Industrial, Venture Creation, Co-op)	3 Credits
Free Elective 자유선택		19	All courses acceptable	At least 19 Credits

* For Liberal Arts and Leadership requirements, refer to school Common requirements

01. Graduation Requirement [졸업 이수요건]

All students must check each department(school) graduation requirements. You must complete at least minimum credits for each category. Also see the overall graduation requirements on next page.
모든 학생은 졸업을 위하여 각 학과(부)별 졸업 이수요건을 확인하여야 합니다. 각 영역별 최소학점 이상을 이수하여야 합니다. 다음 페이지에 있는 계열별 졸업 요건도 반드시 함께 확인하시기 바랍니다.

2. Basic Requirements [기초 이수요건]

No.	Course Code	Course Title	Major 전공	Double Major 복수전공	Minor 부전공
			13 credits	6 credits	-
1	MTH112	Calculus II (3)	○		
2	PHY103	General Physics II (3)	○		
3	CHM102	General Chemistry II (3)	○		
4	PHY108	General Physics Lab II (1)	○		
5	CHM106	General Chemistry Lab II (1)	○		
6	MTH201	Differential Equations (3)	●	●	
7	MTH203	Applied Linear Algebra (3)	●	●	
8	MTH211	Statistics (3)	○		
9	MGT102	Entrepreneurship (3)	○		
10	IE101	Introduction to Data Science(3)	○		
11	ITP117	Introduction to AI Programming II (3)	○		
12	ITP111	Probability & Random Process (3)	○		
13	ITP112	Discrete Mathematics (3)	○		
14	UNI101	Understanding Major (1) **Mechanical Engineering and Future**	○		

●: Required ○: Elective ◑: Recommended, ( ): credits

02. Basic Requirement [기초 이수요건]

Each department(school) has basic course requirments for major/double major/minor. Major requirements will be counted as 'Basic elective'. If there are double major and minor requirements, completed credits will be counted as free elective.
각 학과(부)에는 전공/복수전공/부전공 기초 교과 이수 요건이 있습니다. 각 전공(Major) 이수요건은 기초선택 요건으로 인정되며, 복수전공/부전공에 필수 요건이 있는 학과(부)의 경우 해당 교과 이수시 해당 학점은 자유선택으로 인정됩니다.

3. Curriculum [기계공학과 교육과정]

▶ Credit Requirements [이수학점]

Department (School)	Major(전공)			Double Major(복수전공)			Minor(부전공)		
	R	E	Total	R	E	Total	R	E	Total
Department of Mechanical Engineering	27	21	**48**	18	18	**36**	9	9	**18**

*R: Required, E: Elective

▶ Required [전공필수]

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp.	Remarks	Semester
UEE201	Introduction to Environmental Engineering 환경공학개론	○	○	○	3-3-0		1
UEE202	Earth and Environmental Sciences 지구환경과학	○	○	○	3-3-0		1
UEE203	Introduction to Civil Engineering 건설공학개론	○	○	○	3-3-0		1
UEE204	Introduction to Urban Planning 도시계획개론	○	○	○	3-3-0		1
UEE205	Introduction to Natural Hazards 자연재해개론	○	○	○	3-3-0		1
UEE490	Graduate Thesis 졸업논문	○	-	-	0 credit		1,2
Total		**15**	**15**	**15**			

* Double major students can choose 4 subjects out of 5 required courses above, and minor for 2 subjects.

03. Credit Requirements [전공/복수전공/부전공 이수학점]

Major, Double Major, Minor has [Required] and [Elective] courses. You must complete certain credits in Required and Elective courses.
전공/복수전공/부전공에는 [필수교과]와 [선택교과]가 있습니다. 각 필수교과, 선택교과 중에서 일정 학점 이상을 이수하여야 합니다.

04. Course List (교과목록)

[Required] and [Elective] courses are listed by each department(school). Also, read carefully of the captions written below the list. The ○ notation in the list means a course that is only counted by a particular major type. Ex) If there are no circles on [Minor] courses, those courses will not be counted as minor credits. It will be counted as free elective courses.
각 학과(부)별로 [필수교과], [선택교과]가 표기되어 있습니다. 과목 목록 하단에 주석이 있는 경우 자세히 읽어보시기 바랍니다. 목록에 있는 ○ 표기는 특정 전공 유형에게만 인정되는 교과를 의미합니다. 예를 들어, 부전공에 ○ 표기가 안되어 있으면 부전공 학점으로 인정받을 수 없고 자유선택으로만 인정 가능합니다.

4. Curriculum Change [교육과정 변경사항]

2021	→	2022
〈NEW〉	→	UEE337 Building Collapse and Safety Inspection Techniques 건물 붕괴와 안전진단 기술
UEE335 Structural Engineering Lab 구조공학실험		〈Closed〉 Substitution[대체과목]: UEE337
UEE354 Disaster Risk Analysis 재난위험성 분석		〈Closed〉 Substitution[대체과목]: UEE352
UEE451 Weather Analysis and Prediction 날씨분석 및 예측		〈Closed〉 Substitution[대체과목]: UEE205

05. Curriculum Change [교육과정 변경사항]

Changes from 2023 curriculum to 2024 curriculum will be listed.
2021학년도 교육과정 대비 2022학년도 변경사항이 기재되어 있습니다.

5. Curriculum Map [교육과정 이수 체계도]

Freshman		Sophomore		Junior		Senior	
Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall
Required Basic Courses	Elective Basic Courses	Classical Mechanics I	Classical Mechanics II	Quantum Physics I	Quantum Physics II	Thermal and Statistical Physics II	Fluid Physic
	General Physics II	Electro-magnetism I	Electro-magnetismII	Computational Physics	Thermal and Statistical Physics I	Introduction to Plasma Physics	Nuclear and Elementary Particle Physics
	General Physics Lab II	Modern Physics	Mathematical Physics	Physics Lab II	Solid State Physics I	Biological Physics	Introduction to Beam Physics
	Calculus II	Applied Linear Algebra	Physics Lab I	Astrophysics :Stars and Blackholes	Astrophysics :Galaxies and the Universe	Solid Physics II :Quantum Materilas	Introduction to Theoretical Physics

06. Curriculum Map [교육과정 이수 체계도]

Recommended curriculum path is suggested by each department (school)
각 학과(부)별 권장 이수 체계도가 각 학과(부)별로 기재되어 있습니다.

Graduation Requirements

■ Engineering Field (이공계열)

※ Below credits are minimum requirements for each category (각 영역별로 기재된 학점은 최소 충족 학점임)

Category		Course List		Credits		Total (Credits)
Basic 기초	Required 기초필수	Calculus I		3		17
		General Physics I		3		
		General Chemistry I		3		
		General Biology		3		
		Introduction to AI Programming I		3		
		General Physics Lab I		1		
		General Chemistry Lab I		1		
	Elective 기초선택	Follow each department(school) requirements		At least 13		At least 13
Liberal Arts 교양	Language 언어*	Korean Students	Chinese I	Choose 1 (2 credits)	2	At least 24
			Chinese II			
			Korean Writing			
		International Students	Korean I	Choose 1 (2 credits)		
			Korean II			
	English 영어	Lev.1	English Camp	4		
			English Listening & Speaking (Intermediate)			
			English Reading & Writing (Intermediate)			
		Lev.2	English Listening & Speaking (Intermediate)			
			English Reading & Writing (Intermediate)			
		Lev.3	English Listening & Speaking (Advanced)			
			English Reading & Writing (Advanced)			
		Lev.4	Exemption			
	Liberal Arts 교양	Take 18 credits in Liberal Arts Category		18		
Major 전공 *Refer to each department(school) requirements		Major [전공]		At least 48		At least 51
		Internship (Choose one among Research, Industrial, Venture Creation, Co-op)		3		
		Double Major [복수전공] (Optional)		At least 36		-
		Minor [부전공] (Optional)		At least 18		
Free Elective 자유선택		All courses acceptable		Follow Each department(school) requirements		
Leadership 리더십프로그램		UNIST Leadership Program		6AU		

Total 124 credits / 6AU

*Language: Students can fulfill requirements taking French/Japanese/German/Russian courses through credit exchange

■ Business Administration Field (경영계열)

※ Below credits are minimum requirements for each category (각 영역별로 기재된 학점은 최소 충족 학점임)

<table>
<tr><th colspan="2">Category</th><th colspan="3">Course List</th><th colspan="2">Credits</th><th>Total (Credits)</th></tr>
<tr><td rowspan="6">Basic
기초</td><td rowspan="5">Required
기초필수</td><td colspan="2">Calculus I</td><td rowspan="5">Choose 1</td><td colspan="2">3</td><td rowspan="5">9</td></tr>
<tr><td colspan="2">Introduction to AI Programming I</td><td colspan="2">3</td></tr>
<tr><td colspan="2">General Physics I</td><td rowspan="3">3</td></tr>
<tr><td colspan="2">General Chemistry I</td></tr>
<tr><td colspan="2">General Biology</td></tr>
<tr><td>Elective
기초선택</td><td colspan="3">Follow each department(school) requirements</td><td colspan="2">At least 19</td><td>At least 19</td></tr>
<tr><td rowspan="12">Liberal Arts
교양</td><td rowspan="5">Language
언어*</td><td rowspan="3">Korean Students</td><td>Chinese I</td><td rowspan="3">Choose 1
(2 credits)</td><td rowspan="5">2</td><td rowspan="12">At least 24</td></tr>
<tr><td>Chinese II</td></tr>
<tr><td>Korean Writing</td></tr>
<tr><td rowspan="2">International Students</td><td>Korean I</td><td rowspan="2">Choose 1
(2 credits)</td></tr>
<tr><td>Korean II</td></tr>
<tr><td rowspan="8">English
영어</td><td rowspan="3">Lev.1</td><td>English Camp</td><td colspan="2" rowspan="8">4</td></tr>
<tr><td>English Listening & Speaking (Intermediate)</td></tr>
<tr><td>English Reading & Writing (Intermediate)</td></tr>
<tr><td rowspan="2">Lev.2</td><td>English Listening & Speaking (Intermediate)</td></tr>
<tr><td>English Reading & Writing (Intermediate)</td></tr>
<tr><td rowspan="2">Lev.3</td><td>English Listening & Speaking (Advanced)</td></tr>
<tr><td>English Reading & Writing (Advanced)</td></tr>
<tr><td>Lev.4</td><td>Exemption</td></tr>
<tr><td>Liberal Arts
교양</td><td colspan="3">Take 18 credits in Liberal Arts Category</td><td colspan="2">18</td></tr>
<tr><td rowspan="4">Major
전공
*Refer to each department(school) requirements</td><td colspan="3">Major [전공]</td><td colspan="2">At least 48</td><td rowspan="2">At least 51</td></tr>
<tr><td colspan="3">Internship (Choose one among Research, Industrial, Venture Creation, Co-op)</td><td colspan="2">3</td></tr>
<tr><td colspan="3">Double Major [복수전공] (Optional)</td><td colspan="2">At least 36</td><td rowspan="2">-</td></tr>
<tr><td colspan="3">Minor [부전공] (Optional)</td><td colspan="2">At least 18</td></tr>
<tr><td colspan="2">Free Elective
자유선택</td><td colspan="3">All courses acceptable</td><td colspan="3">Follow Each department(school) requirements</td></tr>
<tr><td colspan="2">Leadership
리더십프로그램</td><td colspan="3">UNIST Leadership Program</td><td colspan="3">6AU</td></tr>
</table>

Total 124 credits / 6AU

*Language: Students can fulfill requirements taking French/Japanese/German/Russian courses through credit exchange

■ Major / Double Major / Minor credit requirements of each department(school)
[학과(부)별 전공 / 복수전공 / 부전공 전공 요구 학점]

College 단과대학	Department(School) 학과(부)	Major 전공			Double Major 복수전공			Minor 부전공		
		R	E	Total	R	E	Total	R	E	Total
College of Engineering 공과대학	Department of Mechanical Engineering 기계공학과	27	21	**48**	18	18	**36**	9	9	**18**
	Department of Civil, Urban, Earth, and Environmental Engineering 지구환경도시건설공학과	15	39	**54**	12	24	**36**	6	12	**18**
	Department of Materials Science and Engineering 신소재공학과	21	30	**51**	21	18	**39**	12	6	**18**
	School of Energy and Chemical Engineering 에너지화학공학과	33	18	**51**	33	6	**39**	18	0	**18**
	Department of Nuclear Engineering 원자력공학과	27	27	**54**	15	21	**36**	3	15	**18**
College of Information & Biotechnology 정보바이오융합대학	Department of Design 디자인학과	30	18	**48**	30	6	**36**	12	6	**18**
	Department of Biomedical Engineering 바이오메디컬공학과	21	33	**54**	15	24	**39**	12	6	**18**
	Department of Industrial Engineering 산업공학과	24	24	**48**	15	21	**36**	9	9	**18**
	Department of Biological Sciences 생명과학과	32	22	**54**	14	22	**36**	11	7	**18**
	Department of Electrical Engineering 전기전자공학과	21	27	**48**	18	18	**36**	18	0	**18**
	Department of Computer Science and Engineering 컴퓨터공학과	24	24	**48**	18	21	**39**	15	15	**30**
College of Natural Sciences 자연과학대학	Department of Physics 물리학과	24	30	**54**	18	18	**36**	12	6	**18**
	Department of Mathematical Sciences 수리과학과	30	24	**54**	15	21	**36**	12	6	**18**
	Department of Chemistry 화학과	30	24	**54**	18	18	**36**	12	6	**18**
-	School of Business Administration 경영과학부	21	27	**48**	21	15	**36**	12	6	**18**

※ R: Required (필수) / E: Elective (선택)

※ Double Major and Minor are optional. Students can apply for Double Major and Minor in their 3rd semester.
복수전공, 부전공은 선택사항이며 3학기에 신청 가능.

■ Graduation Requirements of each department(school) [학과(부)별 졸업과제]

College 단과대학	Department(School) 학과(부)	Requirements
College of Engineering 공과대학	Department of Mechanical Engineering 기계공학과	MEN490 Thesis Study [졸업연구] (3 credits)
	Department of Civil, Urban, Earth, and Environmental Engineering 지구환경도시건설공학과	CUEE490 Graduate Thesis [졸업논문] (0 credits)
	Department of Materials Science and Engineering 신소재공학과	Complete at least 3 credits of Research Internship or Coop internship and submit internship report
	School of Energy and Chemical Engineering 에너지화학공학과	ECHE490 Undergraduate Thesis Research [학사졸업논문연구] (3 credits)
	Department of Nuclear Engineering 원자력공학과	NE490 Graduate Thesis [졸업논문] (0 credits)
College of Information & Biotechnology 정보바이오 융합대학	Department of Design 디자인학과	Complete course: DES431 Creative Design 1 [창의디자인1] (3 credits)
	Department of Biomedical Engineering 바이오메디컬공학과	Complete course: BME490 Capstone Design [캡스톤디자인] (3 credits)
	Department of Industrial Engineering 산업공학과	Complete course: IE450 Project Lab [프로젝트랩] (3 credits)
	Department of Biological Sciences 생명과학과	BIO490 Thesis Research [졸업논문] (3 credits)
	Department of Electrical Engineering 전기전자공학과	EEE490 Undergraduate Research [졸업연구] (3 credits)
	Department of Computer Science and Engineering 컴퓨터공학과	CSE401 Research in Computer Science and Engineering [졸업연구] (3 credits)
College of Natural Sciences 자연과학대학	Department of Physics 물리학과	PHY490 Graduate Thesis [졸업논문] (0 credits)
	Department of Mathematical Sciences 수리과학과	MTH490 Graduate Thesis [졸업논문] (0 credits)
	Department of Chemistry 화학과	CHM400 Thesis [졸업논문] (3 credits)
-	School of Business Administration 경영과학부	Complete course: MGT499 Strategic Management [경영전략] (3 credits)

Basic Courses [기초]

Category			Course Code	Course Title	Cred. -Lect. -Exp.	Remarks	Semester
-	ENG	BUS					
Required (필수)	O	O	MTH111	Calculus I 미적분학 I	3-3-1		1
	O	O	ITP107	Introduction to AI Programming I 기초 인공지능 프로그래밍 I	3-2-2		1,2
	O	O	PHY101 (PHY102)	General Physics I (General Physics I H) 일반물리학 I (고급일반물리학 I)	3-3-0	() is a honor course	1
	O		CHM101	General Chemistry I 일반화학 I	3-3-0		1
	O		BIO101 (BIO103)	General Biology (Advanced General Biology) 일반생물 (고급일반생물학)	3-3-0	() is a honor course	1,2
	O	X	CHM105	General Chemistry Lab I 일반화학실험 I	1-0-2		1
	O	X	PHY107	General Physics Lab I 일반물리학실험 I	1-0-2		1
Elective (선택)			MTH112	Calculus II 미적분학 II	3-3-1		2
			MTH201	Differential Equations 미분방정식	3-3-0	[PRE] MTH111	1,2
			MTH203	Applied Linear Algebra 응용선형대수	3-3-0		1,2
			MTH211	Statistics 통계학	3-3-0		1,2
			PHY103 (PHY104)	General Physics II (General Physics II H) 일반물리학 II (고급일반물리학 II)	3-3-0	() is a honor course	2
			PHY108	General Physics Lab II 일반물리학실험 II	1-0-2		2
			CHM102	General Chemistry II 일반화학 II	3-3-0		2
			CHM106	General Chemitry Lab II 일반화학실험 II	1-0-2	[PRE] CHM101, CHM105	2
			ITP117	Introduction to AI Programming II 기초 인공지능 프로그래밍 II	3-2-2		1,2
			ITP111	Probability and Random Processes 확률과 랜덤 프로세스	3-3-0		1,2
			ITP112	Discrete Mathematics 이산수학	3-3-0		2
			MGT102	Entrepreneurship 기업가정신	3-3-0		1,2
			IE101	Introduction to Data Science 데이터사이언스 개론	3-3-0		2
			MGT106	Economics 경제원론	3-3-0	Only for Business Administration Field	1
Understanding Major 전공의 이해 교과			UNI101	Mechanical Engineering and Future 기계공학과 미래	1-1-0	Mechanical Engineering 기계공학과	2
			UNI102	What you may (not) want to know about cities and environment 알쓸도환: 알아두면 쓸데 있는 도시와 환경이야기	1-1-0	Civil, Urban, Earth, and Environmental Engineering 지구환경도시건설공학과	2
			UNI103	Trend in Materials Science and Engineering 재료과학 맛보기	1-1-0	Materials Science and Engineering 신소재공학과	2

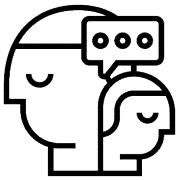
Basic Requirements

Category			Course Code	Course Title	Cred. -Lect. -Exp.	Remarks	Semester
-	ENG	BUS					
Understanding Major[1] 전공의 이해 교과			UNI104	Trends in Energy & Chemical Engineering 에너지화학공학소개	1-1-0	Energy and Chemical Engineering 에너지화학공학과	2
			UNI105	The future of Nuclear Engineering 원자력의 미래	1-1-0	Nuclear Engineering 원자력공학과	2
			UNI106	What is Design? 디자인이란?	1-1-0	Design 디자인학과	2
			UNI107	BME to change the world 세상을 바꾸는 바이오메디컬공학	1-1-0	Biomedical Engineering 바이오메디컬공학과	2
			UNI108	Industrial Engineering Relay Seminar 산업공학 릴레이 세미나	1-1-0	Industrial Engineering 산업공학과	2
			UNI109	Emerging Issues in Biological Sciences 첨단 생명과학 연구분야 소개	1-1-0	Biological Sciences 생명과학과	2
			UNI110	Introduction to Modern Electrical Engineering 최신전기전자공학소개	1-1-0	Electrical Engineering 전기전자공학과	1
			UNI111	Introduction to Computer Science and Engineering 컴퓨터공학 소개	1-1-0	Computer Science and Engineering 컴퓨터공학과	2
			UNI112	Physics & Innovative Technology 물리학과 첨단기술	1-1-0	Physics 물리학과	2
			UNI113	Introduction to Modern Mathematics 현대수학입문	1-1-0	Mathematical Sciences 수리과학과	2
			UNI114	Why Chemistry? 왜 화학인가?	1-1-0	Chemistry 화학과	2
			UNI115	Principles of management 경영원론	1-1-0	Business Administration 경영과학부	2

※ ENG: Engineering Field, BUS: Business Administration Field
※ MGT106 Economics is not basic elective course for engineering field students, but when students take the course it can be counted as free elective.
1) There are no restrictions in taking understanding major courses, but for graduation requirement, only 2 credits will be counted.

School of Liberal Arts [인문학부]

■ School Introduction [학부소개]



With a view to realizing UNIST's vision of educating global leaders in science and technology who will contribute to the prosperity of humankind, the School of Liberal Arts (SLA) is committed to nurturing the creativity, critical thinking and communication skills of students. The SLA offers undergraduate courses in humanities, social sciences, visual arts, and musical instrument performances including piano and violin. The SLA faculty and staff members are dedicated to providing quality teaching and cultivating the various talents of individual students. In an effort to assure UNIST students of the best education, SLA will continue to diversify its curriculum and extend collaboration with other departments and institutions.

■ Liberal Arts Curriculum [교양 교육과정]

Category	Course Code	Course Title	Cred. -Lect. -Exp.	Remarks	Semester
English	ENG110	English Listening&Speaking(Intermediate) 영어 듣기&말하기 (중급)	2-1-2	Take 2 according to your level	1,2
	ENG111	English Listening&Speaking(Advanced) 영어 듣기&말하기 (상급)	2-1-2		1,2
	ENG113	English Reading&Writing(Intermediate) 영어 읽기&쓰기(중급)	2-1-2		1,2
	ENG114	English Reading&Writing(Advanced) 영어 읽기&쓰기(상급)	2-1-2		1,2
Language	LNG201	Chinese I 중국어 I	2-1-2	Only for Korean Students *LNG100 will be offered in Korean	1,2
	LNG202	Chinese II 중국어 II	2-1-2		1,2
	LNG100	Korean Writing 한국어 글쓰기	2-1-2		1,2
	LNG203	Korean I 한국어 I	2-1-2	Only for International Students (Non-Korean Students)	1,2
	LNG204	Korean II 한국어 II	2-1-2		1,2
Liberal Arts	SLA100	First-Year Seminar 1학년 세미나	3-3-0		1,2
	SLA111	Understanding Visual Arts 시각예술의 이해	3-2-1		1,2
	SLA121	Music and Creativity, Piano 음악과 창의성, 피아노	3-1-2		1,2
	SLA122	Music and Creativity, Strings 음악과 창의성, 현악	3-1-2		1,2
	SLA123	Contemporary Piano 컨템포러리 피아노	3-1-2		1,2
	SLA124	Understanding Western Music 서양음악의 이해	3-3-0		1,2
	SLA125	Violin Fundamentals 바이올린의 기초	3-1-2		1,2
	SLA126	Music Appreciation 음악의 이해	3-2-1		1,2

School of Liberal Arts

Category	Course Code	Course Title	Cred. -Lect. -Exp.	Remarks	Semester
Liberal Arts	SLA131	Literature and Creativity 문학과 창의성	3-3-0		1,2
	SLA132	Drama 드라마	3-3-0		1,2
	SLA133	Literature and Science 문학과 과학	3-3-0		1,2
	SLA141	Media and Culture 미디어와 문화	3-3-0		1,2
	SLA151	History of Korean Civilization 한국문명사	3-3-0		1,2
	SLA152	Evolution of Civilization 문명의 발전	3-3-0		1,2
	SLA153	Foundations of East Asian Civilization 동아시아 문명의 기초	3-3-0		1,2
	SLA154	History of Modern East Asia 동아시아의 근현대사	3-3-0		1,2
	SLA161	Introduction to Philosophy 철학개론	3-3-0		1,2
	SLA171	Science of Human Behavior 인간행동의 과학	3-3-0		1,2
	SLA181	Discovering Anthropology 인류학의 발견	3-3-0		1,2
	SLA190	Introduction to Linguistics 언어학개론	3-3-0		1,2
	SLA212	Visual Culture and Art 시각 문화와 예술	3-2-1		1,2
	SLA213	Themes of Contemporary Art 현대 미술의 테마	3-2-1		1,2
	SLA221	Advanced Piano 피아노 연주	3-1-2		1,2
	SLA222	Chamber Music 실내악	3-1-2		1,2
	SLA231	Korean Literature and Gender 한국문학과 젠더	3-3-0		1,2
	SLA232	Russian Literature 러시아문학	3-3-0		1,2
	SLA234	Contemporary Korean Fiction 한국현대소설	3-3-0		1,2
	SLA235	Introduction to Digital Humanities 디지털 인문학 입문	3-3-0		1,2
	SLA241	Effective Communication 효과적 커뮤니케이션	3-3-0		1,2
	SLA242	Media Technology and Human Values 미디어기술과 인간가치	3-3-0		1,2
	SLA243	Global Politics and Media 국제 정치와 미디어	3-3-0		1,2
	SLA251	History of Modern Korea 한국 근현대사	3-3-0		1,2
	SLA252	History of Contemporary World 현대 세계사	3-3-0		1,2
	SLA253	History of Science 과학기술사	3-3-0		1,2

Category	Course Code	Course Title	Cred. -Lect. -Exp.	Remarks	Semester
Liberal Arts	SLA254	Understanding Korea 한국의 이해	3-3-0		1,2
	SLA255	Introduction to Science, Technology and Society 과학기술학(STS) 개론	3-3-0		1,2
	SLA256	U.S. History 미국사	3-3-0		1,2
	SLA257	History of International Relations 국제관계사	3-3-0		1,2
	SLA258	Economic Anthropology 경제 인류학	3-3-0		1,2
	SLA261	Critical Thinking 비판적 사고	3-3-0		1,2
	SLA262	Philosophy of Religion 종교철학	3-3-0		1,2
	SLA263	Fundamental Issues of Philosophy 철학의 근본문제	3-3-0		1,2
	SLA271	Cognitive Science 인지과학	3-3-0		1,2
	SLA281	Society and Culture 사회와 문화	3-3-0		1,2
	SLA282	Understanding Popular Culture 대중문화의 이해	3-3-0		1,2
	SLA283	Gender and Society 젠더와 사회	3-3-0		1,2
	SLA292	Introduction to English Styles 영문체 개론	3-3-0		1,2
	SLA293	English Language & Culture 영어와 문화	3-3-0		1,2
	SLA298	Global English in Engineering Community 글로벌영어와 공학	3-3-0		1,2
	SLA310	Topics in Arts 예술 특강	3-3-0		1,2
	SLA311	Art, Community, Environment 예술, 공동체, 환경	3-2-1		1,2
	SLA320	Topics in Music 음악 특강	3-1-2		1,2
	SLA321	19th Century Piano Music 19세기 피아노 음악	3-1-2		1,2
	SLA322	Violin Seminar 바이올린 세미나	3-1-2		1,2
	SLA330	Topics in Literature 문학 특강	3-3-0		1,2
	SLA332	Dostoevsky and Tolstoy 도스토옙스키와톨스토이	3-3-0		1,2
	SLA333	AI and Storytelling AI와 스토리텔링	3-3-0		1,2
	SLA334	Literary Understanding of Multimodal Generation 멀티모달 생성의 문학적 이해	3-3-0		1,2
	SLA340	Topics in Communication Studies 커뮤니케이션특강	3-3-0		1,2
	SLA341	Computer Mediated Communication 컴퓨터매개커뮤니케이션	3-3-0		1,2
	SLA342	Personality, Self, and Communication: IntrapersonalCommunication 자아커뮤니케이션	3-3-0		1,2
	SLA350	Topics in History 역사특강	3-3-0		1,2

School of Liberal Arts

Category	Course Code	Course Title	Cred. -Lect. -Exp.	Remarks	Semester
Liberal Arts	SLA351	History Through Film 영화를통한역사	3-3-0		1,2
	SLA360	Topics in Philosophy 철학특강	3-3-0		1,2
	SLA361	Metaphysical 형이상학	3-3-0		1,2
	SLA362	Ethics 윤리학	3-3-0		1,2
	SLA364	Logic 논리학	3-3-0		1,2
	SLA370	Topics in Psychology 심리학특강	3-3-0		1,2
	SLA380	Topics in Anthropology 인류학특강	3-3-0		1,2
	SLA382	AI and Society 인공지능(AI)과사회	3-3-0		1,2
	SLA384	Human Evolution 인류의진화	3-3-0		1,2
	SLA398	SLA Special Topics Ⅰ SLA특강	Variable		1,2
	SLA399	SLA Special Topics Ⅱ SLA특강II	Variable		1,2
	SLA451	History, Technoscience, and the Public 공적영역과테크노사이언스	3-3-0		1,2
	SLA461	Philosophy of Science 과학철학	3-3-0		1,2
	SLA481	Risk Society and the 21st Century 21세기와위험사회	3-3-0		1,2
	SLA490	Writing in Academic Disciplines 전공영어쓰기	3-3-0		1,2
	SLA491	Technical Writing in English 영어논문작성법	3-3-0		1,2

*Language: ① Students can fulfill requirements taking French/Japanese/German/Russian courses through credit exchange. ② Restrictions for Korean/International students will only be applied for students entered from 2021.

■ Curriculum Change

2023	→	2024
〈NEW〉	→	SLA211 Design Thinking 디자인씽킹
		SLA225 Intermediate Violin 중급 바이올린
		SLA352 History of Modern Europe 유럽의 근현대사

■ Language Exemption Guideline

Students who meet language exam criteria below will have their language requirements exempted.

Category	Type of Exam	Score (Criteria)
Chinese 중국어	HSK	Lev.5 or higher
Spanish 스페인어	DELE	A2 or higher
Japanese 일본어	JLPT	N2 or higher
German 독일어	Goethe -Zertifikat	A2 or higher
French 프랑스어	DELF	A2 or higher
Russian 러시아어	TORFL	Lev.1 or higher
Korean (For International Students)	TOPIK	Lev.3 or higher

School of Liberal Arts

■ English requirements by level [레벨별 이수 가이드]

All students should take English Level test and take 2 courses (4 credits) according to the level.
Students entered from 2023 will have 'Listening & Speaking level' and 'Reading & Writing' level separately.
모든 학생은 레벨에 따라 영어 교과를 2과목(4학점) 이수하여야 합니다.
2023년 입학생부터는 듣기&말하기 레벨과 읽기&쓰기 레벨이 각각 따로 부여됩니다.

▶ Students entered in 2022 and before

Course Code	Course Title	Lev.1	Lev.2	Lev.3	Lev.4
-	English Camp (0 credit)	●	-	-	-
ENG110	English Listening & Speaking (Intermediate)	●	●	-	-
ENG111	English Listening & Speaking (Advanced)	-	-	●	-
ENG113	English Reading & Writing (Intermediate)	●	●	●	-
ENG114	English Reading & Writing (Advanced)	-			-

* Lev.4 students will have English courses exempted. (Applies to all students including students entered before 2021) [레벨4는 영어 수업 이수 면제됨 - 2021학년도 이전 입학생들에게도 일괄 적용됨]

▶ Students entered in 2023

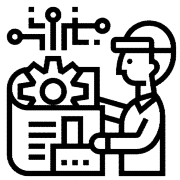
		English Listening & Speaking			
		Lev.1	Lev.2	Lev.3	Lev.4
English Reading & Writing	Lev.1	- English Camp - English Listening & Speaking (Intermediate) - English Reading & Writing (Intermediate)	-	-	-
	Lev.2	-	English Listening & Speaking (Intermediate)	English Listening & Speaking (Advanced)	Exemption
			English Reading & Writing (Intermediate)	English Reading & Writing (Intermediate)	English Reading & Writing (Intermediate)
	Lev.3	-	English Listening & Speaking (Intermediate)	English Listening & Speaking (Advanced)	Exemption
			English Reading & Writing (Advanced)	English Reading & Writing (Advanced)	English Reading & Writing (Advanced)
	Lev.4	-	English Listening & Speaking (Intermediate)	English Listening & Speaking (Advanced)	Exemption
			Exemption	Exemption	Exemption

※ (Common/공통사항) In case of English native speakers, English requirements can be exempted by submitting relevant documents that can prove 3-years or more experience in English-speaking high school (ex.certificate of graduation, etc.) and getting permission from English course instructors. [영어 원어민의 경우, 영어권 고등학교에서 3년이상 재학 및 수료자임을 증빙할 수 있는 자료(졸업증명서)를 제출 후 영어 교과 담당 교원 승인을 통해 영어 과목 이수를 면제 받을 수 있음]

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]

Category 구분		Credits 이수학점	Remarks 비고	Subtotal 소계
Basic 기초	Required 필수	17	Calculus I(3), General Physics I(3), General Chemistry I(3), General Biology(3), Introduction to AI Programming I(3), General Chemistry Lab I(1), General Physics Lab I(1) (Total 17 credits)	At least 30 Credits
	Elective 선택[학과 지정]	13	Complete basic elective courses at least 13 credits including Applied Linear Algebra(3) and Differential Equations(3)	
Major 전공	Required 필수	27	Refer to Required course list below	At least 48 Credits
	Elective 선택	21	Refer to Elective course list below	
	Internship 인턴십	3	Internship (Choose one among Research, Industrial, Venture Creation, Co-op)	3 Credits
Free Elective 자유선택		19	All courses acceptable	At least 19 Credits

* For Liberal Arts and Leadership requirements, refer to school Common requirements

2. Basic Requirements [기초 이수요건]

No.	Course Code	Course Title	Major 전공	Double Major 복수전공	Minor 부전공
			13 credits	6 credits	-
1	MTH112	Calculus II (3)	○		
2	PHY103	General Physics II (3)	○		
3	CHM102	General Chemistry II (3)	○		
4	PHY108	General Physics Lab II (1)	○		
5	CHM106	General Chemistry Lab II (1)	○		
6	MTH201	Differential Equations (3)	●	●	
7	MTH203	Applied Linear Algebra (3)	●	●	
8	MTH211	Statistics (3)	○		
9	MGT102	Entrepreneurship (3)	○		
10	IE101	Introduction to Data Science(3)	○		
11	ITP117	Introduction to AI Programming II (3)	○		
12	ITP111	Probability & Random Process (3)	○		
13	ITP112	Discrete Mathematics (3)	○		
14	UNI101	Understanding Major (1) **Mechanical Engineering and Future**	○		

●: Required ○: Elective ◑: Recommended, ( ): credits

3. Curriculum [기계공학과 교육과정]

▶ Credit Requirements [이수학점]

Department (School)	Major(전공)			Double Major(복수전공)			Minor(부전공)		
	R	E	Total	R	E	Total	R	E	Total
Department of Mechanical Engineering	27	21	**48**	18	18	**36**	9	9	**18**

*R: Required, E: Elective

▶ Required [전공필수]

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp.	Remarks	Seme ster
MEN210	Thermodynamics 열역학	○	○	○	3-3-0		1
MEN220	Fluid Mechanics 유체역학	○	○	○	3-3-0	[PRE] MEN220	2
MEN230	Solid Mechanics I 고체역학 I	○	○	○	3-3-0		1
MEN231	Solid Mechanics II 고체역학 II	○	○	○	3-3-0	[PRE] MEN230	2
MEN250	Mechanical Drawing and Lab 기계제도 및 실습	○	○	○	3-2-2		1
MEN270	Dynamics 동역학	○	○	○	3-3-0		2
MEN300	Mechanical Engineering Lab I 기계공학실험 I	○	○	○	3-1-4	[PRE] MEN231,MEN310	2
MEN310	Heat Transfer 열전달	○	○	○	3-3-0	[PRE] MEN210,MEN220	1

Department of Mechanical Engineering

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp.	Remarks	Seme ster
MEN490	Thesis Study 졸업연구	○			3-0-6		1,2

※ Double Major: Take 6 courses(18 credits) among above courses excluding MEN490 Thesis Study.
복수전공: 졸업연구를 제외한 8과목 중 최소 6과목(18학점) 이수
※ Minor: Take 3 courses(9 credits) among above excluding MEN490 Thesis Study.
부전공: 졸업연구를 제외한 8과목 중 최소 3과목(9학점) 이수
※ Courses that are not required for Minor/Double Major can be counted as Elective course.
복수전공자, 부전공자에게 필수로 인정되지 않는 전공필수 과목을 이수했을 경우 전공선택으로 인정가능

▶ Elective [전공선택]

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp.	Remark	Seme ster
MEN211	Applied Thermodynamics 응용열역학	○	○	○	3-3-0	[PRE] MEN210	2
MEN301	Numerical Analysis 수치해석	○	○	○	3-2-2	[PRE] MTH201	2
MEN303	Applied Engineering Mathematics 응용공학수학	○	○	○	3-3-0		1
MEN320	Applied Fluid Mechanics 응용유체역학	○	○	○	3-3-0	[PRE] MEN220	1
MEN350	Manufacturing Processes and Lab 기계공작법 및 실습	○	○	○	3-2-2	[PRE] MEN230	1
MEN351	Machine Element Design 기계요소설계	○	○	○	3-3-0	[PRE] MEN231	2
MEN352	Creative Engineering Design I (Capstone Design) 창의적공학설계 I (캡스톤디자인)	○	○	○	3-1-4		2
MEN353	Manufacturing System Design & Simulation 생산시스템 설계 및 시뮬레이션	○	○	○	3-3-0		2
MEN370	Dynamic Systems and Control 시스템제어	○	○	○	3-3-0		1
MEN371	System Dynamics 시스템 동역학	○	○	○	3-3-0		1
MEN400	Mechanical Engineering Lab II 기계공학실험 II	○	○	○	3-1-4	[PRE] MEN231,MEN270, MEN310	1
MEN402	Introduction to Finite Element Method 유한요소법개론	○	○	○	3-3-0	[PRE] MEN231, MEN301	2
MEN411	Combustion 연소공학	○	○	○	3-3-0	[PRE] MEN210, MEN220	1
MEN412	Air-Conditioning and Refrigeration 공기조화냉동	○	○	○	3-3-0	[PRE] MEN210	2
MEN413	Computational Fluid Dynamics 전산유체역학	○	○	○	3-3-0	[PRE] MEN301,MEN320	2
MEN414	Design of Fluid Thermal Systems 열유체시스템 설계	○	○	○	3-3-0	[PRE] MEN310	2
MEN415	Aerodynamics 공기역학	○	○	○	3-3-0	[PRE] MEN220	1
MEN420	Introduction to Aerosol Technology 에어로졸공학개론	○	○	○	3-3-0	[PRE] MEN220	1
MEN431	Introduction to Plastic Deformation 소성학개론	○	○	○	3-3-0	[PRE] MEN231	1

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp.	Remark	Seme ster
MEN432	Introduction to Mechanics of Composite Materials 복합재역학개론	○	○	○	3-3-0	[PRE] MEN231	1
MEN451	Introduction to MEMS MEMS 개론	○	○	○	3-3-0		2
MEN452	Creative Engineering Design II (Capstone Design) 창의적공학설계 II (캡스톤디자인)	○	○	○	3-1-4		1
MEN453	Computer Aided Engineering 컴퓨터이용공학	○	○	○	3-2-2		1
MEN454	Optimal Design 최적설계	○	○	○	3-2-2		1
MEN455	3D Printing 3D 프린팅	○	○	○	3-3-0		1
MEN456	Artificial Intelligence Based Digital Manufacturing AI 기반 디지털 제조 공학	○	○	○	3-3-0		1
MEN457	Introduction to Electric-Electronic Engineering 전기전자공학개론	○	○	○	3-3-0	[PRE] PHY103	1
MEN461	Introduction to Robotics 로봇공학	○	○	○	3-3-0		2
MEN470	Mechanical Vibration 기계진동학	○	○	○	3-3-0	[PRE] MEN270	2
MEN481	UAV Flight Control and Simulation 무인기 비행제어 및 시뮬레이션	○	○	○	3-3-0	[PRE] MEN270,MEN370	1
MEN482	UAV Navigation and Flight Computers 무인기 항법 및 운용	○	○	○	3-3-0	[PRE] MEN270,MEN370	2
MEN491	Creating Autonomous Car 자율주행 자동차 만들기	○	○	○	3-3-0	[PRE] MEN270,MEN370	1
MEN497	Special Topics in Mechanical Engineering I 기계공학특론 I	○	○	○	3-3-0		-
MEN498	Special Topics in Mechanical Engineering II 기계공학특론 II	○	○	○	3-3-0		-
MEN499	Special Topics in Mechanical Engineering III 기계공학특론 III	○	○	○	3-3-0		-
MSE316	Wearable smart healthcare electronic system 웨어러블 스마트 헬스케어 전자소자 시스템	○	○		3-3-0		

※ [PRE]: Prerequisite(선이수), [IDEN]: Identical(동일지정교과)

4. Curriculum Change [교육과정 변경사항]

2023	→	2024
MEN302 Introduction to Finite Element Method 유한요소법개론 [PRE: MEN231]	→	MEN402 Introduction to Finite Element Method 유한요소법개론 [PRE: MEN231, MEN301]

Department of Mechanical Engineering

5. Curriculum Map [교육과정 이수 체계도]

Sophomore		Junior		Senior		
1st semester	2nd semester	1st semester	2nd semester	1st semester	2nd semester	
Thermodynamics	Applied Thermodynamics	Heat Transfer		Introduction to Aerosol Technology	Air-Conditioning and Refrigeration	Thesis Study
				Introduction to Electric-Electronic Engineering		
Solid Mechanics I	Solid Mechanics II	Manufacturing Processes and Lab	Manufacturing System Design and Simulation	Introduction to Plastic Deformation	Introduction to MEMS	Thesis Study
				Introduction to Mechanics of Composite Materials		
				A.I based Digital Manufacturing		
Mechanical Drawing and Lab			Machine Element Design	Optimal Design		Thesis Study
			Creative Engineering Design I	Creative Engineering Design II		
	Fluid Mechanics	Applied Fluid Mechanics		Combustion	Design and Fluid Thermal Systems	Thesis Study
				Aerodynamics	Computational Fluid Dynamics	
	Dynamics	Dynamic System and Control		3D Printing	Mechanical Vibration	Thesis Study
		System Dynamics		Creating Autonomous Car	Introduction to Robotics	
				UAV Flight Control and Simulation	UAV Navigation and Flight Computers	
Differential Equations	Applied Liner Algebra	Applied Engineering Mathematics	Numerical Analysis	Computer Aided Engineering	Introduction to Finite Element Method	Thesis Study
			Mechanical Engineering Lab I	Mechanical Engineering Lab II		

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. Civil, Urban, Earth, and Environmental Engineering is an interdisciplinary field of study th at is dedicated to education and research on the resilient protection of natural and built environments against disasters, as well as the sustainable development of urban society. In this field, the students will learn fundamental knowledge associated with urban and environmental issues, and will explore more advanced courses regarding Environmental Sciences and Engineering (climate change, water and air treatment, environmental analysis and modeling), Urban Infrastructure Engineering (urban planning, construction materials, structural mechanics and design, health monitoring), and Disaster Management Engineering (fine dust, earthquake, typhoon). The Department of Urban and Environmental Engineering at UNIST is committed to developing innovative technologies in the related fields and cultivating future leaders who will make a huge impact on our profession and society.

1. Graduation Requirement [졸업 이수요건]

Category 구분		Credits 이수학점	Remarks 비고	Subtotal 소계
Basic 기초	Required 필수	17	Calculus I(3), General Physics I(3), General Chemistry I(3), General Biology(3), Introduction to AI Programming I(3), General Chemistry Lab I(1), General Physics Lab I(1) (Total 17 credits)	At least 30 Credits
	Elective 선택[학과 지정]	13	1) “What you may (not) want to know about cities and environment” is included in the fundamental elective, but not included in the requirement for graduation 2) All the other fundamental elective courses will be accepted in CUEE	
Major 전공	Required 필수	15	Refer to Required course list below	At least 54 Credits
	Elective 선택	39	Refer to Elective course list below	
	Internship 인턴십	3	Internship (Choose one among Research, Industrial, Venture Creation, Co-op)	3 Credits
Free Elective 자유선택		13	All courses acceptable	At least 13 Credits

* For Liberal Arts and Leadership requirements, refer to school Common requirements

Department of Civil, Urban, Earth, and Environmental Engineering

2. Basic Requirements [기초 이수요건]

No.	Course Code	Course Title	Major 전공	Double Major 복수전공	Minor 부전공
			13 Credits	-	-
1	MTH112	Calculus II (3)	○		
2	PHY103	General Physics II (3)	○		
3	CHM102	General Chemistry II (3)	○		
4	PHY108	General Physics Lab II (1)	○		
5	CHM106	General Chemistry Lab II (1)	○		
6	MTH201	Differential Equations (3)	○		
7	MTH203	Applied Linear Algebra (3)	○		
8	MTH211	Statistics (3)	○		
9	MGT102	Entrepreneurship (3)	○		
10	IE101	Introduction to Data Science(3)	○		
11	ITP117	Introduction to AI Programming II (3)	○		
12	ITP111	Probability & Random Process (3)	○		
13	ITP112	Discrete Mathematics (3)	○		
14	UNI102	Understanding Major (1) **What you may (not) want to know about cities and environment**	○		

●: Required ○: Elective ◑: Recommended, ( ): credits

3. Curriculum [지구환경도시건설공학과 교육과정]

▶ Credit Requirements [이수학점]

Department (School)	Major(전공)			Double Major(복수전공)			Minor(부전공)		
	R	E	Total	R	E	Total	R	E	Total
Department of Urban and Environmental Engineering	15	39	**54**	12	24	**36**	6	12	**18**

*R: Required, E: Elective

▶ Required [전공필수]

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp.	Remarks	Seme ster
CUEE201	Introduction to Environmental Engineering 환경공학개론	○	○	○	3-3-0		1
CUEE202	Earth and Environmental Sciences 지구환경과학	○	○	○	3-3-0		1
CUEE203	Introduction to Civil Engineering 건설공학개론	○	○	○	3-3-0		1
CUEE204	Introduction to Urban Planning 도시계획개론	○	○	○	3-3-0		1
CUEE205	Introduction to Natural Hazards 자연재해개론	○	○	○	3-3-0		1
CUEE490	Graduate Thesis 졸업논문	○	-	-	0 credit		1,2

* Double major students can choose 4 subjects out of 5 required courses above, and minor for 2 subjects.

▶ Elective [전공선택]

Course Code	Course Title	Major	Double	Minor	Cred -Lect. -Exp.	Remark	Seme ster
CUEE206	Science Humanities 과학인문학	○	○	○	3-3-0		2
CUEE211	Environmental Chemistry 환경화학	○	○	○	3-3-0		1
CUEE212	Water Pollution 수질오염	○	○	○	3-3-0		-
CUEE213	Environmental Colloids Science 환경콜로이드과학	○	○	○	3-3-0		-
CUEE221	Air Pollution 대기오염	○	○	○	3-3-0		2
CUEE222	Atmosphere and Ocean Sciences 대기해양과학	○	○	○	3-3-0		2
CUEE223	Atmospheric Physics 대기물리	○	○	○	3-3-0		-
CUEE224	Atmospheric Chemistry 대기화학	○	○	○	3-3-0		-
CUEE231	Mechanics of Materials 재료역학	○	○	○	3-3-0	[PRE] CUEE203	2
CUEE241	Geographic Information System 지리정보시스템	○	○	○	3-3-0		2
CUEE311	Water Treatment Engineering 수처리공학	○	○	○	3-3-0		-
CUEE312	Biomass and Bioenergy 바이오매스 및 바이오에너지	○	○	○	3-3-0		-
CUEE313	Aquatic Chemistry Laboratory 수질화학실험	○	○	○	3-1-4		-
CUEE314	Environmental Data Analysis and Practice 환경데이터분석	○	○	○	3-3-0		1
CUEE315	Waste Engineering and Resource Recovery 자원순환과 폐기물관리	○	○	○	3-3-0		
CUEE321	Analysis of Pollutants 오염물질분석 및 실험	○	○	○	3-1-4		-
CUEE322	Introduction to Remote Sensing 원격탐사개론	○	○	○	3-3-0		-
CUEE323	Atmospheric Dynamics 대기역학	○	○	○	3-3-0		-
CUEE324	Environmental Thermodynamics 환경열역학	○	○	○	3-3-0		1
CUEE331	Structural Analysis 구조역학	○	○	○	3-3-0	[PRE] CUEE231	1
CUEE332	Matrix Structural Analysis 매트릭스구조해석	○	○	○	3-3-0		-
CUEE333	Concrete Structures 콘크리트구조공학	○	○	○	3-3-0	[PRE] CUEE231	2
CUEE336	Soil Mechanics 토질역학	○	○	○	3-3-0		1
CUEE337	Building Collapse and Safety Inspection Techniques 건물 붕괴와 안전진단 기술	○	○	○	3-3-0		1
CUEE341	Urban Transportation Planning 교통계획	○	○	○	3-3-0		1
CUEE342	Urban Development 도시개발	○	○	○	3-3-0		2
CUEE351	Probability Concepts in Engineering 공학확률	○	○	○	3-3-0		2

Department of Civil, Urban, Earth, and Environmental Engineering

Course Code	Course Title	Major	Double	Minor	Cred -Lect. -Exp.	Remark	Semester
CUEE352	Disaster Management 재난관리	○	○	○	3-3-0		2
CUEE353	Numerical Modeling and Analysis 수치모델링및분석	○	○	○	3-3-0		2
CUEE354	Disaster Monitoring and Prediction using Artificial Intelligence AI를 활용한 재난재해 모니터링 및 예측	○	○	○	3-3-0		-
CUEE411	Water and Wastewater Engineering 상하수도공학	○	○	○	3-3-0		2
CUEE412	Environmental Bioprocess 환경생물공정	○	○	○	3-3-0		-
CUEE413	Hydraulics 수리학	○	○	○	3-3-0		2
CUEE414	Water Treatment Modeling: Principles and Practice 수처리모델링	○	○	○	3-3-0		-
CUEE421	Earth Environment Numerical Analysis 지구환경전산실습	○	○	○	3-1-4		-
CUEE422	Climate Change Engineering 기후변화공학	○	○	○	3-3-0		2
CUEE423	GIS-Based Modeling GIS기반모델링	○	○	○	3-3-0		-
CUEE424	Statistics in Earth and Environmental Sciences 지구환경통계학	○	○	○	3-3-0		1
CUEE431	Steel Structures 강구조공학	○	○	○	3-3-0	[PRE] CUEE231	-
CUEE432	Introduction to Structural Dynamics 구조동역학개론 (구조진동론)	○	○	○	3-3-0		-
CUEE433	Construction Materials 건설재료공학	○	○	○	3-3-0	[PRE] CUEE203	-
CUEE434	Foundation Engineering 기초공학	○	○	○	3-3-0		-
CUEE441	Urban Design 도시설계	○	○	○	3-3-0		1
CUEE452	Satellite Remote Sensing 위성원격탐사	○	○	○	3-3-0		-
CUEE453	Properties of Concrete 콘크리트재료공학	○	○	○	3-3-0		-
CUEE491	Special Topics in Urban and Environmental Engineering I 도시환경공학특론 I	○	○	○	3-3-0		-
CUEE492	Special Topics in Urban and Environmental Engineering II 도시환경공학특론 II	○	○	○	3-3-0		-
CUEE493	Special Topics in Urban and Environmental Engineering III 도시환경공학특론 III	○	○	○	3-3-0		-
CUEE494	Special Topics in Urban and Environmental Engineering IV 도시환경공학특론 IV	○	○	○	3-3-0		-
CUEE495	Special Topics in Urban and Environmental Engineering V 도시환경공학특론 V	○	○	○	3-3-0		-
UNI206	Predicting Earthquake Waves 지진파 예측하기	○	○	○	3-3-0		-
CHM211	Organic Chemistry I 유기화학 I	○	○	○	3-3-0	Refer to each department section	

Course Code	Course Title	Major	Double	Minor	Cred -Lect. -Exp.	Remark	Seme ster
CHM212	Organic Chemistry II 유기화학 II	○	○	○	3-3-0	Refer to each department section	
CHM231	Physical Chemistry I 물리화학 I	○	○	○	3-3-0		
CHM232	Physical Chemistry II 물리화학 II	○	○	○	3-3-0		
CHM391	Instrumental Analysis 기기분석	○	○	○	3-3-0		
IE07	Statistical Computing 통계계산	○	○	○	3-3-0		
IE303	Data Mining 데이터마이닝	○	○	○	3-3-0		
IE313	Time-series Analysis 시계열분석	○	○	○	3-3-0		
IE406	Applied Machine Learning 기계학습 응용	○	○	○	3-3-0		
IE422	Social Network Analysis 사회연결망분석	○	○	○	3-3-0		
MEN220	Thermodynamics 유체역학	○	○	○	3-3-0		
MEN301	Numerical Analysis 수치해석	○	○	○	3-2-2		
MGT211	Microeconomics 미시경제학	○	○	○	3-3-0		
MGT315	Econometrics 계량경제학	○	○	○	3-3-0		
UNI203	Design and implementation of data-driven machine learning 데이터기반 머신러닝 설계 및 제작	○	○	○	1-1-0		

※ [PRE]: Prerequisite(선이수), [IDEN]: Identical(동일지정교과)

4. Curriculum Change [교육과정 변경사항]

2023	→	2024
〈NEW〉	→	CUEE315 Waste Engineering and Resource Recovery 자원순환과 폐기물관리

※ All of the course codes have changed to CUEE from UEE due to the department name change

Department of Civil, Urban, Earth, and Environmental Engineering

5. Curriculum Map [교육과정 이수 체계도]

● Environmental Eng. ● Environmental Science ● Construction Eng. ● Urban Planning ● Disaster Management

Course Code	Course Title	Recommendation by each detailed majors
CUEE206	Science Humanities 과학인문학	● ● ● ● ●
CUEE211	Environmental Chemistry 환경화학	● ● ○ ○ ○
CUEE212	Water Pollution 수질오염	● ○ ○ ○ ●
CUEE213	Environmental Colloids Science 환경콜로이드과학	● ○ ○ ○ ○
CUEE221	Air Pollution 대기오염	● ● ○ ○ ●
CUEE222	Atmosphere and Ocean Sciences 대기해양과학	○ ● ○ ○ ●
CUEE223	Atmospheric Physics 대기물리	○ ● ○ ○ ○
CUEE224	Atmospheric Chemistry 대기화학	○ ● ○ ○ ●
CUEE231	Mechanics of Materials 재료역학	○ ○ ● ○ ●
CUEE241	Geographic Information System 지리정보시스템	○ ● ● ● ●
CUEE311	Water Treatment Engineering 수처리공학	● ○ ○ ○ ○
CUEE312	Biomass and Bioenergy 바이오매스 및 바이오에너지	● ○ ○ ○ ○
CUEE313	Aquatic Chemistry Laboratory 수질화학실험	● ○ ○ ○ ○
CUEE314	Environmental Data Analysis and Practice 환경데이터분석	● ● ○ ○ ○
CUEE315	Waste Engineering and Resource Recovery 자원순환과 폐기물관리	● ○ ○ ○ ○
CUEE321	Analysis of Pollutants 오염물질분석 및 실험	● ● ○ ○ ○
CUEE322	Introduction to Remote Sensing 원격탐사개론	○ ● ● ● ●
CUEE323	Atmospheric Dynamics 대기역학	○ ● ○ ○ ○
CUEE324	Environmental Thermodynamics 환경열역학	● ● ○ ○ ○
CUEE331	Structural Analysis 구조역학	○ ○ ● ○ ●
CUEE332	Matrix Structural Analysis 매트릭스구조해석	○ ○ ● ○ ○
CUEE333	Concrete Structures 콘크리트구조공학	○ ○ ● ○ ○
CUEE334	Properties of Concrete 콘크리트재료공학	○ ○ ● ○ ○
CUEE336	Soil Mechanics 토질역학	○ ○ ● ○ ●
CUEE337	Building Collapse and Safety Inspection Techniques 건물 붕괴와 안전진단 기술	○ ○ ● ● ●
CUEE341	Urban Transportation Planning 교통계획	○ ○ ○ ● ○

Course Code	Course Title	Recommendation by each detailed majors
CUEE342	Urban Development 도시개발	○ ○ ○ ● ○
CUEE351	Probability Concepts in Engineering 공학확률	● ● ● ● ●
CUEE352	Disaster Management 재난관리	○ ○ ○ ● ●
CUEE353	Numerical Modeling and Analysis 수치모델링및분석	● ● ● ○ ●
CUEE354	Disaster monitoring and prediction using artificial intelligence AI를 활용한 재난재해 모니터링 및 예측	● ● ○ ● ●
CUEE411	Water and Wastewater Engineering 상하수도공학	● ○ ● ○ ○
CUEE412	Environmental Bioprocess 환경생물공정	● ○ ○ ○ ○
CUEE413	Hydraulics 수리학	● ○ ● ○ ○
CUEE414	Water Treatment Modeling: Principles and Practice 수처리모델링	● ○ ○ ○ ○
CUEE421	Earth Environment Numerical Analysis 지구환경전산실습	○ ● ○ ○ ○
CUEE422	Climate Change Engineering 기후변화공학	● ● ○ ○ ○
CUEE423	GIS-Based Modeling GIS기반모델링	○ ● ● ● ●
CUEE424	Statistics in Earth and Environmental Sciences 지구환경통계학	○ ● ○ ○ ○
CUEE431	Steel Structures 강구조공학	○ ○ ● ○ ○
CUEE432	Introduction to Structural Dynamics 구조동역학개론 (구조진동론)	○ ○ ● ○ ●
CUEE433	Construction Materials 건설재료공학	○ ○ ● ○ ○
CUEE434	Foundation Engineering 기초공학	○ ○ ● ○ ●
CUEE441	Urban Design 도시설계	○ ○ ○ ● ●
CUEE442	Urban Planning Studio 도시계획 종합설계	○ ○ ○ ● ●
CUEE452	Satellite Remote Sensing 위성원격탐사	○ ● ○ ● ○
CUEE491	Special Topics in Urban and Environmental Engineering Ⅰ 도시환경공학특론 Ⅰ	● ● ● ● ●
CUEE492	Special Topics in Urban and Environmental Engineering Ⅱ 도시환경공학특론 Ⅱ	● ● ● ● ●
CUEE493	Special Topics in Urban and Environmental Engineering Ⅲ 도시환경공학특론 Ⅲ	● ● ● ● ●
CUEE494	Special Topics in Urban and Environmental Engineering Ⅳ 도시환경공학특론 Ⅳ	● ● ● ● ●
CUEE495	Special Topics in Urban and Environmental Engineering Ⅴ 도시환경공학특론 Ⅴ	● ● ● ● ●

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]

Category 구분		Credits 이수학점	Remarks 비고	Subtotal 소계
Basic 기초	Required 필수	17	Calculus I(3), General Physics I(3), General Chemistry I(3), General Biology(3), Introduction to AI Programming I(3), General Chemistry Lab I(1), General Physics Lab I(1) (Total 17 credits)	At least 32 Credits
	Elective 선택[학과 지정]	15	Recommended: General Physics II(3), General Chemistry II(3), Differential Equations(3), Applied Linear Algebra(3), Introduction to AI Programming II(3)	
Major 전공	Required 필수	21	Refer to Required course list below	At least 51 Credits
	Elective 선택	30	Refer to Elective course list below	
	Internship 인턴십	3	Department graduation requirement: Complete at least 3 credits of research internship or Coop internship and submit internship report	3 Credits
Free Elective 자유선택		14	All courses acceptable	At least 14 Credits

* For Liberal Arts and Leadership requirements, refer to school Common requirements

2. Basic Requirements [기초 이수요건]

No.	Course Code	Course Title	Major 전공	Double Major 복수전공	Minor 부전공
			15 credits	-	-
1	MTH112	Calculus II (3)	○		
2	PHY103	General Physics II (3)	◑		
3	CHM102	General Chemistry II (3)	◑		
4	PHY108	General Physics Lab II (1)	○		
5	CHM106	General Chemistry Lab II (1)	○		
6	MTH201	Differential Equations (3)	◑		
7	MTH203	Applied Linear Algebra (3)	◑		
8	MTH211	Statistics (3)	○		
9	MGT102	Entrepreneurship (3)	○		
10	IE101	Introduction to Data Science(3)	○		
11	ITP117	Introduction to AI Programming II (3)	◑		
12	ITP111	Probability & Random Process (3)	○		
13	ITP112	Discrete Mathematics (3)	○		
14	UNI103	Understanding Major (1) **Trend in Materials Science and Engineering**	○		

●: Required ○: Elective ◑: Recommended, ( ): credits
*It is recommended to take the above recommended courses for Double major/Minor students.

3. Curriculum [신소재공학과 교육과정] ※Course opening semester is subject to change.

▶ Credit Requirements [이수학점]

Department (School)	Major(전공)			Double Major(복수전공)			Minor(부전공)		
	R	E	Total	R	E	Total	R	E	Total
Department of Materials Science and Engineering	21	30	**51**	21	18	**39**	12	6	**18**

*R: Required, E: Elective

▶ Required [전공필수]

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp.	Remarks	Seme ster
MSE202	Introduction to Materials Science and Engineering 재료공학개론	○	○	○	3-3-0		1
MSE203	Physical Chemistry I: Thermodynamics 재료물리화학I: 열역학	○	○	○	3-3-0		2
MSE230	Introduction to Crystallography 결정학개론	○	○	○	3-3-0		1
MSE290	Introduction to Computational Materials Science 전산재료과학개론	○	○		3-3-0		2
MSE300	Materials Lab 재료실험	○	○		3-1-4		2
MSE312	Phase Transformations in Materials 재료상변태	○	○	○	3-3-0		1
MSE354	Introduction to Semiconductors 반도체개론	○	○		3-3-0		1

*Courses that are not required for Minor can be counted as Elective course

Department of Materials Science and Engineering

▶ Elective [전공선택]

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remarks	Semester
MSE204	Electromagnetics 전자기학	○	○	○	3-3-0		1
MSE211	Physical Chemistry of Materials II: Reaction Engineering 재료물리화학II: 반응공학	○	○	○	3-3-0		2
MSE250	Modern Physics of Materials: Quantum Mechanics 재료현대물리: 양자역학	○	○	○	3-3-0		1
MSE253	Introduction to Nanomaterials 나노재료개론	○	○	○	3-3-0		2
MSE270	Introduction to Polymer Materials 고분자재료개론	○	○	○	3-3-0		2
MSE304	Data Analytics for Materials Science and Engineering 재료공학 데이터 분석	○	○	○	3-3-0		2
MSE311	Introduction to Metallic Materials 금속재료개론	○	○	○	3-3-0		2
MSE313	Mechanical Behavior of Materials 재료의기계적거동	○	○	○	3-3-0		2
MSE315	Microstructure-Property Relationships I 미세구조와 물성 I	○	○	○	3-3-0		1
MSE316	Wearable smart healthcare electronic system 웨어러블 스마트 헬스케어 전자소자 시스템	○	○	○	3-2-2		2
MSE317	Surface Science of Materials 재료표면과학	○	○	○	3-3-0	[PRE] MSE202	1
MSE318	Polymer Stuructures and Properties 고분자 구조 및 물성	○	○	○	3-3-0		2
MSE350	Solid State Physics of Materials 재료고체물리	○	○	○	3-3-0		2
MSE351	Thin Film Technology 박막공학	○	○	○	3-3-0		1
MSE355	Nano-energy Materials 나노에너지재료	○	○	○	3-3-0		1
MSE356	Nanophotonics 나노포토닉스	○	○	○	3-3-0		1
MSE360	Bio-inspired Materials Science 바이오소재과학	○	○	○	3-3-0	[IDEN] BME235	2
MSE372	Polymer Physics 고분자 물리	○	○	○	3-3-0		1
MSE401	Transmission Electron Microscopy 전자현미경학	○	○	○	3-3-0		1
MSE405	Introduction to Crystal Growth 결정성장개론	○	○	○	3-3-0		1
MSE406	Materials for Photoelectrochemical Devices 광전기화학 소재 및 소자	○	○	○	3-3-0		1
MSE407	Semiconductor Device Characteristics and AI Hardware Application 반도체소자 특성과 AI 하드웨어 응용	○	○	○	3-3-0		2
MSE431	Introduction to Spintronics 스핀트로닉스개론	○	○	○	3-3-0		2
MSE434	Microstructure-Property Relationships II 미세구조와 물성 II	○	○	○	3-3-0		2
MSE452	Nano Semiconductor Devices 나노반도체소자	○	○	○	3-3-0		1

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remarks	Semester
MSE453	Semiconductor Processing 반도체집적공정	○	○	○	3-3-0		2
MSE454	Nano-Materials Reliability 나노소재신뢰성	○	○	○	3-3-0		1
MSE471	Polymer Composites 고분자복합재료	○	○	○	3-3-0		1
MSE491	Special Topics in Materials Science and Engineering I 신소재공학특론I	○	○	○	3-3-0		-
MSE492	Special Topics in Materials Science and Engineering II 신소재공학특론II	○	○	○	3-3-0		-
MSE493	Special Topics in Materials Science and Engineering III 신소재공학특론III	○	○	○	3-3-0		-
MSE494	Special Topics in Materials Science and Engineering IV 신소재공학특론IV	○	○	○	3-3-0		-
BIO201	Molecular Biology 분자생물학	○	○	○	3-3-0	Refer to each department section	
BIO211	Biochemistry I 생화학 I	○	○	○	3-3-0		
BME211	Engineering Physiology 공학생리학	○	○	○	3-3-0		
BME390	Searching for Novel CRISPR/Cas System at Gamk-pond 가막못에서 새로운 유전자 가위 찾기	○	○	○	3-3-0		
BME437	AI-based Affective Engineering AI 기반 감성공학	○	○	○	3-3-0		
CHM211	Organic Chemistry I 유기화학 I	○	○	○	3-3-0		
CHM291	Analytical Chemistry I 분석화학 I	○	○	○	3-3-0		
CHM321	Biochemistry I 생화학 I	○	○	○	3-3-0		
CHM351	Inorganic Chemistry I 무기화학I	○	○	○	3-3-0		
CHM353	AI기반 디지털 화학 AI-Based Digital Chemistry	○	○	○	3-3-0		
ECHE312	Electrochemistry 전기화학	○	○	○	3-3-0		
ECHE342	Machine Learning Based Analysis for Biocatalysts 머신러닝을 이용한 생촉매 분석	○	○	○	3-3-0		
ECHE350	AI-driven Design of Energy Materials and Process 인공지능 기반 에너지 소재 및 공정 설계	○	○	○	3-3-0		
EEE432	Semiconductor VLSI Devices Engineering 반도체집적소자공학	○	○	○	3-3-0		
FIA419	Valuing Large Scale Investments(LSI) 대규모 프로젝트의 가치평가 및 시뮬레이션	○	○	○	3-3-0		
IE308	Service Intelligence 서비스 지능	○	○	○	3-3-0		
MEN230	Solid Mechanics I 고체역학 I	○	○	○	3-3-0		
MEN301	Numerical Analysis 수치해석	○	○	○	3-2-2		

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Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remarks	Seme ster
MEN431	Introduction to Plastic Deformation 소성학개론	○	○	○	3-3-0		
MEN456	Artificial Intelligence Based Digital Manufacturing AI 기반 디지털 제조 공학	○	○	○	3-3-0		
MEN491	Creating Autonomous Car 자율주행 자동차 만들기	○	○	○	3-3-0		
MTH434	Mathematical Analysis and Computation for Machine Learning 머신러닝 해석학 원리와 계산	○	○	○	3-3-0		
MTH450	Deep Learning Methods for Solving Partial Differential Equations 편미분방정식 계산을 위한 딥러닝 방법	○	○	○	3-3-0		
NE370	Nuclear Power Plant Accident Diagnosis using AI techniques AI를 이용한 원전 사고 진단	○	○	○	3-3-0		
PHY201	Classical Mechanics I 고전역학 I	○	○	○	3-3-0		
PHY231	Green Hydrogen Production System Based on Plasmonic Photoexcitation 빛을 이용한 청정수소 생산 시스템 설계	○	○	○	3-3-0		
PHY301	Quantum Physics I 양자물리학 I	○	○	○	3-3-0		
PHY303	Thermal and Statistical Physics I 열 및 통계물리학 I	○	○	○	3-3-0		
PHY407	Semiconductor Physics 반도체물리학	○	○	○	3-3-0		
PHY451	Network Science and Machine Intelligence 네트워크과학과 기계지능	○	○	○	3-3-0	Refer to each department section	
PHY461	Challenge to Advanced Topics in Plasma Physics 현대 플라즈마 물리 난제 도전	○	○	○	3-3-0		
CUEE337	Building Collapse and Safety Inspection Techniques 건물 붕괴와 안전진단 기술	○	○	○	3-3-0		
UNI201	Photodynamic Therapy 광역동 치료	○	○	○	1-1-0		
UNI202	Blockchain and Cryptocurrencies 블록체인과 암호화폐	○	○	○	1-1-0		
UNI203	Design and Implementation of data-driven machine learning 데이터기반 머신러닝 설계 및 제작	○	○	○	1-1-0		
UNI204	Software Hacking and Defense 소프트웨어 해킹과 방어	○	○	○	1-1-0		
UNI205	Dynamic Programming and its Applications 동적계획법과 사회기업문제	○	○	○	1-1-0		
UNI206	Predicting Earthquake Waves 지진파 예측하기	○	○	○	1-1-0		
UNI207	Creative Computing for Media Art 창의적 컴퓨팅과 미디어아트	○	○	○	1-1-0		
UNI208	Inventory Management Optimization Strategies 재고관리 최적화 전략	○	○	○	1-1-0		
UNI209	Creative Design and CAD for SMR 소형원전 설계와 CAD 실습	○	○	○	1-1-0		

※ [PRE]: Prerequisite(선이수), [IDEN]: Identical(동일지정교과)

4. Curriculum Change [교육과정 변경사항]

2023	→	2024
MSE315 Physical Properties of Materials 재료물성론	→	MSE315 Microstructure-Property Relationships I 미세구조와 물성 I
MSE434 Microstructure-Property Relationships:Foundations in Physical Metallurgy 미세구조와 물성	→	MSE434 Microstructure-Property Relationships II 미세구조와 물성 II
MSE432 Piezoelectric Materials 압전재료	→	〈Closed〉

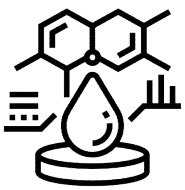
Department of Materials Science and Engineering

5. Curriculum Map [교육과정 이수 체계도]

1st semester, Sophomore	2nd semester, Sophomore	1st semester, Junior	2nd semester, Junior	1st semester, Senior	2nd semester, Senior
[MSE202] Introduction to Materials Science and Engineering 재료공학개론	**[MSE290] Introduction to Computational Materials Science 전산재료과학개론**	**[MSE312] Phase Transformations in Materials 재료상변태**	**[MSE300] Materials Lab 재료실험**	[MSE471] Polymer Composites 고분자복합재료	[MSE431] Introduction to Spintronics 스핀트로닉스개론
[MSE230] Introduction to Crystallography 결정학개론	**[MSE203] Physical Chemistry I: Thermodynamics 재료물리화학I:열역학**	**[MSE354] Introduction to Semiconductors 반도체개론**	[MSE350] Solid State Physics of Materials 재료고체물리	[MSE401] Transmission Electron Microscopy 전자현미경학	[MSE453] Semiconductor Processing 반도체집적공정
[MSE270] Introduction to Polymer Materials 고분자재료개론	[MSE253] Introduction to Nanomaterials 나노재료개론	[MSE355] Nano-energy Materials 나노에너지재료	[MSE311] Introduction to Metallic Materials 금속재료개론	[MSE454] Nano-Materials Reliability 나노소재신뢰성	[MSE434] Microstructure -Property RelationshipsII 미세구조와물성II
	[MSE211] Physical Chemistry of Materials II: Reaction Engineering 재료물리화학II:반응공학	[MSE351] Thin Film Technology 박막공학	[MSE313] Mechanical Behavior of Materials 재료의기계적거동	[MSE452] Nano Semiconductor Devices 나노반도체소자	[MSE407] Semiconductor Device Characteristics and AI Hardware Application 반도체소자 특성과 AI 하드웨어 응용
	[MSE204] Electromagnetics 전자기학	[MSE356] Nanophotonics 나노포토닉스	[MSE316] Wearable smart healthcare electronic system 웨어러블 스마트 헬스케어 전자소자 시스템	[MSE405] Introduction to Crystal Growth 결정성장개론	
	[MSE250] Modern Physics of Materials: Quantum Mechanics 재료현대물리:양자역학	[MSE372] Polymer Physics 고분자물리	[MSE304] Data Analytics for Materials Science and Engineering 재료공학데이터분석	[MSE456] Semiconductor Materials and Devices 반도체재료 및 소자	
		[MSE317] Surface Science of Materials 재료표면과학	[MSE318] Polymer Structures and Properties 고분자 구조 및 물성	[MSE406] Materials for Photoelectrochemical Devices 광전기화학 소재 및 소자	
		[MSE360] Bio-inspired Materials Science 바이오소재과학	[MSE434] Microstructure -Property RelationshipsI 미세구조와물성 II		

School of Energy and Chemical Engineering [에너지화학공학과]

■ School Introduction [학과소개]



The School of Energy and Chemical Engineering (ECHE) at UNIST aims to promote the growth of highly capable and motivated engineers who can address challenges not only in existing chemical processes but in globally emerging topics of energy and environment. By taking core courses of chemical engineering, such as transport phenomena and reactor design, students will gain a deep understanding of the chemical engineering principles, and learn how the principle applies to solving problems in the following areas: design and control of chemical processes, next-generation catalysis, novel functional materials and devices, biosystems and metabolic engineering, artificial intelligence, modeling and simulation of chemical processes, and energy harvesting and storage. Students will have opportunities to evaluate and clarify their career direction by taking laboratory courses and a research internship, both of which are carefully designed and advised by the faculty members in ECHE. Having close ties with leading research institutions and industry partners, both domestic and overseas, ECHE at UNIST also provides a well established academia-industry convergence research program in various fields.

1. Graduation Requirement [졸업 이수요건]

Category 구분		Credits 이수학점	Remarks 비고	Subtotal 소계
Basic 기초	Required 필수	17	Calculus I(3), General Physics I(3), General Chemistry I(3), General Biology(3), Introduction to AI Programming I(3), General Chemistry Lab I(1), General Physics Lab I(1) (Total 17 credits)	At least 32 Credits
	Elective 선택[학과 지정]	15	5 mandatory courses designated by school -Calculus II, General Physics II, General Chemistry II, Differential Equations, Introduction to AI Programming II	
Major 전공	Required 필수	33	Refer to the required courses * Additional requirements for graduation 1) Choosing 2 experimental courses out of 6 2) Undergraduate Thesis Research	At least 51 Credits
	Elective 선택	18	Refer to Elective course list below	
	Internship 인턴십	3	Internship (Choose one among Research, Industrial, Venture Creation, Co-op)	3 Credits
Free Elective 자유선택		14	All courses accepted	At least 14 Credits

* For Liberal Arts and Leadership requirements, refer to school Common requirements

School of Energy and Chemical Engineering

2. Basic Requirements [기초 이수요건]

No.	Course Code	Course Title	Major 전공	Double Major 복수전공	Minor 부전공
			15 credits	15 credits	15 credits
1	MTH112	Calculus II (3)	●	●	●
2	PHY103	General Physics II (3)	●	●	●
3	CHM102	General Chemistry II (3)	●	●	●
4	PHY108	General Physics Lab II (1)			
5	CHM106	General Chemistry Lab II (1)			
6	MTH201	Differential Equations (3)	●	●	●
7	MTH203	Applied Linear Algebra (3)			
8	MTH211	Statistics (3)			
9	MGT102	Entrepreneurship (3)			
10	IE101	Introduction to Data Science(3)			
11	ITP117	Introduction to AI Programming II (3)	●	●	●
12	ITP111	Probability & Random Process (3)			
13	ITP112	Discrete Mathematics (3)			
14	UNI104	Understanding Major (1) **Trends in Energy & Chemical Engineering**			

●: Required ○: Elective ◑: Recommended, ( ): credits

※ Understanding Major 'Trends in Energy & Chemical Engineering (에너지화학공학 소개)' course is recommended to take as a free elective

※ School required fundamental courses should be completed before the Major Selection

3. Curriculum [에너지화학공학과 교육과정]

▶ Credit Requirements [이수학점]

Department (School)	Major(전공)			Double Major(복수전공)			Minor(부전공)		
	R	E	Total	R	E	Total	R	E	Total
School of Energy and Chemical Engineering	33	18	**51**	33	6	**39**	18	0	**18**

*R: Required, E: Elective

▶ Required [전공필수]

Course Code	Course Name	Major	Double	Minor	Cred -Lect -Exp	Remarks	Seme ster
ECHE201	Organic Chemistry I 유기화학 I	○	○	○	3-3-0	[IDEN] CHM211	1
ECHE203	Physical Chemistry I 물리화학 I	○	○	○	3-3-0		1
ECHE212	Introduction to Chemical Process 화학공정개론	○	○	○	3-3-0		1
ECHE223	Energy Materials Lab 에너지 재료실험	○	○		3-0-6		2
ECHE231	Chemical Engineering Thermodynamics 화공열역학	○	○	○	3-3-0		2
ECHE302	Advanced Chemical Engineering Lab 첨단화학공학실험	○	○		3-0-6		1
ECHE311	Chemical Reaction Engineering 반응공학	○	○	○	3-3-0		2

Course Code	Course Name	Major	Double	Minor	Cred -Lect -Exp	Remarks	Semester
ECHE331	Transport Phenomena: Momentum, Heat, and Mass Transfer 전달현상: 운동량, 열, 물질전달	○	○	○	3-3-0	[PRE] Required: MTH201 and Choose one among following courses:ECHE203, ECHE231,MEN210, MEN211,UEE324,MSE203,NE331,CHM336	1
ECHE314	Energy Conversion and Storage Lab 에너지변환 및 저장실험	○	○		3-0-6		2
ECHE323	Solar Cells Lab 태양전지실험	○	○		3-0-6		1
ECHE341	Engineering Biology Lab 생물화학공학실험	○	○		3-0-6		2
ECHE351	Introduction to Polymer Science and Engineering 고분자과학개론	○	○		3-3-0	[PRE] ECHE201 [IDEN] CHM372,MSE270	1
ECHE352	Advanced Fluid Mechanics 고급유체역학	○	○		3-3-0		2
ECHE361	Organic/Physical Chemistry Lab 유기물리화학실험	○	○		3-0-6		2
ECHE490	Undergraduate Thesis Research 학사졸업논문연구	○	○		3-0-6		1,2

*Courses that are not required for Minor can be counted as Elective course

▶ Elective [전공선택]

Course Code	Course Name	Major	Double	Minor	Cred -Lect -Exp	Remarks	Semester
ECHE202	Organic Chemistry II 유기화학 II	○	○		3-3-0	[IDEN] CHM212	1
ECHE213	Analytical Chemistry 분석화학	○	○		3-3-0	[IDEN] CHM291	1
ECHE218	Fundamentals of Energy Conversion Systems 에너지 변환 시스템 개론	○	○		3-3-0		-
ECHE222	Physical Chemistry II: Kinetics 물리화학 II: 동역학	○	○		3-3-0		2
ECHE240	Engineering Biochemistry 공학생화학	○	○		3-3-0		2
ECHE241	Fundamentals of Engineering Biology 공학생물학	○	○		3-3-0	[PRE] BIO101	1
ECHE242	Machine Learning for Chemical Engineering 화학공학 머신러닝	○	○		3-3-0		1
ECHE251	Introduction to Carbon Neutral Technology 탄소중립기술개론	○	○		3-3-0	[IDEN] CN202	2
ECHE301	Computational Methods for Chemical Engineering 화학공학전산	○	○		3-3-0		2
ECHE304	Inorganic Chemistry I 무기화학 I	○	○		3-3-0		1
ECHE312	Electrochemistry 전기화학	○	○		3-3-0		1
ECHE313	Solid State Chemistry 고체화학	○	○		3-3-0	[IDEN] CHM454	1
ECHE315	Introduction to Crystallography 결정학개론	○	○		3-3-0		1

School of Energy and Chemical Engineering

Course Code	Course Name	Major	Double	Minor	Cred -Lect -Exp	Remarks	Seme ster
ECHE316	Electronic Devices 전자소자	○	○		3-3-0		-
ECHE317	Fundamentals of Energy Materials 에너지재료개론	○	○		3-3-0	[IDEN] CHM313	1
ECHE320	Electrocatalysis 전기화학 촉매반응	○	○		3-3-0		1
ECHE321	Polymer Material Science 고분자재료과학	○	○		3-3-0	[PRE] ECHE351	2
ECHE322	Instrumental Analysis 기기분석	○	○		3-3-0	[IDEN] CHM391	1
ECHE324	Computational Materials Science 전산재료과학	○	○		3-3-0		-
ECHE326	Inorganic Chemistry II 무기화학 II	○	○		3-3-0		2
ECHE340	Biochemical Engineering 생물화학공학	○	○		3-3-0		1
ECHE342	Machine Learning Based Analysis for Biocatalysts 머신러닝을 이용한 생촉매 분석	○	○		3-3-0		1
ECHE350	AI-driven Design of Energy Materials and Process 인공지능 기반 에너지 소재 및 공정 설계	○	○		3-3-0		2
ECHE402	Separation Process 분리공정	○	○		3-3-0		1
ECHE410	Phase Transformation 재료상변태	○	○		3-3-0		2
ECHE412	Principle of Solution Processing 용액공정개론	○	○		3-3-0		-
ECHE413	Introduction to New Energy Conversion and Storage 신에너지 변환 및 저장개론	○	○		3-3-0		2
ECHE416	Introduction to Nanoscience and Nanotechnology 나노과학 및 기술	○	○		3-3-0	[IDEN] CHM371	-
ECHE421	Fundamentals of Semiconductor Fabrication 반도체공정개론	○	○		3-3-0		-
ECHE422	Fundamentals of Electrochemical System 전기화학시스템개론	○	○		3-3-0	[PRE] ECHE203	-
ECHE423	Introduction to Application Technologies of Energy Devices: ESS &EV 에너지기기응용기술개론: ESS & EV	○	○		3-3-0		1
ECHE431	Introduction to Catalysis 촉매개론	○	○		3-3-0		2
ECHE432	Chemical Engineering Mathematics 화공수학	○	○		3-3-0		2
ECHE441	Introduction to Molecular Biotechnology 분자생물공학	○	○		3-3-0		-
ECHE442	Process Design and Economics 공정설계 및 경제성	○	○		3-3-0		2
ECHE443	Chemical Process Control 공정제어	○	○		3-3-0		1
ECHE450	Special Topics in Energy and Chemical Engineering I 에너지화학공학 특론 I	○	○		3-3-0		-
ECHE451	Special Topics in Energy and Chemical Engineering II 에너지화학공학 특론 II	○	○		3-3-0		-
ECHE452	Special Topics in Energy and Chemical Engineering III 에너지화학공학 특론 III	○	○		3-3-0		-

Course Code	Course Name	Major	Double	Minor	Cred -Lect -Exp	Remarks	Semester
ECHE453	Special Topics in Energy and Chemical Engineering IV 에너지화학공학 특론 IV	○	○		3-3-0		-
ECHE454	Special Topics in Energy and Chemical Engineering V 에너지화학공학 특론 V	○	○		3-3-0		-
BME390	Searching for Novel CRISPR/Cas System at Gamk-pond 가막못에서 새로운 유전자 가위 찾기	○	○		3-3-0	Refer to each department section	
BME437	AI-based Affective Engineering AI 기반 감성공학	○	○		3-3-0		
CSE302	Building Customized Computers 맞춤형 컴퓨터 만들기	○	○		3-3-0		
CHM232	Physical Chemistry II 물리화학 II	○	○		3-3-0		
CHM291	Analytical Chemistry I 분석화학 I	○	○		3-3-0		
CHM333	Physical Chemistry III 물리화학 III	○	○		3-3-0		
IE308	Service Intelligence 서비스지능	○	○		3-3-0		
MEN456	Artificial Intelligence Based Digital Manufacturing AI 기반 디지털 제조 공학	○	○		3-3-0		
MEN491	Creating Autonomous Car 자율주행 자동차 만들기	○	○		3-3-0		
MSE316	Wearable smart healthcare electronic system 웨어러블 스마트 헬스케어 전자소자 시스템	○	○		3-3-0		
MSE351	Thin Film Technology 박막공학	○	○		3-3-0		
MSE452	Semiconducting Devices 반도체소자	○	○		3-3-0		
MSE454	Nano-Materials Reliability 나노소재신뢰성	○	○		3-3-0		
NE370	Nuclear Power Plant Accident Diagnosis using AI Techniques AI를 이용한 원전 사고 진단	○	○		3-3-0		
PHY451	Network Science and Machine Intelligence 네트워크과학과 기계지능	○	○		3-3-0		
CUEE206	Science Humanities 과학인문학	○	○		3-3-0		
CUEE337	Building collapse and safety inspection techniques 건물 붕괴와 안전진단 기술	○	○		3-3-0		
UNI201	Photodynamic Therapy 광역동 치료	○	○		1-1-0		
UNI202	Blockchain and Cryptocurrencies 블록체인과 암호화폐	○	○		1-1-0		
UNI203	Design and Implementation of data-driven machine learning 데이터기반 머신러닝 설계 및 제작	○	○		1-1-0		
UNI204	Software Hacking and Defense 소프트웨어 해킹과 방어	○	○		1-1-0		
UNI205	Dynamic Programming and its Applications 동적계획법과 사회기업문제	○	○		1-1-0		

※ [PRE]: Prerequisite(선이수), [IDEN]: Identical(동일지정교과)

School of Energy and Chemical Engineering

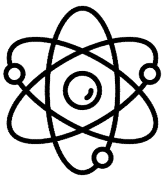
4. Curriculum Map [교육과정 이수 체계도]

1st semester, Sophomore	2nd semester, Sophomore	1st semester, Junior	2nd semester, Junior	1st semester, Senior	2nd semester, Senior
[ECHE201] Organic Chemistry I 유기화학 I	[ECHE231] Chemical Eng. Thermodynamics 화공열역학	[ECHE331] Transport Phenomena 전달현상	[ECHE311] Chemical Reaction Engineering 반응공학	-	[ECHE490] Undergraduate Thesis Research 학사졸업논문연구
[ECHE203] Physical Chemistry I 물리화학 I	[ECHE223] Lab for Energy Materials 에너지재료실험	[ECHE351] Introduction to Polymer Science and Engineering 고분자과학개론	[ECHE352] Advanced Fluid Mechanics 고급유체역학	-	-
[ECHE212] Intro to Chemical Process 화학공정개론		[ECHE302] Advanced Chemical Engineering Lab 첨단화학공학실험	[ECHE361] Organic/Physical Chemistry Lab 유기물리화학실험	-	-
		[ECHE323] Solar Cells Lab 태양전지실험	[ECHE341] Engineering Biology Lab 생물화학공학실험	-	-
			[ECHE314] Energy Conversion and Storage Lab 에너지변환 및 저장실험		

* You should choose 2“Lab” courses out of total 6 for graduation, so the “Lab” courses written above table could be optional.

Department of Nuclear Engineering
[원자력공학과]

■ Department Introduction [학과소개]



Nuclear Engineering is comprised of various science and engineering branches, such as nuclear reactor physics, radiation engineering, nuclear safety engineering, thermohydraulics, nuclear materials engineering, radiation material science, nuclear fuel cycle engineering, health physics, nuclear policy, nuclear material safeguards and non-proliferation, nuclear power plant decontamination and decommissioning, and nuclear fusion science and engineering, and also medical radiation science with artificial intelligence(AI). Department of Nuclear Engineering currently has 10 faculty members and provides a variety of courses covering almost all the branches of nuclear science and engineering above mentioned. The thoroughness of our program will promote students to be fully qualified nuclear scientists and engineers who can compete globally.

1. Graduation Requirement [졸업 이수요건]

Category 구분		Credits 이수학점	Remarks 비고	Subtotal 소계
Basic 기초	Required 필수	17	Calculus I(3), General Physics I(3), General Chemistry I(3), General Biology(3), Introduction to AI Programming I(3), General Chemistry Lab I(1), General Physics Lab I(1) (Total 17 credits)	At least 30 Credits
	Elective 선택[학과 지정]	13	Complete at least 13 credits including Applied Linear Algebra(3), Differential Equations(3), Calculus II(3) and Statistics(3)	
Major 전공	Required 필수	27	Refer to Required course list below Graduation thesis required(No credits for thesis)	At least 54 Credits
	Elective 선택	27	Refer to Elective course list below	
	Internship 인턴십	3	Internship (Choose one among Research, Industrial, Venture Creation, Co-op)	3 Credits
Free Elective 자유선택		13	All courses acceptable	At least 13 Credits

* For Liberal Arts and Leadership requirements, refer to school Common requirements

Department of Nuclear Engineering

2. Basic Requirements [기초 이수요건]

No.	Course Code	Course Title	Major 전공	Double Major 복수전공	Minor 부전공
			13 credits	6 credits	-
1	MTH112	Calculus II (3)	●		
2	PHY103	General Physics II (3)	○		
3	CHM102	General Chemistry II (3)	○		
4	PHY108	General Physics Lab II (1)	○		
5	CHM106	General Chemistry Lab II (1)	○		
6	MTH201	Differential Equations (3)	●	●	
7	MTH203	Applied Linear Algebra (3)	●	●	
8	MTH211	Statistics (3)	●		
9	MGT102	Entrepreneurship (3)	○		
10	IE101	Introduction to Data Science(3)	○		
11	ITP117	Introduction to AI Programming II (3)	○		
11	ITP111	Probability & Random Process (3)	○		
12	ITP112	Discrete Mathematics (3)	○		
14	UNI105	Understanding Major (1) **The Future of Nuclear Engineering**	◑		

●: Required ○: Elective ◑: Recommended, ( ): credits
* It is recommended to take 'The future of Nuclear Engineering' course for double major

3. Curriculum [원자력공학과 교육과정]

▶ Credit Requirements [이수학점]

Department (School)	Major(전공)			Double Major(복수전공)			Minor(부전공)		
	R	E	Total	R	E	Total	R	E	Total
Department of Nuclear Engineering	27	27	**54**	15	21	**36**	3	15	**18**

*R: Required, E: Elective

▶ Required [전공필수]

Course Code	Course Title	Major	Double[1)]	Minor	Cred -Lect -Exp	Remark	Seme ster
NE200	Fundamentals of Nuclear Engineering 원자력공학개론	○	○	○	3-3-0		1
NE210	Nuclear Radiation Engineering&Experiment 원자력방사선공학 및 실험	○	○		3-2-2		1
NE220	Nuclear Materials Engineering & Experiment 원자력재료공학 및 실험	○	○		3-2-2		2
NE300	Introduction to Nuclear Reactor Theory 원자로이론 개론	○	○		3-3-0		2
NE310	Nuclear System Engineering & Experiment 원자로계통공학 및 실험	○	○		3-2-2		2
NE320	Introduction to Nuclear Reliability Engineering 신뢰도 공학 개론	○	○		3-3-0		1
NE340	Introduction to Nuclear Fuel Cycle Engineering 핵연료주기공학 개론	○	○		3-3-0		1
NE350	Fundamentals of Plasma Physics 플라즈마 물리학 기초	○	○		3-3-0	[PRE]NE250 [IDEN]PHY427	1

Course Code	Course Title	Major	Double[1)]	Minor	Cred -Lect -Exp	Remark	Seme ster
NE400	Fundamentals of Nuclear Fusion 핵융합개론	○	○		3-3-0		1
NE490	Graduation Thesis 졸업논문	○			0 credit		1,2

1) Double Major: Take 5 courses(15 credits) among 8 courses (Fundamentals of Nuclear Engineering, Nuclear Radiation Engineering & Experiment, Nuclear Materials Engineering & Experiment, Introduction to Nuclear Reactor Theory, Nuclear System Engineering & Experiment, Introduction to Nuclear Fuel Cycle Engineering, Fundamentals of Plasma Physics. Fundamentals of Nuclear Fusion)
1) 복수전공은 원자력공학개론, 원자력방사선공학 및 실험, 원자력재료공학 및 실험, 원자로이론 개론, 원자로계통공학 및 실험, 핵연료주기공학 개론, 플라즈마 물리학 기초, 핵융합개론 중 5개(15학점) 이수
* Courses that are not required for Minor/Double Major can be counted as Elective course
* 복수전공자, 부전공자에게 필수로 인정되지 않는 전공필수 과목을 이수했을 경우 선택으로 인정가능

▶ Elective [전공선택]

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Seme ster
NE211	Medical Radiation Engineerirng 의료방사선공학	○	○	○	3-3-0		2
NE230	Introduction to Artificial Intelligence in Medicine 의료인공지능 개론	○	○	○	3-3-0		2
NE240	Nuclear Chemical Engineering 원자력화학공학	○	○	○	3-3-0		-
NE250	Fundamentals of Electromagnetics 전자기학개론	○	○	○	3-3-0		-
NE251	Scientific Computation in Nuclear Fusion 전산핵융합기초	○	○	○	3-3-0		-
NE301	Nuclear Reactor Numerical Analysis 원자로 수치해석	○	○	○	3-3-0		1
NE330	Nuclear Fuel Engineering & Experiment 핵연료공학 및 실험	○	○	○	3-2-2		1
NE331	Thermodynamics and Metallurgy of Nuclear Materials 원자력재료열역학	○	○	○	3-3-0		1
NE341	Radioactive Waste Management 방사성폐기물관리	○	○	○	3-3-0		2
NE370	Nuclear Power Plant Accident Diagnosis using AI Techniques AI를 이용한 원전 사고 진단	○	○	○	3-3-0		2
NE401	Nuclear Reactor Lab 원자로실험	○	○	○	3-0-6		-
NE410	Power Plant Systems 원전시스템	○	○	○	3-3-0		1
NE420	Introduction to Nuclear Engineering IT 원자력 IT 개론	○	○	○	3-2-2		2
NE430	Introduction to Radiation Materials Science 방사선재료과학 개론	○	○	○	3-3-0		-
NE440	Instrumentation and Control Systems 원전계측제어시스템	○	○	○	3-3-0		2
NE450	Deep Learning in Medical Imaging 의료영상과 딥러닝	○	○	○	3-3-0		1
NE491	Special Topics on Nuclear Engineering and Science I 원자력공학 및 과학 특론 I	○	○	○	3-3-0		-
NE492	Special Topics on Nuclear Engineering and Science II 원자력공학 및 과학 특론 II	○	○	○	3-3-0		-
NE493	Special Topics on Nuclear Engineering and Science III 원자력공학 및 과학 특론 III	○	○	○	3-3-0		-

Department of Nuclear Engineering

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Seme ster
NE494	Special Topics on Nuclear Engineering and Science IV 원자력공학 및 과학 특론 IV	○	○	○	3-3-0		-
UNI209	Creative Design and CAD for SMR 소형원전 설계와 CAD 실습	○	○	○	1-0-2		S/W Sem
ECHE203	Physical Chemistry I 물리화학 I	○	○		3-3-0	Refer to each department section	
ECHE322	Instrumental Analysis 기기분석	○	○		3-3-0		
ECHE416	Introduction to Nanoscience and Nanotechnology 나노과학 및 기술	○	○		3-3-0		
MEN210	Thermodynamics 열역학	○	○		3-3-0		
MEN211	Applied Thermodynamics 응용열역학	○	○		3-3-0		
MEN220	Fluid Mechanics 유체역학	○	○		3-3-0		
MEN231	Solid Mechanics I 고체역학 I	○	○		3-3-0		
MEN270	Dynamics 동역학	○	○		3-3-0		
MEN301	Numerical Analysis 수치해석	○	○		3-2-2		
MEN310	Heat Transfer 열전달	○	○		3-3-0		
MEN320	Applied Fluid Mechanics 응용유체역학	○	○		3-3-0		
MEN457	Introduction to Electric-Electonic Engineering 전기전자공학개론	○	○		3-3-0		
MSE202	Introduction to Materials Science and Engineering 재료공학개론	○	○		3-3-0		
MSE203	Physical Chemistry I: Thermodynamics 재료물리화학I: 열역학	○	○		3-3-0		
IE313	Time-series Analysis 시계열 분석	○	○	○	3-3-0		
PHY204	Electromagnetism II 전자기학 II	○	○		3-3-0		
PHY301	Quantum Physics I 양자물리학 I	○	○		3-3-0		
PHY303	Thermal and Statistical Physics I 열 및 통계물리학 I	○	○		3-3-0		
PHY315	Solid State Physics I 고체물리학 I	○	○		3-3-0		

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

4. Curriculum Map [교육과정 이수 체계도]

Sophomore		Junior		Senior	
1st semester	2nd semester	1st semester	2nd semester	1st semester	2nd semester
(NE200) Fundamentals in Nuclear Engineering	(NE220) Nuclear Materials Engineering & Experiment	(NE300) Introduction to Nuclear Reactor Theory	(NE310) Nuclear System Engineering & Experiment	(NE400) Fundamentals of Nuclear Fusion	(NE420) Introduction to Nuclear Engineering IT
(NE240) Nuclear Chemical Engineering	(NE251) Scientific Computation in Nuclear Fusion	(NE340) Nuclear Fuel Engineering & Experiment	(NE320) Introduction to Nuclear Reliability Engineering	(NE401) Nuclear Reactor Lab	(NE410) Power Plant Systems
(NE250) Fundamentals of Electromagnetics	(NE211) Medical Radiation Engineering	(NE350) Fundamentals of Plasma Physics	(NE301) Nuclear Reactor Numerical Analysis	(NE430) Introduction to Radiation Materials Science	(NE440) Instrumentation and Control Systems
(NE210) Nuclear Radiation Engineering & Experiment		(NE330) Nuclear Fuel Engineering & Experiment	(NE331) Thermodynamics and Metallurgy of Nuclear Materials		(NE490) Graduation Thesis
		(NE341) Radioactive Waste Management	(NE351) Introduction to Perturbation Methods		
		(NE360) Deep Learning in Medical Imaging	(NE352) Introduction to Plasma Kinetic Theory and Nonlinear Physics		

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. Micro Degree Requirement [마이크로전공 이수학점]

Major	Micro(마이크로전공)		
	LECT	EXP	Total
Carbon Neutrality	6	4	10

2. Curriculum [탄소중립 마이크로전공 교육과정]

Category	Classification	Course Code	Course Title	Cred. -Lect. -Exp.	Semester
Required	LECT	CN201	Introduction to Carbon Neutral Policy 탄소중립정책개론	3-3-0	2
		CN202	Introduction to Carbon Neutral Technologies 탄소중립기술개론	3-3-0	1
	EXP	CN301	Carbon Neutral Project I 탄소중립 프로젝트 I	2-0-4	1,2
		CN302	Carbon Neutral Project II 탄소중립 프로젝트 II	2-0-4	1,2

3. Curriculum Change [교육과정 변경사항]

2023	→	2024
CN302 Carbon Neutral Project II 탄소중립 프로젝트 II	→	CN302 Carbon Neutral Project II 탄소중립 프로젝트 II [PRE; CN301]

College of Information and Biotechnology

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]

Category 구분		Credits 이수학점	Remarks 비고	Subtotal 소계
Basic 기초	Required 필수	17	Calculus I(3), General Physics I(3), General Chemistry I(3), General Biology(3), Introduction to AI Programming I(3), General Chemistry Lab I(1), General Physics Lab I(1) (Total 17 credits)	At least 30 Credits
	Elective 선택[학과 지정]	13	Take 13 credits among the basic course list Recommended: 2 courses Elective: 11 courses	
Major 전공	Required 필수	30	Refer to Required course list below	At least 48 Credits
	Elective 선택	18	Refer to Elective course list below	
	Internship 인턴십	3	Internship (Choose one among Research, Industrial, Venture Creation, Co-op)	3 Credits
Free Elective 자유선택		19	All courses accepted	At least 19 Credits

* For Liberal Arts and Leadership requirements, refer to school Common requirements

2. Basic Requirements [기초 이수요건]

No.	Course Code	Course Title	Major 전공	Double Major 복수전공	Minor 부전공
			13 Credits	-	-
1	MTH112	Calculus II (3)	○		
2	PHY103	General Physics II (3)	○		
3	CHM102	General Chemistry II (3)	○		
4	PHY108	General Physics Lab II (1)	○		
5	CHM106	General Chemistry Lab II (1)	○		
6	MTH201	Differential Equations (3)	○		
7	MTH203	Applied Linear Algebra (3)	○		
8	MTH211	Statistics (3)	◑		
9	MGT102	Entrepreneurship (3)	◑		
10	IE101	Introduction to Data Science(3)	○		
11	ITP117	Introduction to AI Programming II (3)	○		
12	ITP111	Probability & Random Process (3)	○		
13	ITP112	Discrete Mathematics (3)	○		
14	UNI106	Understanding Major (1) **What is Design?**	◑		

●: Required ○: Elective ◑: Recommended, ( ): credits
*It is recommended to take the above Major recommended courses for Double major/Minor students.

3. Curriculum [디자인학과 교육과정]

▶ Credit Requirements [이수학점]

Department (School)	Major(전공)			Double Major(복수전공)			Minor(부전공)		
	R	E	Total	R	E	Total	R	E	Total
Department of Design	30	18	**48**	30	6	**36**	12	6	**18**

*R: Required, E: Elective

▶ Required [전공필수]

Course Code	Course Title	Major	Double	Minor	Cred. -Lect. -Exp.	Remark	Seme ster
DES201	Designing Ambient Things 앰비언트한 것들의 디자인	○	○	○	3-2-2		1
DES202	Product Design Fundamentals 제품디자인기초	○	○	○	3-2-2	[PRE] DES201	2
DES232	3D CAD 3D CAD	○	○	○	3-2-2		2
DES301	Product Design I 제품디자인 I	○	○	-	3-2-2	[PRE] DES202	1
DES302	Product Design II 제품디자인 II	○	○	-	3-2-2	[PRE] DES301	2
DES332	UX design research methods UX 디자인 연구 방법	○	○	-	3-2-2		2
DES342	Service design fundamental 서비스 디자인 기초	○	○	○	3-2-2		1
DES405	Design Communication 디자인 커뮤니케이션	○	○	-	3-2-2		1

Department of Design

Course Code	Course Title	Major	Double	Minor	Cred. -Lect. -Exp.	Remark	Seme ster
DES431*	Creative Design 1 창의디자인 1	○	○	-	3-2-2	[PRE] DES302	1
DES432*	Creative Design 2 창의디자인 2	○	○	-	3-2-2	[PRE] DES431	2

※ Students who choose Design as their major or Double major are required to take both 'Creative Design 1(DES431)' and 'Creative Design 2 (DES432)' before graduation.

▶ Elective [전공선택]

Course Code	Course Title	Major	Double	Minor	Cred. -Lect. -Exp.	Remark	Seme ster
DES222	Fundamental Digital Design 디지털 디자인 기초	○	○	○	3-3-0		2
DES231	Design Knowledge and Skills 디자인 지식과 기술	○	○	○	3-2-2		2
DES233	Design for Sustainability 지속가능한 디자인	○	○	○	3-3-0		2
DES324	Prototyping for Design 디자인 프로토타이핑	○	○	○	3-3-0		1
DES341	Fundamental Electrical-Electronic Practice 기초전기전자실습	○	○	○	3-2-2		2
DES401	Tangible Interaction and Interfaces 탠저블 인터랙션 및 인터페이스	○	○	○	3-3-0		2
DES402	Interactive Technology 인터액티브 기술	○	○	○	3-3-0		1
DES403	Product Understanding Use and Experience 제품의 이해-사용과 경험	○	○	○	3-3-0		2
DES404	Human-Centered AI and design 인간중심 AI 및 디자인	○	○	○	3-2-2		2
DES407	System thinking for Designers 디자이너를 위한 시스템 사고	○	○	○	3-2-2		2
DES408	Design for Welbeing 웰빙을 위한 디자인	○	○	○	3-3-0		1
DES410	Special Topics in Design I 디자인 특론 I	○	○	○	3-3-0		-
DES420	Special Topics in Design II 디자인 특론 II	○	○	○	3-3-0		-
DES430	Special Topics in Design III 디자인 특론 III	○	○	○	3-3-0		-
UNI207	Creative Computing for Media Art 창의적 컴퓨팅과 미디어아트	○	○	○	3-3-0		
BME206	Cognitive Neuroscience 인지신경과학	○	○	○	3-3-0	Refer to each department section	
BME303	Color Science & Engineering 색채과학과 공학	○	○	○	3-3-0		
BME307	Biomechanics 인체역학	○	○	○	3-3-0		
BME308	Sensation and Perception 감각과 지각	○	○	○	3-3-0		
BME442	Experimental Design 실험계획법	○	○	○	3-3-0		
BME437	AI-based Affective Engineering AI 기반 감성공학	○	○	○	3-3-0		

Course Code	Course Title	Major	Double	Minor	Cred. -Lect. -Exp.	Remark	Semester
CSE333	Introduction to Human Computer Interaction 인간-컴퓨터 상호작용 개론	○	○	○	3-3-0	Refer to each department section	
CSE362	Artificial Intelligence 인공지능	○	○	○	3-3-0		
CSE468	Information Visualization 정보시각화기술	○	○	○	3-3-0		
CSE469	Introduction to Robotics 로보틱스 개론	○	○	○	3-3-0		
IE308	Service Intelligence 서비스 지능	○	○	○	3-3-0		
MEN455	3D Printing 3D 프린팅	○	○	○	3-3-0		
MEN461	Introduction to Robotics 로봇공학	○	○	○	3-3-0		
MEN491	Creating Autonomous Car 자율주행 자동차 만들기	○	○	○	3-3-0		
MGT204	Marketing Management 마케팅 관리	○	○	○	3-3-0		
MGT471	Managing Innovation and Change 혁신과 변화의 관리	○	○	○	3-3-0		
UNI202	Blockchain and Cryptocurrencies 블록체인과 암호화폐	○	○	○	1-1-0		
UNI203	Design and implementation of data-driven machine learning 데이터기반 머신러닝 설계 및 제작	○	○	○	1-1-0		

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

4. Curriculum Change [교육과정 변경사항]

2023	→	2024
DES342 Service design fundamental 서비스 디자인 기초	→	DES342 Service design fundamental 서비스 디자인 기초 (Elective → Required)
DES406 Usability Engineering 사용성 공학		〈Closed〉

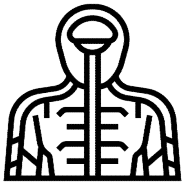
Department of Design

5. Curriculum Map [교육과정 이수 체계도]

Sophomore		Junior		Senior	
Spring	Fall	Spring	Fall	Spring	Fall
Designing Ambient Things	Product Design Fundamentals	Product Design1	Product Design2	Creative Design1	Creative Design2
	3D CAD	Service design fundamental	UX design research methods	Design Communication	Usability Engineering
	Fundamental Digital Design	Prototyping for Design	Fundamental Electrical-Electronic Practice	Interactive Technology	Tangible Interaction and Interface
	Design Knowledge and Skills		Design for Sustainability		Product Understanding Use and Experience
					Human-Centered AI and Design
					System thinking for Designers

Department of Biomedical Engineering
[바이오메디컬공학과]

■ Department Introduction [학과소개]



Department of biomedical engineering (BME) aims to improve human health by applying advanced engineering principles and methods to medical and biological problems, such as disease diagnostics, health monitoring, treatment, and therapy. In order to meet the increased needs in healthcare, BME at UNIST pursues to train creative global leaders through top-class interdisciplinary research and education programs. Our competitive research programs is focused on selected topics including advanced biomedical devices, rehabilitation and regenerative engineering, genome engineering, brain & cognitive engineering, and digital healthcare.

1. Graduation Requirement [졸업 이수요건]

Category 구분		Credits 이수학점	Remarks 비고	Subtotal 소계
Basic 기초	Required 필수	17	Calculus I(3), General Physics I(3), General Chemistry I(3), General Biology(3), Introduction to AI Programming I(3), General Chemistry Lab I(1), General Physics Lab I(1) (Total 17 credits)	At least 33 Credits
	Elective 선택[학과 지정]	16	Recommend: Calculus2(3), General Physics2(3), General Chemistry2(3),Statistics(3), AIP2(3), BME to change the world(1)	
Major 전공	Required 필수	21	Refer to Required course list below	At least 54 Credits
	Elective 선택	33	Refer to Elective course list below	
	Internship 인턴십	3	Internship (Choose one among Research, Industrial, Venture Creation, Co-op)	3 Credits
Free Elective 자유선택		10	All courses accepted	At least 10 Credits

* For Liberal Arts and Leadership requirements, refer to school Common requirements

Department of Biomedical Engineering

2. Basic Requirements [기초 이수요건]

No.	Course Code	Course Title	Major 전공	Double Major 복수전공	Minor 부전공
			16 credits	-	-
1	MTH112	Calculus II (3)	◑		
2	PHY103	General Physics II (3)	◑		
3	CHM102	General Chemistry II (3)	◑		
4	PHY108	General Physics Lab II (1)	○		
5	CHM106	General Chemistry Lab II (1)	○		
6	MTH201	Differential Equations (3)	○		
7	MTH203	Applied Linear Algebra (3)	○		
8	MTH211	Statistics (3)	◑		
9	MGT102	Entrepreneurship (3)	○		
10	IE101	Introduction to Data Science(3)	○		
11	ITP117	Introduction to AI Programming II (3)	◑		
12	ITP111	Probability & Random Process (3)	○		
13	ITP112	Discrete Mathematics (3)	○		
14	UNI107	Understanding Major (1) **BME to change the world**	◑		

●: Required ○: Elective ◑: Recommended, ( ): credits

3. Curriculum [바이오메디컬공학과 교육과정]

▶ Credit Requirements [이수학점]

Department (School)	Major(전공)			Double Major(복수전공)			Minor(부전공)		
	R	E	Total	R	E	Total	R	E	Total
Department of Biomedical Engineering	21	33	**54**	15	24	**39**	12	6	**18**

*R: Required, E: Elective

▶ Required [전공필수]

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Seme ster
BME210	Engineering Mathematics 공학수학	○	○		3-3-0		1
BME260	Molecular and Cellular Biology 분자세포생물학	○	○	○	3-3-0		2
BME301	Computational Methods for Biomedical Engineering 생명공학전산	○	○	○	3-3-0		1
BME312	Engineering Physiology 공학생리학	○	○	○	3-3-0		1
BME313	Biomedical Instrumentation Laboratory 의료기기실험	○	○	○	3-1-4		2
BME441	Biostatistics for Engineers 공학통계	○			3-3-0		2
BME490	Capstone Project 캡스톤 프로젝트	○	○	○	3-2-2		1

※Courses that are not required for Minor/Double Major can be counted as Elective course.

▶ Elective [전공선택]

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Semester
BME201	Introduction to Network Biology 네트워크생물학개론	○	○	○	3-3-0		2
BME202	Genomics 게놈학	○	○	○	3-3-0		1
BME204	Biosensors & Signals 바이오센서와 신호	○	○	○	3-1-4		1
BME206	Cognitive Neuroscience 인지신경과학	○	○	○	3-3-0		2
BME212	Biomedical instrumentation & analysis 의생명기기분석	○	○	○	3-2-2		1
BME213	Biophysical Chemistry 생물물리화학	○	○	○	3-3-0	[PRE] CHM101,CHM102	1
BME219	Optical Imaging 광학이미징	○	○	○	3-3-0		1
BME235	Tissue Engineering 조직공학	○	○	○	3-3-0	[IDEN] MSE360	2
BME280	Artificial Intelligence in Medicine 의과학 AI	○	○	○	3-3-0		2
BME281	Basic Biostatistics in Medicine 기초 의과학 생물통계	○	○	○	3-3-0		2
BME282	Introduction to Genomics 게놈학 개론	○	○	○	3-3-0		2
BME283	Introduction to Biomedical Imaging 의료영상 개론	○	○	○	3-3-0		2
BME284	Introduction to Rehabilitation & Regeneration 재활재생 개론	○	○	○	3-3-0		2
BME285	Brain & Cognitive Engineering 뇌인지공학	○	○	○	3-3-0		2
BME286	Introduction to Precision Nanomedicine 정밀나노의학 개론	○	○	○	3-3-0		2
BIO301	Cell BioInogy 세포생물학	○			3-3-0		1
BME302	Stem Cell Engineering 줄기세포공학	○	○	○	3-3-0		-
BME303	Color Science & Engineering 색체과학과 공학	○	○	○	3-3-0		1
BME304	Brain and Human Behavior I - Common to humans 뇌와 인간행동 I - 공통특성	○	○	○	3-3-0		1
BME305	Brain and Human Behavior II - Difference between humans 뇌와 인간행동 II - 개인차	○	○	○	3-3-0		2
BME307	Biomechanics 인체역학	○	○	○	3-3-0		1
BME308	Sensation and Perception 감각과 지각	○	○	○	3-3-0		2
BME309	Decision Making and the Brain 의사결정의 신경과학	○	○	○	3-3-0		1
BME311	Transport Phenomena in Biological Systems 생체유체역학	○	○	○	3-3-0	[PRE] MTH201	1
BME321	Biomedical Optics 의광학개론	○	○	○	3-3-0		2
BME326	Genome Technology 게놈응용기술학	○	○	○	3-3-0		1

Department of Biomedical Engineering

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Seme ster
BME330	Introduction to Digital Healthcare 디지털 헬스케어 개론	○	○	○	3-3-0		2
BME332	Neural Interface Device 신경 인터페이스 소자	○	○	○	3-3-0		
BME331	Introduction to Neuroimaging 뉴로이미징 개론	○	○	○	3-3-0		2
BME333	Genetics 유전학	○	○	○	3-3-0		2
BME390	Searching for Novel CRISPR/Cas System at Gamak-Pond 가막못에서 새로운 유전자 가위 찾기	○	○	○	3-2-2		2
BME391	DIY custom microscope using your smartphone 스마트폰으로 나만의 현미경 만들기	○	○	○	3-2-2		2
BME401	Special Topics in Biomedical Engineering Ⅰ 바이오메디컬공학특론 Ⅰ	○	○	○	3-3-0		-
BME402	Special Topics in Biomedical Engineering Ⅱ 바이오메디컬공학특론 Ⅱ	○	○	○	3-3-0		-
BME403	Special Topics in Biomedical Engineering Ⅲ 바이오메디컬공학특론 Ⅲ	○	○	○	3-3-0		-
BME407	Bio-imaging and Deep Learning 바이오 이미징과 딥러닝	○	○	○	3-3-0		1
BME408	Introduction to Pharmacology and Pharmaceutics 약리학 및 약제학 개론	○	○	○	3-3-0		2
BME411	Biological Physics 생물물리학	○	○	○	3-3-0		-
BME412	Organ-on-a-chip 생체모사공학	○	○	○	3-3-0		1
BME415	Biomedical Research with Model Organisms 모델 생물을 이용한 생명공학	○	○	○	3-3-0		
BME424	Cancer Genomics 암 게놈학	○	○	○	3-3-0	[PRE] BME202,BME203	1
BME433	Laser and Biomedical Application 레이저와 바이오 응용	○	○	○	3-3-0		1
BME437	AI-based Affective Engineering AI 기반 감성공학	○	○	○	3-3-0		1
BME440	BME440 Advanced Biophotonics 고급 바이오광학	○	○	○	3-3-0		1
BME442	Experimental Design 실험계획법	○	○	○	3-3-0	[PRE] MTH211	1
BME443	Advanced Biomedical Instruments 최신의료기기	○	○	○	3-3-0		2
BME444	Nano-Bio Engineering 나노바이오공학	○	○	○	3-3-0		1
BME445	Advanced Proteomics 고급 단백질체학	○	○	○	3-3-0		1
BME446	Animal Cell Culture 동물세포공학	○	○	○	3-3-0		1
BME447	AI-based Neural Data Science AI 기반 뇌과학 데이터 사이언스	○	○	○	3-3-0		2
BME460	Advanced Machine Learning and AI in Clinical Medicine 고급 의과학 AI	○	○	○	3-3-0		
BME461	Field Practice of Translational Research 중개연구 현장실습	○	○	○	3-2-2		

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Semester
BIO231	The Chemical Basis of Life 생명현상의 화학적 이해	○	○	○	3-3-0		
BIO305	Neuroscience I 신경과학 I	○	○	○	3-3-0		
BIO306	Neuroscience II 신경과학 II	○	○	○	3-3-0		
BIO320	Genome Integrity and Cancer 유전체 총체성과 암 발생의 이해	○	○	○	3-3-0		
BIO332	Human Physiology 생리학	○	○	○	3-3-0		
BIO340	Developmental Biology 발생학	○	○	○	3-3-0		
BIO432	Immunology 면역학	○	○	○	3-3-0		
BIO435	Cancer Biology 암생물학	○	○	○	3-3-0		
CSE302	Building Customized Computers 맞춤형 컴퓨터 만들기	○	○	○	3-2-2		
DES342	Service design fundamental 서비스 디자인 기초	○	○	○	3-2-2		
ECHE240	Engineering Biochemistry 공학생화학	○	○	○	3-3-0		
ECHE241	Fundamentals in Engineering Biology 공학생물학	○	○	○	3-3-0		
ECHE242	Machine Learning for Chemical Engineering 화학공학 머신러닝	○	○	○	3-3-0		
ECHE340	Biochemical Engineering 생물화학공학	○	○	○	3-3-0	Refer to each department section	
ECHE441	Introduction to Molecular Biotechnology 분자생물공학	○	○	○	3-3-0		
IE307	Statistical Computing 통계계산	○	○	○	3-3-0		
IE303	Data Mining 데이터 마이닝	○	○	○	3-3-0		
IE313	Time-series Analysis 시계열 분석	○	○	○	3-3-0		
IE406	Applied Machine Learning 기계학습 응용	○	○	○	3-3-0		
MEN455	3D Printing 3D 프린팅	○	○	○	3-3-0		
MSE316	Wearable Smart Healthcare Electronic System 웨어러블 스마트 헬스케어 전자소자 시스템	○	○	○	3-3-0		
MTH210	Mathematical Foundations of Machine Learning 머신러닝의 수학적 원리	○	○	○	3-3-0		
NE211	Medical Radiation Engineering 의료방사선공학	○	○	○	3-3-0		
NE450	Deep Learning in Medical Imaging 의료영상과 딥러닝	○	○	○	3-3-0		
PHY451	Network Science and Machine Intelligence 네트워크과학과 기계지능	○	○	○	3-3-0		
UNI203	Design and implementation of data-driven machine learning 데이터기반 머신러닝 설계 및 제작	○	○	○	1-1-0		
BIO291	Explore the microbes that inhabit the campus 캠퍼스에 서식하는 미생물 탐색	○	○	○	3-2-2		
ECHE342	Machine Learning Based Analysis for Biocatalysts 머신러닝을 이용한 생촉매 분석	○	○	○	3-3-0		

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

Department of Biomedical Engineering

4. Curriculum Change [교육과정 변경사항]

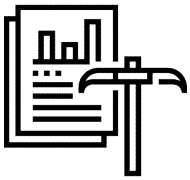
2023	→	2024
BME211 Engineering Physiology 공학생리학		BME312 Engineering Physiology 공학생리학
BME260 Essential Biology 필수 생물학		BME260 Molecular and Cellular Biology 분자세포생물학
BME280 Deep Learning in Medicine 의과학 AI		BME280 Artificial Intelligence in Medicine 의과학 AI
BME281 Biostatistics in Medicine 의과학 생물통계		BME281 Basic Biostatistics in Medicine 기초 의과학 생물통계
BME285 Introduction to Brain & Cognitive Engineering 뇌인지공학 개론	→	BME285 Brain & Cognitive Engineering 뇌인지공학
BME286 Introduction to Precision Nanomedicine 정밀의료 개론		BME286 Introduction to Precision Nanomedicine 정밀나노의학 개론
〈NEW〉		BME332 Neural Interface Device 신경 인터페이스 소자
		BME415 Biomedical Research with Model Organisms 모델 생물을 이용한 생명공학
		BME460 Advanced Machine Learning and AI in Clinical Medicine 고급 의과학 AI
		BME461 Field Practice of Translational Research 중개연구 현장실습

5. Curriculum Map [교육과정 이수 체계도]

	2nd year-Spring	2nd year-Fall	3rd year-Spring	3rd year-Fall	4th year-Spring	4th year-Fall
공통 (필수)	공학수학 Engineering Mathematics BME210		생명공학전산 Computational Methods for BME BME301	의료기기실험 Biomedical Instrumentation Laboratory BME313	캡스톤프로젝트 Capstone Project BME490	
	공학생리학 Engineering Physiology BME312					공학통계 Biostatistics for Engineers BME441
	분자세포생물학 Molecular and Cellular Biology BME260					
공통	바이오센서와 신호 Biosensors & Signals BME204	의과학AI Artificial Intelligence in Medicine BME280		디지털헬스케어 개론 Introduction to Digital Healthcare BME330	생물물리학 Biological Physics BME411	
	의생명기기분석 Biomedical instrumentation& analysis BME212	기초의 과학 생물통계 Basic Biostatistics in Medicine BME281			고급의과학AI Advanced Machine Learning and AI in Clinical Medicine BME460	
					중개연구 현장실습 Field Practice of Translational Research BME461	
Genomics/ Bioinformatics	게놈학 Genomics BME202	게놈학 개론 Introduction to Genomics BME282	게놈응용기술학 Genome Technology BME326	가막못에서 유전자가위찾기 Searching for Novel CRISPR/Cas System at Gamak-pond BME390	고급단백질체학 Advanced Proteomics BME445	암게놈학 Cancer Genomics BME424
			네트워크생물학 Introduction to Network Biology BME201	유전학 Genetics BME333		모델생물을이용한 생명공학 Biomedical Research with Model Organism BME412
Biomedical Imaging	광학이미징 Optical Imaging BME219	의료영상 개론 Introduction to Biomedical Imaging BME283		스마트폰 현미경 만들기 DIY custom microscope using your smartphone BME391	바이오이미징과딥러닝 Bio-imaging and Deep Learning BME407	최신의료기기 Advanced Biomedical Instruments BME443
				뉴로이미징 개론 Introduction to Neuroimaging BME331	고급 바이오광학 Advanced Biophotonics BME440	레이저와바이오 응용 Lasers and Biomedical Applications BME433
				의광학 개론 Biomedical Optics BME321		
Brain & Cognitive Engineering	뇌와 인간행동I Brain and Human Behavior I BME304	뇌인지공학 Brain & Cognitive Engineering BME285	의사결정의신경과학 Decision making and the Brain BME309	감각과 지각 Sensation and Perception BME308	AI 감성공학 AI-based Affective Engineering BME437	AI기반 뇌과학 데이터 사이언스 AI-based Neural Data Science BME447
		인지신경과학 Cognitive Neuroscience BME206	색채과학과 공학 Color Science & Engineering BME303		실험계획법 Experimental Design BME442	
			뇌와 인간행동II Brain and Human BehaviorII BME305			
Rehabilitation & Regeneration		조직공학 Tissue Engineering BME235	인체역학 Biomechanics BME307		동물세포공학 Animal Cell Culture BME446	생체모사공학 Organ-on-a-chip BME412
		재활재생 개론 Intro. to Rehabilitation & Regeneration BME284		신경인터페이스 소자 Neural Interface Device BME332	줄기세포공학 Stem Cell Engineering BME414	
Precision Nanomedicine	생물물리화학 Biophysical Chemistry BME213	정밀나노의학개론 Introduction to Precision Nanomedicine BME286	생체유체역학 Transport Phenomena in Biological System BME311		나노바이오공학 Nano-Bioengineering BME444	약리학및약제학 개론 Intro. to Pharmacology and Pharmaceutics BME408

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]

Category 구분		Credits 이수학점	Remarks 비고	Subtotal 소계
Basic 기초	Required 필수	17	Calculus I(3), General Physics I(3), General Chemistry I(3), General Biology(3), Introduction to AI Programming I(3), General Chemistry Lab I(1), General Physics Lab I(1) (Total 17 credits)	At least 32 Credits
	Elective 선택[학과 지정]	15	Complete 15 credits including required courses Required: Applied Linear Algebra(3), Statistics(3), AIP2(3)	
Major 전공	Required 필수	24	Refer to Required course list below - Must include Project Lab (3 credits)	At least 48 Credits
	Elective 선택	24	Refer to Elective course list below	
	Internship 인턴십	3	Internship (Choose one among Research, Industrial, Venture Creation, Co-op)	3 Credits
Free Elective 자유선택		17	All courses accepted	At least 17 Credits

* For Liberal Arts and Leadership requirements, refer to school Common requirements

2. Basic Requirements [기초 이수요건]

No.	Course Code	Course Title	Major 전공	Double Major 복수전공	Minor 부전공
			15 credits	15 credits	15 credits
1	MTH112	Calculus II (3)	○	○	○
2	PHY103	General Physics II (3)			
3	CHM102	General Chemistry II (3)			
4	PHY108	General Physics Lab II (1)			
5	CHM106	General Chemistry Lab II (1)			
6	MTH201	Differential Equations (3)			
7	MTH203	Applied Linear Algebra (3)	●	●	○
8	MTH211	Statistics (3)	●	○	○
9	MGT102	Entrepreneurship (3)			
10	IE101	Introduction to Data Science(3)	○	○	○
11	ITP117	Introduction to AI Programming II (3)	●	●	○
12	ITP111	Probability & Random Process (3)	◑	◑	○
13	ITP112	Discrete Mathematics (3)	○	○	○
14	UNI108	Understanding Major (1) **Industrial Engineering Relay Seminar**	○	○	○

●: Required ○: Elective ◑: Recommended, ( ): credits

3. Curriculum [산업공학과 교육과정]

▶ Credit Requirements [이수학점]

Department (School)	Major(전공)			Double Major(복수전공)			Minor(부전공)		
	R	E	Total	R	E	Total	R	E	Total
Department of Industrial Engineering	24	24	**48**	15	21	**36**	9	9	**18**

*R: Required, E: Elective

▶ Required [전공필수]

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Semester
IE201	Operations Research I 계량경영학 I	○	○	○	3-3-0	[PRE] MTH203	2
IE209	Industrial Operations Management 생산운영관리	○	○	○	3-3-0		1
IE303	Data Mining 데이터 마이닝	○	○	○	3-3-0		2
IE305	Operations Research II 계량경영학 II	○	○	○	3-3-0	[PRE] IE201,IE209	1
IE307	Statistical Computing 통계계산	○	○	○	3-3-0	[PRE] MTH211, MTH204(or MTH203)	1
IE313	Time-series Analysis 시계열 분석	○	○	○	3-3-0	[PRE] MTH211	2
IE404	Data-driven Process Management 데이터 기반 프로세스 관리	○	○	○	3-3-0		2
IE406	Applied Machine Learning 기계학습 응용	○	○	○	3-3-0	[PRE] IE303,MTH211	1

Department of Industrial Engineering

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Seme ster
IE450	Project Lab. 프로젝트 랩	○	○		3-1-4		1

※ Students with major/double major must complete 'Project Lab(3)' as a required course.
※ 'Project Lab' course not required for Minor can be counted as Free Elective course.

▶ Elective [전공선택]

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Seme ster
IE308	Service Intelligence 서비스 지능	○	○	○	3-3-0	[PRE] IE209	-
IE361	Quantitative Technology Management 계량기술경영	○	○	○	3-3-0		-
IE362	Statistical Quality Management 통계적 품질관리	○	○	○	3-3-0		1
IE363	Introduction to Algorithmic Trading 알고리즘 트레이딩 개론	○	○	○	3-3-0	[PRE] IE305, ITP111	
IE408	Principles of Deep Learning 딥러닝 원론	○	○	○	3-3-0	[PRE] ITP117, IE303	1
IE412	AI for Finance 금융인공지능	○	○	○	3-3-0		1
IE421	Blockchain Systems 블록체인 시스템	○	○	○	3-3-0		-
IE422	Social Network Analysis 사회 연결망 분석	○	○	○	3-3-0	[PRE] IE303	2
IE470	Special Topics in IE Ⅰ IE 특론 Ⅰ	○	○	○	3-3-0		-
IE471	Special Topics in IE Ⅱ IE 특론 Ⅱ	○	○	○	3-3-0		-
IE472	Special Topics in IE Ⅲ IE 특론 Ⅲ	○	○	○	3-3-0		-
UNI202	Blockchain and Cryptocurrencies 블록체인과 암호화폐	○	○	○	1-1-0		1
UNI205	Dynamic Programming and its Applications 동적계획법과 사회기업문제	○	○	○	1-1-0		Winter
UNI208	Inventory Management Optimization Strategies 재고관리 최적화 전략	○	○	○	1-1-0		2
BME206	Cognitive Neuroscience 인지신경과학	○	○	○	3-3-0	Refer to each department section	
BME442	Experimental Design 실험계획법	○	○	○	3-3-0		
CSE362	Artificial Intelligence 인공지능	○	○	○	3-3-0		
CSE364	Software Engineering 소프트웨어공학	○	○	○	3-3-0		
CSE463	Machine Learning 기계 학습	○	○	○	3-3-0		
ECHE350	AI-driven Design of Energy Materials and Process 인공지능 기반 에너지 소재 및 공정 설계	○	○	○	3-3-0		
MEN201	Computational Tools for Engineers 공학전산기법	○	○	○	3-3-0		

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Semester
MEN301	Numerical Analysis 수치해석	○	○	○	3-2-2	Refer to each department section	
MEN353	Manufacturing System Design & Simulation 생산시스템 설계 및 시뮬레이션	○	○	○	3-3-0		
MEN455	3D Printing 3D 프린팅	○	○	○	3-3-0		
MEN491	Creating Autonomous Car 자율주행 자동차 만들기	○	○	○	3-3-0		
MGT315	Econometrics 계량경제학	○	○	○	3-3-0		
MTH251	Mathematical Analysis Ⅰ 해석학 Ⅰ	○	○	○	3-3-0		
MTH321	Numerical Analysis 수치해석학	○	○	○	3-3-0		
MTH342	Probability 확률론	○	○	○	3-3-0		
MTH344	Mathematical Statistics 수리통계학	○	○	○	3-3-0		
MTH361	Mathematical Modeling and Applications 수리모형방법론	○	○	○	3-3-0		
MTH421	Introduction to Partial Differential Equations 편미분방정식개론	○	○	○	3-3-0		
MTH461	Stochastic Processes 확률과정론	○	○	○	3-3-0		
CUEE206	Science Humanities 과학인문학	○	○	○	3-3-0		
UNI203	Design and implementation of data-driven machine learning 데이터기반 머신러닝 설계 및 제작	○	○	○	1-1-0		

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

4. Curriculum Change [교육과정 변경사항]

2023	→	2024
IE307 Statistical Computing 통계계산	→	IE307 Statistical Computing 통계계산 [PRE] MTH211, MTH204(or MTH203)
〈NEW〉		IE363 Introduction to Algorithmic Trading 알고리즘 트레이딩 개론

Department of Industrial Engineering

5. Curriculum Map [교육과정 이수 체계도]

Sophomore 1st semester	Sophomore 2nd Semester	Junior 1st semester	Junior 2nd Semester	Senior 1st semester	Senior 2nd Semester
Industrial Operations Management (IE209)	Operations Research Ⅰ (IE201)	Operations Research Ⅱ (IE305)	Time-series Analysis (IE313)	Applied Machine Learning (IE406)	Data-driven Process Management (IE404)
		Statistical Computing (IE307)	Data Mining (IE303)	Project Lab (IE450)	
		Statistical Quality Management (IE362)	Service Intelligence (IE308)	Principles of Deep Learning (IE408)	Social Network Analysis (IE422)
			Quantitative Technology Management (IE361)	AI for Finance (IE412)	
			Introduction to Algorithmic Trading (IE363)	Blockchain Systems (IE421)	

*Yellow: Required, Pink: Elective

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]

Category 구분		Credits 이수학점	Remarks 비고	Subtotal 소계
Basic 기초	Required 필수	17	Calculus I(3), General Physics I(3), General Chemistry I(3), General Biology(3), Introduction to AI Programming I(3), General Chemistry Lab I(1), General Physics Lab I(1) (Total 17 credits)	At least 32 Credits
	Elective 선택[학과 지정]	15	Required: Applied Linear Algebra(3), Statistics(3)	
Major 전공	Required 필수	32	Refer to Required course list below - Must include Thesis research(3 credits)	At least 54 Credits
	Elective 선택	22	Refer to Elective course list below	
	Internship 인턴십	3	Internship (Choose one among Research, Industrial, Venture Creation, Co-op)	3 Credits
Free Elective 자유선택		11	All Courses Accepted	At least 11 Credits

* For Liberal Arts and Leadership requirements, refer to school Common requirements

Department of Biological Sciences

2. Basic Requirements [기초 이수요건]

No.	Course Code	Course Title	Major 전공	Double Major 복수전공	Minor 부전공
			15 credits	6 credits	-
1	MTH112	Calculus II (3)	○		
2	PHY103	General Physics II (3)	○		
3	CHM102	General Chemistry II (3)	○		
4	PHY108	General Physics Lab II (1)	○		
5	CHM106	General Chemistry Lab II (1)	○		
6	MTH201	Differential Equations (3)			
7	MTH203	Applied Linear Algebra (3)	●	●	
8	MTH211	Statistics (3)	●	●	
9	MGT102	Entrepreneurship (3)			
10	IE101	Introduction to Data Science(3)	○		
11	ITP117	Introduction to AI Programming II (3)	○		
12	ITP111	Probability & Random Process (3)			
13	ITP112	Discrete Mathematics (3)			
14	UNI109	Understanding Major (1) **Emerging Issues in Biological Sciences**	○		

●: Required ○: Elective ◑: Recommended, ( ): credits

3. Curriculum [생명과학과 교육과정]

▶ Credit Requirements [이수학점]

Department (School)	Major(전공)			Double Major(복수전공)			Minor(부전공)		
	R	E	Total	R	E	Total	R	E	Total
Department of Biological Sciences	32	22	**54**	14	22	**36**	11	7	**18**

*R: Required, E: Elective

▶ Required [전공필수]

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Semester
BIO201	Molecular Biology 분자생물학	○	○	○	3-3-0		2
BIO211	Biochemistry I 생화학 I	○	○	○	3-3-0		1
BIO241	Microbiology 미생물학	○			3-3-0		-
BIO261	Biochemistry Laboratory 생화학실험	○	○	○	3-1-4		1
BIO301	Cell Biology 세포생물학	○	○	○	3-3-0		1
BIO305	Neuroscience I 신경과학 I	○			3-3-0		1
BIO330	Bioinformatics 생정보학	○			3-3-0		2
BIO333	Genetics 유전학	○			3-3-0	[PRE] BIO201 or BIO211	2

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Seme ster
BIO340	Developmental Biology 발생학	○			3-3-0		1
BIO341	Immunology 면역학	○			3-3-0		1
BIO490	Thesis Research 졸업논문	○	○		3-3-0		1,2

※Courses that are not required for Minor/Double Major can be counted as Elective course.

▶ Elective [전공선택]

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Seme ster
BIO202	Molecular Biology Laboratory 분자생물학 실험	○	○	○	3-1-4		2
BIO221	Biochemistry II 생화학 II	○	○	○	3-3-0		2
BIO231	The Chemical Basis of Life 생명현상의 화학적 이해	○	○	○	3-3-0		2
BIO251	Nobel Prizes and Notable Discoveries 노벨 생리의학상의 이해	○	○	○	3-3-0		1
BIO291	Explore the microbes that inhabit the campus 캠퍼스에 서식하는 미생물 탐색	○	○	○	3-2-2		1
BIO306	Neuroscience II 신경과학 II	○	○	○	3-3-0		2
BIO307	Current Topics in Biological Sciences 현대생명과학동향	○	○	○	2-2-0		1
BIO314	Instrumental Bioanalysis 생물기기분석	○	○	○	3-3-0		1
BIO320	Genome Integrity and Cancer 유전체 총체성과 암 발생의 이해	○	○	○	3-3-0	[PRE] BIO201	1
BIO332	Human Physiology 생리학	○	○	○	3-3-0		2
BIO342	Introduction to Immunology in Human Diseases 질환이해를 위한 면역학개론	○	○	○	3-3-0		2
BIO361	Cell Biology & Genetics Laboratory 세포생물학 및 유전학실험	○	○	○	3-1-4		2
BIO401	Special Topics in Biological Sciences I 생명과학특론 I	○	○	○	3-3-0		-
BIO402	Special Topics in Biological Sciences II 생명과학특론 II	○	○	○	3-3-0		-
BIO403	Special Topics in Biological Sciences III 생명과학특론 III	○	○	○	3-3-0		-
BIO404	Introduction to Biological Physics 기초생물물리학	○	○	○	3-3-0		1
BIO412	Microbial Physiology 미생물생리학	○	○	○	3-3-0	[PRE] BIO331	-
BIO413	Metabolomics: Understanding Metabolism 대사체학	○	○	○	3-3-0		
BIO433	Biochemistry of Signal Transduction and Regulation 세포신호전달	○	○	○	3-3-0		1
BIO435	Cancer Biology 암생물학	○	○	○	3-3-0	[PRE] BIO201, BIO301	1

Department of Biological Sciences

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Semester
BIO436	Emerging Principles of Gene Expression 유전자 발현의 이해	○	○	○	3-3-0		1
BIO438	Endocrinology and Metabolism 내분비 및 대사학	○	○	○	3-3-0		2
BIO440	Tissue and Organ Development 조직 및 장기 발생학	○	○	○	3-3-0		2
BME202	Genomics 게놈학	○	○	○	3-3-0	Refer to each department section	
BME206	Cognitive Neuroscience 인지신경과학	○	○	○	3-3-0		
BME281	Basic Biostatistics in Medicine 기초 의과학 생물통계	○	○	○	3-3-0		
BME286	Introduction to Precision Nanomedicine 정밀나노의학 개론	○	○	○	3-3-0		
BME321	Biomedical Optics 의광학개론	○	○	○	3-3-0		
BME408	Introduction to Pharmacology and Pharmaceutics 약리학 및 약제학 개론	○	○	○	3-3-0		
BME424	Cancer Genomics 암 게놈학	○	○	○	3-3-0		
CHM211	Organic Chemistry I 유기화학 I	○	○	○	3-3-0		

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

4. Curriculum Change [교육과정 변경사항]

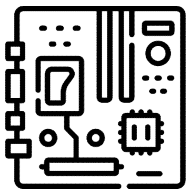
2023	→	2024
BIO340 Developmental Biology 발생학 [PRE: BIO201]	→	BIO340 Developmental Biology 발생학
〈NEW〉		BIO413 Metabolomics: Understanding Metabolism 대사체학

5. Curriculum Map [교육과정 이수 체계도]

2nd year-Spring	2nd year-Fall	3rd year-Spring	3rd year-Fall	4th year-Spring	4th year-Fall
Biochemistry Ⅰ	Molecular Biology Laboratory	Cell Biology	Neuroscience Ⅱ	Introduction to Biological Physics	Microbial Physiology
Microbiology	Biochemistry Ⅱ	Neuroscience Ⅰ	Bioinformatics	Biochemistry of Signal Transduction and Regulation	Endocrinology and Metabolism
Nobel Prizes and Notable Discoveries	The Chemical Basis of Life	Current Topics in Biological Sciences	Human Physiology	Cancer Biology	Tissue and Organ Development
Biochemistry Laboratory		Instrumental Bioanalysis	Genetics	Emerging Principles of Gene Expression	Metabolomics: Understanding Metabolism
Explore the microbes that inhabit the campus		Genome Integrity and Cancer	Introduction to Immunology in Human Diseases		
Molecular Biology		Developmental Biology	Cell Biology & Genetics Laboratory		
		Immunology			

Department of Electrical Engineering
[전기전자공학과]

■ Department Introduction [학과소개]



Electrical engineering (EE) is a field of engineering that deals with everything from solid-state devices and designing integrated circuits to developing information and control systems. It focuses on research and development of IT convergence systems which are capable of enriching the future life of human being to be pleasant, secured, convenient and socially connected. A broad range of IT technologies in the EE areas are to be proactively merged together to create new benefits with the advent of ubiquitous information society driven by digital convergence.

1. Graduation Requirement [졸업 이수요건]

Category 구분		Credits 이수학점	Remarks 비고	Subtotal 소계
Basic 기초	Required 필수	17	Calculus I(3), General Physics I(3), General Chemistry I(3), General Biology(3), Introduction to AI Programming I(3), General Chemistry Lab I(1), General Physics Lab I(1) (Total 17 credits)	At least 33 Credits
	Elective 선택[학과 지정]	16	Required: Calculus II(3), Applied Linear Algebra(3), Differential Equations(3), Understanding major (1) + any elective and recommended courses (6 credits) by dept.	
Major 전공	Required 필수	21	Refer to Required course list below * At least 18 credits (Required courses) + Undergraduate research(3)	At least 48 Credits
	Elective 선택	27	Refer to Elective course list below	
	Internship 인턴십	3	Internship (Choose one among Research, Industrial, Venture Creation, Co-op)	3 Credits
Free Elective 자유선택		16	All Courses Accepted	At least 16 Credits

* For Liberal Arts and Leadership requirements, refer to school Common requirements

2. Basic Requirements [기초 이수요건]

No.	Course Code	Course Title	Major 전공	Double Major 복수전공	Minor 부전공
			16 credits	10 credits	10 credits
1	MTH112	Calculus II (3)	●	●	●
2	PHY103	General Physics II (3)	◑		
3	CHM102	General Chemistry II (3)	○		
4	PHY108	General Physics Lab II (1)	○		
5	CHM106	General Chemistry Lab II (1)	○		
6	MTH201	Differential Equations (3)	●	●	●
7	MTH203	Applied Linear Algebra (3)	●	●	●
8	MTH211	Statistics (3)	○		
9	MGT102	Entrepreneurship (3)	○		
10	IE101	Introduction to Data Science(3)	○		
11	ITP117	Introduction to AI Programming II (3)	◑		
12	ITP111	Probability & Random Process (3)	◑		
13	ITP112	Discrete Mathematics (3)	○		
14	UNI110	Understanding Major (1) **Introduction to Modern Electrical Engineering**	●	●	●

●: Required ○: Elective ◑: Recommended, ( ): credits

* 부전공/복수전공은 기초 이수요건 교과목 (미적분학II, 미분방정식, 응용선형대수, 전공기초과목)을 전공 진입(변경) 전에 이수하는 것을 권장, 전공 진입(변경) 후에는 첫학기 이내에 필수 이수

* Students in minor and Double major are recommended to take the fundamental required courses before selecting or transfer the major and at least should complete them within the first semester after the major selection or transfer.

3. Curriculum [전기전자공학과 교육과정]

▶ Credit Requirements [이수학점]

Department (School)	Major(전공)			Double Major(복수전공)			Minor(부전공)		
	R	E	Total	R	E	Total	R	E	Total
Department of Electrical Engineering	21	27	**48**	18	18	**36**	18	0	**18**

*R: Required, E: Elective

▶ Required [전공필수]

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Seme ster
EEE201	Basic Circuit Theory and Laboratory 회로이론 및 실험	○	○	○	4-3-2		1
EEE202	Digital Logic and Laboratory 디지털로직 및 실험	○	○	○	4-3-2		2
EEE204	Electromagnetics I 전자기학 I	○	○	○	3-3-0		1
EEE205	Signals and Systems 신호및시스템	○	○	○	3-3-0		2
EEE301	Communications and Information Theory 통신 및 정보 이론	○	○	○	3-3-0	[PRE] ITP111	1
EEE302	Electric Energy Systems 전기에너지시스템	○	○	○	3-3-0	[PRE] EEE201	1
EEE303	Microelectronics I and Laboratory 전자회로 I 및 실험	○	○	○	4-3-2	[PRE] EEE201	2

Department of Electrical Engineering

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Seme ster
EEE304	Semiconductor Engineering 반도체공학	○	○	○	3-3-0		1
EEE490	Undergraduate research 졸업연구	○	-	-	3-3-0		1,2

※ **Major:** At least 18 credits (Required courses) + Undergraduate research (3 credits) should be completed. (필수교과 최소 18학점과 졸업연구(3) 필수이수. 그 외 선택과목으로 인정)
※ **Minor:** At least 18 credits should be completed. (필수교과 최소 18학점 필수이수)
※ **Double:** At least 18 credits should be completed. (필수교과 최소 18학점 필수이수. 그 외 선택과목으로 인정)
※ EEE490 Undergraduate research not required for Minor/Double Major can be counted as Free Elective course.

▶ Elective [전공선택]

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Seme ster
EEE223	Electrical Engineering Programming 전기전자공학 프로그래밍	○	○	○	3-3-0		1
EEE231	Electromagnetics II 전자기학 II	○	○	○	3-3-0	[PRE] EEE204	2
EEE241	Physical Electronics 물리전자	○	○	○	3-3-0		2
EEE311	Microelectronics II and Laboratory 전자회로 II 및 실험	○	○	○	4-3-2	[PRE] EEE303	1
EEE312	VLSI Design 초고밀도 집적회로 설계	○	○	○	3-3-0		2
EEE321	Computer Networks 컴퓨터 네트워크	○	○	○	3-3-0	[IDEN] CSE351	2
EEE326	Tensor Processor Design for Image Recognition 영상 인식을 위한 텐서 프로세서 설계	○	○	○	3-1-4	[PRE] EEE202	1
EEE331	Microwave Engineering 마이크로파공학	○	○	○	3-3-0	[PRE] EEE204	2
EEE351	Automatic Control 자동제어	○	○	○	3-3-0		1
EEE352	Digital Signal Processing 디지털신호처리	○	○	○	3-3-0		2
EEE353	Optimization Theory 최적화이론	○	○	○	3-3-0		-
EEE354	Basic Math for AI 인공지능을 위한 기초수학	○	○	○	3-3-0		
EEE411	Analog Integrated Circuits 아날로그 집적회로 설계	○	○	○	3-3-0	[PRE] EEE311	-
EEE431	Power Electronics 전력전자공학	○	○	○	3-3-0		2
EEE441	Optoelectronics 광전자공학	○	○	○	3-3-0	[PRE] EEE204, EEE304	1
EEE442	Semiconductor VLSI Devices Engineering 반도체집적소자공학	○	○	○	3-3-0	[PRE] EEE304	2
EEE451	Intelligent Communication System 지능형 통신 시스템	○	○	○	3-3-0		
EEE480	Special Topics in EE I 전자및전기공학특론 I	○	○	○	3-3-0		-
EEE481	Special Topics in EE II 전자및전기공학특론 II	○	○	○	3-3-0		-
EEE482	Special Topics in EE III 전자및전기공학특론 III	○	○	○	3-3-0		-

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Semester
EEE483	Special Topics in EE Ⅳ 전자및전기공학특론 Ⅳ	○	○	○	3-3-0		-
EEE484	Special Topics in EE Ⅴ 전자및전기공학특론 Ⅴ	○	○	○	3-3-0		-
EEE485	Special Topics in EE Ⅵ 전자및전기공학특론 Ⅵ	○	○	○	3-3-0		-
CSE261	Computer Architecture 컴퓨터구조	○	○	○	3-3-0	Refer to each department section	
CSE463	Machine Learning 기계학습	○	○	○	3-3-0		
IE308	Service Intelligence 서비스 지능	○	○	○	3-3-0		
MEN491	Creating Autonomous Car 자율주행 자동차 만들기	○	○	○	3-3-0		
MSE316	Wearable smart healthcare electornic system 웨어러블 스마트 헬스케어 전자소사 시스템	○	○	○	3-3-0		
PHY301	Quantum Physics Ⅰ 양자물리학 Ⅰ	○	○	○	3-3-0		
PHY315	Solid State Physics Ⅰ 고체물리학 Ⅰ	○	○	○	3-3-0		
PHY427	Introduction to Plasma Physics 플라즈마 물리학 입문	○	○	○	3-3-0		
UNI202	Blockchain and Cryptocurrencies 블록체인과 암호화폐	○	○	○	1-1-0		
UNI203	Design and implementation of data-driven machine learning 데이터기반 머신러닝 설계 및 제작	○	○	○	1-1-0		

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

4. Curriculum Change [교육과정 변경사항]

2023	→	2024
〈NEW〉	→	EEE354 Basic Math for AI 인공지능을 위한 기초수학
		EEE451 Intelligent Communication System 지능형 통신 시스템

Department of Electrical Engineering

5. Curriculum Map [교육과정 이수 체계도]

Field

Circuit

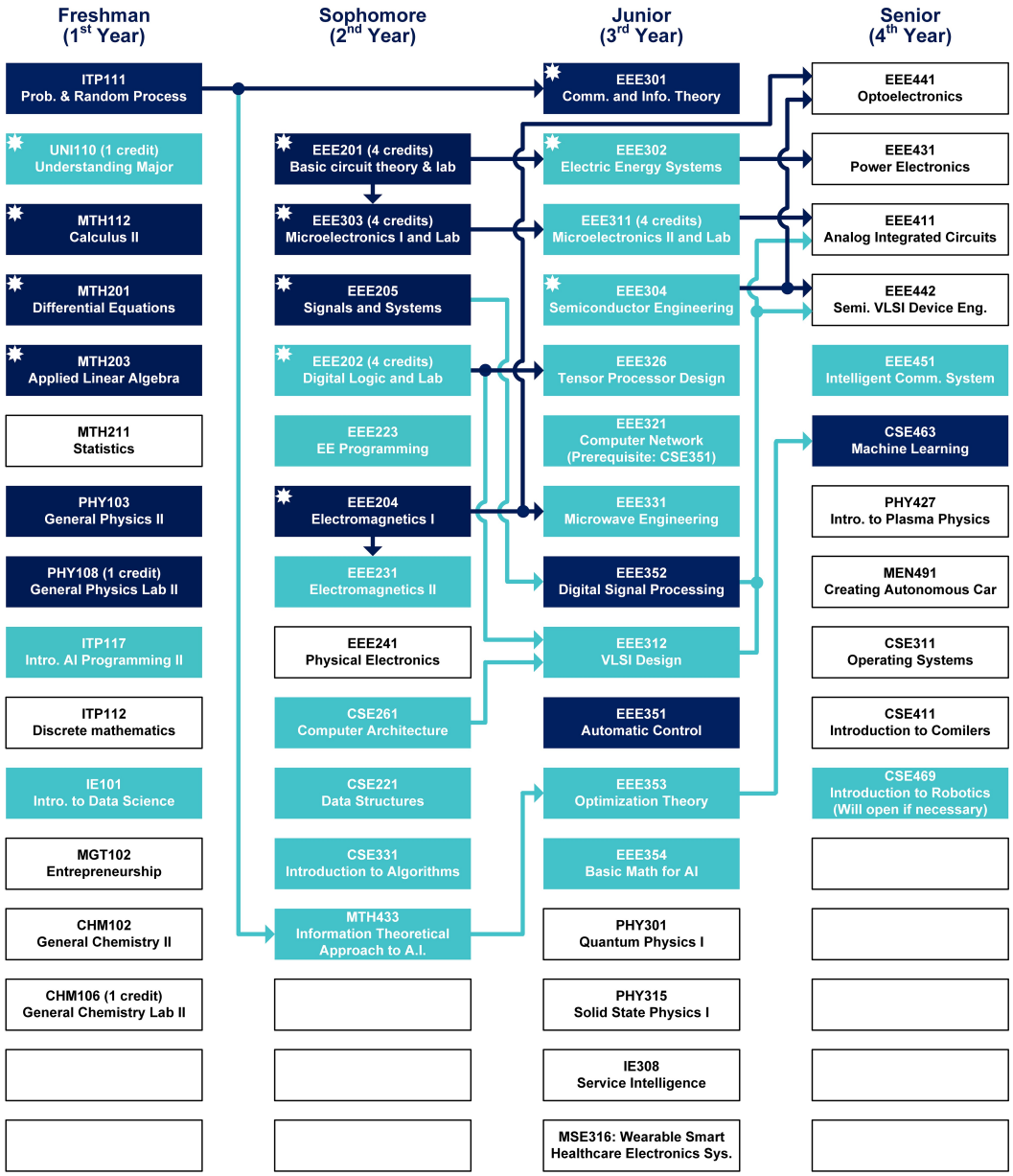
- EE Requirement
- Strongly recommended
- Recommended
- Prerequisite by EE
- Prerequisite by field

Freshman (1st Year)	Sophomore (2nd Year)	Junior (3rd Year)	Senior (4th Year)
ITP111 Prob. & Random Process		EEE301 Comm. and Info. Theory	EEE441 Optoelectronics
UNI110 (1 credit) Understanding Major	EEE201 (4 credits) Basic circuit theory & lab	EEE302 Electric Energy Systems	EEE431 Power Electronics
MTH112 Calculus II	EEE303 (4 credits) Microelectronics I and Lab	EEE311 (4 credits) Microelectronics II and Lab	EEE411 Analog Integrated Circuits
MTH201 Differential Equations	EEE205 Signals and Systems	EEE304 Semiconductor Engineering	EEE442 Semi. VLSI Device Eng.
MTH203 Applied Linear Algebra	EEE202 (4 credits) Digital Logic and Lab	EEE326 Tensor Processor Design	EEE451 Intelligent Comm. System
MTH211 Statistics	EEE223 EE Programming	EEE321 Computer Network (Prerequisite: CSE351)	CSE463 Machine Learning
PHY103 General Physics II	EEE204 Electromagnetics I	EEE331 Microwave Engineering	PHY427 Intro. to Plasma Physics
PHY108 (1 credit) General Physics Lab II	EEE231 Electromagnetics II	EEE352 Digital Signal Processing	MEN491 Creating Autonomous Car
ITP117 Intro. AI Programming II	EEE241 Physical Electronics	EEE312 VLSI Design	
ITP112 Discrete mathematics	CSE261 Computer Architecture	EEE351 Automatic Control	
IE101 Intro. to Data Science		EEE353 Optimization Theory	
MGT102 Entrepreneurship		EEE354 Basic Math for AI	
CHM102 General Chemistry II		PHY301 Quantum Physics I	
CHM106 (1 credit) General Chemistry Lab II		PHY315 Solid State Physics I	
		IE308 Service Intelligence	
		MSE316: Wearable Smart Healthcare Electronics Sys.	

Field

Communication & Signal Processing

- EE Requirement
- Strongly recommended
- Recommended
- Prerequisite by EE
- Prerequisite by field

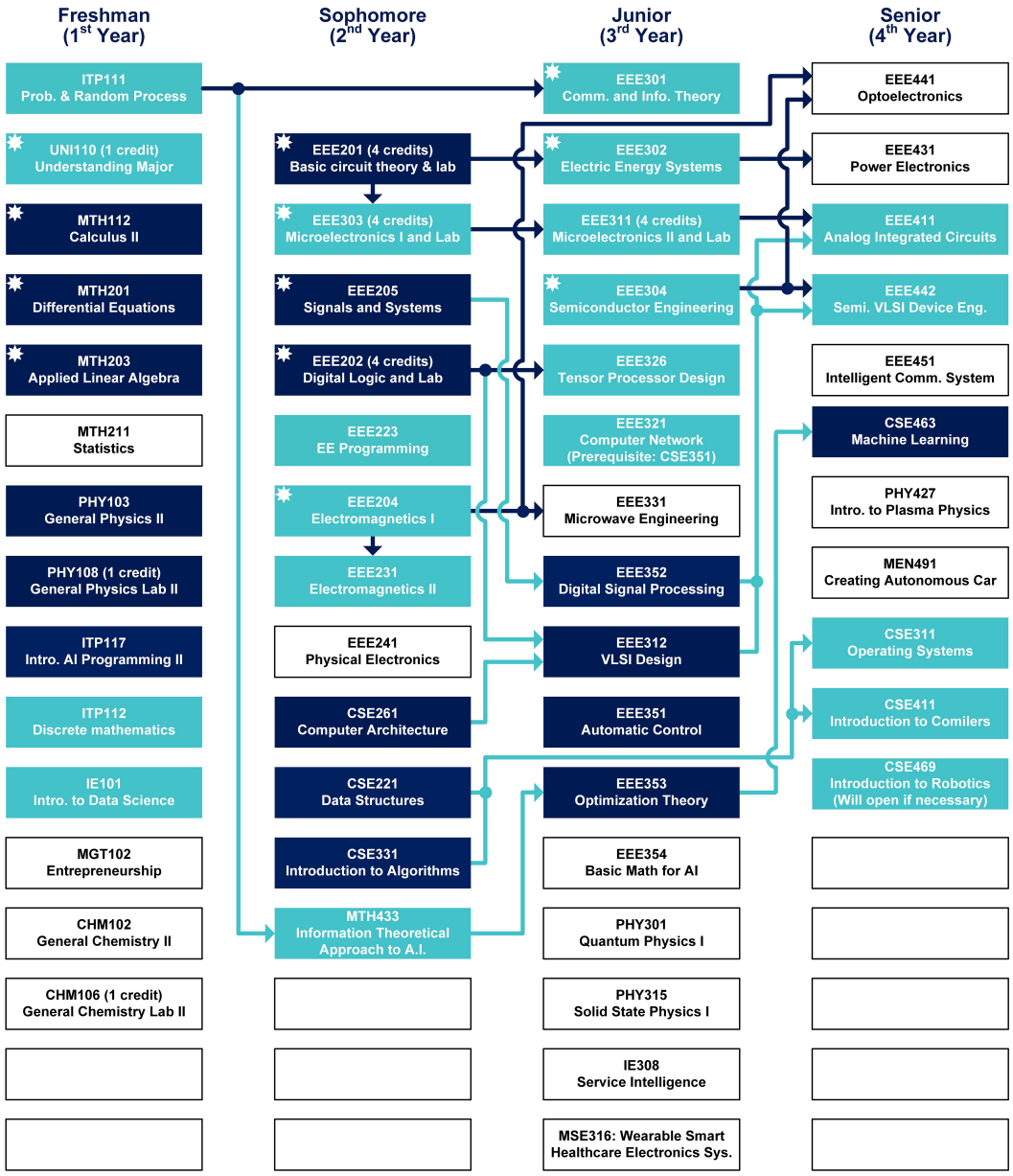


Department of Electrical Engineering

Field

Computer & Software

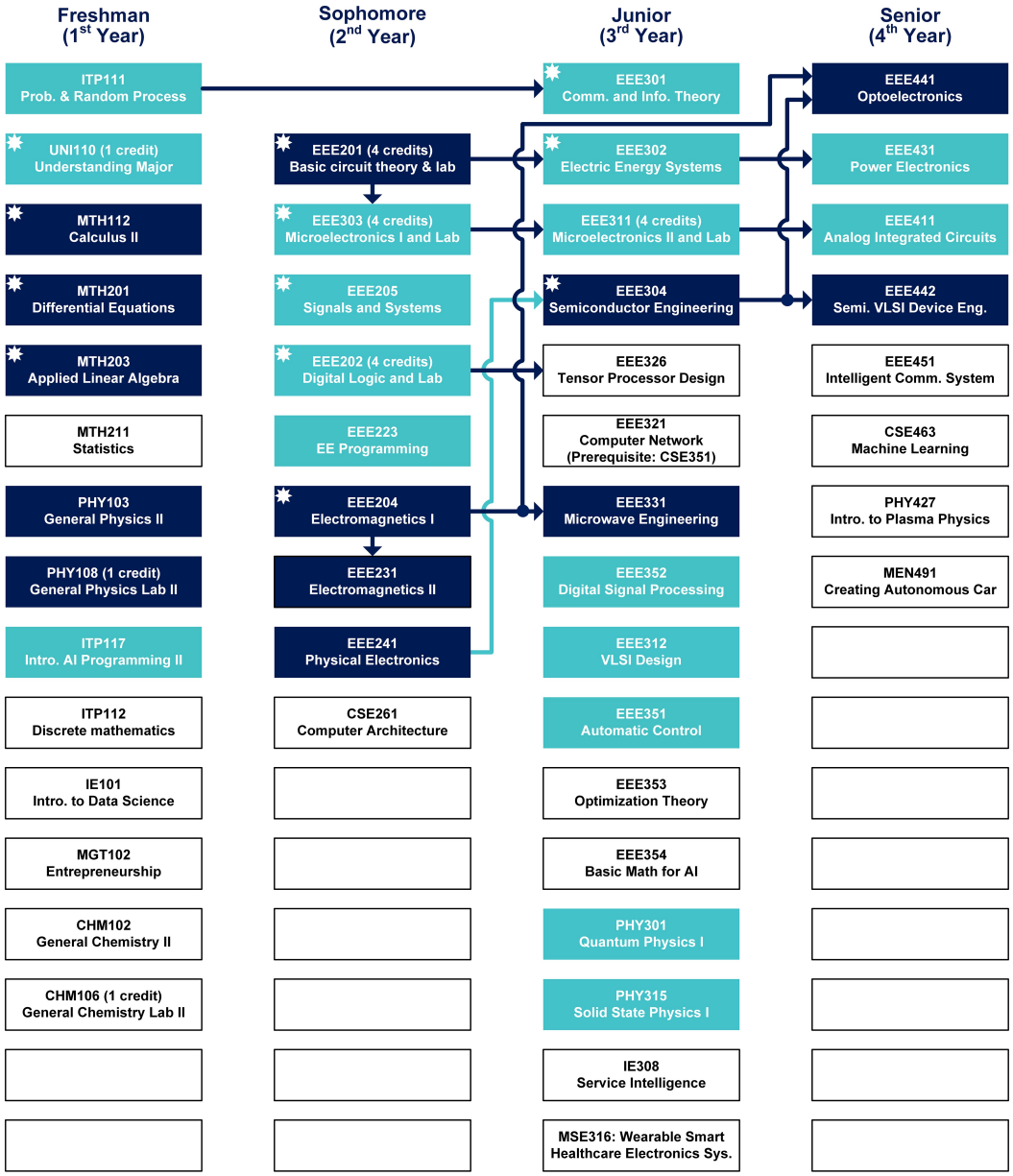
- EE Requirement
- Strongly recommended
- Recommended
- Prerequisite by EE
- Prerequisite by field



Field

Device

- EE Requirement
- Strongly recommended
- Recommended
- Prerequisite by EE
- Prerequisite by field

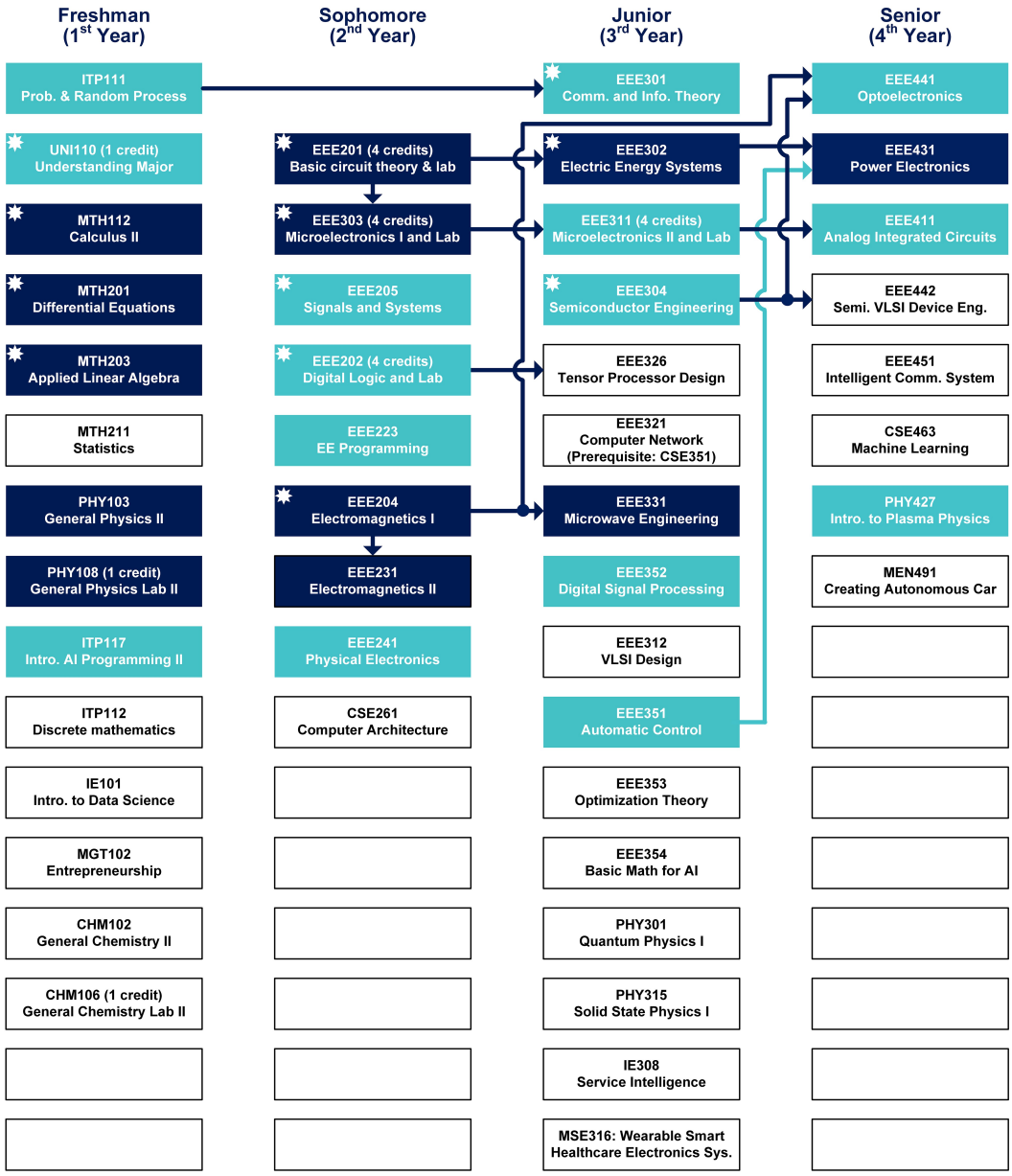


Department of Electrical Engineering

Field

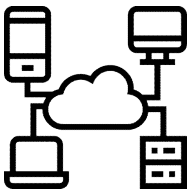
EM (Wave) & Power

- EE Requirement
- Strongly recommended
- Recommended
- Prerequisite by EE
- Prerequisite by field



Department of Computer Science and Engineering [컴퓨터공학과]

■ Department Introduction [학과소개]



While most of people are familiar with computers, not many people have a good understanding of what computer science and engineering (CSE) is really about. Implementation of computer programs that improve the quality of human life is an important aspect of computer science and engineering, however learning how to write computer programs is not the core discipline of computer science but just a necessary skill to implement and prove creative and innovative computational logics and ideas in many broad sub-areas of computer science such as algorithms, theoretical computer science, programming languages, operating systems, databases, networks, computer security, computer graphics, artificial intelligence, and many more. In CSE track, students learn foundational principles of the core sub-areas of computer science. Having this curriculum, we cultivate the finest computer scientists and engineers that have the ability of conducting highly creative and innovative research and creating high-quality computing solutions. CSE graduates typically find jobs in IT-related companies or national research institutes or continue to study in graduate schools.

1. Graduation Requirement [졸업 이수요건]

Category 구분		Credits 이수학점	Remarks 비고	Subtotal 소계
Basic 기초	Required 필수	17	Calculus I(3), General Physics I(3), General Chemistry I(3), General Biology(3), Introduction to AI Programming I(3), General Chemistry Lab I(1), General Physics Lab I(1) (Total 17 credits)	At least 33 Credits
	Elective 선택[학과 지정]	16	Take 16 credits among the basic course list - Required: 4 courses - Recommended: 2 courses - Elective: 3 courses	
Major 전공	Required 필수	24	Refer to Required course list below	At least 48 Credits
	Elective 선택	24	Refer to Elective course list below	
	Internship 인턴십	3	Internship (Choose one among Research, Industrial, Venture Creation, Co-op)	3 Credits
Free Elective 자유선택		16	All Courses Accepted	At least 16 Credits

* For Liberal Arts and Leadership requirements, refer to school Common requirements

Department of Computer Science and Engineering

2. Basic Requirements [기초 이수요건]

No.	Course Code	Course Title	Major 전공	Double Major 복수전공	Minor 부전공
			16 credits	16 credits	16 credits
1	MTH112	Calculus II (3)	○	○	○
2	PHY103	General Physics II (3)			
3	CHM102	General Chemistry II (3)			
4	PHY108	General Physics Lab II (1)			
5	CHM106	General Chemistry Lab II (1)			
6	MTH201	Differential Equations (3)	○	○	○
7	MTH203	Applied Linear Algebra (3)	●	●	●
8	MTH211	Statistics (3)	◑	◑	◑
9	MGT102	Entrepreneurship (3)			
10	IE101	Introduction to Data Science(3)	○	○	○
11	ITP117	Introduction to AI Programming II (3)	●	●	●
12	ITP111	Probability & Random Process (3)	◑	◑	◑
13	ITP112	Discrete Mathematics (3)	●	●	●
14	UNI111	Understanding Major (1) **Introduction to CSE**	●	●	●

●: Required ○: Elective ◑: Recommended, ( ): credits

3. Curriculum [컴퓨터공학과 교육과정]

▶ Credit Requirements [이수학점]

Department (School)	Major(전공)			Double Major(복수전공)			Minor(부전공)		
	R	E	Total	R	E	Total	R	E	Total
Department of Computer Science and Engineering	24	24	**48**	18	21	**39**	15	15	**30**

*R: Required, E: Elective

▶ Required [전공필수]

Course Code	Course Title	Major[1)]	Double[2)]	Minor[3)]	Cred. -Lect. -Exp.	Remark	Semester
CSE221	Data Structures 데이터구조	○	○	○	3-3-0		2
CSE241	Advanced Programming 고급 프로그래밍	○	○		3-3-0		1
CSE251	System Programming 시스템 프로그래밍	○	○		3-3-0		1
CSE261	Computer Architecture 컴퓨터구조	○	△		3-3-0		2
CSE271	Principles of Programming Languages 프로그래밍언어	○	○	○	3-3-0	[PRE] ITP112	2
CSE311	Operating Systems 운영체제	△	△		3-3-0	[PRE] CSE221	1
CSE331	Introduction to Algorithms 알고리즘	○	○	○	3-3-0	[PRE] CSE221	1

Course Code	Course Title	Major[1]	Double[2]	Minor[3]	Cred. -Lect. -Exp.	Remark	Semester
CSE351	Computer Networks 컴퓨터네트워크	△	△		3-3-0	[IDEN] EEE311	2
CSE401	Research in Computer Science and Engineering 졸업연구	○			3-3-0		-

1) Major: Take at least 1 course within recommended courses(△) except required courses(O)
2) Double major: Take at least 1 course within recommended courses(△) except required courses(O) (*Excluding CSE401)
3) Minor: Take at least 5 courses including required courses(O) (*Excluding CSE401)

▶ Elective [전공선택]

Course Code	Course Title	Major[1]	Double[2]	Minor[3]	Cred. -Lect. -Exp.	Remark	Semester
CSE302	Building Customized Computers 맞춤형 컴퓨터 만들기	○	○	○	3-2-2		-
CSE303	Basic Math for AI 인공지능을 위한 기초수학	○	○	○	3-3-0		-
CSE304	Introduction to Data Mining 데이터마이닝 개론	○	○	○	3-3-0		
CSE321	Database Systems 데이터베이스 시스템	○	○	○	3-3-0	[PRE] CSE221	2
CSE332	Theory of Computation 계산 이론	○	○	○	3-3-0	[PRE] ITP112	2
CSE333	Introduction to Human Computer Interaction 인간-컴퓨터 상호작용 개론	○	○	○	3-3-0		1
CSE362	Artificial Intelligence 인공지능	○	○	○	3-3-0	[PRE] CSE331, MTH203, MTH112	2
CSE364	Software Engineering 소프트웨어공학	○	○	○	3-3-0		1
CSE402	Natural Language Processing 자연어처리	○	○	○	3-3-0		-
CSE403	Deep Learning 딥 러닝	○	○	○	3-3-0		-
CSE411	Introduction to Compilers 컴파일러 개론	○	○	○	3-3-0	[PRE] CSE271	2
CSE412	Parallel Computing 병렬 컴퓨팅	○	○	○	3-3-0	[PRE] CSE311	1
CSE463	Machine Learning 기계 학습	○	○	○	3-3-0	[PRE] CSE221, MTH203, MTH112, ITP111	1
CSE465	Mobile Computing 모바일 컴퓨팅	○	○	○	3-3-0	[PRE] CSE351	2
CSE466	Cloud Computing 클라우드 컴퓨팅	○	○	○	3-3-0	[PRE] CSE311	2
CSE467	Computer Security 컴퓨터보안	○	○	○	3-3-0	[PRE] CSE261	1
CSE468	Information Visualization 정보시각화기술	○	○	○	3-3-0		2

Department of Computer Science and Engineering

CSE469	Introduction to Robotics 로보틱스 개론	○	○	○	3-3-0	[PRE] CSE331, MTH203, MTH112	1
CSE471	Computer Graphics 컴퓨터 그래픽스	○	○	○	3-3-0	[PRE] CSE221, CSE331	1
CSE472	Computer Vision 컴퓨터 비전	○	○	○	3-3-0	[PRE] MTH203, ITP111, CSE221	2
CSE480	Special Topic in CSE Ⅰ 컴퓨터 공학 특론 Ⅰ	○	○	○	3-3-0		-
CSE481	Special Topic in CSE Ⅱ 컴퓨터 공학 특론 Ⅱ	○	○	○	3-3-0		-
CSE482	Special Topic in CSE Ⅲ 컴퓨터 공학 특론 Ⅲ	○	○	○	3-3-0		-
CSE483	Special Topic in CSE Ⅳ 컴퓨터 공학 특론 Ⅳ	○	○	○	3-3-0		-
CSE484	Special Topic in CSE Ⅴ 컴퓨터 공학 특론 Ⅴ	○	○	○	3-3-0		-
UNI204	Software Hacking and Defense 소프트웨어 해킹과 방어	○	○	○	1-1-0		-
MTH204	Linear Algebra 선형대수학				3-3-0	Refer to each department section	
MTH260	Elementary Number Theory 정수론				3-3-0		
MTH344	Mathematical Statistics 수리통계학				3-3-0		
IE303	Data Mining 데이터마이닝				3-3-0		
IE406	Applied Machine Learning 기계학습 응용				3-3-0		
IE421	Blockchain Systems 블록체인 시스템				3-3-0		
EEE202	Digital Logic and Laboratory 디지털 로직 및 실험				4-3-2		
EEE205	Signals and Systems 신호 및 시스템				3-3-0		
EEE301	Communications and Information Theory 통신 및 정보 이론				3-3-0		
EEE326	Tensor Processor Design for Image Recognition 영상 인식을 위한 텐서 프로세서 설계				3-3-0		
EEE351	Automatic Control 자동제어				3-3-0		
MEN490	Creating Autonomous Car 자율주행 자동차 만들기				3-3-0		
PHY208	Network Science for Complex Systems 복잡계 네트워크 사이언스개론				3-3-0		
UNI202	Blockchain and Cryptocurrencies 블록체인과 암호화폐				1-1-0		
UNI203	Design and Implementation of data-driven machine learning 데이터기반 머신러닝 설계 및 제작				1-1-0		

*[PRE]: Prerequisite(선이수), [IDEN]: Identical(동일지정교과)
1) Major: Up to 3 courses from other departments can be accepted as elective credits.
2) Double major: Up to 2 courses from other departments can be accepted as elective credits.
3) Minor: Only 1 course from other departments can be accepted as elective credits.
※ If a course from other departments is opened by CSE afterward, you may take only one of the CSE course and other department's course, and the additional course will not be counted as a CSE major elective course.

4. Curriculum Change [교육과정 변경사항]

2023	→	2024
〈NEW〉	→	CSE304 Introduction to Data Mining 데이터마이닝 개론

5. Curriculum Map [교육과정 이수 체계도]

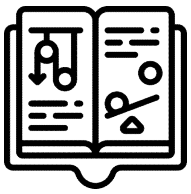
Sophomore		Junior		Senior	
Spring	Fall	Spring	Fall	Spring	Fall
Advanced Programming	Data Structures	Software Engineering	Artificial Intelligence	Parallel Computing	Introduction to Compilers
System Programming	Computer Architecture	Introduction to Algorithms	Computer Networks	Machine Learning	Mobile Computing
	Principles of Programming Languages	Operating Systems	Theory of Computation	Computer Graphics	Cloud Computing
		Introduction to Human Computer Interaction	Database Systems	Computer Security	Information Visualization
				Intelligent Robots	Computer Vision

※ The opening semesters for each courses can be changed depending on the department's circumstances.

College of Natural Sciences

Department of Physics
[물리학과]

■ Department Introduction [학과소개]



Physics forms a fundamental knowledge system and a framework of 'thinking' for almost every other contemporary science and technology. We incubate the next generation human resources to inherit and lead the diverse researches in modern physics by providing a set of related curriculums. In the physics track of UNIST, we offer not only basic physics courses such as classical mechanics, electromagnetism, quantum physics, statistical physics, mathematical physics and basic laboratory experiments, but also advanced courses for the future research such as solid state physics, optics, computational physics, plasma and beam physics, biological physics, particle physics, cosmology, advanced experiments, etc.

1. Graduation Requirement [졸업 이수요건]

Category 구분		Credits 이수학점	Remarks 비고	Subtotal 소계
Basic 기초	Required 필수	17	Calculus I(3), General Physics I(3), General Chemistry I(3), General Biology(3), Introduction to AI Programming I(3), General Chemistry Lab I(1), General Physics Lab I(1) (Total 17 credits)	At least 30 Credits
	Elective 선택[학과 지정]	13	General Physics II(3), General Physics Lab II(1), Calculus II(3), Applied Linear Algebra(3), Differential Equations(3)	
Major 전공	Required 필수	24	Refer to Required course list below	At least 54 Credits
	Elective 선택	30	Refer to Elective course list below	
	Internship 인턴십	3	Internship (Choose one among Research, Industrial, Venture Creation, Co-op)	3 Credits
Free Elective 자유선택		13	All Courses Accepted	At least 13 Credits

* For Liberal Arts and Leadership requirements, refer to school Common requirements

Department of Physics

2. Basic Requirements [기초 이수요건]

No.	Course Code	Course Title	Major 전공	Double Major 복수전공	Minor 부전공
			13 credits	13 credits	6 credits
1	MTH112	Calculus II (3)	●	●	◑
2	PHY103	General Physics II (3)	●	●	●
3	CHM102	General Chemistry II (3)			
4	PHY108	General Physics Lab II (1)	●	●	●
5	CHM106	General Chemistry Lab II (1)			
6	MTH201	Differential Equations (3)	●	●	◑
7	MTH203	Applied Linear Algebra (3)	●	●	◑
8	MTH211	Statistics (3)			
9	MGT102	Entrepreneurship (3)			
10	IE101	Introduction to Data Science(3)			
11	ITP117	Introduction to AI Programming II (3)			
12	ITP111	Probability & Random Process (3)			
13	ITP112	Discrete Mathematics (3)			
14	UNI112	Understanding Major **Physics & Innovative Technology**			

●: Required ○: Elective ◑: Recommended, ( ): credits

* For Minor students, It is highly recommended to take Calculus II, Diffential Equations, Applied Linear Algebra

* General Physics 1, General Physics Lab 1 must be completed when Business administration field students plan to take Physics as their minor or double major.

3. Curriculum [물리학과 교육과정]

▶ Credit Requirements [이수학점]

Department (School)	Major(전공)			Double Major(복수전공)			Minor(부전공)		
	R	E	Total	R	E	Total	R	E	Total
Department of Physics	24	30	**54**	18	18	**36**	12	6	**18**

*R: Required, E: Elective

▶ Micro Degree Credit Requirements [마이크로전공 이수학점]

Major	Micro(마이크로전공)			
	R	E	P	Total
Quantum Information	3	3	3	**9**

*R: Required, E: Elective, P: Project

▶ Required [전공필수]

Course Code	Course Title	Major	Double	Minor	Micro	Cred. -Lect. -Exp.	Remark	Semester
PHY201	Classical Mechanics I 고전역학 I	○	○	○		3-3-0	[PRE] PHY101, PHY103	1
PHY203	Electromagnetism I 전자기학 I	○	○	○		3-3-0	[PRE] PHY101, PHY103	1

Course Code	Course Title	Major	Double	Minor	Micro	Cred. -Lect. -Exp.	Remark	Seme ster
PHY207	Physics Lab I 물리학실험 I	○	○			3-1-4	[PRE] PHY101 PHY103	2
PHY213	Fundamentals of Quantum Information 양자정보기초	○	○		○	3-3-0	[PRE] PHY101 PHY103	1
PHY223	Mathematical Physics 수리물리학	○				3-3-0	[PRE] PHY201 PHY203	2
PHY301	Quantum Physics I 양자물리학 I	○	○	○		3-3-0	[PRE] PHY101, PHY103	1
PHY303	Thermal and Statistical Physics I 열 및 통계물리학 I	○	○	○		3-3-0	[PRE] PHY101, PHY103	1
PHY311	Computational Physics 전산물리학	○				3-3-0		1
PHY490	Grauation Thesis 졸업논문	○				0 credit		1,2

※ 복수전공 졸업논문 제외 8과목 중 최소 6과목(18학점)/부전공 졸업논문 제외 8과목 중 최소 4과목(12학점) 이수
Students pursuing a double major should take at least six courses (18 credits) out of eight, excluding Graduation Thesis. Students pursuing a minor should take at least four courses (12 credits) out of eight, excluding Graduation Thesis.
※ 트랙제 학생들의 경우 창의시스템구현과 졸업논문 중 하나를 선택하여 이수
Students following the track-based curriculum may choose either an Interdisciplinary Project or Graduation Thesis.

▶ Elective [전공선택]

Course Code	Course Title	Major	Double	Minor	Micro	Cred. -Lect. -Exp.	Remark	Seme ster
PHY202	Classical Mechanics II 고전역학 II	○	○	○		3-3-0	[PRE] PHY201	2
PHY204	Electromagnetism II 전자기학 II	○	○	○		3-3-0	[PRE] PHY203	2
PHY208	Network Science for Complex Systems 복잡계 네트워크 사이언스 개론	○	○	○		3-3-0		2
PHY231	Green Hydrogen Production System Based on Plasmonic Photoexcitation 빛을 이용한 청정수소 생산 시스템 설계	○	○	○		3-2-2		2
PHY302	Quantum Physics II 양자물리학 II	○	○	○		3-3-0	[PRE] PHY301	2
PHY307	Physics Lab II 물리학실험 II	○	○	○		3-1-4	[PRE] PHY101, PHY103	1
PHY315	Solid State Physics I 고체물리학 I	○	○	○		3-3-0	[PRE] PHY301	2
PHY321	Optics 광학	○	○	○		3-3-0	[PRE] PHY203	2
PHY341	Precision Measurement Lab 정밀계측실험	○	○	○		3-1-4		2
PHY407	Semiconductor Physics 반도체물리학	○	○	○		3-2-2		2
PHY415	Solid State Physics II: Quantum Material 고체물리학 II: 양자물성	○	○	○		3-3-0	[PRE] PHY315	1
PHY418	Thermal and Statistical Physics II : Soft Matter Physics 열 및 통계물리학 II: 연성물질물리학	○	○	○		3-3-0	[PRE] PHY303	2
PHY421	Quantum Computing Hardware 양자컴퓨팅하드웨어	○	○	○	○	3-3-0		1

Department of Physics

Course Code	Course Title	Major	Double	Minor	Micro	Cred. -Lect. -Exp.	Remark	Seme ster
PHY423	Quantum Optics and Quantum Dynamics 양자광학 및 양자동역학	○	○	○	○	3-3-0	[PRE] PHY301	1
PHY424	Quantum Modeling and Simulation of Light-Matter Interaction 양자 물리계 모델링 및 시뮬레이션	○	○	○	○	3-3-0	[PRE] PHY423	2
PHY425	Atomic and Molecular Physics 원자 및 분자물리학	○	○	○		3-3-0	[PRE] PHY301	-
PHY427	Introduction to Plasma Physics 플라즈마 물리학 입문	○	○	○		3-3-0	[PRE] PHY203 [IDEN] NE350	-
PHY428	Introduction to Beam Physics: Principles and Technologies of Particle Accelerators 빔 물리학 입문: 입자가속기의 원리와 기술	○	○	○		3-3-0	[PRE] PHY203	-
PHY429	Nuclear and Elementary Particle Physics 핵 및 입자물리학	○	○	○		3-3-0	[PRE] PHY301, PHY313	-
PHY431	Quantum Information Project 양자정보 프로젝트	○	○	○	○	3-0-6	**Required for Micro Major**	1,2
PHY433	Astrophysics : Stars and Blackholes 천체물리학: 항성과 블랙홀	○	○	○		3-3-0	[PRE] PHY201	1
PHY434	Astrophysics : Galaxies and the Universe 천체물리학: 은하와 우주	○	○	○		3-3-0	[PRE] PHY201	2
PHY435	Biological Physics 생물물리학	○	○	○		3-3-0	[PRE] PHY303	-
PHY437	Nonlinear Dynamics 비선형동역학	○	○	○		3-3-0	[PRE] PHY201	-
PHY439	Introduction to Modern Theoretical Physics 현대이론물리학 입문	○	○	○		3-3-0	[PRE] PHY301, PHY313	-
PHY441	Fluid Physics 유체물리학	○	○	○		3-3-0	[PRE] PHY201	1
PHY451	Network Science and Machine Intelligence 네트워크과학과 기계지능	○	○	○		3-3-0	[PRE] PHY303	2
PHY461	Challenge to Advanced Topics in Plasma Physics 현대 플라즈마 물리 난제 도전	○	○	○		3-2-2		2
PHY471	Special Topics in Physics I 물리학 특강 I	○	○	○		3-3-0	[PRE] PHY223	1
PHY472	Special Topics in Physics II 물리학 특강 II	○	○	○		3-3-0		-
PHY473	Special Topics in Physics III 물리학 특강 III	○	○	○		3-3-0		-
MEN220	Fluid Mechanics 유체역학	○	○	○		3-3-0	Refer to each department section	
MSE230	Introduction to Crystallography 결정학개론	○	○	○		3-3-0		
MSE407	Semiconductor Device Characteristics and AI Hardware Application 반도체소자 특성과 AI 하드웨어 응용	○	○			3-3-0		
MSE431	Introduction to Spintronics 스핀트로닉스개론	○	○	○		3-3-0		
EEE331	Microwave Engineering 마이크로파공학	○	○	○		3-3-0		
EEE441	Optoelectronics 광전자공학	○	○	○		3-3-0		
CSE463	Machine Learning 기계학습	○	○	○		3-3-0		

Course Code	Course Title	Major	Double	Minor	Micro	Cred. -Lect. -Exp.	Remark	Semester
BME219	Optical Imaging 광학이미징	○	○	○		3-3-0	Refer to each department section	
BME321	Biomedical Optics 의광학개론	○	○	○		3-3-0		
BME447	AI-based Neural Data Science AI 기반 뇌과학 데이터 사이언스	○	○			3-3-0		
CHM353	AI-Based Digital Chemistry AI 기반 디지털 화학	○	○			3-3-0		
MTH204	Linear Algebra 선형대수학	○	○	○		3-3-0		
MTH251	Mathematical Analysis I 해석학 I	○	○	○		3-3-0		
MTH271	Methods of Applied Mathematics 응용수학방법론	○	○	○		3-3-0		
MTH313	Complex Analysis I 복소해석학I	○	○	○		3-3-0		
MTH321	Numerical Analysis 수치해석학	○	○	○		3-3-0		
MTH361	Mathematical Modeling and Applications 수리모형방법론	○	○	○		3-3-0		
MTH450	Deep Learning Methods for Solving Partial Differential Equations 편미분방정식을 계산을 위한 딥러닝 방법	○	○	○		3-3-0		
CUEE354	Disaster Monitoring and Prediction using Artificial Intelligence AI를 활용한 재난재해 모니터링 및 예측	○	○	○		3-3-0		
UNI206	Predicting Earthquake Waves 지진파 예측하기	○	○			3-3-0		

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

Department of Physics

4. Curriculum Change [교육과정 변경사항]

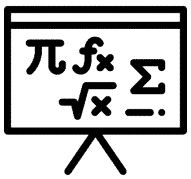
2023	→	2024
PHY471 Special Topics in Physics I 물리학 특강 I	→	PHY471 Special Topics in Physics I 물리학 특강 I [PRE: PHY223]
PHY451 Network Science and Machine Intelligence 네트워크과학과 기계지능		PHY451 Network Science and Machine Intelligence 네트워크과학과 기계지능 [PRE: PHY303]
PHY424 Quantum Modeling and Simulation of Light 양자 물리계 모델링 및 시뮬레이션		PHY424 Quantum Modeling and Simulation of Light 양자 물리계 모델링 및 시뮬레이션 [PRE: PHY423]
PHY423 Quantum Optics and Quantum Dynamics 양자광학 및 양자동역학		PHY423 Quantum Optics and Quantum Dynamics 양자광학 및 양자동역학 [PRE: PHY301]

5. Curriculum Map [교육과정 이수 체계도]

Freshman		Sophomore		Junior		Senior	
Spring	**Fall**	**Spring**	**Fall**	**Spring**	**Fall**	**Spring**	**Fall**
Required Basic Courses	Elective Basic Courses	Classical Mechanics I	Classical Mechanics II	Quantum Physics I	Quantum Physics II	Semiconductor Physics	Thermal and Statistical Physics II
	General Physics II	Electro-magnetism I	Electro-magnetismII	Thermal and Statistical Physics I	Solid State Physics I	Solid Physics II :Quantum Materials	Quantum Computing Hardware
	General Physics Lab II	Fundamentals of Quantum Information	Mathematical Physics	Computational Physics	Optics	Quantum Optics and Quantum Dynamics	Quantum Modeling and Simulation of Light-Matter Interaction
	Calculus II	Applied Linear Algebra	Physics Lab I	Physics Lab II	Precision Measurement Lab	Atomic and Molecular Physics	Introduction to Beam Physics: Principles and Technologies of Particle Accelerators
		Differential Equations	Green Hydrogen Production System Based on Plasmonic Photoexcitation			Introduction to Plasma Physics	Nuclear and Elementary Particle Physics
		Network Science for Complex Systems				Quantum Information Project	Quantum Information Project
						Astrophysics :Stars and Blackholes	Astrophysics :Galaxies and the Universe
						Biological Physics	Fluid Physic
						Nonlinear Dynamics	Network Science and Machine Intelligence
						Introduction to Modern Theoretical Physics	Challenge to Advanced Topics in Plasma Physics
							Graduation Thesis

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 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]

Category 구분		Credits 이수학점	Remarks 비고	Subtotal 소계
Basic 기초	Required 필수	17	Calculus I(3), General Physics I(3), General Chemistry I(3), General Biology(3), Introduction to AI Programming I(3), General Chemistry Lab I(1), General Physics Lab I(1) (Total 17 credits)	At least 33 Credits
	Elective 선택[학과 지정]	16	Differential Equations (3), Applied Linear Algebra (3), Statistics (3), Introduction to AI Programming II(3), Calculus II(3), Understanding Major(1)	
Major 전공	Required 필수	30	Refer to Required course list below Graduation thesis required(No credits for thesis)	At least 54 Credits
	Elective 선택	24	Refer to Elective course list below	
	Internship 인턴십	3	Internship (Choose one among Research, Industrial, Venture Creation, Co-op)	3 Credits
Free Elective 자유선택		10	All Course Accepted	At least 10 Credits

* For Liberal Arts and Leadership requirements, refer to school Common requirements

2. Basic Requirements [기초 이수요건]

No.	Course Code	Course Title	Major 전공	Double Major 복수전공	Minor 부전공
			16 credits	15 credits	12 credits
1	MTH112	Calculus II (3)	●	●	●
2	PHY103	General Physics II (3)			
3	CHM102	General Chemistry II (3)			
4	PHY108	General Physics Lab II (1)			
5	CHM106	General Chemistry Lab II (1)			
6	MTH201	Differential Equations (3)	●	●	●
7	MTH203	Applied Linear Algebra (3)	●	●	●
8	MTH211	Statistics (3)	●	●	●
9	MGT102	Entrepreneurship (3)			
10	IE101	Introduction to Data Science(3)			
11	ITP117	Introduction to AI Programming II (3)	●	●	
12	ITP111	Probability & Random Process (3)			
13	ITP112	Discrete Mathematics (3)			
14	UNI113	Understanding Major (1) **Introduction to Modern Mathematics**	●		

●: Required ○: Elective ◑: Recommended, ( ): credits

3. Curriculum [수리과학과 교육과정]

▶ Credit Requirements [이수학점]

Department	Major(전공)			Double Major(복수전공)			Minor(부전공)		
	R	E	Total	R	E	Total	R	E	Total
Department of Mathematical Sciences	30	24	**54**	15	21	**36**	12	6	**18**

*R: Required, E: Elective

▶ Required [전공필수]

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remarks	Seme ster
MTH204	Linear Algebra 선형대수학	○	○	○	3-3-0	[PRE] MTH201,MTH203	2
MTH251	Mathematical Analysis I 해석학 I	○	○	○	3-3-0		1
MTH302	Modern Algebra I 현대대수학 I	○	○	○	3-3-0	Recommended Course*: MTH230	1
MTH313	Complex Analysis I 복소해석학 I	○	○	○	3-3-0	Recommended Course: MTH251	1
MTH315	Ordinary Differential Equations 상미분방정식론	○	○	○	3-3-0	[PRE] MTH201,MTH203	2
MTH321	Numerical Analysis 수치해석학	○	○	○	3-3-0	[PRE] MTH201,MTH203	2
MTH342	Probability 확률론	○	○	○	3-3-0		2
MTH413	Differential Geometry I 미분기하학 I	○	○	○	3-3-0		-

Department of Mathematical Sciences

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remarks	Seme ster
MTH351	General Topology 위상수학	○	○	○	3-3-0	[PRE] MTH251 Recommended Course*: MTH230	2
MTH421	Introduction to Partial Differential Equations 편미분방정식개론	○	○	○	3-3-0	[PRE] MTH201,MTH203 Recommended Course: MTH315, MTH251	1
MTH490	Graduation Thesis 졸업논문	○			0 credit		1,2

* It is highly recommended to register the subject related to academic connectivity.
※ If you have taken more than five required courses (15 credits) in the case of a Double major, the excess credits can be replaced with major elective credits. For minor, if you have taken more than four courses (12 credits) required for your major, the excess credits can be replaced with major elective credits.
※If you have taken MTH322, it can substitute required course, MTH321.
※ 복수전공은 전공필수 과목을 5과목(15학점)을 초과하여 수강한 경우, 초과 학점은 전공선택 학점으로 대체 가능. 부전공은 전공필수 과목을 4과목(12학점)을 초과하여 수강한 경우, 초과 학점은 전공선택 학점으로 대체 가능
※ 전공 선택 과목(MTH322)을 수강한 경우, 전공 필수 과목(MTH321)으로 대체 가능

▶ Elective [전공선택]

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remarks	Seme ster
MTH210	Mathematical Foundations of Machine Learning 머신러닝의 수학적 원리	○	○	○	3-3-0		1
MTH230	Set Theory 집합론	○	○	○	3-3-0		-
MTH252	Mathematical Analysis II 해석학 II	○	○	○	3-3-0	[PRE] MTH203,MTH251	2
MTH260	Elementary Number Theory 정수론	○	○	○	3-3-0		2
MTH271	Methods of Applied Mathematics 응용수학방법론	○	○	○	3-3-0	Recommended Course: MTH203	-
MTH281	Discrete Mathematics 이산수학	○	○	○	3-3-0		-
MTH303	Modern Algebra II 현대대수학 II	○	○	○	3-3-0	[PRE] MTH302	2
MTH314	Complex Analysis II 복소해석학 II	○	○	○	3-3-0	[PRE] MTH313, Recommended Course: MTH251, MTH252	-
MTH322	Numerical Analysis and Machine Learning 수치해석 및 머신러닝	○	○	○	3-3-0	[PRE] MTH201, MTH203	-
MTH330	Introduction to Geometry 기하학 개론	○	○	○	3-3-0		-
MTH343	Financial Mathematics 금융수학	○	○	○	3-3-0		1
MTH344	Mathematical Statistics 수리통계학	○	○	○	3-3-0		-
MTH361	Mathematical Modeling and Applications 수리모형방법론	○	○	○	3-3-0	[PRE] MTH201, MTH203	-
MTH362	Mathematical Analysis and Modeling for the Industrial Data 수리적 산업데이터 분석 및 모델링	○	○	○	3-3-0		1
MTH401	Real Analysis 실해석학	○	○	○	3-3-0	[PRE] MTH251, MTH351	1

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remarks	Seme ster
MTH403	Probability and Stochastic Processes 확률 및 확률 과정론	○	○	○	3-3-0	[PRE] MTH251, MTH342	-
MTH405	Numerical Analysis and Applications 수치해석 및 응용	○	○	○	3-3-0		1
MTH411	Numerical Methods for Partial Differential Equations I 편미분방정식의 수치방법 I	○	○	○	3-3-0		-
MTH412	Dynamical Systems 동적 시스템	○	○	○	3-3-0	[PRE] MTH251	2
MTH414	Differential Geometry II 미분기하학 II	○	○	○	3-3-0	[PRE]MTH413	-
MTH422	Partial Differential Equations 편미분방정식	○	○	○	3-3-0		2
MTH432	Algebraic Topology 대수적 위상수학	○	○	○	3-3-0	[PRE]MTH112,MTH351 MTH302	-
MTH433	Information Theoretical Approach to A.I. 정보이론과 인공지능	○	○	○	3-3-0	[PRE] MTH251 Recommended Course: MTH342 or MTH403	2
MTH434	Mathematical Analysis and Computation for Machine Learning 머신러닝 해석학 원리와 계산	○	○	○	3-2-2		
MTH450	Deep Learning Methods for Solving Partial Differential Equations 편미분방정식을 계산을 위한 딥러닝 방법	○	○	○	3-3-0	MTH112, MTH203	1
MTH460	Representation Theory and Applications 표현론 및 응용	○	○	○	3-3-0		1
MTH461	Stochastic Processes 확률과정론	○	○	○	3-3-0	[PRE] MTH342	-
MTH480	Topics in Mathematics I 수학 특강 I	○	○	○	3-3-0		-
MTH481	Topics in Mathematics II 수학 특강 II	○	○	○	3-3-0		-
UNI203	Design and implementation of data-driven machine learning 데이터기반 머신러닝 설계 및 제작	○	○	○	1-1-0		-
CSE302	Building Customized Computers 맞춤형 컴퓨터 만들기	○	○	○	3-2-2	Refer to each department section	
CSE463	Machine Learning 기계 학습	○	○	○	3-3-0		
FIA331	Introduction to Financial Engineering 금융공학개론	○	○	○	3-3-0		
IE201	Operations Research I 계량경영학 I	○	○	○	3-3-0		
IE308	Service Intelligence 서비스 지능	○	○	○	3-3-0		
IE412	Financial Artificial Intelligence 금융인공지능	○	○	○	3-3-0		

Department of Mathematical Sciences

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remarks	Semester
MEN220	Fluid Mechanics 유체역학	○	○	○	3-3-0	Refer to each department section	
MEN301	Numerical Analysis 수치해석	○	○	○	3-3-0		
MEN302	Introduction to Finite Element Method 유한요소법개론	○	○	○	3-3-0		
PHY201	Classical Mechanics I 고전역학 I	○	○	○	3-3-0		
PHY223	Mathematical Physics 수리물리학	○	○	○	3-3-0		
PHY437	Nonlinear Dynamics 비선형동역학	○	○	○	3-3-0		
UNI202	Blockchain and Cryptocurrencies 블록체인과 암호화폐	○	○	○	1-1-0		
UNI207	Creative Computing for Media Art 창의적 컴퓨팅과 미디어아트	○	○	○	1-1-0		
UNI208	Inventory Management Optimization Strategies 재고관리 최적화 전략	○	○	○	1-1-0		
FIA451	Financial Market Analysis using AI 인공지능을 활용한 금융시장 분석	○	○	○	3-3-0		
MEN491	Creating Autonomous Car 자율주행 자동차 만들기	○	○	○	3-3-0		
PHY451	Network Science and Machine Intelligence 네트워크과학과 기계지능	○	○	○	3-3-0		
PHY461	Challenge to Advanced Topics in Plasma Physics 현대 플라즈마 물리 난제 도전	○	○	○	3-2-2		
CUEE354	Disaster Monitoring and Prediction using Artificial Intelligence AI를 활용한 재난재해 모니터링 및 예측	○	○	○	3-3-0		
BME447	AI-based Neural Data Science AI 기반 뇌과학 데이터 사이언스	○	○	○	3-3-0		

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

4. Curriculum Change [교육과정 변경사항]

2023	→	2024
MTH432 Algebraic Topology 대수위상	→	MTH432 Algebraic Topology 대수적 위상수학
〈NEW〉		MTH460 Representation Theory and Applications 표현론 및 응용

5. Curriculum Map [교육과정 이수 체계도]

Sophomore		Junior		Senior	
Spring	**Fall**	**Spring**	**Fall**	**Spring**	**Fall**
미분방정식 Differential Equations	**통계학** Statistics	**집합론** Set Theory	**상미분방정식론Ⓡ** Ordinary Differential Equations	**미분기하학 IⓇ** Differential Geometry I	**확률 및 확률 과정론** Probability and Stochastic Processes
응용선형대수 Applied Linear Algebra	**선형대수학Ⓡ** Linear Algebra	**현대대수학 IⓇ** Modern Algebra I	**수치해석학Ⓡ** Numerical Analysis	**편미분방정식 개론Ⓡ** Introduction to Partial Differential Equations	**미분기하학 II** Differential Geometry II
해석학 IⓇ Mathematical Analysis I	**해석학 II** Mathematical Analysis II	**복소해석학 IⓇ** Complex Analysis I	**확률론Ⓡ** Probability	**실해석학** Real Analysis	**편미분방정식** Partial Differential Equations
머신러닝의 수학적 원리 Mathematical Foundations of Machine Learning	**응용수학방법론** Methods of Applied Mathematics	**수치해석 및 머신러닝** Numerical Analysis and Machine Learning	**위상수학Ⓡ** General Topology	**수치해석 및 응용** Numerical Analysis and Applications	**머신러닝 해석학 원리와 계산** Mathematical Analysis and Computation for Machine Learning
이산수학 Discrete Mathematics		**금융수학** Financial Mathematics	**정수론** Elementary Number Theory	**동적시스템** Dynamical Systems	**확률과정론** Stochastic Processes
		수리모형방법론 Mathematical Modeling and Applications	**현대대수학 II** Modern Algebra II	**대수적 위상수학** Algebraic Topology	**수학특강 II** Topics in Mathematics II
		수리적 산업데이터 분석 및 모델링 Mathematical Analysis and Modeling for the Industrial Data	**복소해석학 II** Complex Analysis II	**정보이론과 인공지능** Information Theoretical Approach to A.I.	**졸업논문Ⓡ** Graduation Thesis
			기하학개론 Introduction to Geometry	**편미분방정식 계산을 위한 딥러닝 방법** Deep Learning Methods for Solving Partial Differential Equations	
				표현론 및 응용 Representation Theory and Applications	
				수학특강 I Topics in Mathematics I	
				수리통계학 Mathematical Statistics	

Department of Chemistry
[화학과]

■ Department Introduction [학과소개]

Chemistry is a central science that seeks the understanding of nature and interactions between atoms and molecules. In addition to this essential scientific question, modern development such as nanoscience offers new chances to explore the world of 'beyondatoms and molecules. The department offers lectures and experimental courses in all fields of chemistry: physical, organic, analytical, biological, and materials/polymers chemistry. The department stresses a research experience as an essential educational tool. Research opportunities with our world-class researchers are provided to all undergraduate students in the state-of-the art facilities and environment.

1. Graduation Requirement [졸업 이수요건]

Category 구분		Credits 이수학점	Remarks 비고	Subtotal 소계
Basic 기초	Required 필수	17	Calculus I(3), General Physics I(3), General Chemistry I(3), General Biology(3), Introduction to AI Programming I(3), General Chemistry Lab I(1), General Physics Lab I(1) (Total 17 credits)	At least 31 Credits
	Elective 선택[학과 지정]	14	General Chemistry II(3), General Chemistry Lab II(1), General Physics II(3), AIP II(3), Calculus II (3), Why Chemistry?(1)	
Major 전공	Required 필수	30	Refer to Required course list below Including 3 Credits of Graduation Thesis	At least 54 Credits
	Elective 선택	24	Refer to Elective course list below	
	Internship 인턴십	3	Internship (Choose one among Research, Industrial, Venture Creation, Co-op)	3 Credits
Free Elective 자유선택		12	All courses accepted	At least 12 Credits

* For Liberal Arts and Leadership requirements, refer to school Common requirements

2. Basic Requirements [기초 이수요건]

No.	Course Code	Course Title	Major 전공	Double Major 복수전공	Minor 부전공
			14 credits	14 credits	3 credits
1	MTH112	Calculus II (3)	●	●	
2	PHY103	General Physics II (3)	●	●	
3	CHM102	General Chemistry II (3)	●	●	●
4	PHY108	General Physics Lab II (1)	○		
5	CHM106	General Chemistry Lab II (1)	●	●	
6	MTH201	Differential Equations (3)	○		
7	MTH203	Applied Linear Algebra (3)	○		
8	MTH211	Statistics (3)	○		
9	MGT102	Entrepreneurship (3)	○		
10	IE101	Introduction to Data Science(3)	○		
11	ITP117	Introduction to AI Programming II (3)	●	●	
12	ITP111	Probability & Random Process (3)	○		
13	ITP112	Discrete Mathematics (3)	○		
14	UNI114	Understanding Major **Why Chemistry?**	●	●	

●: Required ○: Elective ◑: Recommended, ( ): credits

* General Chemistry 1, General Chemistry Lab 1 must be completed when Business administration field students plan to take Chemistry as their minor or double major.

3. Curriculum [화학과 교육과정]

▶ Credit Requirements [이수학점]

Department (School)	Major(전공)			Double Major(복수전공)			Minor(부전공)		
	R	E	Total	R	E	Total	R	E	Total
Department of Chemistry	30	24	**54**	18	18	**36**	12	6	**18**

*R: Required, E: Elective

▶ Required [전공필수]

Course Code	Course Title	Major	Double	Minor	Cred. -Lect. -Exp.	Remark	Seme ster
CHM201	Organic Chemistry Lab 유기화학실험	○			2-0-4		2
CHM211	Organic Chemistry I 유기화학 I	○	○	○	3-3-0	[IDEN] ECHE201	1,2
CHM212	Organic Chemistry II 유기화학 II	○	○	○	3-3-0	[IDEN] ECHE202	1,2
CHM231	Physical Chemistry I 물리화학 I	○	○	○	3-3-0		1
CHM232	Physical Chemistry II 물리화학 II	○	○	○	3-3-0		2
CHM291	Analytical Chemistry I 분석화학 I	○	○		3-3-0	[IDEN] ECHE213	1
CHM301	Inorganic Chemistry Lab 무기화학실험	○			2-0-4		1

Department of Chemistry

Course Code	Course Title	Major	Double	Minor	Cred. -Lect. -Exp.	Remark	Semester
CHM302	Physical Chemistry Lab 물리화학실험	○			2-0-4	[PRE] CHM231, CHM232	2
CHM321	Biochemistry I 생화학 I	○			3-3-0	[IDEN] BIO211	1
CHM351	Inorganic Chemistry I 무기화학 I	○	○		3-3-0		1
CHM400	Thesis 졸업논문	○			3-0-6		1,2

※ 복수전공 졸업논문 제외 10과목 중 최소 6과목(18학점)/부전공 졸업논문 제외 10과목 중 최소 4과목(12학점) 이수
Students pursuing a double major should take at least six courses (18 credits) out of ten, excluding Graduation Thesis. Students pursuing a minor should take at least four courses (12 credits) out of ten, excluding Graduation Thesis.
※ 2020년 입학생부터 졸업논문 이수, 2020년 이전 입학생은 기존 창의시스템구현 이수
Students entering from 2020 should take Graduation Thesis. Students entered before 2020 should take Interdisciplinary Project.

▶ Elective [전공선택]

Course Code	Course Title	Major	Double	Minor	Cred. -Lect. -Exp.	Remark	Semester
CHM303	Analytical/Materials Chemistry Lab 분석재료화학실험	○	○	○	2-0-4		2
CHM311	Synthetic Organic Chemistry 합성유기화학	○	○	○	3-3-0		1
CHM313	Fundamental of Energy Materials 에너지재료개론	○	○	○	3-3-0	[IDEN] ECHE317	1
CHM322	Biochemistry II 생화학 II	○	○	○	3-3-0		2
CHM323	Medicinal Chemistry 의약화학	○	○	○	3-3-0	[PRE] CHM211,CHM212	-
CHM324	Spectroscopy in Organic Chemistry 유기분광학	○	○	○	3-3-0		2
CHM333	Physical Chemistry III 물리화학 III	○			3-3-0	[PRE] CHM231,CHM232	1
CHM335	Quantum Chemistry 양자화학	○	○	○	3-3-0	[PRE] CHM232	1
CHM336	Chemical Thermodynamics 화학열역학	○	○	○	3-3-0		-
CHM337	Computational Chemistry 전산화학	○	○	○	3-3-0		-
CHM352	Inorganic Chemistry II 무기화학 II	○			3-3-0		-
CHM353	AI-Based Digital Chemistry AI기반 디지털 화학	○	○	○	3-3-0		-
CHM371	Introduction to Nanochemistry 나노화학개론	○	○	○	3-3-0	[IDEN] ECHE416	2
CHM372	Introduction to Polymer Chemistry 고분자화학개론	○	○	○	3-3-0	[IDEN] ECHE351,MSE270	2
CHM391	Instrumental Analysis 기기분석	○	○		3-3-0	[IDEN] ECHE322	2
CHM401	Special Topics in Chemistry I 화학특론 I	○			3-3-0		-
CHM402	Special Topics in Chemistry II 화학특론 II	○			3-3-0		-

Course Code	Course Title	Major	Double	Minor	Cred. -Lect. -Exp.	Remark	Semester
CHM403	Special Topics in Chemistry Ⅲ 화학특론 Ⅲ	○			3-3-0		-
CHM421	Introduction to Chemical Biology 화학생물학개론	○	○		3-3-0		-
CHM422	Introduction to Supramolecular Chemistry 초분자화학개론	○	○		3-3-0		1
CHM431	Introduction to Molecular Spectroscopy 기초분자분광학	○	○		3-3-0	[PRE] CHM232,CHM333	-
CHM433	Semiconductor Chemistry 반도체화학	○	○		3-3-0		1
CHM451	Inorganic Materials Analysis 무기재료분석	○	○		3-3-0		-
CHM452	Organometallic Chemistry 유기금속화학	○	○		3-3-0		-
CHM453	Bioinorganic Chemistry 생무기화학	○	○		3-3-0		1
CHM454	Solid State Chemistry 고체화학	○	○		3-3-0	[IDEN] ECHE313	1
CHM455	Crystallography 결정학	○	○		3-3-0		-
CHM471	Block Copolymers 블록 코폴리머	○	○		3-3-0		-
CHM473	Nanomaterials Chemistry 나노재료화학	○	○		3-3-0		1
CHM474	Advanced Polymer Chemistry 고급고분자화학	○	○		3-3-0		-
CHM475	Electrochemistry 전기화학	○	○		3-3-0		2
BIO231	The Chemical Basis of Life 생명현상의 화학적 이해	○	○	○	3-3-0	Refer to each department section	
BIO307	Current Topics in Biological Sciences 현대생명과학동향	○	○	○	3-3-0		
ECHE240	Engineering Biochemistry 공학생화학	○	○	○	3-3-0		
ECHE312	Electrochemistry 전기화학	○	○	○	3-3-0		
ECHE350	AI-driven Design of Energy Materials and Process 인공지능 기반 에너지 소재 및 공정 설계	○	○	○	3-3-0		
ECHE413	Introduction to New Energy Conversion and Storage 신에너지 변환 및 저장개론	○	○	○	3-3-0		
ECHE431	Introduction to Catalysis 촉매개론	○	○	○	3-3-0		
PHY201	Classical Mechanics I 고전역학 I	○	○	○	3-3-0		
PHY203	Electromagnetism Ⅰ 전자기학 Ⅰ	○	○	○	3-3-0		
PHY204	Electromagnetism Ⅱ 전자기학 Ⅱ	○	○	○	3-3-0		
PHY223	Mathematical Physics 수리물리학	○	○	○	3-3-0		

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Course Code	Course Title	Major	Double	Minor	Cred. -Lect. -Exp.	Remark	Semester
PHY301	Quantum Physics I 양자물리학 I	○	○	○	3-3-0	Refer to each department section	
PHY302	Quantum Physics II 양자물리학 II	○	○	○	3-3-0		
PHY303	Thermal and Statistical Physics I 열 및 통계물리학 I	○	○	○	3-3-0		
PHY311	Computational Physics 전산물리학	○	○	○	3-3-0		
PHY315	Solid State Physics I 고체물리학 I	○	○	○	3-3-0		
PHY321	Optics 광학	○	○	○	3-3-0		
PHY415	Solid State Physics II : Quantum Material 고체물리학 II : 양자물성	○	○	○	3-3-0		
PHY425	Atomic and Molecular Physics 원자 및 분자물리학	○	○	○	3-3-0		
PHY435	Biological Physics 생물물리학	○	○	○	3-3-0		
CUEE206	Science Humanities 과학인문학	○	○	○	3-3-0		
CUEE211	Environmental Chemistry 환경화학	○	○	○	3-3-0		
UNI203	Design and implementation of data-driven machine learning 데이터기반 머신러닝 설계 및 제작	○	○	○	1-1-0		

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

4. Curriculum Map [교육과정 이수 체계도]

〈Organic Chemistry〉

Semester 1 Sophomore	Semester 2 Sophomore	Semester 1 Junior	Semester 2 Junior	Semester 1 Senior	Semester 2 Senior
PhyChem I	**PhyChem II**	Synth Org Chem	Spec in Org Chem (or Senior)	Intro Supra Mole. Chem	Medicinal Chem (or Junior)
OrgChem 1	**OrgChem II**	**BioChem I**	BioChem II	Fun Energy Mat (or Junior)	Instrumental Analysis (or Junior)
AnalyChem	**OrgChem Exp**	**InorgChem I**	Intro PolymerChem (or Senior)	Quantum Chem	Organometal Chem
	AnalChem Lab	PhyChem II	InorgChem II		Comp Chem
		InorgChem Exp	**PhysChem Lab**		**Thesis**

〈Materials Chemistry〉

Semester 1 Sophomore	Semester 2 Sophomore	Semester 1 Junior	Semester 2 Junior	Semester 1 Senior	Semester 2 Senior
PhyChem I	**PhyChem II**	**InorgChem I**	InorgChem II	Nanomat Chem	Inorg Mater Analysis
OrgChem 1	**OrgChem II**	**BioChem I**	BioChem II	Fun Energy Mat	Instrumental Analysis
AnalyChem	**OrgChem Exp**	PhyChem II	Intro to Nanochem	Solid State Phy Chem	Crystallography
	AnalChem Lab	**InorgChem Exp**	Intro PolymerChem		Comp Chem
					Electrochemistry
			PhysChem Lab		**Thesis**

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〈Physical Chemistry〉

Semester 1 Sophomore	Semester 2 Sophomore	Semester 1 Junior	Semester 2 Junior	Semester 1 Senior	Semester 2 Senior
PhyChem I	**PhyChem II**	**InorgChem I**	Comp Chem	Introduction to Molecular Spectroscopy	Instrumental Analysis
OrgChem 1	**OrgChem II**	**BioChem I**	**PhyChem Exp**	Solid State Phy Chem	Introduction to Nanochemistry
AnalyChem	**OrgChem Exp**	**InorgChem Exp**	Optics	Quantum Physics I	Comp Chem
Applied Linear Algebra	Electromagnetism I	PhyChem III		Fundamental of Energy Materials	**Thesis**
	AnalChem Lab	Quantum Chem			

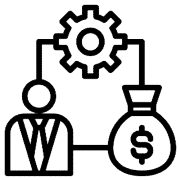
〈Inorganic Chemistry〉

Semester 1 Sophomore	Semester 2 Sophomore	Semester 1 Junior	Semester 2 Junior	Semester 1 Senior	Semester 2 Senior
PhyChem I	**PhyChem II**	**InorgChem I**	InorgChem II	Introduction to Supra. Chem	Inorg Mater Analysis
OrgChem 1	**OrgChem II**	**BioChem I**	Bioinorganic chem	Nanomaterials Chem	Instrumental Analysis
AnalyChem	**OrgChem Exp**	PhyChem III	Intro to Nanochem	Solid State Phy Chem	Crystallography
	AnalChem Lab	**InorgChem Exp**	Organometallic Chem	Fun Energy Mat	Comp Chem
			PhysChem Lab		**Thesis**

School of Business Administration

School of Business Administration
[경영과학부]

■ School Introduction [학부소개]



The mission of the UNIST School of Business Administration (SBA) is to educate and develop leaders and enterprise builders, who create new wealth by integrating science & technology with business management. The academic curriculum of the School is specifically tailored to accomplish this mission by offering focus courses in critical-thinking, data analytics, and entrepreneurship as well as a variety of courses in conventional management. Through our rigorous and contemporary curriculum, students will build a strong theoretical foundation and gain the agility to pursue myriad options on the path to becoming influential leaders and business champions, who will create a better world.

The School of Business Administration boasts faculty members who have obtained Ph.D. degrees from prominent institutions. Their courses enable students to acquire expert business knowledge by emphasizing individual, experiential, and team-based learning. Specifically, by offering courses taught in English, students develop the confidence to effectively communicate their ideas in the international language of commerce. With the smallest faculty-student ratio in South Korea, research and education are more personalized, relevant, and forward-thinking, and collaborations between faculty and students are more productive.

Our students can enjoy various benefits, to wit: 1) receive world-class education; 2) participate in research with faculty members; 3) study abroad; 4) sign-up for practice-based or research-based internship programs; 5) receive scholarship for almost all students; and 6) live in dormitory complexes. The School of Business Administration provides a transformational experience, enabling students to realize their full potential.

In 2018, the UNIST SBA received AACSB (Association to Advance Collegiate School of Business) International Accreditation, which means that our programs at the bachelor's, master's, and doctoral levels have proven to be among the top 5 percent in business education worldwide. We hope that all young people who dream of becoming a global leader in the field of research or practice in cutting-edge new industries can join the UNIST SBA to leap together.

1. Graduation Requirement [졸업 이수요건]

Category 구분		Credits 이수학점	Remarks 비고	Subtotal 소계
Basic 기초	Required 필수	9	Required: Calculus I (3), Introduction to AI Programming I (3) Elective: Choose 1 among General Physics I(3), General Chemistry I(3), General Biology(3) (Total 9 credits)	At least 28 Credits
	Elective 선택[학과 지정]	19	Required: Applied Linear Algebra(3), Statistics(3), Entrepreneurship(3), Economics(3), Principles of Management(1) Elective: Calculus II (3), Differential Equations(3), Introduction to Data Science(3), AIP II (3), Discrete Mathematics(3), Probability&Random Process(3)	
Major 전공	Required 필수	21	Refer to Required course list below	At least 48 Credits
	Elective 선택	27	Refer to Elective course list below	
	Internship 인턴십	3	Internship (Choose one among Research, Industrial, Venture Creation, Co-op)	3 Credits
Free Elective 자유선택		21	All Courses Accepted	At least 21 Credits

* For Liberal Arts and Leadership requirements, refer to school Common requirements

2. Basic Requirements [기초 이수요건]

No.	Course Code	Course Title	Major 전공	Double Major 복수전공	Minor 부전공
			19 credits	10 credits	-
1	MTH112	Calculus II (3)	○		
2	PHY103	General Physics II (3)			
3	CHM102	General Chemistry II (3)			
4	PHY108	General Physics Lab II (1)			
5	CHM106	General Chemistry Lab II (1)			
6	MTH201	Differential Equations (3)	○		
7	MTH203	Applied Linear Algebra (3)	●		
8	MTH211	Statistics (3)	●	●	
9	MGT102	Entrepreneurship (3)	●	●	
10	IE101	Introduction to Data Science(3)	○		
11	ITP117	Introduction to AI Programming II (3)	○		
12	ITP111	Probability & Random Process (3)	○		
13	ITP112	Discrete Mathematics (3)	○		
14	MGT106	Economics(3)	●	●	
15	UNI115	Understanding Major **Principles of Management**	●	●	

●: Required ○: Elective ◑: Recommended, ( ): credits

3. Curriculum [경영과학부 교육과정]

▶ Credit Requirements [이수학점]

Department (School)	Major(전공)			Double Major(복수전공)			Minor(부전공)		
	R	E	Total	R	E	Total	R	E	Total
School of Business Administration	21	27	**48**	21	15	**36**	12	6	**18**

*R: Required, E: Elective

▶ Required [전공필수]

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Seme ster
MGT201	Management Information Systems 경영정보론	○	○	○	3-3-0		2
MGT202	Organizational Behavior 조직행동론	○	○	○	3-3-0		1
MGT204	Marketing Management 마케팅관리	○	○	○	3-3-0		1
MGT205	Financial Accounting 재무회계	○	○	○	3-3-0		1
MGT207	Financial Management 재무관리	○	○	○	3-3-0		2
MGT209	Operations Management 생산운영관리	○	○	○	3-3-0		2
MGT499	Strategic Management 경영전략	○	○	○	3-3-0		1

*MGT499 경영전략은 졸업과제로서 주전공, 복수전공은 반드시 이수하여야 함
*Major and double major must complete MGT499 Strategic Management.

School of Business Administration

▶ Elective [전공선택]

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Seme ster
MGT101	Business Communication & Leadership 비즈니스커뮤니케이션 & 리더십	○	○	○	3-3-0		1
MGT203	International Business 국제경영학	○	○	○	3-3-0		-
MGT206	Managerial Accounting 관리회계	○	○	○	3-3-0	[PRE] MGT205	2
MGT210	Data Analysis & Decision Making 경영통계분석	○	○	○	3-3-0	[PRE] MTH211	1
MGT211	Microeconomics 미시경제학	○	○	○	3-3-0	[PRE] MGT106	2
MGT302	Human Resource Management 인사관리	○	○	○	3-3-0	[PRE] MGT202	2
MGT303	Strategic Human Resource Management 전략적 인적자원 관리	○	○	○	3-3-0		2
MGT306	Business Ethics 기업경영윤리	○	○	○	3-3-0		-
MGT312	Macroeconomics 거시경제학	○	○	○	3-2-2	[PRE] MGT211	1
MGT315	Econometrics 계량경제학	○	○	○	3-3-0	[PRE] MTH211	2
MGT317	International Economics 국제경제학	○	○	○	3-3-0	[PRE] MGT312	2
MGT330	Consumer Behavior 소비자행동	○	○	○	3-3-0	[PRE] MGT204	-
MGT331	International Marketing 국제마케팅	○	○	○	3-3-0	[PRE] MGT204	2
MGT332	Brand Management 브랜드관리론	○	○	○	3-3-0	[PRE] MGT204	-
MGT361	Technology Management 기술경영	○	○	○	3-3-0		-
MGT363	Operations Research 계량경영학	○	○	○	3-3-0		2
MGT367	Business Data Science 비즈니스 데이터 사이언스	○	○	○	3-3-0	[PRE] MTH211	1
MGT372	Internet Business and Marketing 인터넷 비즈니스	○	○	○	3-3-0		-
MGT380	Supply Chain Management 공급망관리	○	○	○	3-3-0		-
MGT410	Special Topics in MGT Ⅰ 경영과학특론Ⅰ	○	○	○	1-1-0		-
MGT411	Special Topics in MGT Ⅱ 경영과학특론Ⅱ	○	○	○	2-2-0		-
MGT412	Special Topics in MGT Ⅲ 경영과학특론Ⅲ	○	○	○	3-3-0		-
MGT414	Special Topics in MGT Ⅳ 경영과학특론Ⅳ	○	○	○	3-3-0		-
MGT415	Special Topics in MGT Ⅴ 경영과학특론 Ⅴ	○	○	○	3-3-0		-
MGT432	Marketing Research 마케팅조사론	○	○	○	3-3-0	[PRE] MTH211	1
MGT433	Advertising Management 광고관리론	○	○	○	3-3-0	[PRE] MGT204	-

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Seme ster
MGT436	Digital Marketing 디지털 마케팅	○	○	○	3-3-0	[PRE] MGT204	2
MGT466	Business AI 비즈니스 AI	○	○	○	3-3-0	[PRE] MTH211, MGT367	2
MGT471	Managing Innovation and Change 혁신과 변화의 관리	○	○	○	3-3-0		1
MGT473	Entrepreneurship and Venture Management 창업과 벤처	○	○	○	3-3-0		-
MGT475	Analyzing Innovation Strategy Using Technology Data 기술데이터를 활용한 혁신전략 분석	○	○	○	3-2-2		
MGT491	Independent Study 개별연구	○	○	○	3-3-0		-
FIA301	Investments 투자론	○	○	○	3-3-0	[PRE] MTH211	2
FIA303	Futures and Option 선물과 옵션	○	○	○	3-3-0	[PRE] MGT207	1
FIA304	International Finance 국제재무관리	○	○	○	3-3-0	[PRE] MGT207	-
FIA305	Corporate Finance 기업재무론	○	○	○	3-3-0	[PRE] MGT207	1
FIA321	Intermediate Accounting 1 중급회계1	○	○	○	3-3-0	[PRE] MGT205	1
FIA331	Introduction to Financial Engineering 금융공학개론	○	○	○	3-3-0	[PRE] MGT207	2
FIA332	Quantitative Finance 계량재무론	○	○	○	3-3-0	[PRE] MGT207	1
FIA402	Fixed Income Securities 채권투자	○	○	○	3-3-0	[PRE] MGT207	1
FIA404	Risk Management 리스크관리	○	○	○	3-3-0	[PRE] MGT207	2
FIA417	Financial Markets 증권시장론	○	○	○	3-3-0	[PRE] MGT207	2
FIA418	Venture Finance 벤처파이낸스	○	○	○	3-3-0	[PRE] MGT207	-
FIA419	Valuing Large Scale Investments(LSI) 대규모 프로젝트의 가치평가 및 시뮬레이션	○	○	○	3-3-0		2
FIA431	Financial Time-series Analysis 금융시계열 분석	○	○	○	3-3-0	[PRE] MTH211	2
FIA432	Business Lab for Financial Engineering 금융공학 비즈니스랩	○	○	○	3-3-0		2
FIA441	Financial Statement Analysis 재무제표분석	○	○	○	3-3-0	[PRE] MGT205	2
FIA443	Cost Accounting 원가관리전략	○	○	○	3-3-0	[PRE] MGT206	-
FIA450	Data Science for finance 금융빅데이터 분석	○	○	○	3-3-0		2
FIA451	Financial Market Analysis using AI 인공지능을 활용한 금융시장 분석	○	○	○	3-3-0		1
ECHE350*	AI-driven Design of Energy Materials and Process 인공지능 기반 에너지 소재 및 공정 설계	○			3-3-0	Refer to each department section	
IE201	Operations Reserach I 계량경영학 I	○	○	○	3-3-0		

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Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Seme ster
MEN456*	Artificial Intelligence Based Digital Manufacturing AI 기반 디지털 제조 공학	○			3-3-0		
MEN490*	Creating Autonomous Car 자율주행 자동차 만들기	○			3-3-0		
MTH204	Advanced Linear Algebra 선형대수학	○	○	○	3-3-0		
MTH342	Probability 확률론	○	○	○	3-3-0		
NE370*	Nuclear Power Plant Accident Diagnosis using AI Techniques AI를 이용한 원전 사고 진단	○			3-3-0		
PHY451*	Network Science and Machine Intelligence 네트워크과학과 기계지능	○			3-3-0		
UEE337*	Building collapse and safety inspection techniques 건물 붕괴와 안전진단 기술	○			3-3-0		
UNI201*	Photodynamic Therapy 광역동 치료	○			1-1-0		
UNI202*	Blockchain and Cryptocurrencies 블록체인과 암호화폐	○			1-1-0		
UNI203*	Design and implementation of data-driven machine learning 데이터기반 머신러닝 설계 및 제작	○			1-1-0		
UNI204*	Software Hacking and Defense 소프트웨어 해킹과 방어	○			1-1-0		
UNI205*	Dynamic Programming and its Applications 동적계획법과 사회기업문제	○			1-1-0		
UNI206*	Predicting Earthquake Waves 지진파 예측하기	○			1-1-0	Refer to each department section	
UNI207*	Creative Computing for Media Art 창의적 컴퓨팅과 미디어아트	○			1-1-0		
UNI208*	Inventory Management Optimization Strategies 재고관리 최적화 전략	○			1-1-0		
UNI209*	Creative Design and CAD for SMR 소형원전 설계와 CAD실습	○			1-1-0		
UNI210*	Multi-Criteria Decision Making 다기준 의사결정 기법	○			1-1-0		
SLA333	AI and Storytelling AI와 스토리텔링	○			3-3-0		
CHM353	AI-based Digital Chemistry AI기반 디지털화학	○			3-3-0		
MSE316	Wearable Smart Healthcare Electronic System 웨어러블 스마트 헬스케어 전자소자 시스템	○			3-2-2		
MSE407	Semiconductor Device Characteristics and AI Hardware Application 반도체소자 특성과 AI 하드웨어 응용	○			3-3-0		
CUEE354	Disaster Monitoring and Prediction using Artificial Intelligence AI를 활용한 재난재해 모니터링 및 예측	○			3-3-0		
CUEE442	Urban Planning Studio 도시계획 종합설계	○			3-3-0		
IE308	Service Intelligence 서비스 지능	○			3-3-0		
IE313	Time-series Analysis 시계열 분석	○			3-3-0		

Course Code	Course Title	Major	Double	Minor	Cred -Lect -Exp	Remark	Semester
BME390	Searching for Novel CRISPR/Cas System at Gamak-Pond 가막못에서 새로운 유전자 가위 찾기	○			3-2-2	Refer to each department section	
BME391	DIY custom microscope using your smartphone 스마트폰으로 나만의 현미경 만들기	○			3-2-2		
BME437	AI-based Affective Engineering AI 기반 감성공학	○			3-3-0		
BME447	AI-based Neural Data Science AI 기반 뇌과학 데이터 사이언스	○			3-3-0		
MTH434	Mathematical Analysis and Computation for Machine Learning 머신러닝 해석학 원리와 계산	○			3-2-2		
MTH450	Deep Learning Methods for Solving Partial Differential Equations 편미분방정식을 계산을 위한 딥러닝 방법	○			3-3-0		
PHY231	Green Hydrogen Production System Based on Plasmonic Photoexcitation 빛을 이용한 청정수소 생산 시스템 설계	○			3-2-2		
PHY461	Challenge to Advanced Topics in Plasma Physics 현대 플라즈마 물리 난제 도전	○			3-2-2		
CSE302	Building Customized Computers 맞춤형 컴퓨터 만들기	○			3-2-2		
ECHE342	Machine Learning Based Analysis for Biocatalysts 머신러닝을 이용한 생촉매 분석	○			3-3-0		
BIO291	Explore the micobes that inhabit the campus 캠퍼스에 서식하는 미생물 탐색	○			3-2-2		
MTH362	Mathematical Analysis and Modeling for the Industrial Data 수리적 산업데이터 분석 및 모델링	○			3-3-0		

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

*AI연계 교과목·POL교과목·One-day Lecture 교과목으로 이수한 학점은 주전공에 한하여 최대 9학점까지 전공선택 학점으로 인정함

4. Curriculum Change [교육과정 변경사항]

2023	→	2024
〈New〉	→	MGT475 Analyzing Innovation Strategy Using Technology Data 기술데이터를 활용한 혁신전략 분석

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5. Curriculum Map [교육과정 이수 체계도]

Sophomore 1st Semester	Sophomore 2nd Semester	Junior 1st Semester	Junior 2nd Semester	Senior 1st Semester	Senior 2nd Semester
경영통계분석 (Data Analysis & Decision Making)	경영정보론 (Management Information Systems)	비즈니스데이터 사이언스 (Business Data Science)	비즈니스AI (Business AI)		금융공학 비즈니스랩 (Business Lab for Financial Engineering)
조직행동론 (Organizational Behavior)		혁신과 변화의 관리 (Managing Innovation and Change)	인사관리 (Human Resource Management)	경영전략 (Strategic Management)	경영과학특론 (Special Topics in MGT)
비즈니스커뮤니케이션&리더십 (Business Communication & Leadership)				**기술데이터를 활용한 혁신전략 분석* (Analyzing Innovation Strategy Using Technology Data)**	
마케팅관리 (Marketing Management)		마케팅조사론 (Marketing Research)	국제마케팅 (International Marketing)		디지털 마케팅 (Digital marketing)
	생산운영관리 (Operations Management)	공급망관리 (Supply Chain Management)			
	계량경영학 (Operations Research)				
미시경제학 (Microeconomics)		거시경제학 (Macroeconomics)	국제경제학 (International Economics)		
			계량경제학 (Econometrics)		
재무회계 (Financial Accounting)	관리회계(Managerial Accounting)	중급회계(Intermediate Accounting 1)	재무제표분석 (Financial Statement Analysis)		
	재무관리 (Financial Management)	선물과 옵션 (Futures and Option)	금융공학개론 (Introduction to Financial Engineering)	**금융시계열 분석 (Financial Time-series Analysis)**	**증권시장론 (Financial Markets)**
	투자론 (Investments)	계량재무론 (Quantitative Finance)		채권투자 (Fixed Income Securities)	리스크 관리 (Risk Management)
					인공지능을 활용한 금융시장 분석* (Financial Market Analysis using AI)

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