트랙제 학생을 위한
통합 졸업요건 안내서

Integrated graduation requirement for students following track-based curriculum

☐ What is Integrated graduation requirement for track based curriculum? 트랙제 통합 요건이란?

- The integrated graduation requirement for students following track based curriculum is a revised graduation requirement regardless of the entrance year. Originally students should have followed their entrance year curriculum but with this integrated graduation requirement students can easily follow this curriculum. Fundamental and major requirement has been adjusted. For Liberal Arts courses, refer to 2021 catalog.
- 트랙제를 유지하는 학생들을 위한 '입학연도 무관' 통합 졸업요건입니다. 기존에는 본인 입학연도의 커리큘럼을 따라 이수하여야 하였으나, 트랙제 유지를 희망하는 학생들의 경우 졸업 요건 충족을 위하여 본 안내서 한권만 참고하시면 됩니다. 계열기초와 전공 요건이 학부별로 조정되었습니다. 교양은 2021학년도 Catalog를 참고하세요!

☐ Notification regarding Integrated graduation requirement / 트랙별 통합 요건 주요 안내사항

- **(Common)** Details are provided in each school sector.
- **(Common)** Students entered between 2011~2012 and students affiliated in DHE-SDC track(not MANE-SDC track) and DHE-HSE track should follow their entrance year curriculum. (This integrated graduation requirement will not be applied for those students)
- **(Fundamental)** Complete based on 1 Track. Fundamental requirement has been changed from all required to Basic required and elective. Please check details of your school/track.
- **(Fundamental)** From 2021, MGT102 Entrepreneurship and Big Data has been separated to ①MGT102 Entrepreneurship and ②IE101 Introduction to Data Science. Already taken MGT102 Entrepreneurship and Big Data will be counted either MGT102 Entrepreneurship or IE101 Introduction to Data Science.
- **(Major)** Already taken required course will be counted as required course. (Except MEN/MANE track and BME track: refer to each track requirement)
- **(Major)** All course code is written based on 2021 curriculum. Please check the changed course history from 2021 catalog.
- **(Major)** This integrated graduation requirement applies to students regardless of their entrance year but NSE, HFE, ENE, ACE track students should refer to their requirements according to their entrance year. (Please check details in each school requirements)
- **(Major)** Students following track-based curriculum should complete interdisciplinary project. However, some school offers graduation thesis related courses as a substitution. Please read carefully.
- **(Free Elective)** Originally free elective has been counted based on the course but it has been changed to sum of credits of ① Excessive credits of each category + ② Sum of courses that are not included in any categories.

- **(공통)** 학부/트랙별 세부사항은 각 학부 세부 요건을 확인하세요
- **(공통)** 이 통합요건은 입학연도와 무관하여 적용되지만, 2011~2012학번, 디자인및인간공학부-제어설계공학(기계항공및원자력공학부 아님, ~2016) 트랙과 인간및시스템공학(HSE)트랙 소속 학생은 대부분의 학생이 본인 입학년도의 교육과정대로 이수하시면 됩니다.
- **(기초)** 1트랙 기준으로 기초 요건은 충족하시면 됩니다. 계열기초 이수 요건이 기초필수/기초선택으로 나눠지게 되었고 각 전공마다 다르니 반드시 요건을 확인해주세요.
- **(기초)** MGT102 기업가정신과 빅데이터 교과 기 이수 학생은 MGT102 기업가 정신, IE101 데이터사이언스개론 과목 중 한가지만 인정 가능합니다.
- **(전공)** 기 이수한 전공 필수학점은 필수로 인정받을 수 있습니다. (단, 기계항공및원자력공학부 기계항공공학(이전 기계공학 포함), 생명과학부 생명공학 트랙의 경우 학과(부)별 요건을 별도로 확인해주세요)
- **(전공)** 교과목 코드는 2021학년도 기준으로 작성된 것으로, 2021년 카탈로그상 교과목 변천사를 확인하여 교과목 변경사항 확인 가능합니다.
- **(전공)** 전공 이수학점, 과목 리스트는 학번 무관 한가지 기준이 적용됩니다. 그러나, 원자력과학및공학 트랙, 인간공학 트랙, 에너지공학 트랙, 화학공학 트랙의 경우 학문 특성과 요건을 고려하여 학번별로 이수학점이 다소 차이가 있습니다.
- **(전공)** 트랙제를 이수하는 학생은 창의시스템구현을 의무이수하여야 합니다. 그러나 학부별로 신규 학과제의 졸업논문 특성의 교과를 인정하는 경우도 있으니 학과별 요건을 별도 확인하시기 바랍니다.
- **(자유선택)** 자유선택의 개념이 변경되었습니다. 기존에는 과목 단위로 이수해야 했던 것이 ① 각 영역 초과학점 + ② 어느 영역에도 속하지 않는 교과학점으로 변경되었습니다.

(Unit: Credit)

School	Track	Basic Required	Basic Elective	Major	
				1 Track R	2 Track R
MANE	MAE, MEN	17	13	24	9
	SDC			18	0
	NSE		13	27~33	3
UEE	ESE		13	6	6
	UIE			15	6
	DME			15	6
DHE	ID		13	30	0
	HFE		16	18~24	0
SLS	BME		16	24	12
	BIO		15	23	15
MSE	AMS		15	15	3
	NME, SE			15	3
ECHE	ENE		15	28~30	12
	ACE			23~27	15
ECE	EE		15	21	12
	CSE		15	33	3
SNS	PHY		13	24	12
	MTH		15	30	12
	CHM		14	27	12
SME	MGE		15	24	9
SBA	MGT	9	19	18	9
	FIA			18	9
	EPS			-	9

*For details, refer to each school guidelines. 세부사항은 각 학부별 요건 참고
*Free Elective: ① Excessive credits of each category + ② All courses accepted

☐ Additional Announcement / 경과조치

- (Fundamental) There will be no change in courses recognized when changing field
  (계열기초) 기존 트랙제 교육과정상 적용했던 계열변경시 인정 교과 등은 그대로 적용함
  *When following track-based system, field change conditions will be maintained.
  트랙제 이수시 계열변경 요건은 기존 연도별 조건 유지

Field	Course
Engineering Field → Business Field 이공계열 → 경영계열	Calculus1=Caculus
	Business Programming = Engineering Programming 1 = Introduction to AI Programming 1
	General Physics 1= General Physics
	General Chemistry 1=General Chemistry
Business Field → Engineering Field 경영계열 → 이공계열	Calculus=Calculus1
	Business Programming = Engineering Programming 1 = Introduction to AI Programming 1
	General Physics = General Physics1

- (Fundamental) As all fundamental requirements are changed, the fundamental required for 2nd track and majoring in different field has been abolished.
  (계열기초) 기초 요건을 통합/변경하기 때문에 기존 2트랙 융합전공 요구 기초교과, 복수전공 요구 기초교과 요건은 폐지함 (다른 계열의 전공을 융합전공을 하는 경우에 요구되었던 조건도 폐지)

■ Engineering Field (이공계열)

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

<table>
<tr><th colspan="2">Category</th><th colspan="2">Course List</th><th colspan="2">Credits</th><th>Total (Credits)</th></tr>
<tr><td rowspan="8">Basic
기초</td><td rowspan="7">Required
기초필수</td><td colspan="2">Calculus I</td><td colspan="2">3</td><td rowspan="7">17</td></tr>
<tr><td colspan="2">General Physics I</td><td colspan="2">3</td></tr>
<tr><td colspan="2">General Chemistry I</td><td colspan="2">3</td></tr>
<tr><td colspan="2">General Biology</td><td colspan="2">3</td></tr>
<tr><td colspan="2">Introduction to AI Programming I</td><td colspan="2">3</td></tr>
<tr><td colspan="2">General Physics Lab I</td><td colspan="2">1</td></tr>
<tr><td colspan="2">General Chemistry Lab I</td><td colspan="2">1</td></tr>
<tr><td>Elective
기초선택</td><td colspan="2">Follow each school requirements</td><td colspan="2">At least 13</td><td>At least 13</td></tr>
<tr><td rowspan="15">Liberal Arts
교양</td><td rowspan="6">Language
언어*</td><td colspan="2">Chinese Foundation</td><td rowspan="6">Choose 1
(2 credits)</td><td rowspan="6">2</td><td rowspan="15">At least 24</td></tr>
<tr><td colspan="2">Chinese Forward</td></tr>
<tr><td colspan="2">Spanish Foundation</td></tr>
<tr><td colspan="2">Korean Foundation(For International Students)</td></tr>
<tr><td colspan="2">Korean for Everyday(For International Students)</td></tr>
<tr><td colspan="2">Korean Writing</td></tr>
<tr><td rowspan="9">English
영어</td><td rowspan="3">Lev.1</td><td>English Camp</td><td rowspan="9">4</td></tr>
<tr><td>English Listening
&Speaking (Intermediate)</td></tr>
<tr><td>English Reading & Writing</td></tr>
<tr><td rowspan="2">Lev.2</td><td>English Listening
&Speaking (Intermediate)</td></tr>
<tr><td>English Reading & Writing</td></tr>
<tr><td rowspan="2">Lev.3</td><td>English Listening
&Speaking (Advanced)</td></tr>
<tr><td>English Reading & Writing</td></tr>
<tr><td>Lev.4</td><td>Exemption</td></tr>
<tr><td>Liberal Arts
교양</td><td colspan="2">Take 18 credits in Liberal Arts Category</td><td colspan="2">18</td></tr>
<tr><td rowspan="4">Major
전공
*Refer to each school requirements</td><td colspan="2">1 Track</td><td colspan="2">14~15 Curriculum: 48
16~20 Curriculum: 54</td><td rowspan="4">69 or 75</td></tr>
<tr><td colspan="2">2 Track</td><td colspan="2">18</td></tr>
<tr><td colspan="2">Internship (Choose one among
Research, Industrial, Venture Creation, Co-op)</td><td colspan="2">3</td></tr>
<tr><td colspan="2">Interdisciplinary Project</td><td colspan="2">0/0</td></tr>
<tr><td colspan="2">Free Elective
자유선택</td><td colspan="2">① Excessive Credits
+
② All courses acceptable</td><td colspan="2">Total credit - [Basic] - [Liberal Arts] - [Major] credits
*Varies from school to school</td><td></td></tr>
<tr><td colspan="2">Leadership
리더십프로그램</td><td colspan="2">UNIST Leadership Program</td><td colspan="2">6AU</td><td></td></tr>
<tr><td colspan="7">Total 135/142 credits / 6AU</td></tr>
</table>

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

*Students following previous 2014-2015 curriculum: 135 credits / 2016 and after: 142 credits

■ 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></td><td colspan="2">3</td><td rowspan="5">9</td></tr>
<tr><td colspan="2">Introduction to AI Programming I</td><td></td><td colspan="2">3</td></tr>
<tr><td>General Physics I</td><td rowspan="3">Choose 1</td><td rowspan="3"></td><td colspan="2" rowspan="3">3</td></tr>
<tr><td>General Chemistry I</td></tr>
<tr><td>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="15">Liberal Arts
교양</td><td rowspan="6">Language
언어*</td><td colspan="3">Chinese Foundation</td><td colspan="2" rowspan="6">Choose 1
(2 credits)</td><td rowspan="15">At least 24</td></tr>
<tr><td colspan="3">Chinese Forward</td></tr>
<tr><td colspan="3">Spanish Foundation</td></tr>
<tr><td colspan="3">Korean Foundation(For International Students)</td></tr>
<tr><td colspan="3">Korean For Everyday(For International Students)</td></tr>
<tr><td colspan="3">Korean Writing</td></tr>
<tr><td rowspan="9">English
영어</td><td rowspan="3">Lev.1</td><td>English Camp</td><td rowspan="9"></td><td colspan="2" rowspan="9">4</td></tr>
<tr><td>English Listening
&Speaking (Intermediate)</td></tr>
<tr><td>English Reading & Writing</td></tr>
<tr><td rowspan="2">Lev.2</td><td>English Listening
&Speaking (Intermediate)</td></tr>
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&Speaking (Advanced)</td></tr>
<tr><td>English Reading & Writing</td></tr>
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<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 colspan="2" rowspan="4">Major
전공
*Refer to each school requirement</td><td colspan="3">1 Track</td><td colspan="2">14~15 Curriculum: 48
16~20 Curriculum: 54</td><td rowspan="4">69 or 75</td></tr>
<tr><td colspan="3">2 Track</td><td colspan="2">18</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">Interdisciplinary Project</td><td colspan="2">0/0</td></tr>
<tr><td colspan="2">Free Elective
자유선택</td><td colspan="3">① Excessive Credits
+
② All courses acceptable</td><td colspan="2">Total credit - [Basic] - [Liberal Arts] - [Major] credits
*Varies from school to school</td><td></td></tr>
<tr><td colspan="2">Leadership
리더십프로그램</td><td colspan="3">UNIST Leadership Program</td><td colspan="2">6AU</td><td></td></tr>
<tr><td colspan="8">Total 134/141 credits / 6AU</td></tr>
</table>

*Language: Students can fulfill requirements taking French/Japanese/German/Russian courses through credit exchange
*Students following previous 2014-2015 curriculum: 134 credits / 2016 and after: 141 credits

How to check my track requirement
트랙별 요건 확인 방법

■ 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 school requirements	At least 13	At least 13

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credits 13 Credits
1	MTH112	Calculus II [미적분학 II] (3)	○
2	PHY103	General Physics II [일반물리학 II] (3)	○
3	CHM102	General Chemistry II [일반화학 II] (3)	○
4	PHY108	General Physics Lab II [일반물리실험 II] (1)	○
5	CHM106	General Chemistry Lab II [일반화학실험 II] (1)	○
6	MTH201	Differential Equations [미분방정식] (3)	●
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	●
8	MTH211	Statistics [통계학] (3)	○
9	MGT102	Entrepreneurship [기업가정신] (3)	○
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	○
11	ITP117	Introduction to AI Progamming II [기초인공지능프로그래밍 II] (3)	○
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	○
13	ITP112	Discrete Mathematics [이산수학] (3)	○
14	UNI101	Understanding Major (1) Mechanical Engineering and Future	○

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

① Basic Required 기초필수

Please check each field basic required courses.
계열별 기초 필수를 확인해주세요.

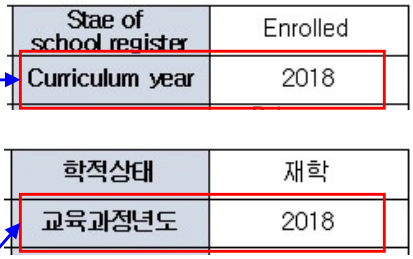
② Basic Elective 기초선택 요건

Every track has their own basic elective courses. Please check each track requirement.
각 트랙에는 개별 기초선택 요건들이 지정되어 있습니다. 아래 각 학부별 기초선택 요건을 확인해주세요

2. Track(Major) Requirement (트랙(전공) 이수 요건)

Track 트랙	Category 필수/선택	Required Credit		Course Code(2021) 2021학년도 과목코드	Course Title 과목명
1 Track 1트랙	Required 필수	24 Credits		MEN210	Thermodynamics 열역학
				MEN220	Fluid Mechanics 유체역학
				MEN230	Solid mechanics I 고체역학 I
				MEN231	Solid Mechanics II 고체역학 II
				MEN250	Mechanical Drawing and Lab 기계제도및실습
				MEN270	Dynamics 동역학
				MEN300	Mechanical Engineering Lab I 기계공학실험 I
				MEN310	Heat Transfer 열전달
	Elective 선택	14~15 Curriculum	24 Cred.	Take courses among each year curriculum offered as elective or among 2021 Department of Mechanical Engineering elective 연도별 전공선택 및 21학년도 기계공학과 전공선택 중 이수	
		16 Curriculum~	30 Cred.		
2 Track 2트랙	Required 필수	9 Credits		Take 3 courses among above 1 Track Required courses 위 필수과목 리스트 중 3개(9학점) 이수	
	Elective 선택	9 Credits		Take courses among each year curriculum offered as elective or among 2021 Department of Mechanical Engineering elective 연도별 전공선택 및 21학년도 기계공학과 전공선택 중 이수	

* Only courses among above required courses will be counted as required courses. Previous selective required courses will be counted as elective.



③ Track(Major) Requirement 트랙(전공) 이수 요건

You don't need to refer to each year catalog anymore. Just simply check your graduation requirement with this file. Check your following curriculum year in your 'List of Course Taking' through portal-graduation. (*In case of students entered in 2013, the curriculum year will be 2014 or 2015. Please double check your curriculum year.)
And check your required credit, and course list in each school section.

이제 매 학년도 카탈로그를 별도로 확인하실 필요가 없습니다. 이 트랙별 통합요건만 확인하시면 됩니다!
포털-졸업-학점이수표 첫페이지의 본인이 따르는 교육과정년도를 확인해주시고, 해당 교육과정년도에 맞는 이수 요건을 확인해주세요!
*2013학번의 경우 2014 또는 2015로 설정되어 있으니 개별 학점이수표를 꼭 확인해주세요.
교육과정년도를 확인하셨다면, 각 학부-트랙별 요건을 보고 이수 학점, 과목 리스트를 확인해서 이수하시면 됩니다.

School of Mechanical, Aerospace, Nuclear Engineering [기계항공및원자력공학부]

□ Mechanical and Aerospace Engineering(MAE) Track, Mechanical Engineering(MEN) Track
기계항공공학(MAE), 기계공학(MEN) 트랙

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credits 13 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	○
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	○
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	○
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	○
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	○
6	MTH201	Differential Equations [미분방정식] (3)	●
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	●
8	MTH211	Statistics [통계학] (3)	○
9	MGT102	Entrepreneurship [기업가정신] (3)	○
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	○
11	ITP117	Introduction to AI Programming Ⅱ 기초인공지능프로그래밍Ⅱ] (3)	○
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	○
13	ITP112	Discrete Mathematics [이산수학] (3)	○
14	UNI101	Understanding Major (1) Mechanical Engineering and Future	○

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

2. Track(Major) Requirement (트랙(전공) 이수 요건)

Track 트랙	Category 필수/선택	Required Credit		Course Code(2021) 2021학년도 과목코드	Course Title 과목명
1 Track 1트랙	Required 필수	24 Credits		MEN210	Thermodynamics 열역학
				MEN220	Fluid Mechanics 유체역학
				MEN230	Solid mechanics Ⅰ 고체역학Ⅰ
				MEN231	Solid Mechanics Ⅱ 고체역학 Ⅱ
				MEN250	Mechanical Drawing and Lab 기계제도및실습
				MEN270	Dynamics 동역학
				MEN300	Mechanical Engineering Lab Ⅰ 기계공학실험Ⅰ
				MEN310	Heat Transfer 열전달
	Elective 선택	14~15 Curriculum	24 Cred.	Take courses among each year curriculum offered as elective or among 2021 Department of Mechanical Engineering elective 연도별 전공선택 및 21학년도 기계공학과 전공선택 중 이수	
		16 Curriculum~	30 Cred.		
2 Track 2트랙	Required 필수	9 Credits		Take 3 courses among above 1 Track Required courses 위 필수과목 리스트 중 3개(9학점) 이수	
	Elective 선택	9 Credits		Take courses among each year curriculum offered as elective or among 2021 Department of Mechanical Engineering elective 연도별 전공선택 및 21학년도 기계공학과 전공선택 중 이수	

* Only courses among above required courses will be counted as required courses. Previous selective required courses will be counted as elective.

□ System Design and Control Engineering(SDC) Track / 제어설계공학(SDC) 트랙

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credit 13 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	○
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	○
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	○
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	○
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	○
6	MTH201	Differential Equations [미분방정식] (3)	●
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	●
8	MTH211	Statistics [통계학] (3)	○
9	MGT102	Entrepreneurship [기업가정신] (3)	○
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	○
11	ITP117	Introduction to AI Programming Ⅱ 기초인공지능프로그래밍Ⅱ] (3)	○
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	○
13	ITP112	Discrete Mathematics [이산수학] (3)	○
14	UNI101	Understanding Major (1) Mechanical Engineering and Future	○

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

2. Track(Major) Requirement (트랙(전공) 이수 요건)

Track 트랙	Category 필수/선택	Required Credit		Course Code(2021) 2021학년도 과목코드	Course Title 과목명
1 Track 1트랙	Required 필수	18 Credits		MEN230	Solid Mechanics Ⅰ 고체역학 Ⅰ
				MEN231	Solid Mechanics Ⅱ 고체역학 Ⅱ
				MEN250	Mechanical Drawing and Lab 기계제도및실습
				MEN270	Dynamics 동역학
				MEN300	Mechanical Engineering Lab Ⅰ 기계공학실험Ⅰ
				MEN490	Thesis Study 졸업연구
	Elective 선택	17~20	36 Credits	Take courses among each year curriculum offered as elective or among 2021 Department of Mechanical Engineering elective 연도별 전공선택 및 21학년도 기계공학과 전공선택 중 이수	
2 Track 2트랙	Required 필수	0 Credit		-	
	Elective 선택	18 Credits		Take courses among each year curriculum offered as elective or among 2021 Department of Mechanical Engineering elective 연도별 전공선택 및 21학년도 기계공학과 전공선택 중 이수	

□ Nuclear Science and Engineering(NSE) Track / 원자력과학및공학(NSE) 트랙

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credits 13 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	●
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	○
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	○
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	○
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	○
6	MTH201	Differential Equations [미분방정식] (3)	●
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	●
8	MTH211	Statistics [통계학] (3)	●
9	MGT102	Entrepreneurship [기업가정신] (3)	○
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	○
11	ITP117	Introduction to AI Programming Ⅱ 기초인공지능프로그래밍Ⅱ] (3)	○
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	○
13	ITP112	Discrete Mathematics [이산수학] (3)	○
14	UNI105	Understanding Major (1) The Future of Nuclear Engineering	◑

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

2. Track(Major) Requirement (트랙(전공) 이수 요건)

<table>
<tr><th>Track
트랙</th><th>Category
필수/선택</th><th colspan="2">Required Credit</th><th>Course Code(2021)
2021학년도 과목코드</th><th>Course Title
과목명</th></tr>
<tr><td rowspan="15">1 Track
1트랙</td><td rowspan="10">Required
필수</td><td rowspan="5">14~16
Curriculum</td><td rowspan="5">27
Credits</td><td>NE200</td><td>Fundamentals of Nuclear Engineering
원자력공학 개론</td></tr>
<tr><td>NE210</td><td>Nuclear Radiation Engineering & Experiment
원자력방사선공학 및 실험</td></tr>
<tr><td>NE220</td><td>Nuclear Materials Engineering & Experiment
원자력재료공학 및 실험</td></tr>
<tr><td>NE300</td><td>Introduction to Nuclear Reactor Theory
원자로이론 개론</td></tr>
<tr><td>NE310</td><td>Nuclear System Engineering & Experiment
원자로계통공학 및 실험</td></tr>
<tr><td rowspan="5">17~20
Curriculum</td><td rowspan="5">33
Credits</td><td>NE320</td><td>Introduction to Nuclear Reliability Engineering
신뢰도 공학개론</td></tr>
<tr><td>NE340</td><td>Introduction to Nuclear Fuel Cycle Engineering
핵연료주기공학 개론</td></tr>
<tr><td>NE350</td><td>Fundamentals of Plasma Physics
플라즈마 물리학 기초</td></tr>
<tr><td>NE400</td><td>Fundamentals of Nuclear Fusion
핵융합 개론</td></tr>
<tr><td>NE410</td><td>Power Plant Systems
원전시스템</td></tr>
<tr><td>NE420</td><td>Introduction to Nuclear Engineering IT
원자력 IT 개론</td></tr>
<tr><td rowspan="3">Elective
선택</td><td>14~15
Curriculum</td><td>21
Cred.</td><td colspan="2" rowspan="3">Take courses among each year curriculum offered as elective or among 2021 Department of Nuclear Engineering elective
연도별 전공선택 및 21학년도 원자력공학과 전공선택 중 이수</td></tr>
<tr><td>16
Curriculum</td><td>27
Cred.</td></tr>
<tr><td>17~20
Curriculum</td><td>21
Cred.</td></tr>
<tr><td rowspan="2">2 Track
2트랙</td><td>Required
필수</td><td colspan="2">3 Credits</td><td>NE200</td><td>Fundamentals of Nuclear Engineering
원자력공학 개론</td></tr>
<tr><td>Elective
선택</td><td colspan="2">15 Credits</td><td colspan="2">연도별 전공선택 및 21학년도 원자력공학과 전공선택 중 이수</td></tr>
</table>

* NSE students should follow credits according to their following curriculum

School of Urban and Environmental Engineering [도시환경공학부]

□ Environmental Science and Engineering(ESE) Track / 환경과학공학(ESE) 트랙

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credits 13 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	○
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	○
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	○
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	○
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	○
6	MTH201	Differential Equations [미분방정식] (3)	○
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	○
8	MTH211	Statistics [통계학] (3)	○
9	MGT102	Entrepreneurship [기업가정신] (3)	○
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	○
11	ITP117	Introduction to AI Programming Ⅱ 기초인공지능프로그래밍Ⅱ] (3)	○
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	○
13	ITP112	Discrete Mathematics [이산수학] (3)	○
14	UNI102	Understanding Major (1) What you may (not) want to know about cities and environment	○

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

2. Track(Major) Requirement (트랙(전공) 이수 요건)

Track 트랙	Category 필수/선택	Required Credit		Course Code(2021) 2021학년도 과목코드	Course Title 과목명
1 Track 1트랙	Required 필수	6 Credits		UEE201	Introduction to Environmental Engineering 환경공학개론
				UEE202	Earth and Environmental Sceicnes 지구환경과학
	Elective 선택	14~15 Curriculum	42 Cred.	Take courses among each year curriculum offered as elective or among 2021 Department of Urban and Environmental Engineering elective 연도별 전공선택 및 21학년도 도시환경공학과 전공선택 중 이수	
		16~20 Curriculum	48 Cred.		
2 Track 2트랙	Required 필수	6 Credits		UEE201	Introduction to Environmental Engineering 환경공학개론
				UEE202	Earth and Environmental Sceicnes 지구환경과학
	Elective 선택	12 Credits		Take courses among each year curriculum offered as elective or among 2021 Department of Urban and Environmental Engineering elective 연도별 전공선택 및 21학년도 도시환경공학과 전공선택 중 이수	

□ Urban Infrastructure Engineering(UIE) Track / 도시건설공학(UIE) 트랙

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credits 13 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	○
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	○
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	○
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	○
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	○
6	MTH201	Differential Equations [미분방정식] (3)	○
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	○
8	MTH211	Statistics [통계학] (3)	○
9	MGT102	Entrepreneurship [기업가정신] (3)	○
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	○
11	ITP117	Introduction to AI Programming Ⅱ 기초인공지능프로그래밍Ⅱ] (3)	○
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	○
13	ITP112	Discrete Mathematics [이산수학] (3)	○
14	UNI102	Understanding Major (1) What you may (not) want to know about cities and environment	○

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

2. Track(Major) Requirement (트랙(전공) 이수 요건)

Track 트랙	Category 필수/선택	Required Credit		Course Code(2021) 2021학년도 과목코드		Course Title 과목명
1 Track 1트랙	Required 필수	15 Credits		Core Required	UEE203	Introduction to Civil Engineering 건설공학개론
					UEE204	Introduction to Urban Planning 도시계획개론
					UEE231	Mechanics of Materials 재료역학
					UEE241	Geographic Information System 지리정보시스템
				Selective Required	UEE201	Introduction to Environmental Engineering 환경공학개론
					UEE202	Earth and Environmental Sciences 지구환경과학
					UEE205	Introduction to Natural Hazards 자연재해개론
					UEE331	Structural Analysis 구조역학
					UEE351	Probability Concepts in Engineering 공학확률
	Elective 선택	14~15 Curriculum	33 Cred.	Take courses among each year curriculum offered as elective or among 2021 Department of Urban and Environmental Engineering elective 연도별 전공선택 및 21학년도 도시환경공학과 전공선택 중 이수		
		16~20 Curriculum	39 Cred.			
2 Track 2트랙	Required 필수	6학점		UEE203		Introduction to Civil Engineering 건설공학개론
				UEE204		Introduction to Urban Planning 도시계획개론
	Elective 선택	12학점		Take courses among each year curriculum offered as elective or among 2021 Department of Urban and Environmental Engineering elective 연도별 전공선택 및 21학년도 도시환경공학과 전공선택 중 이수		

※ Core Required: Must take 4 courses, Selective Required: Take 1 among 5 courses

□ Disaster Management Engineering(DME) Track / 재난관리공학(DME) 트랙

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credits 13 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	○
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	○
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	○
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	○
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	○
6	MTH201	Differential Equations [미분방정식] (3)	○
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	○
8	MTH211	Statistics [통계학] (3)	○
9	MGT102	Entrepreneurship [기업가정신] (3)	○
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	○
11	ITP117	Introduction to AI Programming Ⅱ [기초인공지능프로그래밍Ⅱ] (3)	○
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	○
13	ITP112	Discrete Mathematics [이산수학] (3)	○
14	UNI102	Understanding Major (1) What you may (not) want to know about cities and environment	○

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

2. Track(Major) Requirement (트랙(전공) 이수 요건)

Track 트랙	Category 필수/선택	Required Credit		Course Code(2021) 2021학년도 과목코드		Course Title 과목명
1 Track 1트랙	Required 필수	15 Credits		Core Required	UEE201	Introduction to Environmental Engineering 환경공학개론
					UEE203	Introduction to Civil Engineering 건설공학개론
					UEE204	Introduction to Urban Planning 도시계획개론
					UEE205	Introduction to Natural Hazards 자연재해개론
				Selective Required	UEE202	Earth and Environmental Sciences 지구환경과학
					UEE351	Probability Concepts in Engineering 공학확률
					UEE352	Disaster Management 재난관리
	Elective 선택	14~15 Curriculum	33 Cred.	Take courses among each year curriculum offered as elective or among 2021 Department of Urban and Environmental Engineering elective 연도별 전공선택 및 21학년도 도시환경공학과 전공선택 중 이수		
		16~20 Curriculum	39 Cred.			
2 Track 2트랙	Required 필수	6 Credits		Core Required	UEE205	Introduction to Natural Hazards 자연재해개론
				Selective Required	UEE201	Introduction to Environmental Engineering 환경공학개론
					UEE202	Earth and Environmental Sciences 지구환경과학
					UEE203	Introduction to Civil Engineering 건설공학개론
					UEE204	Introduction to Urban Planning 도시계획개론
					UEE351	Probability Concepts in Engineering 공학확률
					UEE352	Disaster Management 재난관리
	Elective 선택	12 Credits		Take courses among each year curriculum offered as elective or among 2021 Department of Urban and Environmental Engineering elective 연도별 전공선택 및 21학년도 도시환경공학과 전공선택 중 이수		

※ Core Required: Must take all course(s), Selective Required: Take 1 among them

School of Materials Science and Engineering
[신소재공학부]

□ Advanced Materials Science(AMS) Track / 첨단소재과학, 신소재과학(AMS) 트랙

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credits 15 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	○
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	◑
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	◑
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	○
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	○
6	MTH201	Differential Equations [미분방정식] (3)	◑
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	◑
8	MTH211	Statistics [통계학] (3)	○
9	MGT102	Entrepreneurship [기업가정신] (3)	○
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	○
11	ITP117	Introduction to AI Programming Ⅱ 기초인공지능프로그래밍Ⅱ] (3)	◑
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	○
13	ITP112	Discrete Mathematics [이산수학] (3)	○
14	UNI103	Understanding Major (1) Trend in Materials Science and Engineering	○

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

2. Track(Major) Requirement (트랙(전공) 이수 요건)

Track 트랙	Category 필수/선택	Required Credit		Course Code(2021) 2021학년도 과목코드	Course Title 과목명
1 Track 1트랙	Required 필수	15 Credits		MSE202	Introduction to Materials Science and Engineering 재료공학개론
				MSE203	Physical Chemistry Ⅰ: Thermodynamics 재료물리화학Ⅰ:열역학
				MSE230	Introduction to Crystallography 결정학개론
				MSE290	Introduction to Computational Materials Science 전산재료과학개론
				MSE300	Materials Lab 재료실험
				MSE312	Phase Transformations in Materials 재료상변태
				MSE313	Mechanical Behavior of Materials 재료의기계적거동
				MSE350	Solid State Physics of Materials 재료고체물리
				MSE354	Introduction to Semiconductor 반도체개론
	Elective 선택	14~15 Curriculum	33 Cred.	Take courses among each year curriculum offered as elective or among 2021 Department of Materials Science and Engineering elective 연도별 전공선택 및 21학년도 신소재공학과 전공선택 중 이수	
		'16~20 Curriculum	39 Cred.		
2 Track 2트랙	Required 필수	3 Credits		MSE202	Introduction to Materials Science and Engineering
				MSE203	Physical Chemistry Ⅰ: Thermodynamics 재료물리화학Ⅰ:열역학
				MSE230	Introduction to Crystallography 결정학개론
				MSE290	Introduction to Computational Materials Science 전산재료과학개론
	Elective 선택	15 Credits		Take courses among each year curriculum offered as elective or among 2021 Department of Materials Science and Engineering elective 연도별 전공선택 및 21학년도 신소재공학과 전공선택 중 이수	

□ Nano Materials Engineering(NME), Semiconductor Engineering(SE) Track

나노재료공학(NME), 반도체재료공학(SE) 트랙

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credits 15 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	○
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	◑
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	◑
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	○
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	○
6	MTH201	Differential Equations [미분방정식] (3)	◑
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	◑
8	MTH211	Statistics [통계학] (3)	○
9	MGT102	Entrepreneurship [기업가정신] (3)	○
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	○
11	ITP117	Introduction to AI Programming Ⅱ 기초인공지능프로그래밍Ⅱ] (3)	◑
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	○
13	ITP112	Discrete Mathematics [이산수학] (3)	○
14	UNI103	Understanding Major (1) Trend in Materials Science and Engineering	○

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

2. Track(Major) Requirement (트랙(전공) 이수 요건)

Track 트랙	Category 필수/선택	Required Credit		Course Code(2021) 2021학년도 과목코드	Course Title 과목명
1 Track 1트랙	Required 필수	15 Credits		MSE203	Physical Chemistry I :Thermodyanmics 재료물리화학1:열역학
				MSE253	Introduction to Nanomaterials 나노재료개론
				MSE313	Mechanical Behavior of Materials 재료의기계적거동
				MSE270	Introduction to Polymer Materials 고분자재료개론
				MSE354	Introduction to Semiconductor 반도체개론
				MSE202	Introduction to Materials Science and Enigneering 재료공학개론
				MSE250	Modern Physics of Materials: Quantum Mechanics 재료현대물리:양자역학
				MSE300	Materials Lab 재료실험
				MSE204	Electromagnetics 전자기학
				MSE312	Phase Transformations in Materials 재료상변태
				MSE230	Introduction to Crystallography 결정학개론
				MSE290	Introduction to Computational Materials Science 전산재료과학개론
	Elective 선택	14~15 Curriculum	33 Cred.	Take courses among each year curriculum offered as elective or among 2021 Department of Materials Science and Engineering elective 연도별 전공선택 및 21학년도 신소재공학과 전공선택 중 이수	
		16~20 Curriculum	39 Cred.		
2 Track 2트랙	Required 필수	3 Credits		MSE203	Physical Chemistry I :Thermodyanmics 재료물리화학1:열역학
				MSE253	Introduction to Nanomaterials 나노재료개론
				MSE313	Mechanical Behavior of Materials 재료의기계적거동
				MSE270	Introduction to Polymer Materials 고분자재료개론
				MSE354	Introduction to Semiconductor 반도체개론
	Elective 선택	15 Credits		Take courses among each year curriculum offered as elective or among 2021 Department of Materials Science and Engineering elective 연도별 전공선택 및 21학년도 신소재공학과 전공선택 중 이수	

School of Energy and Chemical Engineering
[에너지및화학공학부]

☐ Energy Engineering(ENE) Track / 에너지공학(ENE) 트랙

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credits 15 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	●
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	●
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	●
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	
6	MTH201	Differential Equations [미분방정식] (3)	●
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	
8	MTH211	Statistics [통계학] (3)	
9	MGT102	Entrepreneurship [기업가정신] (3)	
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	
11	ITP117	Introduction to AI Programming Ⅱ [기초인공지능프로그래밍Ⅱ] (3)	●
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	
13	ITP112	Discrete Mathematics [이산수학] (3)	
14	UNI104	Understanding Major (1) Trend in Energy & Chemical Engineering	

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

2. Track(Major) Requirement (트랙(전공) 이수 요건)

<table>
<tr><th>Track
트랙</th><th colspan="2">Category
필수/선택</th><th colspan="2">Required Credit</th><th>Course Code(2021)
2021학년도 과목코드</th><th>Course Title
과목명</th></tr>
<tr><td rowspan="24">1 Track
1트랙</td><td rowspan="23">Required
필수</td><td rowspan="20">Lec.
이론</td><td colspan="2" rowspan="20">Lecture+Lab
30 Credits*
Lecture: 24 Credits</td><td>ECHE201</td><td>Organic Chemistry Ⅰ 유기화학1</td></tr>
<tr><td>ECHE203</td><td>Physical Chemistry Ⅰ 물리화학1</td></tr>
<tr><td>ECHE213</td><td>Analytical Chemistry 분석화학</td></tr>
<tr><td>ECHE202</td><td>Organic Chemistry Ⅱ 유기화학Ⅱ</td></tr>
<tr><td>ECHE222</td><td>Physical Chemistry Ⅱ 물리화학Ⅱ:동역학</td></tr>
<tr><td>ECHE351</td><td>Introduction to Polymer Science and Enignering
고분자과학개론</td></tr>
<tr><td>ECHE304</td><td>Inorganic Chemistry Ⅰ 무기화학Ⅰ</td></tr>
<tr><td>ECHE312</td><td>Electrochemistry 전기화학</td></tr>
<tr><td>ECHE313</td><td>Solid State Chemistry 고체화학</td></tr>
<tr><td>ECHE322</td><td>Instrumental Analysis 기기분석</td></tr>
<tr><td>ECHE321</td><td>Polymer Material Science 고분자재료과학</td></tr>
<tr><td>ECHE212</td><td>Introduction to Chemical Process 화학공정개론</td></tr>
<tr><td>ECHE231</td><td>Chemical Engineering Thermodynamics 화공열역학</td></tr>
<tr><td>ECHE311</td><td>Chemical Reaction Engineering 반응공학</td></tr>
<tr><td>ECHE331</td><td>Transport Phenomena: Momentum, Heat, and Mass Transfer 전달현상:운동량,열,물질전달</td></tr>
<tr><td>ECHE352</td><td>Advanced Fluid Mechanics 고급유체역학</td></tr>
<tr><td rowspan="3">Lab.
실험</td><td colspan="2" rowspan="3">Lab: Take 2
(6 credits)</td><td>ECHE223</td><td>Energy Materials Lab 에너지재료실험</td></tr>
<tr><td>ECHE314</td><td>Energy Conversion and Storage Lab
에너지변환및저장실험</td></tr>
<tr><td>ECHE323</td><td>Solar Cells Lab 태양전지실험</td></tr>
<tr><td rowspan="2">Electve
선택</td><td>'14~15
Curriculum</td><td>18~20
Credits</td><td colspan="2" rowspan="2">Take courses among each year curriculum offered as elective or among 2021 School of Energy and Chemical Engineering elective
연도별 전공선택 및 21학년도 에너지화학공학과 전공선택 중 이수</td></tr>
<tr><td>'16~20
Curriculum</td><td>24~26
Credits</td></tr>
</table>

Track 트랙	Category 필수/선택	Required Credit	Course Code(2021) 2021학년도 과목코드	Course Title 과목명
2 Track	Required 필수	12 Credits	Take 12 credits among above 1st Track Required Lecture courses 1트랙 전공필수 [이론] 과목 리스트 중 12학점 이수	
	Elective 선택	6 Credits	Take courses among each year curriculum offered as elective or among 2021 School of Energy and Chemical Engineering elective 연도별 전공선택 및 21학년도 에너지화학공학과 전공선택 중 이수	

* 1st Track total credit may vary from students to students depending on lab lecture credits
1트랙 이수학점은 실험 교과 학점에 따라 학생별로 상이할 수 있음

If you have taken	Required 필수학점	Elective 선택학점(14~15)	Elective 선택학점(16)
2 credits + 2 credits Lab courses 2학점 + 2학점 실험 이수	28 Credits	20 Credits	26 Credits
2 credits + 3 credits Lab courses 2학점 + 3학점 실험 이수	29 Credits	19 Credits	25 Credits
3 credits + 3 credits Lab courses 3학점 + 3학점 실험 이수	30 Credits	18 Credits	24 Credits

□ Advanced Chemical Engineering(ACE) Track / 화학공학(ACE) 트랙

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credits 15 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	●
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	●
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	●
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	
6	MTH201	Differential Equations [미분방정식] (3)	●
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	
8	MTH211	Statistics [통계학] (3)	
9	MGT102	Entrepreneurship [기업가정신] (3)	
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	
11	ITP117	Introduction to AI Programming Ⅱ [기초인공지능프로그래밍Ⅱ] (3)	●
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	
13	ITP112	Discrete Mathematics [이산수학] (3)	
14	UNI104	Understanding Major (1) Trend in Energy & Chemical Engineering	

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

2. Track(Major) Requirement (트랙(전공) 이수 요건)

<table>
<tr><th>Track
트랙</th><th colspan="2">Category
필수/선택</th><th colspan="2">Required Credit</th><th>Course Code(2021)
2021학년도 과목코드</th><th>Course Title
과목명</th></tr>
<tr><td rowspan="12">1Track
1트랙</td><td rowspan="10">Required
필수</td><td rowspan="8">Lec.
이론</td><td colspan="2" rowspan="8">Lecture+Lab
27 Credits*
Lecture: 21 Credits</td><td>ECHE201</td><td>Organic Chemistry 유기화학1</td></tr>
<tr><td>ECHE203</td><td>Physical Chemistry 물리화학1</td></tr>
<tr><td>ECHE311</td><td>Chemical Reaction Engineering 반응공학</td></tr>
<tr><td>ECHE331</td><td>Transport Phenomena: Momentum, Heat, and Mass Transfer 전달현상:운동량,열,물질전달</td></tr>
<tr><td>ECHE351</td><td>Introduction to Polymer Science and Enigneering
고분자과학개론</td></tr>
<tr><td>ECHE212</td><td>Introduction to Chemical Process
화학공정개론</td></tr>
<tr><td>ECHE231</td><td>Chemical Engineering Thermodynamics
화공열역학</td></tr>
<tr><td>ECHE352</td><td>Advanced Fluid Mechanics
고급유체역학</td></tr>
<tr><td rowspan="3">Lab
실험</td><td rowspan="2">14~16
Curriculum</td><td rowspan="2">Take 1
(3 Cred.)</td><td>ECHE341</td><td>Engineering Biology Lab
생물화학공학실험</td></tr>
<tr><td>ECHE361</td><td>Organic/Physical Chemistry Lab
유기물리화학실험</td></tr>
<tr><td>17~20
Curriculum</td><td>Take 2
(6 Cred.)</td><td>ECHE302</td><td>Advanced Chemical Engineering Lab
첨단화학공학실험</td></tr>
<tr><td rowspan="3">Elective
선택</td><td>14~15
Curriculum</td><td>24~25
Cred.</td><td colspan="2" rowspan="3">Take courses among each year curriculum offered as elective or among 2021 School of Energy and Chemical Engineering elective
연도별 전공선택 및 21학년도 에너지화학공학과 전공선택 중 이수</td></tr>
<tr><td>16
Curriculum</td><td>30~31
Cred.</td></tr>
<tr><td>17~20
Curriculum</td><td>27~29
Cred.</td></tr>
</table>

Track 트랙	Category 필수/선택	Required Credit	Course Code(2021) 2021학년도 과목코드	Course Title 과목명
2Track 2트랙	Required 필수	15 Credits	ECHE201	Organic Chemistry 유기화학1
			ECHE203	Physical Chemistry 물리화학1
			ECHE311	Chemical Reaction Engineering 반응공학
			ECHE331	Transport Phenomena: Momentum, Heat, and Mass Transfer 전달현상:운동량,열,물질전달
			ECHE351	Introduction to Polymer Science and Enigneering 고분자과학개론
			ECHE212	Introduction to Chemical Process 화학공정개론
			ECHE231	Chemical Engineering Thermodynamics 화공열역학
			ECHE352	Advanced Fluid Mechanics 고급유체역학
	Elective 선택	3 Credits	Take courses among each year curriculum offered as elective or among 2021 School of Energy and Chemical Engineering elective 연도별 전공선택 및 21학년도 에너지화학공학과 전공선택 중 이수	

* 1st Track total credit may vary from students to students depending on lab lecture credits
1트랙 이수학점은 실험 교과 학점에 따라 학생별로 상이할 수 있음

14~16 Curriculum			
If you have taken	Required	선택(14~15)	선택(16)
2 credit lab course 2학점 실험 이수	23 Credits	25 Credits	31 Credits
3 credit lab course 3학점 실험 이수	24 Credits	24 Credits	30 Credits

17 Curriculum~		
If you have taken	필수	선택
2 credits + 2 credits Lab courses 2학점 + 2학점 실험 이수	25 Credits	29 Credits
2 credits + 3 credits Lab courses 2학점 + 3학점 실험 이수	26 Credits	28 Credits
3 credits + 3 credits Lab courses 3학점 + 3학점 실험 이수	27 Credits	27 Credits

School of Design and Human Factors Engineering [디자인및인간공학부]

☐ Industrial Design(ID) Track / 산업디자인(ID) 트랙

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credits 13 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	○
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	○
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	○
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	○
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	○
6	MTH201	Differential Equations [미분방정식] (3)	○
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	○
8	MTH211	Statistics [통계학] (3)	◑
9	MGT102	Entrepreneurship [기업가정신] (3)	◑
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	○
11	ITP117	Introduction to AI Programming Ⅱ [기초인공지능프로그래밍Ⅱ] (3)	○
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	○
13	ITP112	Discrete Mathematics [이산수학] (3)	○
14	UNI106	Understanding Major (1) What is Design?	◑

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

2. Track(Major) Requirement (트랙(전공) 이수 요건)

<table>
<tr><th>Track
트랙</th><th>Category
필수/선택</th><th colspan="2">Required Credit</th><th>Course Code(2021)
2021학년도 과목코드</th><th>Course Title
과목명</th></tr>
<tr><td rowspan="16">1 Track
1트랙</td><td rowspan="14">Required
필수</td><td colspan="2" rowspan="14">30 Credits</td><td>DES201</td><td>Design Elements and Principles 디자인요소와원리</td></tr>
<tr><td>DES202</td><td>Product Design Fundamentals 제품디자인기초</td></tr>
<tr><td>DES232</td><td>3D CAD 3D CAD</td></tr>
<tr><td>DES206</td><td>Design Visulaization 디자인시각화</td></tr>
<tr><td>DES332</td><td>UX design research methods UX디자인연구방법</td></tr>
<tr><td>DES405</td><td>Design Communication 디자인커뮤니케이션</td></tr>
<tr><td>DES301</td><td>Creative Design 1 제품디자인1</td></tr>
<tr><td>DES302</td><td>Creative Design 2 제품디자인2</td></tr>
<tr><td>BME222</td><td>인간공학개론</td></tr>
<tr><td>BME490</td><td>캡스톤프로젝트</td></tr>
<tr><td>DES431*</td><td>Creative Design 창의디자인1*</td></tr>
<tr><td>DES432*</td><td>Creative Design 창의디자인2*</td></tr>
<tr><td>DES221</td><td>Design History & Contexts 디자인역사와맥락</td></tr>
<tr><td>DES342</td><td>Service design fundamental
서비스 디자인 기초</td></tr>
<tr><td>DES231</td><td>Design Knowledge and Skills
디자인지식과기술</td></tr>
<tr><td rowspan="2">Elective
선택</td><td>14~15
Curriculum</td><td>18
Cred.</td><td colspan="2" rowspan="3">Take courses among each year curriculum offered as elective or among 2021 Department of Design elective
연도별 전공선택 및 21학년도 디자인학과 전공선택 중 이수</td></tr>
<tr><td>16~20
Curriculum</td><td>24
Cred.</td></tr>
<tr><td rowspan="2">2 Track
2트랙</td><td>Required
필수</td><td rowspan="2">All
students</td><td>-</td></tr>
<tr><td>Elective
선택</td><td>18학점</td></tr>
</table>

1) 2017-2020 교육과정을 따르는 학생들은 DES431 창의디자인1, DES432 창의디자인2를 의무 이수하여야 함
(※ Student who've followed 2017 to 2020 curriculum are mandatory to take both 'DES431' and 'DES432' for the graduation.)

□ Human Factors Engineering(HFE) Track / 인간공학(HFE) 트랙

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credits 13 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	◑
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	◑
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	◑
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	○
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	○
6	MTH201	Differential Equations [미분방정식] (3)	○
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	○
8	MTH211	Statistics [통계학] (3)	◑
9	MGT102	Entrepreneurship [기업가정신] (3)	○
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	○
11	ITP117	Introduction to AI Programming Ⅱ [기초인공지능프로그래밍Ⅱ] (3)	◑
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	○
13	ITP112	Discrete Mathematics [이산수학] (3)	○
14	UNI107	Understanding Major (1) BME to change the world	◑

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

2. Track(Major) Requirement (트랙(전공) 이수 요건)

<table>
<tr><th>Track
트랙</th><th>Category
필수/선택</th><th colspan="2">Required Credit</th><th>Course Code(2021)
2021학년도 과목코드</th><th>Course Title
과목명</th></tr>
<tr><td rowspan="13">1 Track
1트랙</td><td rowspan="9">Required
필수</td><td colspan="2" rowspan="9">14 Curriculum: 24 Credits (Downsized)

15 Curriculum: 18 Credits

16 Curriculum: 21 Credits

17-20 Curriculum: 24 Credits</td><td>BME222</td><td>Introduction to Human Factor Engineering
인간공학개론</td></tr>
<tr><td>BME307</td><td>Biomechanics 생체역학</td></tr>
<tr><td>BME206</td><td>Cognitive Neuroscience 인지신경과학</td></tr>
<tr><td>BME310</td><td>Experimental Design 실험계획법</td></tr>
<tr><td>DES402</td><td>Interactive Technology 인터액티브기술</td></tr>
<tr><td>BME490</td><td>Capstone Project 캡스톤프로젝트*</td></tr>
<tr><td>BME306</td><td>Biostatistics for Engineers 공학통계</td></tr>
<tr><td>MEN201 (or BME301)</td><td>Computational Tools for Engineers
(or Computational Methods for Biomedical Engineering) 공학전산기법 (또는 생명공학전산)</td></tr>
<tr><td>BME211</td><td>Engineeirng Physiology 공학생리학</td></tr>
<tr><td rowspan="4">Elective
선택</td><td>BIO301</td><td>Cell Biology 세포생물학</td></tr>
<tr><td>BME313</td><td>Biomedical Instrumentation Laboratory
의료기기실험</td></tr>
<tr><td>14 Curriculum</td><td>24 Cred.</td><td colspan="2" rowspan="5">Take courses among each year curriculum offered as elective or among 2021 Department of Biomedical Engineering elective
연도별 전공선택 및 21학년도 바이오메디컬공학과 전공선택 중 이수</td></tr>
<tr><td>15 Curriculum</td><td>30 Cred.</td></tr>
<tr><td>16 Curriculum</td><td>33 Cred.</td></tr>
<tr><td>17~20 Curriculum</td><td>30 Cred.</td></tr>
<tr><td>2 Track
2트랙
No Required
*필수없음</td><td>Elective
선택</td><td>All students</td><td>18 Cred.</td></tr>
</table>

※ Students entered from 2015 and after must complete BME490 Capstone project. Students entered before 2014 can take BME490 capstone project as required but it is not mandatory.
15학번 이후 학생들은 BME490 (캡스톤프로젝트) 의무 수강. 14학번 이전 학생들은 BME490 (캡스톤프로젝트) 선택적으로 수강 가능.

※ BME210 Engineering Mathematics course is excluded in required course list with similarity to fundamental math courses. However, if taken it can be substituted with MTH203 Applied Linear Algebra
BME210 공학수학은 계열 기초 수학과목(통계학)과의 유사성으로 전공 필수에서 제외하고 계열 기초 수학과목 중 응용선형대수 대체과목으로 인정 가능.

※ Either BME301 Computational Methods for Biomedical Engineering or MEN201 Computational Tools for Engineers can be counted as Required course. BME301 can be substituted with MEN201. However when taken both courses, only one of them will be counted in required course
BME301 생명공학전산과 MEN201 공학전산기법 중 1개 과목만 전공필수 학점으로 인정함. 기존 필수 과목인 MEN201을 BME301로 대체 이수 가능. 두 과목 모두 수강 할 경우 한 과목만 전공필수학점으로 인정.

School of Life Sciences [생명과학부]

□ Biological Sciences(BIO) Track / 생명과학(BIO) 트랙

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credits 15 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	○
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	○
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	○
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	○
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	○
6	MTH201	Differential Equations [미분방정식] (3)	
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	●
8	MTH211	Statistics [통계학] (3)	●
9	MGT102	Entrepreneurship [기업가정신] (3)	
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	○
11	ITP117	Introduction to AI Programming Ⅱ [기초인공지능프로그래밍Ⅱ] (3)	○
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	
13	ITP112	Discrete Mathematics [이산수학] (3)	
14	UNI109	Understanding Major (1) Current Topics in Biological Sciences	○

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

2. Track(Major) Requirement (트랙(전공) 이수 요건)

<table>
<tr><th>Track
트랙</th><th>Category
필수/선택</th><th colspan="2">Required Credit</th><th>Course Code(2021)
2021학년도 과목코드</th><th>Course Title
과목명</th></tr>
<tr><td rowspan="12">1 Track
1트랙</td><td rowspan="11">Required
필수</td><td colspan="2" rowspan="11">23 Credit</td><td>BIO201</td><td>Molecular Biology 분자생물학</td></tr>
<tr><td>BIO211</td><td>Biochemistry Ⅰ 생화학Ⅰ</td></tr>
<tr><td>BIO301</td><td>Cell Biology 세포생물학</td></tr>
<tr><td>BIO430</td><td>Developmental Biology 발생학</td></tr>
<tr><td>BIO332</td><td>Anatomy and Physiology 해부및생리학</td></tr>
<tr><td>BIO221</td><td>Biochemistry Ⅱ 생화학Ⅱ</td></tr>
<tr><td>BIO261</td><td>Biochemistry Laboratory 생화학실험</td></tr>
<tr><td>BIO333</td><td>Genetics 유전학</td></tr>
<tr><td>BIO330</td><td>Bioinformatics 생물정보학</td></tr>
<tr><td>BIO432</td><td>Immunology 면역학</td></tr>
<tr><td>BIO305</td><td>Neuroscience Ⅰ 신경과학Ⅰ</td></tr>
<tr><td>BIO331</td><td>Microbiology 미생물학</td></tr>
<tr><td rowspan="2">Elective
선택</td><td>14~15 Curriculum</td><td>25 Cred.</td><td colspan="2" rowspan="2">Take courses among each year curriculum offered as elective or among 2021 Department of Biological Sciences elective
연도별 전공선택 및 21학년도 생명과학과 전공선택 중 이수</td></tr>
<tr><td>16~20 Curriculum</td><td>31 Cred.</td></tr>
<tr><td rowspan="10">2 Track
2트랙</td><td rowspan="9">Required
필수</td><td colspan="2" rowspan="9">15 Credit</td><td>BIO201</td><td>Molecular Biology 분자생물학</td></tr>
<tr><td>BIO211</td><td>Biochemistry Ⅰ 생화학Ⅰ</td></tr>
<tr><td>BIO301</td><td>Cell Biology 세포생물학</td></tr>
<tr><td>BIO430</td><td>Developmental Biology 발생학</td></tr>
<tr><td>BIO332</td><td>Anatomy and Physiology 해부및생리학</td></tr>
<tr><td>BIO305</td><td>Neuroscience Ⅰ 신경과학Ⅰ</td></tr>
<tr><td>BIO432</td><td>Immunology 면역학</td></tr>
<tr><td>BIO330</td><td>Bioinformatics 생물정보학</td></tr>
<tr><td>Elective
선택</td><td colspan="2">3 Credit</td><td colspan="2">Take courses among each year curriculum offered as elective or among 2021 Department of Biological Sciences elective
연도별 전공선택 및 21학년도 생명과학과 전공선택 중 이수</td></tr>
</table>

□ Biomedical Engineering(BME) Track / 생명공학(BME) 트랙

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credits 16 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	◑
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	◑
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	◑
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	○
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	○
6	MTH201	Differential Equations [미분방정식] (3)	○
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	○
8	MTH211	Statistics [통계학] (3)	◑
9	MGT102	Entrepreneurship [기업가정신] (3)	○
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	○
11	ITP117	Introduction to AI Programming Ⅱ [기초인공지능프로그래밍Ⅱ] (3)	◑
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	○
13	ITP112	Discrete Mathematics [이산수학] (3)	○
14	UNI107	Understanding Major (1) BME to change the world	◑

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

2. Track(Major) Requirement (트랙(전공) 이수 요건)

<table>
<tr><th>Track
트랙</th><th>Category
필수/선택</th><th colspan="2">Required Credit</th><th>Course Code(2021)
2021학년도 과목코드</th><th>Course Title
과목명</th></tr>
<tr><td rowspan="10">1 Track
1트랙</td><td rowspan="8">Required
필수</td><td colspan="2" rowspan="8">24 Credits</td><td>BME211</td><td>Engineering Physiology 공학생리학</td></tr>
<tr><td>BME235</td><td>Tissue Engineering 조직공학</td></tr>
<tr><td>BME301</td><td>Computational Methods for Biomedical Engineering
생명공학전산</td></tr>
<tr><td>BME311</td><td>Transport Phenomena in Biological Systems
생체유체역학</td></tr>
<tr><td>BIO301</td><td>Cell Biology 세포생물학</td></tr>
<tr><td>BME313</td><td>Biomedical Instrumentation Laboratory 의료기기실험</td></tr>
<tr><td>BME204</td><td>Biosensors & Signals 바이오센서와신호</td></tr>
<tr><td>BME490</td><td>Capstone Project 캡스톤프로젝트</td></tr>
<tr><td rowspan="2">Elective
선택</td><td>14~15 Curriculum</td><td>24 Cred.</td><td colspan="2" rowspan="2">Take courses among each year curriculum offered as elective or among 2021 Department of Biomedical Engineering elective
연도별 전공선택 및 21학년도 바이오메디컬공학과 전공선택 중 이수</td></tr>
<tr><td>16~20 Curriculum</td><td>30 Cred.</td></tr>
<tr><td rowspan="5">2 Track
2트랙</td><td rowspan="4">Required
필수</td><td colspan="2" rowspan="4">12 Credits</td><td>BME211</td><td>Engineering Physiology 공학생리학</td></tr>
<tr><td>BME301</td><td>Computational Methods for Biomedical Engineering
생명공학전산</td></tr>
<tr><td>BME311</td><td>Transport Phenomena in Biological Systems
생체유체역학</td></tr>
<tr><td>BME235</td><td>Tissue Engineering 조직공학</td></tr>
<tr><td>Elective
선택</td><td colspan="2">6 Credits</td><td colspan="2">Take courses among each year curriculum offered as elective or among 2021 Department of Biomedical Engineering elective
연도별 전공선택 및 21학년도 바이오메디컬공학과 전공선택 중 이수</td></tr>
</table>

〈Notice〉

※ For 1st Track students, students can choose up to 2 courses taken until 2021 1st semester among BME411 Biological Physics, BME201 Introduction to Network Biology, BME212 Bio-instrumental Analysis, BIO332 Anatomy and Physiology as required

※ For 2nd Track students, students can choose up to 1 courses taken until 2021 1st semester among BME411 Biological Physics, BME201 Introduction to Network Biology, BME212 Bio-instrumental Analysis, BIO332 Anatomy and Physiology as required

※ 1st Track students entered after 2015 must complete BME490 Capstone project. (It can be substituted with either BME470 BME Senior Design Ⅰ or BME480 BME Senior Design Ⅱ)

※ BME210 Engineering Mathematics course is excluded in required course list with similarity to fundamental math courses. However, if taken it can be substituted with MTH203 Applied Linear Algebra

〈안내사항〉

※ 1트랙의 경우 BME411 (생물물리학), BME201 (네트워크생물학개론), BME212 (의료기기분석), BIO332 (해부및생리학) 중 21학년도 1학기까지 수강 한 교과에 한하여 전공 필수로 최대 2개 교과 인정

※ 2트랙의 경우 BME411 (생물물리학), BME201 (네트워크생물학개론), BME212 (의료기기분석), BIO332 (해부및생리학) 중 21학년도 1학기까지 수강 한 교과에 한하여 최대 1개 교과 인정

※ 1트랙의 경우 15학번 이후 학생들은 BME490 (캡스톤 프로젝트) 의무 수강. BME470 (BME시니어 디자인Ⅰ) 또는 BME480 (BME시니어디자인Ⅱ) 으로 대체 가능.

※ BME210 공학수학은 계열기초 수학과목과의 유사성으로 전공 필수에서 제외하나, 계열기초 응용선형대수 과목으로 대체 인정.

School of Electrical and Computer Engineering [전기전자컴퓨터공학부]

☐ Electrical Engineering(EE) Track / 전기전자공학(EE) 트랙

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credits 15 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	●
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	◑
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	○
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	○
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	○
6	MTH201	Differential Equations [미분방정식] (3)	●
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	●
8	MTH211	Statistics [통계학] (3)	○
9	MGT102	Entrepreneurship [기업가정신] (3)	○
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	○
11	ITP117	Introduction to AI Programming Ⅱ [기초인공지능프로그래밍Ⅱ] (3)	◑
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	◑
13	ITP112	Discrete Mathematics [이산수학] (3)	○
14	UNI110	Understanding Major (1) Introduction to Modern Electrical Engineering	○

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

2. Track(Major) Requirement (트랙(전공) 이수 요건)

Track 트랙	Category 필수/선택	Required Credit		Course Code(2021) 2021학년도 과목코드	Course Title 과목명
1 Track 1트랙	Required 필수	21 Credits		EEE201	Basic Circuit Theory and Laboratory 회로이론 및 실험
				EEE202	Digital Logic and Laboratory 디지털로직 및 실험
				EEE204	Electromagnetics Ⅰ 전자기학Ⅰ
				EEE205	Signals and Systems 신호및시스템
				EEE301	Communications and Information Theory 통신 및 정보 이론
				EEE302	Electric Energy Systems 전기에너지시스템
				EEE303	Microelectronics Ⅰ and Laboratory 전자회로Ⅰ 및 실험
				EEE304	Semiconductor Engineering 반도체공학
				EEE311	Microelectronics Ⅱ and Laboratory 전자회로Ⅱ 및 실험
				EEE351	Automatic Control 자동제어
				EEE352	Digital Signal Processing 디지털신호처리
				ITP111	Probability and Random Processes 확률과 랜덤 프로세스
	Elective 선택	14~15 Curriculum	27 Cred.	Take courses among each year curriculum offered as elective or among 2021 Department of Electrical Engineering elective 연도별 전공선택 및 21학년도 전기전자공학과 전공선택 중 이수	
		16~20 Curriculum	33 Cred.		

Track 트랙	Category 필수/선택	Required Credit	Course Code(2021) 2021학년도 과목코드	Course Title 과목명
2 Track 2트랙	Required 필수	12 Credits	EEE201	Basic Circuit Theory and Laboratory 회로이론 및 실험
			EEE202	Digital Logic and Laboratory 디지털로직 및 실험
			EEE204	Electromagnetics Ⅰ 전자기학Ⅰ
			EEE205	Signals and Systems 신호및시스템
			EEE301	Communications and Information Theory 통신 및 정보 이론
			EEE302	Electric Energy Systems 전기에너지시스템
			EEE303	Microelectronics Ⅰ and Laboratory 전자회로Ⅰ 및 실험
			EEE304	Semiconductor Engineering 반도체공학
	Elective 선택	6 Credits	Take courses among each year curriculum offered as elective or among 2021 Department of Electrical Engineering elective 연도별 전공선택 및 21학년도 전기전자공학과 전공선택 중 이수	

※ Required credits is based on credits not courses
필수 이수학점은 교과목 아닌 학점 기준

※ EE320 Digital System Lab course is not required for track-based curriculum. This course will only be offered upon request of students in 2022 as Special topic course(elective course) EE320
다지털시스템실험: 트랙제 통합요건에서 필수과목이 아니며, 과목의 수요가 발생할 때 전공선택 특론 교과목으로 2022년에 한하여 개설 예정

※ ITP111 Probability and Random Process is identical course with EE211 Probability and Random Process and can be counted as required course.
ITP111 확률과 랜덤 프로세스는 EE211 확률과 랜덤 프로세스개론과 동일과목으로 전공 필수로 인정받을 수 있음.

□ Computer Science and Engineering(CSE) Track / 컴퓨터공학(CSE) 트랙

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credits 15 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	○
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	
6	MTH201	Differential Equations [미분방정식] (3)	○
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	●
8	MTH211	Statistics [통계학] (3)	◑
9	MGT102	Entrepreneurship [기업가정신] (3)	
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	○
11	ITP117	Introduction to AI Programming Ⅱ [기초인공지능프로그래밍Ⅱ] (3)	●
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	◑
13	ITP112	Discrete Mathematics [이산수학] (3)	●
14	UNI111	Understanding Major (1) Introduction to CSE	◑

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

2. Track(Major) Requirement (트랙(전공) 이수 요건)

<table>
<tr><th>Track
트랙</th><th>Category
필수/선택</th><th colspan="2">Required Credit</th><th>Course Code(2021)
2021학년도 과목코드</th><th>Course Title
과목명</th></tr>
<tr><td rowspan="12">1Track
1트랙</td><td rowspan="11">Required
필수</td><td colspan="2" rowspan="11">33 Credits</td><td>CSE221</td><td>Data Structures 데이터구조</td></tr>
<tr><td>CSE241</td><td>Advanced Programming 고급프로그래밍</td></tr>
<tr><td>CSE331</td><td>Introduction to Algorithms 알고리즘</td></tr>
<tr><td>EEE202</td><td>Digital Logic and Laboratory 디지털로직 및 실험</td></tr>
<tr><td>CSE251</td><td>System Programming 시스템프로그래밍</td></tr>
<tr><td>ITP111</td><td>Probability and Random Process
확률과랜덤프로세스개론</td></tr>
<tr><td>ITP112</td><td>Discrete Mathematics 이산수학</td></tr>
<tr><td>CSE261</td><td>Computer Architecture 컴퓨터구조</td></tr>
<tr><td>CSE311</td><td>Operating Systems 운영체제</td></tr>
<tr><td>CSE332</td><td>Theory of Computation 계산이론</td></tr>
<tr><td>CSE271</td><td>Principles of Programming Languages 프로그래밍언어</td></tr>
<tr><td>CSE351</td><td>Computer Networs 컴퓨터네트워크</td></tr>
<tr><td rowspan="2">Elective
선택</td><td>14~15 Curriculum</td><td>15 Cred.</td><td colspan="2" rowspan="2">Take courses among each year curriculum offered as elective or among 2021 Department of Computer Science and Engineering elective
연도별 전공선택 및 21학년도 컴퓨터공학과 전공선택 중 이수</td></tr>
<tr><td>16~20 Curriculum</td><td>21 Cred.</td></tr>
<tr><td rowspan="4">2Track
2트랙</td><td rowspan="3">Required
필수</td><td colspan="2" rowspan="3">3 Credits</td><td>CSE221</td><td>Data Structures 데이터구조</td></tr>
<tr><td>CSE241</td><td>Advanaced Programming 고급프로그래밍</td></tr>
<tr><td>CSE331</td><td>Introduction to Algorithms 알고리즘</td></tr>
<tr><td>Elective
선택</td><td colspan="2">15 Credits</td><td colspan="2">Take courses among each year curriculum offered as elective or among 2021 Department of Computer Science and Engineering elective
연도별 전공선택 및 21학년도 컴퓨터공학과 전공선택 중 이수</td></tr>
</table>

※ As 'Discrete Mathematics' course is included in both basic and major, students can choose the category
※ '이산수학' 과목의 경우 계열기초 영역과 중복되어 학생에게 이수구분에 대한 선택권을 부여함.

School of Management Engineering
[경영공학부]

☐ Management Engineering(MGE) Track / 경영공학(MGE) 트랙

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credits 15 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	○
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	
6	MTH201	Differential Equations [미분방정식] (3)	
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	●
8	MTH211	Statistics [통계학] (3)	●
9	MGT102	Entrepreneurship [기업가정신] (3)	
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	○
11	ITP117	Introduction to AI Programming Ⅱ [기초인공지능프로그래밍Ⅱ] (3)	●
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	
13	ITP112	Discrete Mathematics [이산수학] (3)	○
14	UNI108	Understanding Major (1) Industrial Engineering Relay Seminar	○

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

2. Track(Major) Requirement (트랙(전공) 이수 요건)

<table>
<tr><th>Track
트랙</th><th>Category
필수/선택</th><th colspan="2">Required Credit</th><th colspan="2">Course Code(2021)
2021학년도 과목코드</th><th>Course Title
과목명</th></tr>
<tr><td rowspan="12">1 Track
1트랙</td><td rowspan="10">Required
필수</td><td colspan="2" rowspan="10">24 Credits</td><td colspan="2">IE201</td><td>Operations Research Ⅰ 계량경영학Ⅰ</td></tr>
<tr><td colspan="2">IE209</td><td>Industrial Operations Management 생산운영관리</td></tr>
<tr><td colspan="2">IE303</td><td>Data Mining 데이터마이닝</td></tr>
<tr><td colspan="2">IE305</td><td>Operations Research Ⅱ 계량경영학Ⅱ</td></tr>
<tr><td colspan="2">IE313</td><td>Time-Series Analysis 시계열분석</td></tr>
<tr><td colspan="2">IE404</td><td>Data-driven Process Management
데이터기반프로세스관리</td></tr>
<tr><td colspan="2">IE406</td><td>Applied Machine Learning 기계학습응용</td></tr>
<tr><td colspan="2">IE207</td><td>Statistical Computing 통계계산</td></tr>
<tr><td colspan="2">IE314</td><td>Investment Science 계량투자론</td></tr>
<tr><td>Must-take course</td><td>IE450</td><td>Project Lab 프로젝트랩</td></tr>
<tr><td rowspan="2">Elective
선택</td><td>14~15 Curriculum</td><td>24 Cred.</td><td colspan="3" rowspan="2">Take courses among each year curriculum offered as elective or among 2021 Department of Industrial Engineering elective
연도별 전공선택 및 21학년도 산업공학과 전공선택 중 이수</td></tr>
<tr><td>16~20 Curriculum</td><td>30 Cred.</td></tr>
<tr><td rowspan="2">2 Track
2트랙</td><td>Required
필수</td><td colspan="2">9학점</td><td colspan="3">Take 9 credits among 1 Track required courses
1트랙 필수 교과 중 9학점 선택 이수</td></tr>
<tr><td>Elective
선택</td><td colspan="2">9학점</td><td colspan="3">Take courses among each year curriculum offered as elective or among 2021 Department of Industrial Engineering elective
연도별 전공선택 및 21학년도 산업공학과 전공선택 중 이수</td></tr>
</table>

※ 1st Track students must complete IE450 Project Lab(Project Lab course will be exempted for 2016 entrants who have completed all the required courses(30 credits) by 2021-1st semester.) 1트랙의 경우 프로젝트랩(IE450)은 반드시 이수 (단, 2016년 교육과정을 따르는 학생 중 2021-1학기까지 기존 전공 필수 학점(30학점)을 모두 이수한 학생의 경우 프로젝트랩 교과 필수 이수 제외)

※ Required courses taken before the above integrated graduation requirements will also be counted as required courses. However, Identical courses will not be double counted. 2021학년도 트랙제 통합요건 적용 이전에 수강한 입학년도 교육과정 전공필수 교과목에 대하여 모두 전공필수 이수학점으로 인정함. 단, 위의 교과목과 동일(Identical) 교과목의 경우는 중복 인정 불가

※ Only above courses will be counted as required courses since the integrated graduation requirement has been set. 2021학년도 트랙제 통합요건 적용 이후에는 위의 교과목만을 전공필수로 인정함.

School of Natural Sciences [자연과학부]

□ Physics(PHY) Track / 물리학(PHY) 트랙

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credits 13 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	●
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	●
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	○
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	●
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	○
6	MTH201	Differential Equations [미분방정식] (3)	●
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	●
8	MTH211	Statistics [통계학] (3)	○
9	MGT102	Entrepreneurship [기업가정신] (3)	○
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	○
11	ITP117	Introduction to AI Programming Ⅱ [기초인공지능프로그래밍Ⅱ] (3)	○
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	○
13	ITP112	Discrete Mathematics [이산수학] (3)	○
14	UNI112	Understanding Major (1) Physics & Innovative Technology	○

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

2. Track(Major) Requirement (트랙(전공) 이수 요건)

Track 트랙	Category 필수/선택	Required Credit		Course Code(2021) 2021학년도 과목코드	Course Title 과목명
1 Track 1트랙	Required 필수	24 Credits		PHY201	Classical Mechanics Ⅰ 고전역학 Ⅰ
				PHY203	Electromagnetism Ⅰ 전자기학 Ⅰ
				PHY301	Quantum Physics Ⅰ 양자물리학 Ⅰ
				PHY303	Thermal and Statistical Physics Ⅰ 열 및 통계물리학 Ⅰ
				PHY207	Physics Lab Ⅰ 물리학실험 Ⅰ
				PHY213	Modern Physics 현대물리학
				PHY223	Mathematical Physics 수리물리학
				PHY311	Computational Physics 전산물리학
	Elective 선택	14~15 Curriculum	24 Cred.	Take courses among each year curriculum offered as elective or among 2021 Department of Physics elective 연도별 전공선택 및 21학년도 물리학과 전공선택 중 이수	
		16~20 Curriculum	30 Cred.		
2 Track 2트랙	Required 필수	12 Credits		PHY201	Classical Mechanics Ⅰ 고전역학 Ⅰ
				PHY203	Electromagnetism Ⅰ 전자기학 Ⅰ
				PHY301	Quantum Physics Ⅰ 양자물리학 Ⅰ
				PHY303	Thermal and Statistical Physics Ⅰ 열 및 통계물리학 Ⅰ
	Elective 선택	6 Credits		Take courses among each year curriculum offered as elective or among 2021 Department of Physics elective 연도별 전공선택 및 21학년도 물리학과 전공선택 중 이수	

- For students entered before 2015(including 2015), PHY204 Electromagnetism Ⅱ, PHY302 Quantum Physics Ⅱ, PHY307 Physics Lab Ⅱ will also be counted as track required course.
  2015학년도 이전 입학한 학생들(2015학번 포함)의 경우, 전자기학2(PHY204), 양자물리학2(PHY302), 물리학실험 2(PHY307)도 1트랙 전공필수과목으로 인정함.
- Students following track based curriculum can choose either interdisciplinary project or PHY490 Graduation Thesis
  트랙제 적용 대상자의 경우, 기존 졸업요건인 창의시스템구현 또는 PHY490 졸업논문을 선택할 수 있음.

□ Mathematical Sciences(MTH) Track / 수리과학(MTH) 트랙

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credits 15 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	●
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	
6	MTH201	Differential Equations [미분방정식] (3)	●
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	●
8	MTH211	Statistics [통계학] (3)	●
9	MGT102	Entrepreneurship [기업가정신] (3)	
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	
11	ITP117	Introduction to AI Programming Ⅱ [기초인공지능프로그래밍Ⅱ] (3)	●
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	
13	ITP112	Discrete Mathematics [이산수학] (3)	
14	UNI113	Understanding Major (1) Introduction to Modern Mathematics	

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

2. Track(Major) Requirement (트랙(전공) 이수 요건)

<table>
<tr><th>Track
트랙</th><th>Category
필수/선택</th><th colspan="2">Required Credit</th><th>Course Code(2021)
2021학년도 과목코드</th><th>Course Title
과목명</th></tr>
<tr><td rowspan="12">1 Track
1트랙</td><td rowspan="11">Required
필수</td><td colspan="2" rowspan="11">30 Credits</td><td>MTH204</td><td>Linear Algebra 선형대수학</td></tr>
<tr><td>MTH251</td><td>Mathematical Analysis Ⅰ 해석학Ⅰ</td></tr>
<tr><td>MTH252</td><td>Mathematical Analysis Ⅱ 해석학Ⅱ</td></tr>
<tr><td>MTH302</td><td>Modern Algebra Ⅰ 현대대수학Ⅰ</td></tr>
<tr><td>MTH313</td><td>Complex Analysis Ⅰ 복소해석학Ⅰ</td></tr>
<tr><td>MTH315</td><td>Ordinary Differential Equations 상미분방정식론</td></tr>
<tr><td>MTH321</td><td>Numerical Analysis 수치해석학</td></tr>
<tr><td>MTH342</td><td>Probability 확률론</td></tr>
<tr><td>MTH351</td><td>General Topology 위상수학</td></tr>
<tr><td>MTH413</td><td>Differential Geometry Ⅰ 미분기하학Ⅰ</td></tr>
<tr><td>MTH421</td><td>Introduction to Partial Differential Equations
편미분방정식개론</td></tr>
<tr><td rowspan="2">Elective
선택</td><td>14~15
Curriculum</td><td>18
Cred.</td><td colspan="2" rowspan="2">Take courses among each year curriculum offered as elective or among 2021 Department of Mathematical Sciences elective
연도별 전공선택 및 21학년도 수리과학과 전공선택 중 이수</td></tr>
<tr><td>16~20
Curriculum</td><td>24
Cred.</td></tr>
<tr><td rowspan="5">2 Track
2트랙</td><td rowspan="4">Required
필수</td><td colspan="2" rowspan="4">12 Credits</td><td>MTH251</td><td>Mathematical Analysis Ⅰ 해석학Ⅰ</td></tr>
<tr><td>MTH302</td><td>Modern Algebra Ⅰ 현대대수학Ⅰ</td></tr>
<tr><td>MTH313</td><td>Complex Analysis Ⅰ 복소해석학Ⅰ</td></tr>
<tr><td>MTH351</td><td>General Topology 위상수학</td></tr>
<tr><td>Elective
선택</td><td colspan="2">6 Credits</td><td colspan="2">Take courses among each year curriculum offered as elective or among 2021 Department of Mathematical Sciences elective
연도별 전공선택 및 21학년도 수리과학과 전공선택 중 이수</td></tr>
</table>

- Students following track based curriculum can choose either interdisciplinary project or MTH490 Graduation Thesis
  트랙제 적용 대상자의 경우, 기존 졸업요건인 창의시스템구현 또는 MTH490 졸업논문을 선택할 수 있음.

□ Chemistry(CHM) Track / 화학(CHM) 트랙

1. Basic Course requirement[Basic Element] (기초 이수 요건(기초선택))

No.	Course Code 과목코드	Course Title 교과목명	Credits 14 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	●
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	●
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	●
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	○
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	●
6	MTH201	Differential Equations [미분방정식] (3)	○
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	○
8	MTH211	Statistics [통계학] (3)	○
9	MGT102	Entrepreneurship [기업가정신] (3)	○
10	IE101	Introduction to Data Science [데이터사이언스개론] (3)	○
11	ITP117	Introduction to AI Programming Ⅱ [기초인공지능프로그래밍Ⅱ] (3)	●
12	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	○
13	ITP112	Discrete Mathematics [이산수학] (3)	○
14	UNI114	Understanding Major (1) Why Chemistry?	

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

2. Track(Major) Requirement (트랙(전공) 이수 요건)

<table>
<tr><th>Track
트랙</th><th>Category
필수/선택</th><th colspan="2">Required Credit</th><th>Course Code(2021)
2021학년도 과목코드</th><th>Course Title
과목명</th></tr>
<tr><td rowspan="12">1 Track
1트랙</td><td rowspan="10">Required
필수</td><td colspan="2" rowspan="10">27 Credits</td><td>CHM201</td><td>Organic Chemistry Lab 유기화학실험</td></tr>
<tr><td>CHM211</td><td>Organic Chemistry Ⅰ 유기화학Ⅰ</td></tr>
<tr><td>CHM212</td><td>Organic Chemistry Ⅱ 유기화학Ⅱ</td></tr>
<tr><td>CHM231</td><td>Physical Chemistry Ⅰ 물리화학Ⅰ</td></tr>
<tr><td>CHM232</td><td>Physical Chemistry Ⅱ 물리화학Ⅱ</td></tr>
<tr><td>CHM291</td><td>Analytical Chemistry Ⅰ 분석화학Ⅰ</td></tr>
<tr><td>CHM301</td><td>Inorganic Chemistry Lab 무기화학실험</td></tr>
<tr><td>CHM302</td><td>Physical Chemistry Lab 물리화학실험</td></tr>
<tr><td>CHM321</td><td>Biochemistry 생화학Ⅰ</td></tr>
<tr><td>CHM351</td><td>Inorganic Chemistry 무기화학Ⅰ</td></tr>
<tr><td rowspan="2">Elective
선택</td><td>14~15 Curriculum</td><td>21 Cred.</td><td colspan="2" rowspan="2">Take courses among each year curriculum offered as elective or among 2021 Department of Chemistry elective
연도별 전공선택 및 21학년도 화학과 전공선택 중 이수</td></tr>
<tr><td>16~20 Curriculum</td><td>27 Cred.</td></tr>
<tr><td rowspan="2">2 Track
2트랙</td><td>Required
필수</td><td colspan="2">12 Credits</td><td colspan="2">Take 12 credits among above 1 Track Required courses
위 필수과목 리스트 중 12학점 이수</td></tr>
<tr><td>Elective
선택</td><td colspan="2">6 Credits</td><td colspan="2">Take courses among each year curriculum offered as elective or among 2021 Department of Chemistry elective
연도별 전공선택 및 21학년도 화학과 전공선택 중 이수</td></tr>
</table>

- Required credits and course list are integrated but already taken courses can be counted as required/elective according to previous each year curriculum. 필수학점 및 교과목은 통합하나 입학 연도 기준 교육과정의 교과 구분에 따라 전공필수/선택과목 여부를 인정할 수 있다.
- Students following track-based curriculum should complete Interdisciplinary project. (Students following department-based curriculum should complete CHM400 thesis) 트랙제 적용 대상자의 경우 기존 졸업요건인 창의시스템구현을 이수한다. (학과제의 경우 모두 CHM400 졸업논문을 이수하도록 한다.)

School of Business Administration
[경영학부]

1. Basic Course requirement[Basic Element]: Applies to both MGT, FIA Track
기초 이수 요건(기초선택): 경영학, 재무회계학 트랙 모두 해당됨

No.	Course Code 과목코드	Course Title 교과목명	Credits 19 Credits
1	MTH112	Calculus Ⅱ [미적분학Ⅱ] (3)	○
2	PHY103	General Physics Ⅱ [일반물리학Ⅱ] (3)	
3	CHM102	General Chemistry Ⅱ [일반화학Ⅱ] (3)	
4	PHY108	General Physics Lab Ⅱ [일반물리실험Ⅱ] (1)	
5	CHM106	General Chemistry Lab Ⅱ [일반화학실험Ⅱ] (1)	
6	MTH201	Differential Equations [미분방정식] (3)	○
7	MTH203	Applied Linear Algebra [응용선형대수] (3)	●
8	MTH211	Statistics [통계학] (3)	●
9	MGT102	Entrepreneurship [기업가정신] (3)	●
10	MGT106	Economics [경제원론] (3)	●
11	IE101	Introduction to Data Science [데이터사이언스개론] (3)	○
12	ITP117	Introduction to AI Programming Ⅱ [기초인공지능프로그래밍Ⅱ] (3)	○
13	ITP111	Probability & Random Process [확률과랜덤프로세스개론] (3)	○
14	ITP112	Discrete Mathematics [이산수학] (3)	○
15	UNI115	Understanding Major (1) Principles of Management	○

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

* For students entered before 2020, below announcement will be applied.
  - One of General Physics, General Chemistry, General Biology will be counted as basic required. Among courses not counted as basic required, one course can be substituted for UNI115 Principles of Management, and the other can be substituted among one of the basic elective courses.

* 2020년 이전 입학생의 경우, 아래 내용을 적용함
  - 일반물리, 일반화학, 일반생물 중 1과목은 기초 필수과목으로 인정함. 기초 필수과목으로 인정받지 않은 2개 과목 중 1과목은 경영원론을 대체할 수 있으며, 나머지 1과목은 기초 선택(○)과목으로 인정할 수 있음

□ Management(MGT) Track / 경영학(MGT) 트랙

- Track(Major) Requirement (트랙(전공) 이수 요건)

Track 트랙	Category 필수/선택	Required Credit		Course Code(2021) 2021학년도 과목코드	Course Title 과목명
1 Track 1트랙	Required 필수	18 Credits		MGT101	Business Communication & Leadership 비즈니스커뮤니케이션
				MGT202	Organizational Behavior 조직행동론
				MGT203	International Business 국제경영학
				MGT204	Marketing Management 마케팅관리
				MGT205	Financial Accounting 재무회계
				MGT207	Financial Management 재무관리
				MGT499	Strategic Management 경영전략
				MGT201	Management Information System 경영정보론
				MGT209	Operations Management 생산운영관리
				MGT206	Managerial Accounting 관리회계
				MGT210	Data Analysis & Decision Making 경영통계분석
				MGT211	Microeconomics 미시경제학
	Elective 선택	14~15 Curriculum	30 Cred.	Take courses among each year curriculum offered as elective or among 2021 School of Business Administration elective 연도별 전공선택 및 21학년도 경영과학부 전공선택 중 이수	
		16~20 Curriculum	36 Cred.		
2 Track 2트랙	Required 필수	9 Credits		MGT202	Organizational Behavior 조직행동론
				MGT203	International Business 국제경영학
				MGT204	Marketing Management 마케팅관리
				MGT205	Financial Accounting 재무회계
				MGT206	Managerial Accounting 관리회계
				MGT207	Financial Management 재무관리
				MGT209	Operations Management 생산운영관리
				MGT210	Data Analysis & Decision Making 경영통계분석
				MGT211	Microeconomics 미시경제학
				MGT499	Strategic Management 경영전략
	Elective 선택	9 Credits		Take courses among each year curriculum offered as elective or among 2021 School of Business Administration elective 연도별 전공선택 및 21학년도 경영과학부 전공선택 중 이수	

□ Finance and Accounting (FIA) Track / 재무회계학(FIA) 트랙

- Track(Major) Requirement (트랙(전공) 이수 요건)

Track 트랙	Category 필수/선택	Required Credit		Course Code(2021) 2021학년도 과목코드	Course Title 과목명
1 Track 1트랙	Required 필수	18 Credits		MGT102	Business Communication & Leadership 비즈니스커뮤니케이션
				MGT201	Management Information Systems 경영정보론
				MGT205	Financial Accounting 재무회계
				MGT207	Financial Management 재무관리
				MGT211	Microeconomics 미시경제학
				FIA301	Investments 투자론
				FIA303	Futures and Option 선물과 옵션
				FIA305	Corporate Finance 기업재무론
				FIA321	Intermediate Accounting 1 중급회계1
				FIA331	Introduction to Financial Engineering 금융공학개론
				FIA332	Quantitative Fiance 계량재무론
				FIA441	Financial Statement Analysis 재무제표분석
				MGT206	Managerial Accounting 관리회계
				MGT210	Data Analysis & Decision Making 경영통계분석
				MGT312	Macroeconomics 거시경제학
				MGT315	Econometrics 계량경제학
	Elective 선택	14~15 Curriculum	30 Cred.	Take courses among each year curriculum offered as elective or among 2021 School of Business Administration elective 연도별 전공선택 및 21학년도 경영과학부 전공선택 중 이수	
		16~20 Curriculum	36 Cred.		
2 Track 2트랙	Required 필수	9 Credits		FIA301	Investments 투자론
				FIA305	Corporate Finance 기업재무론
				MGT205	Financial Accounting 재무회계
				MGT206	Managerial Accounting 관리회계
				MGT207	Financial Management 재무관리
				MGT210	Data Analysis & Decision Making 경영통계분석
				MGT211	Microeconomics 미시경제학
	Elective 선택	9 Credits		Take courses among each year curriculum offered as elective or among 2021 School of Business Administration elective 연도별 전공선택 및 21학년도 경영과학부 전공선택 중 이수	

□ Entrepreneurship(EPS) Track / 벤처경영(EPS) 트랙

- Track(Major) Requirement (트랙(전공) 이수 요건)

Track 트랙	Category 필수/선택	Required Credit	Course Code(2021) 2021학년도 과목코드	Course Title 과목명
2Track 2트랙	Required 필수	9 Credits	MGT204	Marketing Management 마케팅관리
			MGT205	Financial Accounting 재무회계
			MGT361	Technology Management 기술경영
			MGT473	Entrepreneurship and Venture Management 창업과 벤처
			MGT499	Strategic Management 경영전략
	Elective 선택	9 Credits	Take courses among each year curriculum offered as elective or among 2021 School of Business Administration elective 연도별 전공선택 및 21학년도 경영과학부 전공선택 중 이수	