

Curriculum map (Department of Mechanical and Systems Engineering)

⊙ Required Subjects Restricted Subjects

Classification	Number of credits : 1				Number of credits : 2				Number of credits : 3				Number of credits : 4					
	Term 1	Term 2	Term 3	Term 4	Term 1	Term 2	Term 3	Term 4	Term 1	Term 2	Term 3	Term 4	Term 1	Term 2	Term 3	Term 4		
Liberal Arts	⊙ Introduction of Mechanical and System Engineering																	
	⊙ Introduction to Electrical and Communication Engineering																	
	⊙ Introduction to Information Technology																	
	⊙ Introduction to Chemistry and Bioengineering																	
	⊙ All University Guidance 1, II																	
	Developing Intellectual Understanding (Society, Life, Nature)																	
	⊙ Introduction to Information Processing 1 ⊙ Introduction to Information Processing 2																	
	⊙ English(Speaking)-1, English(Speaking)-2, English(Reading)-1, English(Reading)-2																	
	⊙ English(Writing)-1, English(Writing)-2, English(Listening)-1, English(Listening)-2																	
	Developing Intellectual Understanding (Society, Life, Nature), Courses for Developing Practical Knowledge and Sensitivity, Courses for Developing General Skills and Health																	
Language (Pre-Advanced English, Advanced English, Minor in English 1, 2, Non-English Foreign Languages)																		
Major Foundational Courses	⊙ Engineering Ethics																	
	⊙ Technical Writing and Presentation																	
	⊙ Safety and Security Managements for Engineer																	
	⊙ Technical English																	
	⊙ Analysis 1		⊙ Analysis 2															
	⊙ Linear Algebra 1		⊙ Linear Algebra 2															
	⊙ Laboratory Work and Practice on Basic Engineering																	
	Basic Physics (Classical Mechanics) 1		Basic Physics (Classical Mechanics) 2															
	Basic Physics (Electromagnetics) 1		Basic Physics (Electromagnetics) 2															
	Basic Chemistry		Basic Biology 1		Basic Biology 2													
Programming 1		Programming 2																
Probability and Statistics 1		Probability and Statistics 2																
Differential Equation 1		Differential Equation 2																
Department Major	⊙ Fourier and Laplace Transforms		⊙ Vector and Complex Analyses															
	Multiple Integrals		Partial Differential Equation		Industrial Mechanics													
	⊙ Mechanical Manufacturing																	
	⊙ Mechanics of Materials I																	
	⊙ Basic Mechanical System Drawing		⊙ Systems Control I		Internship													
	⊙ Manufacturing Practice I		⊙ Manufacturing Practice II		Production Systems													
	⊙ Thermodynamics I		⊙ Electronic Circuits		⊙ Fundamentals of Vibration													
					⊙ Fluid Mechanics I													
					⊙ Advanced Exercise on Mechanical and Systems Engineering													
					⊙ Graduation Thesis													
Mechanical Engineering Course Major	⊙ Experiments in Mechanical Engineering																	
	⊙ Experiments in Mechanical Engineering																	
	⊙ English for Mechanical Engineering 1 ⊙ English for Mechanical Engineering 2																	
	⊙ Technical Project with Creative Training																	
	Numerical Analysis																	
	⊙ Thermodynamics II																	
	⊙ Fluid Mechanics II																	
	Engineering Plasticity																	
	Applied Materials																	
	⊙ Mechanics of Materials II																	
⊙ Mechanisms																		
⊙ Machine Design																		
⊙ Machine Design and Drawing																		
CAD																		
⊙ Materials Science and Engineering																		
⊙ Nontraditional Machining																		
⊙ Heat Transfer																		
Transport Phenomena of Latent Heat																		
Energy Engineering																		
Practical English for Engineers I Practical English for Engineers II																		
System CAD																		
Operations Research I Operations Research II Operations Research III																		
Image Sensing																		
⊙ Exercise on Systems Engineering																		
Intelligent Robot Management																		
⊙ Practice on Systems Engineering I																		
Robot Mechanisms																		
Robot Dynamics																		
Interface Design																		
Systems Control II																		
Fundamentals for Energy and Environmental Systems																		
Intelligent Control Systems																		
Robotics for Extreme Environments																		
Fundamental Mechatronics I Fundamental Mechatronics II																		
Intelligent Robotics																		
Design of Robots																		
⊙ Practice on Systems Engineering II																		
Cognitive Engineering																		

Faculty of Engineering
Department of
Mechanical and Systems
Engineering

Multifaceted thinking skills
【General Education 1】

Ethics for engineers
【General Education 2】

Design skills to meet social
demands
【Ability to Use Information】

Communicative skills
【(Ability to Act 1)】

Skills for planning, conducting, and
managing tasks
【Ability to Act 2】

Basic knowledge for logical
thinking and application
【Expertise 1】

Fundamental knowledge and
ability to create mechanisms and
systems
【Expertise 2-1】

Discipline-specific knowledge and
application ability for integrated
development of mechanisms and
systems
【Expertise 2-2】

Discipline-specific knowledge and
application ability to maintain and
develop mechanisms and systems
【Expertise 2-3】

Skills for autonomous and
continuous learning
【Ability to Achieve Self-realization】

Curriculum map (Department of Electrical and Communication Engineering)

Ⓞ Required Subjects Restricted Subjects (☆ : Recommended Subjects)

Classification	1st year				2nd year				3rd year				4th year			
	Term 1	Term 2	Term 3	Term 4	Term 1	Term 2	Term 3	Term 4	Term 1	Term 2	Term 3	Term 4	Term 1	Term 2	Term 3	Term 4
General Education Courses	Ⓞ All University Guidance Ⓞ Introduction of Mechanical and System Engineering Ⓞ Introduction to Electrical and Communication Engineering Ⓞ Introduction to Information Technology Ⓞ Introduction to Chemistry and Bioengineering Ⓞ Introduction to Information Processing 1 Ⓞ Introduction to Information Processing 2															
	Courses for Developing Intellectual Understanding (Society, Life, Nature)															
	Courses for Developing Practical Knowledge and Sensitivity (Practice, Arts), Courses for Developing General Skills and Health (Information Education, Career Education, Health and Sports Sciences, Academic Writing)															
	Ⓞ English(Speaking)-1, English(Speaking)-2, English(Reading)-1, English(Reading)-2				Ⓞ English(Speaking)-3, English(Speaking)-4, English(Reading)-3, English(Reading)-4											
	Ⓞ English(Writing)-1, English(Writing)-2, English(Listening)-1, English(Listening)-2				Ⓞ English(S&L)-1, English(S&L)-2, English(R&W)-1, English(R&W)-2											
	Language Courses (English, Non-English Foreign Languages)															
	Ⓞ Laboratory Work and Practice on Basic Engineering Ⓞ Safety and Security Managements for Engineer Ⓞ Analysis1 Ⓞ Analysis2 ☆ Basic Physics (Classical Mechanics) 1 ☆ Basic Physics (Classical Mechanics) 2 Ⓞ Linear Algebra1 Ⓞ Linear Algebra2 ☆ Basic Physics (Electromagnetics) 1 ☆ Basic Physics (Electromagnetics) 2 ☆ Programming 1 ☆ Programming 2 ☆ Differential Equation 1 ☆ Differential Equation 2 Basic Chemistry Basic Biology 1 Basic Biology 2 Probability and Statistics1 Probability and Statistics2															
Major Foundational Courses	Ⓞ Technical English Ⓞ UNIX Programming Ⓞ Special Lectures Ⓞ Technical English B1 Ⓞ Technical English B2															
	Ⓞ Circuit Theory A1 Ⓞ Circuit Theory A2 Ⓞ AnalysisB1 Ⓞ Introduction to Electrical and Communication Engineering Ⓞ Fourier and Laplace Transform Ⓞ Electrical and Communication Engineering Lab A Ⓞ Electrical and Communication Engineering Lab B Ⓞ Electrical and Communication Engineering Lab C Ⓞ Graduation Thesis															
Department Major Courses	Linear Algebra B Vector Analysis Linear Circuit Transient Analysis Transmission Line Theory Complex Analysis Pulse and Digital Circuits Circuit Theory B Computer Mathematics Electrical Communication Engineering Electronic Measurement Introduction to Electronic Circuits Logic Circuits Digital Signal Processing Elementary Condensed-matter Physics Electromagnetism A Internship															
	Ⓞ Electromagnetism B Ⓞ Electrical Machinery and Apparatus A Electrical Machinery and Apparatus B1 Electrical Machinery and Apparatus B2 Power System Engineering A Power System Engineering B Laws and Regulations of Electric Power Supply 1 Laws and Regulations of Electric Power Supply 2 Electric Power Generation Technology 1 Electric Power Generation Technology 2 Control Engineering A Control Engineering B Semiconductor and Electronic Devices Engineering Power Electronics Optoelectronics Electrical and Electronic Materials Electromagnetic Wave Engineering Computer Networks B Information-oriented society and technology Computer Architecture A Computer Architecture B Information Security Introduction to Security Mobile Communications Security Implementation Exercise A Information Theory Security Implementation Exercise B Stochastic and Statistical Theory Multimedia Engineering Object-Oriented Programming Graph Theory															
Major Courses	Energy and Control Systems Intelligent Electronic Systems Network Engineering															
	Design skills to meet social demands [Ability to Use Information] Communicative skills [Ability to Act 1] Skills for planning, conducting, and managing tasks [Ability to Act 2] Skills for autonomous and continuous learning [Ability to Achieve Self-realization]															
	Multifaceted thinking skills [General Education 1] Ethics for engineers [General Education 2] Basic knowledge for logical thinking and application [Expertise 1] Fundamental knowledge in the field of electrical and communication engineering [Expertise 2-1] Ability to apply an advanced level of knowledge and skills in the field of electrical and communication engineering [Expertise 2-2]															

Faculty of Engineering
Department of Electrical and Communication Engineering

Curriculum map (Department of Information Technology)

Ⓞ Required Subjects
Ⓞ Restricted Subjects
↕ 2h Indicates the number of class hours per week
Ⓞ Recommended Subjects

Classification	1st year				2nd year				3rd year				4th year					
	Term 1	Term 2	Term 3	Term 4	Term 1	Term 2	Term 3	Term 4	Term 1	Term 2	Term 3	Term 4	Term 1	Term 2	Term 3	Term 4		
General Education Courses	Ⓞ All University Guidance 1, II		Ⓞ Introduction to Information Processing 1		Ⓞ Introduction to Information Processing 2													
	Courses for Developing Intellectual Understanding (Society, Life, Nature)																	
	Courses for Developing Practical Knowledge and Sensitivity (Practice, Arts), Courses for Developing General Skills and Health (Information Education, Career Education, Health and Sports Sciences, Academic Writing)																	
	English-related Subjects · Non-English Foreign Languages																	
	Ⓞ English(Speaking)-1,2, English(Reading)-1,2, English(Writing)-1,2, English(Listening)-1,2 (Students take two course each semester in the designated semester)				Ⓞ English(S&L)-1,2, English(R&W)-1,2 (Students take one course each semester in the designated semester)													
Major Foundational Courses	Ⓞ Introduction of Mechanical and System Engineering		Ⓞ Introduction to Electrical and Communication Engineering		Ⓞ Introduction to Information Technology		Ⓞ Introduction to Chemistry and Bioengineering						Ⓞ Technical Writing and Presentation		Ⓞ Engineering Ethics			
	Ⓞ Laboratory Work and Practice on Basic Engineering								Ⓞ Technical English									
	Ⓞ Analysis1		Ⓞ Analysis2		Ⓞ Safety and Security Managements for Engineer													
	Ⓞ Linear Algebra1		Ⓞ Linear Algebra2		Basic Physics (Classical Mechanics) 1		Basic Physics (Classical Mechanics) 2		Basic Physics (Electromagnetics) 1		Basic Physics (Electromagnetics) 2							
	Basic Chemistry				Basic Biology 1		Basic Biology 2		○ Programming 1		○ Programming 2							
					○ Probability and Statistics 1		○ Probability and Statistics 2		Differential Equation1		Differential Equation2							
					Ⓞ Exercises on Programming1		Ⓞ Exercises on Programming2		Ⓞ System Programming 1		Ⓞ System Programming 2		Ⓞ Programming Techniques		Object-Oriented Programming Languages			
					Ⓞ Data Structures and Algorithms		Ⓞ Computer Hardware		Ⓞ Operating Systems		Logic Circuits		Ⓞ Software Design		Software Engineering			
					Ⓞ Graph Theory		Ⓞ Information Theory		Pattern Recognition and Learning Computer Mathematics		Ⓞ Applied Mathematics		Ⓞ Artificial Intelligence		Database Systems			
					Ⓞ Applied Analysis								Ⓞ Network Systems		Ⓞ Theory of Computer Control			
													Computer Systems		Computer Control Theory			
															Ⓞ Digital Signal Processing			
															Image Media Processing			
	Department Major Courses	Ⓞ Fundamental Computer Science 1		Ⓞ Fundamental Computer Science 2						Ⓞ Information Technology Experiments A (Computer Hardware)		Internship		Ⓞ Information Technology Experiments B (Media Processing)		Ⓞ Information Technology Experiments C (Computer Software)		
		Ⓞ Graduation Thesis																
														Information Technology in Practice 1		Information Technology in Practice 2		

Faculty of Engineering
Department of Information Technology

Multifaceted thinking skills
【General Education 1】

Ethics for engineers
【General Education 2】

Basic knowledge for logical thinking and application
【Expertise 1】

Knowledge of programming
【Expertise 2-1】

Knowledge of information processing systems
【Expertise 2-2】

Theories of the fundamentals of information processing
【Expertise 2-3】

Design skills to meet social demands
【Ability to Use Information】

Communicative skills
【Ability to Act 1】

Skills for planning, conducting, and managing tasks
【Ability to Act 2】

Skills for autonomous and continuous learning
【Ability to Achieve Self-realization】

No required subjects in this term

Curriculum map (Department of Applied Chemistry and Biotechnology)

⊙ Required Subjects ⊙ Restricted Subjects

○ : Recommended subjects , * : Required Subjects in the Biotechnology course

Classification	1st year				2nd year				3rd year				4th year							
	Term 1	Term 2	Term 3	Term 4	Term 1	Term 2	Term 3	Term 4	Term 1	Term 2	Term 3	Term 4	Term 1	Term 2	Term 3	Term 4				
General Education Courses	⊙ All University Guidance 1, II																			
	⊙ Introduction to Information Processing 1		⊙ Introduction to Information Processing 2																	
	Courses for Developing Intellectual Understanding(Society, Life, Nature)																			
	Courses for Developing Practical Knowledge and Sensitivity(Practice, Arts), Courses for Developing General Skills and Health(Information Education, Career Education, Health and Sports Sciences, Academic Writing)																			
	English-related Subjects · Non-English Foreign Languages																			
Major Foundational Courses	⊙ English(Speaking)-1,2, English(Reading)-1,2, English(Writing)-1,2, English(Listening)-1,2 (Students take two course each semester in the designated semester)				⊙ English(S&L)-1,2, English(R&W)-1,2 (Students take one course each semester in the designated semester)															
	⊙ Introduction of Mechanical and System Engineering								⊙ Engineering Ethics (Implemented in Intensive Lecture)				⊙ Technical Writing and Presentation							
	⊙ Introduction to Electrical and Communication Engineering																			
	⊙ Introduction to Information Technology																			
	⊙ Introduction to Chemistry and Bioengineering																			
	⊙ Analysis 1		⊙ Analysis 2																	
	⊙ Linear Algebra 1		⊙ Linear Algebra 2																	
	⊙ Laboratory Work and Practice on Basic Engineering		⊙ Safety and Security Managements for Engineer																	
	⊙ Basic Chemistry		Basic Physics (Classical Mechanics) 1, Basic Physics (Electromagnetics) 1		Basic Physics (Classical Mechanics) 2, Basic Physics (Electromagnetics) 2															
	⊙ Basic Biology 1, Programming 1, Probability and Statistics 1, Differential Equation 1		⊙ Basic Biology 2, Programming 2, Probability and Statistics 2, Differential Equation 2																	
Department Major Courses	⊙ Physical Chemistry 1		⊙ Inorganic Chemistry 1		⊙ Quantum Chemistry 1		⊙ Physical Chemistry 1, ⊙ Inorganic Chemistry 2, ⊙ Quantum Chemistry 2													
	⊙ Fundamental Organic Chemistry 1		⊙ Fundamental Organic Chemistry 2		⊙ Organic Chemistry 1A		⊙ Organic Chemistry 1B													
	⊙ Analytical Chemistry 1		⊙ Analytical Chemistry 1		⊙ Organic Chemistry 2		⊙ Biochemistry 1		⊙ Biochemistry 2*											
	⊙ Basic Experiments in Chemistry																			
	⊙ English for Chemistry and Biotechnology 1		⊙ English for Chemistry and Biotechnology 1																	
	Internship																			
	⊙ Material Process Experiment 1		⊙ Material Process Experiment 2		⊙ Chemical Engineering 1A		⊙ Chemical Engineering 1B		⊙ Physical Chemistry 3		⊙ Material Process Experiment 3									
	⊙ Synthetic Chemistry Experiment 1		⊙ Synthetic Chemistry Experiment 2		⊙ Organic Chemistry 3						⊙ Synthetic Chemistry Experiment 3									
	⊙ Biotechnology Experiment 1		⊙ Biotechnology Experiment 2		⊙ Biochemistry 3						⊙ Biotechnology Experiment 3		⊙ Biochemistry 4							
	⊙ Thesis Exercise		⊙ Graduation Thesis																	
Major Courses	Material and Process Course (Required Subjects)																			
	Synthetic Chemistry Course (Required Subjects)																			
	Bioengineering Course (Required Subjects)																			
	Each Courses (Conditional Elective Subjects - Restricted Subjects)																			
	Instrumental Analysis																			
	Chemical Engineering 2A		Chemical Equipment Design and Drawing 2		Chemical Engineering 2B		Inorganic Chemistry 3		Inorganic Chemistry 4		Chemical Process Engineering		Inorganic Reaction Chemistry		Chemistry of Inorganic Substance					
	Physical Chemistry 4								Synthetic Organic Chemistry		Biomaterials		Physical Organic Chemistry		Industrial Organic Chemistry					
	Organic Chemistry 4		Functional Molecular Chemistry						Polymer Chemistry		Polymer Physical Chemistry		Stereochimistry							
	Molecular Biology		Biophysics								Gene Engineering		Protein Engineering		Enzyme Engineering					
													Applied Biology		Microbial Chemistry					

Faculty of Engineering
Department of Applied Chemistry and Biotechnology

Multifaceted thinking skills
【General Education 1】

Ethics for engineers
【General Education 2】

Basic knowledge for logical thinking and application
【Expertise 1】

Knowledge and practical ability
【expertise 2-1】

Ability to create new technologies and design devices and materials
【expertise 2-2】

Ability to design and conduct experiments, and to analyze data
【expertise 2-3】

Design skills to meet social demands
【Ability to Use Information】

Communicative skills
【Ability to Act 1】

Skills for planning, conducting, and managing tasks
【Ability to Act 2】

Skills for autonomous and continuous learning
【Ability to Achieve Self-realization】

No required subjects in this term