2023 SUBJECTS (Engineering)

Table (Article 10)　　　　Master's Program　　　　**Common Subjects**

AREAS OF STUDY	REQ OR ELEC.	SUBJECT CODE	SUBJECT	CREDITS	HOURS PER WEEK	YEARS	SEMESTERS	SUBJECT DESCRIPTION
Common	REQUIRED	ESCM11010	Ethical and Social Implications of Engineering	2	2	1	Fall	To address problems from a variety of perspectives in a multifaceted format and improve the practical skills of each student through group discussions to enhance the understanding of engineering ethics and develop the skills required for the social practice of engineering.
		ESCM14010	Master's Thesis in Engineering I	1.5	3	1, 2	Spring, Fall	Under the guidance of the academic advisor, students will conduct research and analysis on the selected research theme in the engineering field of their program to complete the master's thesis. (In the Master's Thesis in Engineering, the Master's Thesis in Engineering I to IV will be conducted continuously according to the progress of the research.)
		ESCM14020	Master's Thesis in Engineering II	1.5	3	1, 2	Spring, Fall	Following the Master's Thesis in Engineering I, students will continue research to complete the Master's thesis.
		ESCM14030	Master's Thesis in Engineering III	1.5	3	1, 2	Spring, Fall	Following the Master's Thesis in Engineering II, students will continue research to complete the Master's thesis.
		ESCM14040	Master's Thesis in Engineering IV	1.5	3	1, 2	Spring, Fall	Following the Master's Thesis in Engineering III, students will continue research to complete the Master's thesis.
		ESCM14050	Special Seminars in Engineering I	1.5	3	1, 2	Spring, Fall	In conjunction with Master's Thesis in Engineering I, students will search and explore literature materials such as research papers or publications, that are related to their research fields and will do practical activities to formulate theories and methodologies.
		ESCM14060	Special Seminars in Engineering II	1.5	3	1, 2	Spring, Fall	In conjunction with Master's Thesis in Engineering II, students will search and explore literature materials such as research papers or publications, that are related to their research fields and will do practical activities to formulate theories and methodologies.
		ESCM14070	Special Seminars in Engineering III	1.5	3	1, 2	Spring, Fall	In conjunction with Master's Thesis in Engineering III, students will search and explore literature materials such as research papers or publications, that are related to their research fields and will do practical activities to formulate theories and methodologies.
		ESCM14080	Special Seminars in Engineering IV	1.5	3	1, 2	Spring, Fall	In conjunction with Master's Thesis in Engineering IV, students will search and explore literature materials such as research papers or publications, that are related to their research fields and will do practical activities to formulate theories and methodologies.
	ELECTIVE	ESCM11020	International Internship I	2	2	1	Spring	Through practical activities such as survey and research work in foreign organizations, schools, government agencies, and similar institutions that speaks English, have experience in different field in Japan and understand various problems related to society and technology from an international perspective.
		ESCM13010	International Internship II	2	2	2	Spring	Through practical activities such as survey and research work in foreign organizations, schools, government agencies, and similar institutions that speaks English, have experience in different field in Japan and understand various problems related to society and technology from an international perspective. (Training will be conducted at a different destination rather than International Internship I)
		ESCM11030	Internship I	1	1	1	Spring	The actual development and participation of projects activities at companies, government agencies, schools and other organizations etc., will give understanding of ; the behavior of members of the society, the structure of the society and approach of work. (About 1 week)
		ESCM12010	Internship II	1	1	1	Fall	The actual development and participation of projects activities at companies, government agencies, schools and other organizations etc., will give understanding of ; the behavior of members of the society, the structure of the society and approach of work. (Training at a different destination from Internship I for about a week)
		ESCM11040	Internship III	2	2	1	Spring	The actual development and participation of projects activities at companies, government agencies, schools and other organizations etc., will give understanding of ; the behavior of members of the society, the structure of the society and approach of work. (About 2 week)
		ESCM12020	Internship IV	2	2	1	Fall	The actual development and participation of projects activities at companies, government agencies, schools and other organizations etc., will give understanding of ; the behavior of members of the society, the structure of the society and approach of work.(Training for about 2 weeks at a different destination from Internship III)

2023 SUBJECTS（Engineering）

Table (Article 10)　　　　Master's Program　　　　**Solid Mechanics and Materials Engineering**

AREAS OF STUDY	REQ OR ELEC.	SUBJECT CODE	SUBJECT	CREDITS	HOURS PER WEEK	YEARS	SEMESTERS	SUBJECT DESCRIPTION
Mechanical Engineering / Energy & Environment	ELECTIVE	ESSM11020	Advanced Theory of Plasticity	2	2	1	Spring	Studies on continuum mechanics and plastic constitutive theory, Analysis of plastic large deformation of metals.
		ESSM11030	Solid Mechanics	2	2	1	Fall	Study of the continuum mechanics at the large deformation and its use in the Finite Element Method.
		ESSM12010	Theory of Elasticity	2	2	1	Spring	Study on stress analysis of two-dimensional problems and linear fracture mechanics.
		ESSM12020	Corrosion and Protection	2	2	1	Fall	Corrosion, Corrosion Protection.
		ESSM12030	Advanced material processing	2	2	1	Spring, Fall	Study of the rigid-plastic finite element method and computer programing.
		ESSM11040	Advanced Partial Differential Equation I	2	2	1	Spring	Advanced Partial Differential Equation
		ESSM12040	Advanced Partial Differential Equation II	2	2	1	Fall	Advanced Partial Differential Equation
		ESSM14020	Special Lecture on Solid Mechanics and Materials Engineering Program I	2	Intensive Course			Recent technological problems and topics in Solid Mechanics and Materials Engineering are lectured.
		ESSM14030	Special Lecture on Solid Mechanics and Materials Engineering Program II	2				Recent technological problems and topics in Solid Mechanics and Materials Engineering are lectured.
		ESSM14040	Special Lecture on Solid Mechanics and Materials Engineering Program A	1				Recent technological problems and topics in Solid Mechanics and Materials Engineering are lectured.
		ESSM14050	Special Lecture on Solid Mechanics and Materials Engineering Program B	1				Recent technological problems and topics in Solid Mechanics and Materials Engineering are lectured.

Requirements:

Students must obtain a total of 30 or more credits including 2 credits from Ethical and Social Implications of Engineering, 6 credits from Master's Thesis in Engineering and further 6 credits from Special Seminars in Engineering. In addition to receiving the necessary instruction, the student must also receive a passing grade on final examinations and thesis.

Method of taking courses:

Students must obtain a total of 16 or more credits from elective courses including 10 or more credits of specialized area courses in the Solid Mechanics and Materials Engineering Program and related subjects specified by the Solid Mechanics and Materials Engineering Program.

2023 SUBJECTS（Engineering）

Table (Article 10)　　　　Master's Program　　　　**Thermal and Fluid Engineering**

AREAS OF STUDY	REQ OR ELEC.	SUBJECT CODE	SUBJECT	CREDITS	HOURS PER WEEK	YEARS	SEMESTERS	SUBJECT DESCRIPTION
Mechanical Engineering / Energy & Environment	ELECTIVE	ESTF11010	Advanced Thermal Engineering I	2	2	1	Spring	Applications of thermal dynamics in engineering
		ESTF12010	Advanced Thermal Engineering II	2	2	1	Fall	Applications of thermal dynamics in engineering
		ESTF11020	Advanced Transport Phenomena	2	2	1	Spring	Fundamentals of momentum, heat and mass transfer.
		ESTF11030	Advanced Fluid Mechanics I	2	2	1	Spring	Study of numerical calculations of compressible flow by solving shock tube problems changing the initial and boundary conditions.
		ESTF14010	Advanced Fluid Mechanics II	2	2	1	Fall	Fundamental of multiphase flow with particles, droplets and bubbles
		ESTF11050	Advanced Heat Transfer Engineering I	2	2	1	Spring	Study of heat and mass transfer on the heat conduction, the heat convection and the thermal radiation.
		ESTF12020	Advanced Heat Transfer Engineering II	2	2	1	Fall	Study of heat transfer and its application, modeling of heat and mass transfer phenomena
		ESTF12030	Advanced Fluid Machinery	2	2	1	Fall	Airfoil performances, design for wind energy conversion systems.
		ESTF12040	Physical chemistry of multiphase and multicomponent systems	2	2	1	Fall	Basic and applied studies of physical chemistry of multiphase and multicomponent systems
		ESSM11040	Advanced Partial Differential Equation I	2	2	1	Spring	Advanced Partial Differential Equation
		ESSM12040	Advanced Partial Differential Equation II	2	2	1	Fall	Advanced Partial Differential Equation
		ESTF14020	Special Lecture on Thermal and Fluid Engineering Program I	2	Intensive Course			Recent technological problems and topics in Thermal and Fluid Engineering are lectured.
		ESTF14030	Special Lecture on Thermal and Fluid Engineering Program II	2				Recent technological problems and topics in Thermal and Fluid Engineering are lectured.
		ESTF14040	Special Lecture on Thermal and Fluid Engineering Program A	1				Recent technological problems and topics in Thermal and Fluid Engineering are lectured.
		ESTF14050	Special Lecture on Thermal and Fluid Engineering Program B	1				Recent technological problems and topics in Thermal and Fluid Engineering are lectured.

Requirements:

Students must obtain a total of 30 or more credits including 2 credits from Ethical and Social Implications of Engineering, 6 credits from Master's Thesis in Engineering and further 6 credits from Special Seminars in Engineering. In addition to receiving the necessary instruction, the student must also receive a passing grade on final examinations and thesis.

Method of taking courses:

Students must obtain a total of 16 or more credits from elective courses including 10 or more credits of specialized area courses in the Thermal and Fluid Engineering Program and related subjects specified by the Thermal and Fluid Engineering Program.

2023 SUBJECTS（Engineering）

Table (Article 10)　　　　Master's Program　　　　**Intelligent Machine Systems**

AREAS OF STUDY	REQ OR ELEC.	SUBJECT CODE	SUBJECT	CREDITS	HOURS PER WEEK	YEARS	SEMESTERS	SUBJECT DESCRIPTION
Mechanical Engineering / Energy & Environment	ELECTIVE	ESIM11010	Soft Control Engineering	2	2	1	Spring	An intensive study of the intelligent control systems: fuzzy control system, neuro-control system, genetic algorithms, stochastic control system.
		ESIM11020	Self-Organizing Systems	2	2	1	Spring	Fundamental and applied theory of soft-organizing systems
		ESIM11030	Applied Control System Theory	2	2	1	Spring	PID control, Regulator, Observer, Fuzzy control, GA., Intelligent control.
		ESIM12010	Advanced Signal Processing in Mechanical Engineering	2	2	1	Fall	Digital signal processing, Fast Fourier Transform, Wavelet, Image processing and feature extraction
		ESIM12020	Intelligent Control Engineering	2	2	1	Fall	Genetic Algorithms, Neural Network, Design for Nonlinear Systems.
		ESSM11040	Advanced Partial Differential Equation I	2	2	1	Spring	Advanced Partial Differential Equation
		ESSM12040	Advanced Partial Differential Equation II	2	2	1	Fall	Advanced Partial Differential Equation
		ESIM14020	Special Lecture on Intelligent Machine Systems Program I	2	Intensive Course			Recent technological problems and topics in Intelligent Machine Systems are lectured.
		ESIM14030	Special Lecture on Intelligent Machine Systems Program II	2				Recent technological problems and topics in Intelligent Machine Systems are lectured.
		ESIM14040	Special Lecture on Intelligent Machine Systems Program A	1				Recent technological problems and topics in Intelligent Machine Systems are lectured.
		ESIM14050	Special Lecture on Intelligent Machine Systems Program B	1				Recent technological problems and topics in Intelligent Machine Systems are lectured.

Requirements:

Students must obtain a total of 30 or more credits including 2 credits from Ethical and Social Implications of Engineering, 6 credits from Master's Thesis in Engineering and further 6 credits from Special Seminars in Engineering. In addition to receiving the necessary instruction, the student must also receive a passing grade on final examinations and thesis.

Method of taking courses:

Students must obtain a total of 16 or more credits from elective courses including 10 or more credits of specialized area courses in the Intelligent Machine Systems Program and related subjects specified by the Intelligent Machine Systemsg Program.

2023 SUBJECTS (Engineering)

Table (Article 10)　　　Master's Program　　　**Electrical Energy and Systems Control Engineering**

AREAS OF STUDY	REQ OR ELEC.	SUBJECT CODE	SUBJECT	CREDITS	HOURS PER WEEK	YEARS	SEMESTERS	SUBJECT DESCRIPTION
Electrical Energy and Systems Control Engineering Program	ELECTIVE	ESES11010	Advanced Power Energy Conversion	2	2	1	Spring	Power energy conversion, renewable energy, optimal operation.
		ESES11020	Advanced Electric Machinery	2	2	1	Spring	The characteristic of electric machinery and the control and energy conversion for electric machinery with power electronics techniques are discussed.
		ESES11030	Advanced Magnetic Materials	2	2	1	Spring	Ferromagnetic materials, magnetostriction, magnetic anisotropy.
		ESES11040	Advanced Medical Electronics	2	2	1	Fall	Medical instrumentation, therapeutic and prosthetic devices.
		ESES11050	Advanced Relativistic Electromagnetism	2	2	1	Spring	Special relativity, electromagnetism, tensor.
		ESES12010	Advanced Power System Analysis	2	2	1	Fall	Computational methods for power system load flow, optimal power flow and stability analysis.
		ESES12020	Advanced Power Electronics	2	2	1	Fall	DC/DC converter, PWM inverter, motor control, AC/DC converter, energy conversion, renewable energy, FACTS devices in power system, advanced control.
		ESES12030	Advanced Plasma Engineering	2	2	1	Fall	Characteristics of plasma, plasma processing.
		ESES12040	Advanced Nonlinear Control Theory	2	2	1	Fall	Geometric properties of nonlinear control systems, stability, nonlinear control system design.
		ESES12050	Advanced Modern Control Theory	2	2	1	Fall	Subject of control, model error CAD system, design method of controlling system.
		ESES14010	Special Lecture on Electrical Energy and Systems Control Program Ⅰ	2	Intensive Course			Will be given a theme by a supervisor.
		ESES14020	Special Lecture on Electrical Energy and Systems Control Program Ⅱ	2				Will be given a theme by a supervisor.
		ESES14030	Special Lecture on Electrical Energy and Systems Control Program Ⅲ	2				Will be given a theme by a supervisor.
		ESES14040	Special Lecture on Electrical Energy and Systems Control Program Ⅳ	2				Will be given a theme by a supervisor.
		ESES14050	Special Lecture on Electrical Energy and Systems Control Program Ⅴ	2				Will be given a theme by a supervisor.
		ESES14060	Special Lecture on Electrical Energy and Systems Control Program Ⅵ	1				Will be given a theme by a supervisor.
		ESES14070	Special Lecture on Electrical Energy and Systems Control Program Ⅶ	1				Will be given a theme by a supervisor.
		ESES14080	Special Lecture on Electrical Energy and Systems Control Program Ⅷ	1				Will be given a theme by a supervisor.
		ESES14090	Special Lecture on Electrical Energy and Systems Control Program Ⅸ	1				Will be given a theme by a supervisor.
		ESES14100	Special Lecture on Electrical Energy and Systems Control Program Ⅹ	1				Will be given a theme by a supervisor.

Requirements:

Students must obtain a total of 30 or more credits including 2 credits from Ethical and Social Implications of Engineering, 6 credits from Master's Thesis in Engineering and further 6 credits from Special Seminars in Engineering. In addition to receiving the necessary instruction, the student must also receive a passing grade on final examinations and thesis.

Method of taking courses:

Students must obtain a total of 16 or more credits from elective courses including 10 or more credits of specialized area courses in the Electrical Energy and Systems Control Engineering Program and related subjects specified by the Electrical Energy and Systems Control Engineering Program.

2023 SUBJECTS (Engineering)

Table (Article 10)　　　Master's Program　　　　　　　　　　**Electronic Systems and Devices**

AREAS OF STUDY	REQ OR ELEC.	SUBJECT CODE	SUBJECT	CREDITS	HOURS PER WEEK	YEARS	SEMESTERS	SUBJECT DESCRIPTION
Electronic Systems and Devices Program	ELECTIVE	ESED11010	Advanced Thin Film Materials Engineering	2	2	1	Spring	Electronic materials, thin film materials processing for electronics.
		ESED11020	Advanced Quantum Computer Engineering	2	2	1	Spring	Quantum algorithms, quantum gates, quantum devices.
		ESED11030	VLSI Systems Design	2	2	1	Spring	VLSI architecture, VLSI layout, circuit simulation, VLSI CAD tools.
		ESED11040	Optical Device Instrumentation Technology	2	2	1	Spring	Passive and Active fiber components using the ultra long optical transmission system based on light-wave phenomenon, "Maxwell's equations, transmission characteristics on optical fibers and fiber design".
		ESED11050	Advanced Dependable Systems	2	2	1	Spring	Dependable computer systems, fault-tolerant systems and error detecting/correcting codes.
		ESED11060	Advanced Wireless Communication Systems	2	2	1	Spring	Multiple Access techniques, Propagation and Noise, Modulation, Coding.
		ESED11070	Advanced Image Processing	2	2	1	Spring	Image processing systems and its applications based on image analysis or inverse problems.
		ESED11080	Telecommunication and Speech Signal Processing	2	2	1	Spring	Signal processing including ARMA filter and Linear Prediction, Speech Coding including PCM, ACELP and EVS.
		ESED12010	Advanced Semiconductor Electronics	2	2	1	Fall	The structure, physical and chemical properties of electronic materials.
		ESED12020	Advanced Vacuum Technology	2	2	1	Fall	Vacuum pumps and gauges, phenomena in vacuum, fabrication processes for semiconductor.
		ESED12030	Organic Electronics Material Engineering	2	2	1	Fall	Organic functional materials, organic electronics devices.
		ESED12050	Advanced Reconfigurable Architecture	2	2	1	Fall	Fundamental of reconfigurable device architecture, and its design method.
		ESED14010	Special Lecture on Electronic Systems and Devices Program Ⅰ	2	Intensive Course			Will be given a theme by a supervisor.
		ESED14020	Special Lecture on Electrical Systems and Devices Program Ⅱ	2				Will be given a theme by a supervisor.
		ESED14030	Special Lecture on Electrical Systems and Devices Program Ⅲ	2				Will be given a theme by a supervisor.
		ESED14040	Special Lecture on Electrical Systems and Devices Program Ⅳ	2				Will be given a theme by a supervisor.
		ESED14050	Special Lecture on Electrical Systems and Devices Program Ⅴ	2				Will be given a theme by a supervisor.
		ESED14060	Special Lecture on Electronic Systems and Devices Program Ⅵ	1				Will be given a theme by a supervisor.
		ESED14070	Special Lecture on Electronic Systems and Devices Program Ⅶ	1				Will be given a theme by a supervisor.
		ESED14080	Special Lecture on Electronic Systems and Devices Program Ⅷ	1				Will be given a theme by a supervisor.
		ESED14090	Special Lecture on Electronic Systems and Devices Program Ⅸ	1				Will be given a theme by a supervisor.
		ESED14100	Special Lecture on Electronic Systems and Devices Program Ⅹ	1				Will be given a theme by a supervisor.

Requirements:

Students must obtain a total of 30 or more credits including 2 credits from Ethical and Social Implications of Engineering, 6 credits from Master's Thesis in Engineering and further 6 credits from Special Seminars in-Engineering. In addition to receiving the necessary instruction, the student must also receive a passing grade on final examinations and thesis.

Method of taking courses:

Students must obtain a total of 16 or more credits from elective courses including 10 or more credits of specialized area courses in the Electronic Systems and Devices Program and related subjects specified by the Electronic Systems and Devices Program.

2023 SUBJECTS (Engineering)

Table (Article 10)　　　　Master's Program　　　　**Civil Engineering**

AREAS OF STUDY	REQ OR ELEC.	SUBJECT CODE	SUBJECT	CREDITS	HOURS PER WEEK	YEARS	SEMESTERS	SUBJECT DESCRIPTION
Civil Engineering	ELECTIVE	ESCE11010	Advanced Design Engineering of Steel Structures	2	2	1	Spring	Yield strength, tensile strength and load bearing properties. Mechanical properties and buckling. Steel structure design and strength evaluation method.
		ESCE11020	Advanced Continuum Mechanics	2	2	1	Spring	New governing equations of a fluid and solid, new constitutive equations of continuum materials, Hook's law of Nakaza, new evaluation system of strength of elastic materials.
		ESCE11030	Advanced Numerical Methods for Fluid Dynamics	2	2	1	Spring	To learn the basics of fluid mechanics, computational fluid dynamics, programming techniques, simulation method and large-scale simulation.
		ESCE11040	Advanced Geotechnical and Geoenvironmental Engineering	2	2	1	Spring	Mass transfer in soil, accumulation and leaching in soil, geo-technical engineering and geomicrobiology, mathematical modelling for geo-materials
		ESCE11050	Advanced Regional Planning and Design	2	2	1	Spring	To understand a regional development skills in the underdeveloped countries.
		ESCE11060	Advanced Environment and Disaster Risk Management	2	2	1	Spring	Methodology and planning systems of natural disaster risk management and environmental creation for sustainable development
		ESCE12010	Advanced Diagnosis Engineering of Steel Structures	2	2	1	Fall	Fatigue of welded joints, Fracture mechanics, Corrosion, Inspection, Retrofit,
		ESCE12020	Advanced Materials Science of Concrete	2	2	1	Fall	Cement hydration, phase equilibrium in cement systems, microstructure of concrete, deterioration mechanisms and diagnosis of concrete structures.
		ESCE12030	Advanced River Engineering	2	2	1	Fall	The course gives numerical simulations of flood flows and river bed variations in complicated boundary geometry by using depth integrated equations of flows in the curvilinear coordinate system.
		ESCE12040	Advanced Rock Mechanics	2	2	1	Fall	This course is concerned with the mechanics and engineering characteristics of discontinuous rock such as the slope stability, underground cabity.
		ESCE13010	Advanced Computational Solid Mechanics	2	2	2	Spring	The course gives the theory of the finite element method, a programming technique for the finite element method using FreeFEM, in addition, how to consider the obtained results.
		ESCE14010	Special Lecture on Civil Program Ⅰ	2				Will be given a theme by a supervisor.
		ESCE14020	Special Lecture on Civil Program Ⅱ	2				Will be given a theme by a supervisor.
		ESCE14030	Special Lecture on Civil Program Ⅲ	2				Will be given a theme by a supervisor.
		ESCE14040	Special Lecture on Civil Program Ⅳ	2				Will be given a theme by a supervisor.
		ESCE14050	Special Lecture on Civil Program Ⅴ	2		Intensive Course		Will be given a theme by a supervisor.
		ESCE14060	Special Lecture on Civil Program Ⅵ	1				Will be given a theme by a supervisor.
		ESCE14070	Special Lecture on Civil Program Ⅶ	1				Will be given a theme by a supervisor.
		ESCE14080	Special Lecture on Civil Program Ⅷ	1				Will be given a theme by a supervisor.
		ESCE14090	Special Lecture on Civil Program Ⅸ	1				Will be given a theme by a supervisor.
		ESCE14100	Special Lecture on Civil Program Ⅹ	1				Will be given a theme by a supervisor.

Requirements:

Students must obtain a total of 30 or more credits including 2 credits from Ethical and Social Implications of Engineering, 6 credits from Master's Thesis in Engineering and further 6 credits from Special Seminars in Engineering. In addition to receiving the necessary instruction, the student must also receive a passing grade on final examinations and thesis.

Method of taking courses:

Students must obtain a total of 16 or more credits from elective courses including 10 or more credits of specialized area courses in the Civil Engineering Program and related subjects specified by the Civil Engineering Program.

Table（Article 10)　　　Master's Program　　　　　　　**Architecture & Building Engineering**

AREAS OF STUDY	REQ OR ELEC.	SUBJECT CODE	SUBJECT	CREDITS	HOURS PER WEEK	YEARS	SEMESTERS	SUBJECT DESCRIPTION
Architecture and Building Engineering	REQUIRED	ESAB11010	Ethics of Architect*	2	2	1	Spring	Please refer to 'Ethical and Social Implications of Engineering' of the required common subjects of the Faculty of Engineering.
	ELECTIVE	ESAB11020	Advanced Architectural Design	2	2	1	Spring	This class focuses on aims, concepts, methodologies, technologies, forms and effects in architectural design around the world.
		ESAB11030	Advanced Urban Planning	2	2	1	Spring	In this lecture, students will learn about planning theory and development design in urban development.
		ESAB11040	Advanced Structural Mechanics	2	2	1	Spring	Elastoplastic analysis, plastic moment, collapse load factor, collapse mechanism, limit states.
		ESAB11050	Advanced Structural Design in Natural Hazard Prone Areas	2	2	1	1st Quarter	This subject provides a detailed explanation of the soil behavior against earthquakes. The aim is to understand the basic concepts for design deep and shallow type foundations for buildings in earthquake prone areas.
		ESAB12010	Advanced Community Space Planning	2	2	1	3rd Quarter	City planning and neighborhood area planning from points of view of community preservation and development.
		ESAB12020	Advanced Environmental Noise	2	2	1	3rd Quarter	Lectures on environmental noise evaluation methods based on noise level and subjective evaluation and the concept of soundscape.
		ESAB12030	Advanced Building Materials	2	2	1・2	Fall	Learn the theory and current status of building life extension, concrete rheology and effective use of waste based on the latest research results.
		ESAB12040	Advanced Construction Data Mining	2	2	1	Fall	Focus on building materials and construction, it outlines the machine learning and big data utilization techniques needed to improve their production efficiency.
		ESAB14010	Special Lecture on Architecture Program I	2				Will be given a theme by a supervisor.
		ESAB14020	Special Lecture on Architecture Program II	2				Will be given a theme by a supervisor.
		ESAB14030	Special Lecture on Architecture Program III	2				Will be given a theme by a supervisor.
		ESAB14040	Special Lecture on Architecture Program IV	2				Will be given a theme by a supervisor.
		ESAB14050	Special Lecture on Architecture Program V	2			Intensive Course	Will be given a theme by a supervisor.
		ESAB14060	Special Lecture on Architecture Program VI	1				Will be given a theme by a supervisor.
		ESAB14070	Special Lecture on Architecture Program VII	1				Will be given a theme by a supervisor.
		ESAB14080	Special Lecture on Architecture Program VIII	1				Will be given a theme by a supervisor.
		ESAB14090	Special Lecture on Architecture Program IX	1				Will be given a theme by a supervisor.
		ESAB14100	Special Lecture on Architecture Program X	1				Will be given a theme by a supervisor.

Requirements:

Students must obtain a total of 30 or more credits including 2 credits from Ethical and Social Implications of Engineering, 6 credits from Master's Thesis in Engineering and further 6 credits from Special Seminars in Engineering. In addition to receiving the necessary instruction, the student must also receive a passing grade on final examinations and thesis.
＊'Ethics of architect' is replaced by 'Ethical and Social Implications of Engineering'.

Method of taking courses:

Students must obtain a total of 16 or more credits from elective courses including 10 or more credits of specialized area courses in the Architecture & Building Engineering Program and related subjects specified by the Architecture & Building Engineering Program.

Computer Science and Intelligent Systems

AREAS OF STUDY	REQ OR ELEC.	CORE Subjects	SUBJECT CODE	SUBJECT	CREDITS	HOURS PER WEEK	YEARS	SEMESTERS	SUBJECT DESCRIPTION
Computer Science and Intelligent Systems	ELECTIVE	○	ESCI11010	Advanced Software Engineering	2	2	1	Spring	Software System Development, Large program, Object Oriented Systems, Persistent Object, Verification, Test
		○	ESCI13010	Advanced Probabilistic Models	2	2	1 or 2	Spring	Mathematical Statistics, Computational Statistics, Data Science, and Human Behavior Modeling
		○	ESCI13020	Advanced Artificial Intelligence	2	2	1 or 2	Spring	Problem Solving, Knowledge Representation, Machine Learning, Evolutionary Computation and Intelligent Agents
		○	ESCI13030	Advanced Intelligent Robotics	2	2	1 or 2	Spring	Intelligence of Autonomous Robots, Learning Methods and Emergence of Robot behaviors. Behavior based AI Systems
		○	ESCI11020	Advanced Intelligent Information Processing	2	2	1 or 2	Spring	Design and Development of Intelligent Systems, Machine Learning, Signal Processing, Knowledge Representation
		○	ESCI12010	Advanced Biological Information Processing	2	2	1	Fall	Techniques for Bio signal Measurements, Analysis of Biological Time-Series Data, Nonlinear Time-Series Analysis
		○	ESCI11030	Project Management Practice	2	2	1 or 2	Fall	Project Management Body of Knowledge, Exercise on IT-related projects
			ESCI11040	Practical Exercise I	2	2	1	Spring	Practical Exercise on Information Technology (The content of the exercise should be different from Practical Exercise II and III)
			ESCI12020	Practical Exercise II	2	2	1	Fall	Practical Exercise on Information Technology (The content of the exercise should be different from Practical Exercise I and III)
			ESCI13040	Practical Exercise III	2	2	2	Spring	Practical Exercise on Information Technology (The content of the exercise should be different from Practical Exercise I and II)
			ESCI11050	Advanced Wireless Systems	2	2	1	Spring	Wireless Communication Related Signal Processing Basics, One of the State-of-the-art Communication System such as OFDM, Mobile Phone such as 4G LTE and 5G, 5G New Radio System, Digital Signal Processing Simulation Tools such as Matlab
		○	ESCI14010	Advanced Algorithms	2	2	1 or 2	Fall	Graph Algorithms, Optimization Algorithms, and Related Applications
		○	ESCI12030	Advanced Information Networks	2	2	1	Fall	Information Network, Internet Architecture, Computer System, Network Security, Internet of Things (IoT) and Whole technology about IT
		○	ESCI12040	Advanced Data Mining	2	2	1	Fall	Web inspired Research involving Search, Models of Search, Retrieval and Data Mining, Algorithm Design and Analysis
		○	ESCI12050	Advanced Multimedia Information Processing	2	2	1	Fall	Digital Signal Processing, Intelligent Image Processing, Physiology and Cognitive Science for Human Perception. Neural Computing and Algorithms for Communication Systems
		○	ESCI12060	Advanced UI/UX	2	2	1	Fall	Human Computer Interaction, Usability Engineering, Interaction Design and User-Centered Design
			ESCI13050	Advanced Artificial Society & Multi-agent Systems	2	2	1 or 2	Spring	Multiagent Systems, Artificial Societies, Simulated Organizations and Interaction of Humans & Computational Agents
			ESCI13060	Advanced Human Augmentation Engineering	2	2	1 or 2	Spring	Studying Technologies and Elemental Technologies to extend and support Human Perception, Cognitive Abilities, and Physical Abilities from Engineering Perspective
			ESCI13070	Advanced Service Engineering	2	2	1 or 2	Spring	Service Engineering, Data Science, and Human Behavior Analysis
			ESCI14020	Advanced Parallel Processing	2	2	1 or 2	Fall	Parallel Programming, Parallel Algorithms, Distributed Algorithms, and Distributed systems
		○	ESCI14070	HCI Special Theory	2	2	1 or 2	Spring or Fall	HCI (Human-Computer Interaction), Research & Development of Interfaces, and Development of Information Science & Industry
		○	ESCI14080	Information and Coding Theory	2	2	1 or 2	Spring or Fall	Information Source Coding, Channel Coding and Applications to Media Compression & Transmission
			ESCI14030	Special Lecture on Computer Science & Intelligent Systems Program I	2	Intensive Course(30hr) (1 or 2) (Spring or Fall)			Will be given a theme by a supervisor
			ESCI14040	Special Lecture on Computer Science & Intelligent Systems Program II	2	Intensive Course(30hr) (1 or 2) (Spring or Fall)			Will be given a theme by a supervisor
			ESCI14050	Special Lecture on Computer Science & Intelligent Systems Program III	1	Intensive Course(15hr) (1 or 2) (Spring or Fall)			Will be given a theme by a supervisor

2023 SUBJECTS（Engineering）

Table（Article 10）   Master's Program   **Computer Science and Intelligent Systems**

AREAS OF STUDY	REQ OR ELEC.	CORE Subjects	SUBJECT CODE	SUBJECT	CREDITS	HOURS PER WEEK	YEARS	SEMESTERS	SUBJECT DESCRIPTION
			ESCI14060	Special Lecture on Computer Science & Intelligent Systems Program Ⅳ	1	Intensive Course(15hr) (1 or 2) (Spring or Fall)			Will be given a theme by a supervisor

Requirements:

Students must obtain a total of 30 or more credits including 2 credits from Ethical and Social Implications of Engineering, 10 credits from the CORE Subjects, 6 credits from Master's Thesis in Engineering and further 6 credits from Special Seminars in Engineering. In addition to receiving the necessary instruction, the student must also receive a passing grade on final examinations and thesis.

Method of taking courses:

At least 16 credits of elective courses, of which at least 10 credits must be earned from the core courses of the Computer Science and Intelligent Systems.

Table (Article 10) Master's Program

FIELD	SUBJECT		Subject Code	SUBJECT	CREDITS	HOURS	YEARS	SEMESTERS	SUBJECT DESCRIPTION
BIOSCIENCE	REQUIRED	COMMON	ESSP11010	Advanced Seminar I	1.5	22.5	1	Fall & Spring	Present and discuss research information such as original academic papers, as well as research plans and findings, in a seminar format.
			ESSP11020	Advanced Seminar II	1.5	22.5	1	Fall & Spring	Present and discuss research information such as original academic papers, as well as research plans and findings, in a seminar format.
			ESSP13010	Advanced Seminar III	1.5	22.5	2	Fall & Spring	Present and discuss research information such as original academic papers, as well as research plans and findings, in a seminar format.
			ESSP13020	Advanced Seminar IV	1.5	22.5	2	Fall & Spring	Present and discuss research information such as original academic papers, as well as research plans and findings, in a seminar format.
			ESSP11030	Thesis Research I	3	90	1	Fall & Spring	For each individual research objective and phase, provide direct instruction and guidance concerning research methods and development.
			ESSP11040	Thesis Research II	3	90	1	Fall & Spring	For each individual research objective and phase, provide direct instruction and guidance concerning research methods and development.
			ESSP13030	Thesis Research III	3	90	2	Fall & Spring	For each individual research objective and phase, provide direct instruction and guidance concerning research methods and development.
			ESSP13040	Thesis Research IV	3	90	2	Fall & Spring	For each individual research objective and phase, provide direct instruction and guidance concerning research methods and development.
	ELECTIVE	COMMON	ESSP13090	International Field Course	2	30	1,2	Spring	Field and laboratory work at field stations to learn techniques of marine and environmental sciences related to LA MER program.
		SPECIAL	ESBI13160	Advanced Topics in Marine Animal Behavior	2	30	1,2	Fall	Topics in behavioral studies for marine animals, such as biotelemetry measurement, ethology and comparative psychology. This class deals mainly with cephalopods as a model animals for this field.
			ESBI13020	Plant Phylogeny and Evolution	2	30	1,2	Fall	Recent advances in flowering plant phylogeny and evolution.
			ESBI13090	Life of Tunicates	2	30	1,2	Spring	Introduction to specific features and functions supporting the life of marine invertebrates, dealing with tunicates.
			ESBI13070	Stress Physiology	2	30	1,2	Fall	Introduction to basic principles of stress physiology, including the production and scavenging mechanisms of active oxygen and active nitrogen in living organisms.
			ESBI13080	Advanced Cell Biology	2	30	1,2	Spring	Current topics in cell biology, with emphasis on the biogenesis of organelles and cytoskeleton.
			ESBI13100	Advanced Molecular Physiology	2	30	1,2	Spring	Fundamentals of molecular biology, cellular physiology, developmental biology, immunology, and neurobiology. Focuses on mammalian and insect systems.
			ESBI13310	Advanced Ichthyology	2	30	1,2	Fall	Recent advances in fish research will be introduced. Students will also introduce research papers or books in a seminar format.

2023 SUBJECTS (Science)

Table (Article 10) Master's Program

FIELD	SUBJECT		Subject Code	SUBJECT	CREDITS	HOURS	YEARS	SEMESTERS	SUBJECT DESCRIPTION
BIOSCIENCE	ELECTIVE	SPECIAL	ESBI13130	Advanced Scientific Manuscript Writing	2	30	1,2	Spring	Structure and organization of scientific publications, as well as how to organize and write manuscripts will be discussed. Special attention will be put on logical organization and troublesome grammar points.
			ESBI13180	Advanced Comparative Endocrinology	2	30	1,2	Fall	Endocrine organs and various hormones in vertebrates. Roles of hormones in metabolism, reproduction, and behavior.
			ESBI13170	Marine Molecular Ecology	2	30	1,2	Fall	Principles and fundamental methods in aquatic animals using molecular and population genetics. Practical method on DNA analysis.
			ESBI13200	Systematic Zoology	2	30	1,2	Spring	Principles and practices of taxonomy, systematics, and phylogenetics of animals, with reference to contemporary discussions on relevant conceptual issues.
			ESBI13120	Responses in Plant Morphogenesis to Environmental Signals	2	30	1,2	Fall	Current topics about the signal cascades of plant morphogenesis caused by environmental signals.
			ESBI13050	Animal Evolution and Diversity	2	30	1,2	Fall	Introduction to evolution and diversity in vertebrates.
			ESBI13060	Advanced Animal Ecology	2	30	1,2	Fall	Overview of animal ecology, animal–plant interaction, and island biology.
			ESBI13220	Advanced Marine Biology	2	30	1,2	Spring	After the revision of basic marine biology concept, the class will discuss about littoral and pelagic ecosystems from major geographic regions (tropical, temperate and polar).
			ESBI13230	Molecular Biochemistry of Plant Biodegradation	2	30	1,2	Fall	Reviews on the current topics in biodegradation of plants with special reference to the mechanisms by which lignocellulolytic enzymes are involved in breakdown of plant cell walls.
			ESBI13210	Advanced Evolutionary Ecology	2	30	1,2	Spring	Evolutionary analysis of form and function, life–history, and sexual dimorphism in animals.
			ESBI13040	Marine Environmental Biology and Ecology	2	30	1,2	Fall	Overview of current research on marine environmental biology.
			ESBI13030	Advanced Coral Reef Ecology	2	30	1,2	Fall	Reviews on current topics in coral reef ecology.
			ESBI13240	Advanced Marine Zootaxonomy	2	30	1,2	Spring	Practices of zootaxonomy of marine invertebrates.
			ESBI13250	Advanced Seminar of Evolutionary Reproductive Biology	2	30	1,2	Spring	Instruction of reproductive biology in terms of evolutionary aspects and practice of analyses with laptop computer.
			ESBI13260	Advanced Plant Taxonomy and Phytogeography	2	30	1,2	Spring	Principles and fundamental methods in plant taxonomy and phytogeography with special reference to the diversity of flowering plants.
			ESBI13110	Advanced Molecular and Cellular Biology	2	30	1,2	Spring	Topics in organelle dynamics and function. Focuses on single membrane bound organelles such as endoplasmic reticulum, Golgi apparatus, peroxisomes, and lysosomes.
			ESBI13020	Advanced Plant Ecology	2	30	1,2	Fall	Review of current topics on the maintenance and origin of biodiversity patterns based on taxonomic, functional and phylogenetic properties.
			ESBI13290	Basics of Symbiosis	2	30	1,2	Spring	Introduction of current topics about the symbiotic relationship between corals and algae.
			ESBI13300	Advanced Biodiversity and Evolution Sciences	2	30	1,2	Spring or Fall	Overview of current research on evolution and biodiversity, focusing mainly on molecular phylogeny and population genetics.

Requirements for course completion:

Students must obtain a total of 30 or more credits including 6 credits from Advanced Seminar and 12 credits from Thesis Research on Bioscience Field. In addition to receiving the necessary instruction, the student must also receive a passing grade on final examinations and Master's thesis.

2023 SUBJECTS (Science)

Table (Article 10) Master's Program

LA MER (Leadership for ASEAN Marine Environments and Resources Program)
Course: Chemistry, Biology and Marine Science
Physics and Earth Sciences

FIELD	SUBJECT		Subject Code	SUBJECT	CREDITS	HOURS	YEARS	SEMESTERS	SUBJECT DESCRIPTION
ENVIRONMENTAL SCIENCE	REQUIRED	COMMON	ESSP11050	Advanced Seminar I	1.5	22.5	1	Fall & Spring	Present and discuss research information such as original academic papers, as well as research plans and findings, in a seminar format.
			ESSP11060	Advanced Seminar II	1.5	22.5	1	Fall & Spring	Present and discuss research information such as original academic papers, as well as research plans and findings, in a seminar format.
			ESSP13050	Advanced Seminar III	1.5	22.5	2	Fall & Spring	Present and discuss research information such as original academic papers, as well as research plans and findings, in a seminar format.
			ESSP13060	Advanced Seminar IV	1.5	22.5	2	Fall & Spring	Present and discuss research information such as original academic papers, as well as research plans and findings, in a seminar format.
			ESSP11070	Thesis Research I	3	90	1	Fall & Spring	For each individual research objective and phase, provide direct instruction and guidance concerning research methods and development.
			ESSP11080	Thesis Research II	3	90	1	Fall & Spring	For each individual research objective and phase, provide direct instruction and guidance concerning research methods and development.
			ESSP13070	Thesis Research III	3	90	2	Fall & Spring	For each individual research objective and phase, provide direct instruction and guidance concerning research methods and development.
			ESSP13080	Thesis Research IV	3	90	2	Fall & Spring	For each individual research objective and phase, provide direct instruction and guidance concerning research methods and development.
	ELECTIVE	COMMON	ESSP13100	International Field Course	2	30	1,2	Spring	Field and laboratory works at field stations to learn techniques of marine and environmental sciences related to LA MER program.
		SPECIAL	ESCH11140	Introduction to Atmospheric Chemistry	2	30	1,2	Spring	This course provides an overview of atmospheric chemistry and a working knowledge of the critical issues that atmospheric chemists face today.
			ESCH11090	Environmental Analytical Chemistry I	2	30	1,2	Spring	This course deals with qualitative and quantitative analytical chemistry, especially principles and procedures of chemical analyses of environmental water sample.
			ESCH11110	Practical Skills in Presentation, Publication and Patent Application	2	30	1,2	Spring	Learning and training presentation/writing skills for research outputs such as: (1) oral presentation at conference (2) poster presentation at conference (3) patent search and submission (4) scientific paper
			ESCH11150	Introduction to Natural Product Chemistry	2	30	1,2	Spring	This course deals with isolation, structure determination and biological activities of natural products.
			ESCH13020	Advanced Environmental Analytical Chemistry	2	30	1,2	Fall or Spring	Lectures on air pollution will be given on the characteristics of air pollutants that affect climate change and our health.
			ESCH13010	Advanced Crustal Hydrosphere Geochemistry	2	30	1,2	Spring	Reviews of geochemical studies about fluids and gasses beneath the seafloor.
			ESCH11080	Biochemistry of Metal Ions	2	30	1,2	Spring	Lecture on roles of metal irons in biology.
			ESCH11120	Catalytic Chemistry	2	30	1,2	Spring	This course describes the preparation methods, basic theories, and latest topics of catalysts used in chemical reactions that cause energy conversion between electrical and chemical energy.
			ESCH11060	Advanced Stereochemistry	2	30	1,2	Fall	This lecture will be about basic knowledge and information how to control stereochemisty on organic reactions.
			ESCH11010	Molecular Spectroscopy I	2	30	1,2	Spring	Spectroscopies to characterize molecular properties and the applications in biophysical chemistry.

2023 SUBJECTS (Science)

Table (Article 10) Master's Program

LA MER (Leadership for ASEAN Marine Environments and Resources Program)
Course: Chemistry, Biology and Marine Science
          Physics and Earth Sciences

FIELD	SUBJECT		Subject Code	SUBJECT	CREDITS	HOURS	YEARS	SEMESTERS	SUBJECT DESCRIPTION
ENVIRONMENTAL SCIENCE	ELECTIVE	SPECIAL	ESEA13130	Advanced Ocean Remote Sensing Ⅰ	2	30	1,2	Spring	Principles of ocean remote sensing such as radiometer, scatterometer and altimeter. Applications of ocean remote sensing to physical oceanography.
			ESEA13140	Advanced Ocean Remote Sensing Ⅱ	2	30	1,2	Spring	Principles of ocean remote sensing such as radiometer, scatterometer and altimeter. Applications of ocean remote sensing to physical oceanography.
			ESEA13150	Advanced Meteorology Ⅰ	2	30	1,2	Fall	Lecture on basic theory and recent advances of atmospheric sciences, including the evolution and structure of precipitating cloud systems in the tropical and subtropical regions.
			ESEA13160	Advanced Meteorology Ⅱ	2	30	1,2	Spring	Lecture on basic theory and recent advances of atmospheric sciences, including the evolution and structure of precipitating cloud systems in the tropical and subtropical regions.
			ESEA13190	Advanced Numerical Weather Prediction Ⅰ	2	30	1,2	Fall	Fundamentals on numerical weather prediction, including basic equations, computer programming, and performing idealized and real through experiments.
			ESEA13200	Advanced Numerical Weather Prediction Ⅱ	2	30	1,2	Spring	Fundamentals on numerical weather prediction, including data analysis, forecast errors, and data assimilation.
			ESEA13090	Advanced Metamorphic Petrology Ⅰ	2	30	1,2	Fall	Petrogenesis and dynamics of metamorphic rocks and its geotectonic implications.
			ESEA13100	Advanced Metamorphic Petrology Ⅱ	2	30	1,2	Spring	Petrogenesis and dynamics of metamorphic rocks and its geotectonic implications.
			ESEA13110	Advanced Geomorphology I	2	30	1,2	Fall	Principles and applications of geomorphological processes such as weathering, erosion, transportation and sedimentation
			ESEA13120	Advanced Geomorphology Ⅱ	2	30	1,2	Spring	Principles and applications of geomorphological processes such as weathering, erosion, transportation and sedimentation
			ESEA13030	Advanced Geochemistry Ⅰ	2	30	1,2	Fall	Isotopic and trace element geochemistry of igneous rocks and its geotectonic implications.
			ESEA13040	Advanced Geochemistry Ⅱ	2	30	1,2	Spring	Isotopic and trace element geochemistry of igneous rocks and its geotectonic implications.
			ESEA13050	Advanced Seismology Ⅰ	2	30	1,2	Fall	This course constitutes an overview of observational and theoretical seismology and the utilization of seismic waves for the study of the earth's interior. Topics include elastic wave propagation, seismic ray theory, interpretation of travel times, surface wave, and seismic tomography.
			ESEA13060	Advanced Seismology Ⅱ	2	30	1,2	Spring	This course constitutes an overview of observational and theoretical seismology and the utilization of seismic waves for the study of the earth's interior. Topics include elastic wave propagation, seismic ray theory, interpretation of travel times, surface wave, and seismic tomography.
			ESEA13170	Coral Reef Earth Science Ⅰ	2	30	1,2	Fall	Lecture on recent advances and topics on earth sciences related to coral reefs, which include geomorphology, geology, geohistory, paleontology, carbonate sedimentology, paleoceanography, environmental sciences, and geoecotechnology.
			ESEA13180	Coral Reef Earth Science Ⅱ	2	30	1,2	Spring	Lecture on recent advances and topics on earth sciences related to coral reefs, which include geomorphology, geology, geohistory, paleontology, carbonate sedimentology, paleoceanography, environmental sciences, and geoecotechnology.
			ESEA13070	Earth History and Palaeontology Ⅰ	2	30	1,2	Fall	This lecture will help you develop key knowledge and research skills in the field of earth history and palaeontology. Lecture on basic training in earth sciences, with a specialisation in stratigraphy and palaeontology.
			ESEA13080	Earth History and Palaeontology Ⅱ	2	30	1,2	Spring	This lecture will help you develop key knowledge and research skills in the field of earth history and palaeontology. Lecture on basic training in earth sciences, with a specialisation in stratigraphy and palaeontology.
			ESBI13150	Advanced Phycology	2	30	1,2	Fall	Current topics on taxonomy, phylogeny, morphology, genetics, ecology etc. of algae and related organisms.

Requirements for course completion:
Students must obtain a total of 30 or more credits including 6 credits from Advanced Seminar and 12 credits from Thesis Research on Environmental Science Field. In addition to receiving the necessary instruction, the student must also receive a passing grade on final examinations and Master's thesis.

Program	Related subject names specified by the program		CREDITS
Solid Mechanics and Materials Engineering	Common Subjects	International Internship I	2
		International Internship II	2
		Internship I	1
		Internship II	1
		Internship III	2
		Internship IV	2
	Thermal and Fluid Engineering	Advanced Thermal Engineering I	2
		Advanced Thermal Engineering II	2
		Advanced Transport Phenomena	2
		Advanced Fluid Mechanics I	2
		Advanced Fluid Mechanics II	2
		Advanced Heat Transfer Engineering I	2
		Advanced Heat Transfer Engineering II	2
		Advanced Fluid Machinery	2
		Physical chemistry of multiphase and multicomponent systems	2
		Special Lecture on Thermal and Fluid Engineering Program I	2
		Special Lecture on Thermal and Fluid Engineering Program II	2
		Special Lecture on Thermal and Fluid Engineering Program A	1
		Special Lecture on Thermal and Fluid Engineering Program B	1
	Intelligent Machine Systems	Soft Control Engineering	2
		Self-Organizing Systems	2
		Applied Control System Theory	2
		Advanced Signal Processing in Mechanical Engineering	2
		Intelligent Control Engineering	2
		Special Lecture on Intelligent Machine Systems Program I	2
		Special Lecture on Intelligent Machine Systems Program II	2
		Special Lecture on Intelligent Machine Systems Program A	1
		Special Lecture on Intelligent Machine Systems Program B	1
Thermal and Fluid Engineering	Common Subjects	International Internship I	2
		International Internship II	2
		Internship I	1
		Internship II	1
		Internship III	2
		Internship IV	2
	Solid Mechanics and Materials Engineering	Advanced Strength of Materials	2
		Advanced Theory of Plasticity	2
		Solid Mechanics	2
		Theory of Elasticity	2
		Corrosion and Protection	2
		Advanced material processing	2
		Special Lecture on Solid Mechanics and Materials Engineering Program I	2
		Special Lecture on Solid Mechanics and Materials Engineering Program II	2
		Special Lecture on Solid Mechanics and Materials Engineering Program A	1
		Special Lecture on Solid Mechanics and Materials Engineering Program B	1
	Intelligent Machine Systems	Soft Control Engineering	2
		Self-Organizing Systems	2
		Applied Control System Theory	2
		Advanced Signal Processing in Mechanical Engineering	2
		Intelligent Control Engineering	2
		Special Lecture on Intelligent Machine Systems Program I	2
		Special Lecture on Intelligent Machine Systems Program II	2
		Special Lecture on Intelligent Machine Systems Program A	1
		Special Lecture on Intelligent Machine Systems Program B	1
Intelligent Machine Systems	Common Subjects	International Internship I	2
		International Internship II	2
		Internship I	1
		Internship II	1
		Internship III	2
		Internship IV	2
	Solid Mechanics and Materials Engineering	Advanced Strength of Materials	2
		Advanced Theory of Plasticity	2
		Solid Mechanics	2
		Theory of Elasticity	2
		Corrosion and Protection	2
		Advanced material processing	2
		Special Lecture on Solid Mechanics and Materials Engineering Program I	2
		Special Lecture on Solid Mechanics and Materials Engineering Program II	2
		Special Lecture on Solid Mechanics and Materials Engineering Program A	1
		Special Lecture on Solid Mechanics and Materials Engineering Program B	1
	Thermal and Fluid Engineering	Advanced Thermal Engineering I	2
		Advanced Thermal Engineering II	2
		Advanced Transport Phenomena	2
		Advanced Fluid Mechanics I	2
		Advanced Fluid Mechanics II	2
		Advanced Heat Transfer Engineering I	2
		Advanced Heat Transfer Engineering II	2
		Advanced Fluid Machinery	2
		Physical chemistry of multiphase and multicomponent systems	2
		Special Lecture on Intelligent Machine Systems Program I	2
		Special Lecture on Intelligent Machine Systems Program II	2
		Special Lecture on Thermal and Fluid Engineering Program A	1
		Special Lecture on Thermal and Fluid Engineering Program B	1

Electrical Energy and Systems Control Engineering	Thermal and Fluid Engineering	Advanced Thermal Engineering Ⅰ	2
		Advanced Thermal Engineering II	2
		Advanced Transport Phenomena	2
		Advanced Fluid Mechanics I	2
		Advanced Fluid Mechanics II	2
		Advanced Heat Transfer Engineering I	2
		Advanced Heat Transfer Engineering II	2
		Advanced Fluid Machinery	2
		Physical chemistry of multiphase and multicomponent systems	2
		Advanced Partial Differential Equation I	2
		Advanced Partial Differential Equation II	2
	Intelligent Machine Systems	Soft Control Engineering	2
		Self-Organizing Systems	2
		Applied Control System Theory	2
		Advanced Signal Processing in Mechanical Engineering	2
		Intelligent Control Engineering	2
		Advanced Partial Differential Equation I	2
		Advanced Partial Differential Equation II	2
	Electronic Systems and Devices	Advanced Thin Film Materials Engineering	2
		Advanced Quantum Computer Engineering	2
		VLSI Systems Design	2
		Optical Device Instrumentation Technology	2
		Advanced Dependable Systems	2
		Advanced Wireless Communication Systems	2
		Advanced Image Processing	2
		Telecommunication and speech signal processing	2
		Advanced Semiconductor Electronics	2
		Advanced Vacuum Technology	2
		Organic Electronics Material Engineering	2
		Advanced Reconfigurable Architecture	2
	Computer Science and Intelligent Systems	Advanced Software Engineering	2
		Advanced Probabilistic Models	2
		Advanced Artificial Intelligence	2
		Advanced Intelligent Robotics	2
		Advanced Intelligent Information Processing	2
		Advanced Biological Information Processing	2
		Advanced Wireless Systems	2
		Advanced Algorithms	2
		Advanced Information Networks	2
		Advanced Data Mining	2
		Advanced Multimedia Information Processing	2
		Advanced UI/UX	2
Electronic Systems and Devices	Electrical Energy and Systems Control Engineering	Advanced Power Energy Conversion	2
		Advanced Electric Machinery	2
		Advanced Magnetic Materials	2
		Advanced Medical Electronics	2
		Advanced Relativistic Electromagnetism	2
		Advanced Power System Analysis	2
		Advanced Power Electronics	2
		Advanced Plasma Engineering	2
		Advanced Nonlinear Control Theory	2
		Advanced Modern Control Theory	2
Civil Engineering	Architecture & Building Engineering	Advanced Architectural Design	2
		Advanced Urban Planning	2
		Advanced Structural Mechanics	2
		Advanced Structural Design in Natural Hazard Prone Areas	2
		Advanced Community Space Planning	2
		Advanced Environmental Noise	2
		Advanced Building Materials	2
		Advanced Construction Data Mining	2
Architecture & Building Engineering	Civil Engineering	Advanced Design Engineering of Steel Structures	2
		Advanced Continuum Mechanics	2
		Advanced Numerical Methods for Fluid Dynamics	2
		Advanced Geotechnical and Environmental Engineering	2
		Advanced Regional Planning and Design	2
		Advanced Environment and Disaster Risk Management	2
		Advanced Diagnosis Engineering of Steel Structures	2
		Advanced Materials Science of Concrete	2
		Advanced River Engineering	2
		Advanced Rock Mechanics	2
		Advanced Computational Solid Mechanics	2
Computer Science and Intelligent Systems	※There are no related subjects		