Super Smart Society Engineering Program

1. IGP (A) Outline

The goal of this program is to cultivate young and excellent talented personnel who can be active at the world level to accelerate the construction of "Super Smart Society" where people can live comfortably and lively. First, the students studying in this program gains broad knowledge and a deep understanding of the subjects of the Graduate Major they belong to. Next, by taking classes of other Graduate Majors the students gain broad knowledge and experience becoming essential researchers and engineers working to realize "Super Smart Society." Through these studies and experiences, the students can form a strong human network regardless of their nationality. Program graduates are expected to be active not only in Japan but also in the world where the realization of "Super Smart Society" is highly desired. This means that excellent young researchers and engineers who complete this program will be the cornerstone of supporting the sustainable growth of humanity. The students are educated in the Integrated Doctoral Education Program and are planning to transition from master's program to doctoral program on a continuous basis for both degrees. Most of the faculty members belonging to the School of Engineering are participating in this program. Since their research field is very wide, an applicant should carefully consult with the faculty member who will become the supervisor in advance about the consistency between the research theme of the applicant and the purpose of this program. Outlines of each Graduate Majors are given below.

1. Graduate Major in Mechanical Engineering: This Major aims at fostering of human resources who possess systematic expertise constituting basic academic principles of mechanical engineering and creative abilities to resolve problems from societal viewpoint using these academic principles. Through this education program, the graduates contribute to the evolutions of advanced science and technology and resolutions of broad societal problems.

2. Graduate Major in Systems and Control Engineering: Our lives, as well as the various equipment and infrastructure that support us are made up of different elements. However, it is shown that the ability to achieve these and the values that are conceived transcend the individual elements to make an overall system. In this Major, all things and matters in nature and society will be objectively analyzed as systems, and students will cultivate the ability to create systems that have value based on this knowledge. Namely, by learning developmental knowledge of measurement, control, planning, and systems science, this program trains talented people who can specifically apply this knowledge to new topics, are flexibly inventive, creative, and are bold and action-oriented individuals.

3. Graduate Major in Electrical and Electronic Engineering: This major offers a broad range of advanced courses as well as fundamental subjects in the field of electrical and electronic engineering. These courses cover basic topics necessary to understand the electrical and electronic engineering, which provide the state-of-the-art science and technology in the fields of "electronic materials," "electron devices," "wave, photonics and communication," "electronic circuit," and "power, energy and environment" and pragmatical courses, in which students acquire the practical skills of electrical and electronic engineering. Along with master's and doctoral research activities, students are expected to enhance the ability to identify and resolve problems.

4. Graduate Major in Information and Communications Engineering: This major aims to cultivate researchers, engineers and candidates of executives globally playing active part in various field such as industries; such individuals have top class competence in theoretical comprehension and practical application development in broad expertise on fundamental and applied technologies, which support human centered and sustainable advanced information and communications society from both hardware and software aspects and include communication and network, signal processing, VLSI (very large scale integrated circuits), computer, security, media information processing, bio information processing, sensory information processing and intelligent information processing.

5. Graduate Major in Industrial Engineering and Economics: Based on the fundamental knowledge in industrial engineering

and economics, students learn advanced knowledge and skills in mathematical engineering, economics, business administration, and management techniques. This program aims to cultivate people with deep insights in technology, organization and economy, and with abilities to discover, investigate, and solve problems in the world.

[IMPORTANT] Students need to fulfill not only with the completion requirements of the Graduate Major they belong to but also the completion requirements set by SSSEP.

1-1. Graduate Major(s) available to IGP (A) Students

Graduate Major in Mechanical Engineering

Graduate Major in Systems and Control Engineering

Graduate Major in Electrical and Electronic Engineering

Graduate Major in Information and Communications Engineering

Graduate Major in Industrial Engineering and Economics

[NOTE] If a student is at the Graduate Major other than the above, consult with the Supervisor and the Steering Committee of SSSEP.

2. Competencies Developed

In this program, students will acquire the following skills:

- Ability to resolve problems using broad engineering knowledge and skills

- Ability to develop a diverse view of things with well-rounded education and engineering ethics

- Ability to see the social trends, and find and solve current problems

- Ability to perform a project with understating of future trends from a global view by collaborating with others

- Ability to have communication and presentation abilities with logical explanation

3. Learning Goals

The goals of student learning as follows:

A) Fundamental knowledge necessary for making use of construction of "Super Smart Society"

B) Specialized and advanced knowledge necessary for developing "Super Smart Society"

C) Interdisciplinary view of science and engineering necessary for realization of "Super Smart Society"

D) Creative and practical research ability

E) Logical communication skills

4. IGP (A) Completion Requirements and Courses

【For Master's degree】

【1.】 IGP (A) Completion Requirements

(1) Credits

    a) Sustainable Engineering Technology (LAW.X417) must be acquired.

    b) 2 credits or more must be acquired as "Fundamental Technology Category" from the 400 level subjects (categorized in the Major courses only) offered by the Graduate Major in the School of Engineering (specified in 1-1. Graduate Major(s) available to IGP (A) Students) other than your own Graduate Major. Note that if subjects offered by the other Major are recommended subjects of your Major, they are regarded as the subjects of your Major.

    c) 2 credits or more must be acquired as "System Implementation Category" from the 500 level subjects (categorized in the Major courses only) offered by the Graduate Major in the School of Engineering (specified in 1-1. Graduate Major(s) available to IGP (A) Students) other than your own Graduate Major. Note that if subjects offered by the other Major are recommended subjects of your Major, they are regarded as the subjects of your Major.

    d) 2 credits or more must be acquired as "Social Service System Category" from the subjects provided by the Graduate Major in Industrial Engineering and Economics (categorized in the Major courses only).

    NOTE: The students belonging to the Graduate Major in Industrial Engineering and Economics need to take 2 credits or more additionally from the subjects described in b) or c) instead of taking the subjects required in d).

    e) The seminar must be acquired in each semester.

(2) Thesis

The student must complete a special research, submit a thesis for the degree and take the final examination given after the submission of her/his thesis for the qualification. The students qualified by the examination can enter the Doctoral program with some formalities.

    Under this program, in addition to the above-mentioned requirements, students must also fulfill the Graduate Major completion requirements to which they belong. For completion requirements of your Graduate Major, please refer to the relevant Graduate Major pages in "Guide to Graduate Majors (for IGP)".

【2.】 IGP (A) Courses

Table M1. Courses of IGP (A)

Course category			Course number			Course title	Credits	Competencies	Learning goals	Comments
Breadth courses	400 level		LAW.X414			Technical Management for Sustainable Engineering	2-0-0	1,2,5	A,C,D	C0M
			LAW.X416			Modern Japan	1-1-0	2,3,4,5	A,B,C,D,E	C0M C1M
			LAW.X417	◎		Sustainable Engineering Technology	1-1-0	2,3,4,5	A,B,C,D,E	
			LAW.X418			Communication Skills in Japanese Industries I	0-1-0	2,3,5	A,C,D,E	C0M C1M
			LAW.X419			Communication Skills in Japanese Industries II	0-1-0	2,3,5	A,C,D,E	C0M C1M

Note：

• ◎：Required course

• Competencies: 1 = Specialist skills, 2 = Intercultural skills, 3 = Communication skills, 4 = Critical thinking skills, 5 = Practical and/or problem-solving skills

• The character preceding the three digits in the course number denotes the course's subdiscipline (i.e., "D" represents the subdiscipline code in the course number LAW.D400.R): X (Global awareness and other breadth courses)

• C0M, C1M: courses that enable students to acquire GA (Graduate Attributes) and that are recognized as equivalent to Career Development Courses (For GA (Graduate Attributes) and Career Development Courses, please refer to the relevant Graduate Major pages in "Guide to Graduate Majors (for IGP).)

Under this program, in addition to the above-mentioned requirements, students must also fulfill the Graduate Major completion requirements to which they belong. For core courses of your Graduate Major, please refer to the relevant Graduate Major pages in "Guide to Graduate Majors (for IGP)".

【For Doctoral degree】

【1.】 IGP (A) Completion Requirements

a) 4 credits of Off-Campus Project of the Graduate Major must be acquired.

b) The seminar must be acquired in each semester.

c) The candidate must complete and upload his/her thesis for the degree, and take and pass the final examination and evaluation of the thesis.

The candidate who satisfies the above requirements and passes the final examination is awarded a doctoral degrees.

Under this program, in addition to the above-mentioned requirements, students must also fulfill the Graduate Major completion requirements to which they belong. For completion requirements of your Graduate Major, please refer to the relevant Graduate Major pages in "Guide to Graduate Majors (for IGP)".

【2.】 IGP (A) Courses

Four (4) credits of Off-Campus Project of the Graduate Major must be acquired.

Under this program, in addition to the above-mentioned requirements, students must also fulfill the Graduate Major completion requirements to which they belong. For core courses of your Graduate Major, please refer to the relevant Graduate Major pages in "Guide to Graduate Majors (for IGP)".