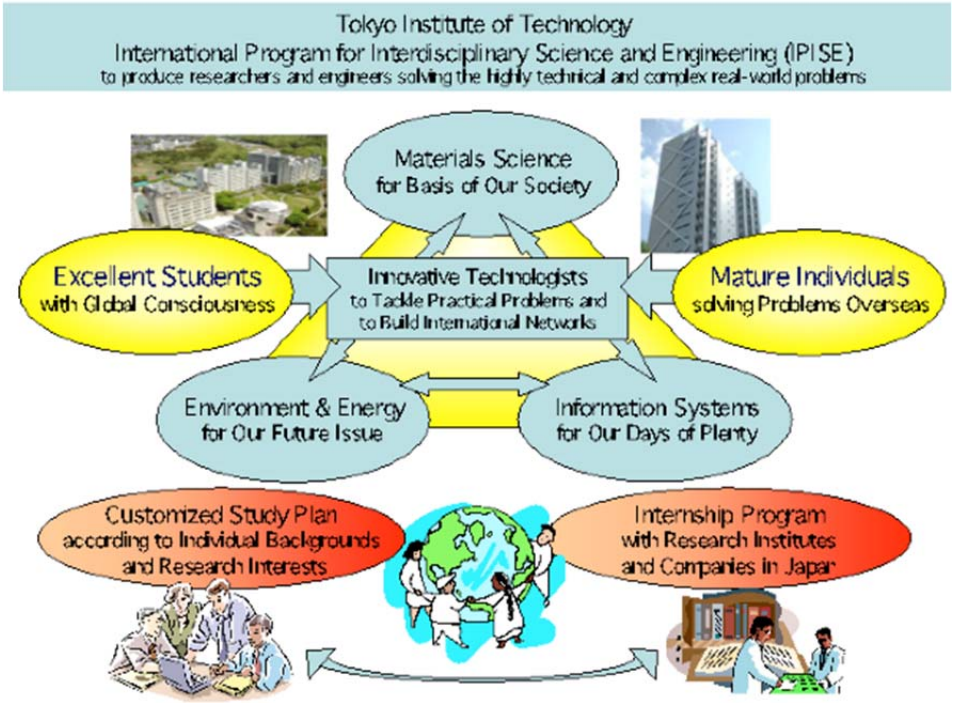
International Program for Interdisciplinary Science and Engineering (IPISE)

1. IGP (A) Outline

This graduate program is designed to produce researchers and engineers capable of solving the highly technical and complex real-world problems relating to materials, the environment, and information, through science and engineering. The independent graduate school that offers this program emphasizes interdisciplinary and creative education and research. In pace with the progress of globalization, the program accepts students from all over the world especially mature individuals with experience in solving problems overseas. The program offers these students a flexible and carefully designed course of education that can be finely customized according to their individual academic backgrounds and research interests, as well as the opportunity for exchange with Japanese students through tuition, and for internships with international research institutes and companies in Japan. The program is geared to producing innovative technologists equipped to tackle practical problems and to build multilateral international networks among them.



In the IPISE, there are three advanced courses: Materials Science, Environment & Energy, and Information Systems. The enrolled student officially belongs to one of the three advanced courses, according to his/her supervisor, and learns under the curriculum offered by the department.

1. Advanced Course of Materials Science and Engineering

The advanced course of Materials Science and Engineering covers a wide range of fields, from basic research in the chemistry of organic, inorganic, metallic, and composite materials, to the development of high-performance materials. They aim to exploit the science and engineering of the near future, in particular future-oriented electronics, to contribute to the construction of a safe, secure, and sustainable society. It is necessary to pass the results of this materials research rapidly and efficiently to the international community. Also, due to the expected standardization and mobility of global-scale universities and graduate schools in the near future, pioneering work is vital in this field.

2. Advanced Course of Environmental and Energy Science and Engineering

The advanced course of Environmental and Energy Science and Engineering is expected to make a contribution to the common global issues that must be addressed in order to construct a sustainable society - namely environmental problems, natural disaster threats, and energy problems. Because the nature of these problems, their conditions of occurrence, and the means for solving them vary from place to place, there is a vital need for innovative technologists who can conduct probing research into specific cases to seek solutions. Positioning these highly individual phenomena into the generalized knowledge system of science is both extremely labor-intensive and time consuming. For this reason, compared with other more highly abstract fields of science, often the results of research efforts cannot be always successfully applied. In this course, the technologists placed in this position are taken up as a major subject of study.

3. Advanced Course of Information Technology and System Sciences

The advanced course of Advanced Course of Information Technology and System Sciences is targeted at high achievers from leading universities in developing countries, or universities with which Tokyo Tech has cooperative agreements, and covers leading-edge, innovative, practical, and original fields of research in intelligent computing and data communications. The course aims to cultivate world-leading individuals who will promote exchange between Japan and international researchers and technologists when they return home after completing their studies.

The IPISE offers Integrated Doctoral Education Program, which is designed as a combined program continuing from Master's Program to Doctoral Program. The students must enroll in Master's Program even if the student was already awarded Master's degree from other university. To finish the IGP-A program of IPISE, the students must fulfill the Graduate Major completion requirements of their departments, in addition to the IPISE classes.

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

Graduate Major in Physics

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 Materials Science and Engineering

Graduate Major in Chemical Science and Engineering

Graduate Major in Mathematical and Computing Science

Graduate Major in Computer Science

Graduate Major in Life Science and Technology

Graduate Major in Architecture and Building Engineering

Graduate Major in Civil Engineering

Graduate Major in Global Engineering for Development, Environment and Society

Graduate Major in Energy Science and Engineering

Graduate Major in Engineering Sciences and Design

Graduate Major in Nuclear Engineering

Graduate Major in Artificial Intelligence

Graduate Major in Urban Design and Built Environment

2. Competencies Developed

The IPISE program is designed to produce researchers and engineers capable of solving the highly technical and complex real-world problems relating to materials, the environment, and information, through science and engineering. The independent graduate school that offers this program emphasizes interdisciplinary and creative education and research. Through this interdisciplinary education and research, we aim to develop students who can think globally and who will have strong problem-solving capabilities.

The IPISE targets Japanese students as well as foreign students. The collaborative learning environment provides a good opportunity for Japanese students to acquire a global perspective and deepen their insights, which are necessary for studying today's science and technology developments in depth. This is another objective of this program.

3. Learning Goals

We aim to develop students who can think globally and who will have strong problem-solving capabilities. To realize this, the following compulsory classes are offered:

1. Seminar for Cultivating International Understandings (SCIU) I 【EEE.Z471】2 credits (3,4 Q)

   Seminar for Cultivating International Understandings (SCIU) II 【EEE.Z472】1 credit (1,2 Q)

   Chair K. Kajikawa

The purpose of this seminar is to provide a platform for international collaboration, mutual understanding and cooperation, while fostering the development of global human resources. The seminar consists of (a) informal research meetings as well as a “science cafe”, (b) Mini-internship and (c) Corporative work between the foreign and Japanese students.

2. Modern Japan【LAW.X416】1 credit (2Q)

   Masahiko Hara, Itaru Kamiya, Olaf Karthaus, Haiwon Lee

Japan is regarded as an industrialized country and science-and-technology-oriented nation, however it has many unique characteristics which differ from those of Western-industrialized countries. Selected foreign and Japanese authorities will lecture on how they view contemporary Japan, with special regard to research activities, international collaboration and mobility, and career paths in the various fields of science and technology based on their experiences.

3. International Communication I【EEE.R411】(1 credit) (3,4 Q)

   International Communication Ⅱ【EEE.R412】(1 credit) (1,2Q)

   International Communication Ⅲ【EEE.R511】(1 credit) (3,4 Q)

   International Communication IV【EEE.R512】(1 credit) (1,2Q)

   Department Chair

This class is provided as a seminar for students from different countries of IPISE to exchange information on background and objective their research.

4. Academic Presentation I【EEE.R421】(1 credit) (3,4 Q)

   Academic Presentation Ⅱ【EEE.R422】(1 credit) (1,2Q)

   Academic Presentation Ⅲ【EEE.R521】(1 credit) (3,4 Q)

   Academic Presentation IV【EEE.R522】(1 credit) (1,2Q)

   Supervisor

An opportunity for student to give her/his presentation on their progress of research activities in front of her/his supervisor.

In addition to the above four compulsory classes, a few classes are recommended for the aim of IPISE program:

Master's Critical Thinking【LAC.M448】(1 credit) (3Q)

Ricinschi Dan, Gonzales Hazel Bantolino

Master's Scientific Communication【LAC.M562】(1 credit) (2Q)

Gonzales Hazel Bantolino, Ricinschi Dan

4. IGP (A) Completion Requirements and Courses

【For Master's Degree 】

【1.】IGP (A) Completion Requirements

The following compulsory classes (8 credits) must be taken to finalize the master degree of the IPISE program:

1. Seminar for Cultivating International Understandings (SCIU) I and II (3 credits)
2. Modern Japan (1 credit)
3. International Communication I-IV (Two of four classes I-IV) (2 credits)
4. Academic Presentation I-IV (Two of four classes I-IV) (2 credits)

Under this program, in addition to the above-mentioned requirements, students must also fulfill the Graduate Major completion requirements of their departments (degree completion requirements). 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			Credits	Competencies	Learning goals	Comments
Major courses	400 level	EEE.R411	○		International Communication I	0-1-0	1,2		*
		EEE.R412	○		International Communication II	0-1-0	1,2		*
		EEE.R421	○		Academic Presentation I	0-1-0	2,3		*
		EEE.R422	○		Academic Presentation II	0-1-0	2,3		*
		EEE.Z471	◎		Seminar for Cultivating International Understandings I	0-2-0	1,2		
		EEE.Z472	◎		Seminar for Cultivating International Understandings II	0-1-0	1,2		
	500 level	EEE.R511	○		International Communication III	0-1-0	1,2		*
		EEE.R512	○		International Communication IV	0-1-0	1,2		*
		EEE.R521	○		Academic Presentation III	0-1-0	2,3		*
		EEE.R522	○		Academic Presentation IV	0-1-0	2,3		*
Breadth courses	400 level	LAW.X416	◎		Modern Japan	1-0-0	1,2,4,5		
Career Development Courses	400 level	LAC.M448			Master's Critical Thinking	1-0-0	1,2,4		
	500 level	LAC.M562			Master's Scientific Communication	1-0-0	1,2,4		

Note：

・◎：Required course, ○：Restricted elective, O：odd academic years, E：even academic years

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

• * International Communication and Academic Presentation: two courses of four (I-IV) must be taken. I and III are provided in (3Q and 4Q), and II and IV are in (1Q and 2Q). This is for the students who would take in (3Q and 4Q) in 1st year and (3Q and 4Q) in 2nd year, (this case I and III), for instance.

Under this program, in addition to the above-mentioned requirements, students must also fulfill the Graduate Major completion requirements of their departments (degree completion requirements). 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

In Doctoral degree program, no compulsory classes are offered.

Students must also fulfill the Graduate Major completion requirements of their departments (degree completion requirements). 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

None

Students must also fulfill the Graduate Major completion requirements of their departments (degree completion requirements). For core courses of your Graduate Major, please refer to the relevant Graduate Major pages in “Guide to Graduate Majors (for IGP)”.