International Graduate Program for Global Leaders on Engineering Systems with Humanities, Social Sciences and Cultural Studies

【Master's degree program】

1. Program Outline

Our program aims to bring up future global leaders in such various fields as policy making, national administration, legal institutes, industry, education, and academic research. We accept excellent students from all over the world, and bring them up to be of capability and skills required to solve essential problems on engineering systems with harmonization among human, organizations, societies, cultures, and science and technology. In order to achieve our goals, we provide courses on knowledge of human, organizations, societies, cultures, science and technology, and Japanese style management technologies, which have obtained the world's respects and reputations.

2. Course Outline and Competencies Developed

Subjects in the program are offered by the faculties of the department of Industrial Engineering and Economics in School of Engineering, utilizing strong and abundant resources related not only to engineering systems but also humanities, social sciences, and cultural studies. In addition, subjects on skills for academic research and knowledge of Japanese language and life will be also offered so as to educate students who will work as a bridge between Japan and their own countries.

This program aims to develop the following competencies.

- Fundamental knowledge to freely utilize mathematical engineering, information, and engineering technologies.
- Knowledge and viewpoints of industrial engineering and economics in order to comprehend management activities and programs in economics.
- Ability for deeper insight in technology and organization, and for discovering, analyzing and solving essential problems.
- Conceptual ability for structuring and modeling problems.
- Ability in explaining, documenting and communicating in English or Japanese language.
- Ability to pursue researches towards new problems.

3. Guide to Study

In order to develop the competences described above, students learn the following in this program.

A) Fundamental knowledge in industrial engineering and economics.

Learn fundamental knowledge of industrial engineering and economics at graduate level in order to utilize mathematical, information, and engineering technology freely.

B) Application of industrial engineering and economics

Learn knowledge and viewpoints of industrial engineering and economics necessary to understand management activities and economic problems.

C) Broad viewpoints and own initiative for learning

Develop insights on technology and organization, ability for discovering, analyzing, and solving essential

problems, as well as conceptual ability for structuring and modeling problems.

D) Experience of engagement with society

Pseudo-experience engagement with society and learning of engineering ethics through lectures by practitioners.

E) Strengthen communication ability

Develop ability to conduct research on new problems through research projects for master thesis, and ability for explaining and communicating information in English/Japanese languages through colloquium and seminars.

4. Program Completion Requirements

In order to complete the master's degree program of International Graduate Program for Global Leaders on Engineering Systems with Humanities, Social Sciences and Cultural Studies, requirements for master's degree in the Industrial Engineering and Economics major must be met. Refer to the description for the master's degree program of the Industrial Engineering and Economics Major, International Graduate Program (C) study guide.

5. Tables of Course Subjects (Core Courses)

Table M2. Core Courses of the Industrial Engineering and Economics Graduate Major

Course category		Course Number	Course			credits	Competencies	Learning goals	Comments
Research seminars	400 level	IEE.Z491.R	◎		Seminar in Industrial Engineering and Economics S1	0-2-0	235	A,B,C	
		IEE.Z492.R	◎		Seminar in Industrial Engineering and Economics F1	0-2-0	235	A,B,C	
	500 level	IEE.Z591.R	◎		Seminar in Industrial Engineering and Economics S2	0-2-0	235	B,C,D, E	
		IEE.Z592.R	◎		Seminar in Industrial Engineering and Economics F2	0-2-0	235	B,C,D, E	
Research-related courses	400 level	IEE.E401	◎		Reading in Industrial Engineering and Economics S	0-1-0	23	A,C,E	
		IEE.E402	◎		Reading in Industrial Engineering and Economics F	0-1-0	23	A,C,E	
	500 level	IEE.E501.L			Academic Presentation in Industrial Engineering and Economics S	0-1-0	12	B,E	
		IEE.E502.L			Academic Presentation in Industrial Engineering and Economics F	0-1-0	12	B,E	
		IEE.E503.L			International Workshop Presentation (Abroad)	0-0-1	12	B,E	Credits from this course are not included in 22 credits of core courses

									required for completion
		IEE.E504.L			International Workshop Presentation (Domestic)	0-0-1	12	B,E	Credits from this course are not included in 22 credits of core courses required for completion
Major courses	400 level	IEE.C432.L			Applied Cognitive Ergonomics	2-0-0	2345	A	□
		IEE.D432.L			Financial Statement Analysis and Valuation	2-0-0	12345	A	□
		IEE.D433.L			Corporate Transformation	2-0-0	23	A	□
		IEE.D434.L			Corporate Finance and Governance	2-0-0	12345	A	□
	500 level	IEE.C501.L			Design Thinking	1-1-0	1245	B,C,D,E	□
		IEE.C530.L			Design Business	1-1-0	12345	B	□
		IEE.C531.L			Enterprise Engineering	2-0-0	234	B	□

Note :

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

・□ : Course is recognized as an Academy for Co-creative Education of Environment and Energy Science, Leading Graduate School (ACEEES) course.

• Competencies: 1 = Intercultural skills; 2 = Communication skills; 3 = Specialist 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 ABC.D400.R): A (mathematical engineering), B (economics), C (business administration), D (industrial engineering management technology), E (others).

6. Courses That Can Be Taken as Career Development Courses

Table M4. Courses That Can Be Taken as Career Development Courses for the ○○ Graduate Major

Course category	Course Number	Course			credits	GA *	Learning goals	Comments
can be taken as Career Development Courses	IEE.C433.L			Advanced Course of Management	2-0-0	C0M C1M	A,C,D,E	
	IEE.C532.L			Management of Technology and Intellectual Property	2-0-0	C1M	B,C,D	

To satisfy the Career Development requirement, credits may be acquired from courses listed above as well as from those listed under Career Development Courses (see the Liberal Arts and Basic Science Courses Guide).

＊GA : Graduate Attribute

【Doctoral degree program】

1. Program Outline

Our program aims to bring up future global leaders with advanced and latest knowledge in such various fields as policy making, national administration, legal institutes, industry, education, and academic research. We accept excellent students from all over the world, and bring them up to be of capability and skills required to solve essential problems on engineering systems with harmonization among human, organizations, societies, cultures, and science and technology. In order to achieve our goals, we provide courses on knowledge of human, organizations, societies, cultures, science and technology, and Japanese style management technologies, which have obtained the world's respects and reputations.

2. Course Outline and Competencies Developed

Subjects in the program are offered by the faculties of the department of Industrial Engineering and Economics in School of Engineering, utilizing strong and abundant resources related not only to engineering systems but also humanities, social sciences, and cultural studies. In addition, subjects on skills for academic research and knowledge of Japanese language and life will be also offered so as to educate students who will work as a bridge between Japan and their own countries.

This doctorate program aims to develop the following competencies at higher levels than the master's degree program.

- Ability to find and analyze problems in management and economic activities utilizing mathematical engineering, information, and engineering technologies.
- Ability to propose new solutions for technological, organizational, and economic problems from the viewpoints of industrial engineering and economics.
- Ability in explaining, documenting and communicating in English or Japanese language.
- Ability to pursue researches towards new problems.
- Ability to publish results of researches on cutting-edge topics in industrial engineering and economics to the world.
- Leadership to propose and pursue projects.

3. Guide to Study

In order to develop the competences described above, students learn the following in this program.

A) Fundamental knowledge in industrial engineering and economics.

Develop ability to discover, analyze problems in management and economic activities utilizing mathematical, information, and engineering technology.

B) Application of industrial engineering and economics

Develop abilities to propose new solutions for problems in technological, organizational, and economic problems from the viewpoints of industrial engineering and economics.

C) Broad viewpoints and own initiative for learning

Develop leadership to propose and pursue projects.

D) Experience of engagement with society

Develop ability to publish results of researches on cutting-edge topics in industrial engineering and economics to the world.

E) Strengthen communication ability

Develop ability to conduct research on new problems through research projects for doctorate dissertation, and ability for explaining and communicating information in English/Japanese languages through seminars.

4. Program Completion Requirements

In order to complete the doctorate degree program of International Graduate Program for Global Leaders on Engineering Systems with Humanities, Social Sciences and Cultural Studies, requirements for doctorate degree in the Industrial Engineering and Economics major must be met. Refer to the description for the doctorate degree program of the Industrial Engineering and Economics Major, International Graduate Program (C) study guide.

5. Tables of Course Subjects (Core Courses)

Table D2. Core Courses of the Industrial Engineering and Economics Graduate Major

Course category		Course Number	Course			credits	Competencies	Learning goals	Comments
Research seminars	600 level	IEE.Z691.R	◎		Seminar in Industrial Engineering and Economics S3	0-2-0	235	C,D,E	
		IEE.Z692.R	◎		Seminar in Industrial Engineering and Economics F3	0-2-0	235	C,D,E	
		IEE.Z693.R	◎		Seminar in Industrial Engineering and Economics S4	0-2-0	235	C,D,E	
		IEE.Z694.R	◎		Seminar in Industrial Engineering and Economics F4	0-2-0	235	C,D,E	
		IEE.Z695.R	◎		Seminar in Industrial Engineering and Economics S5	0-2-0	235	C,D,E	
		IEE.Z696.R	◎		Seminar in Industrial Engineering and Economics F5	0-2-0	235	C,D,E	
Research-related	600 level	IEE.E606.L			Industrial Engineering Off-Campus Project S	0-0-2	2,4,5	B,C,D	
		IEE.E607.L			Industrial Engineering Off-Campus Project F	0-0-2	2,4,5	B,C,D	
		IEE.E608.L			Presentation in Industrial Engineering S	0-2-0	1,2	B,C,E	

		IEE.E609.L			Presentation in Industrial Engineering F	0-2-0	1,2	B,C,E	
Major courses	600 level	IEE.E601.L			Advanced Course for Educational Practice in Industrial Engineering S	0-2-0	2,5	A,B,C,E	
		IEE.E602.L			Advanced Course for Educational Practice in Industrial Engineering F	0-2-0	2,5	A,B,C,E	
		IEE.E603.L			Technical Reading in Industrial Engineering	0-2-0	2,3,5	A,B,C,E	
		IEE.E604.L			Practical Training at Companies (Industrial Engineering) S	0-0-2	2,4,5	B,C,D	
		IEE.E605.L			Practical Training at Companies (Industrial Engineering) F	0-0-2	2,4,5	B,C,D	

Note :

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

・□ : Course is recognized as an Academy for Co-creative Education of Environment and Energy Science, Leading Graduate School (ACEEES) course.

・Competencies: 1 = Intercultural skills; 2 = Communication skills; 3 = Specialist 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 ABC.D400.R): A (mathematical engineering), B (economics), C (business administration), D (industrial engineering management technology), E (others).

6. Courses That Can Be Taken as Career Development Courses

Table D4. Courses That Can Be Taken as Career Development Courses for the Industrial Engineering and Economics Graduate Major

Course category	Course Number	Course			credits	GA *	Learning goals	Comments
can be taken as Career Development Courses	IEE.E606.L			Industrial Engineering Off-Campus Project S	0-2-0	A0D, A1D, A2D, A3D, P0D, P1D, P2D, P3D	B,C,D	
	IEE.E607.L			Industrial Engineering Off-Campus Project F	0-2-0	A0D, A1D, A2D, A3D,	B,C,D	

						P0D, P1D, P2D, P3D		
	IEE.E608.L			Presentation in Industrial Engineering S	0-2-0	A0D, A1D, A2D, A3D, P2D, P3D	B,C,E	
	IEE.E609.L			Presentation in Industrial Engineering F	0-2-0	A0D, A1D, A2D, A3D, P2D, P3D	B,C,E	
	IEE.E604.L			Practical Training at Companies (Industrial Engineering) S	0-0-2	A0D, A3D, P0D, P1D, P2D, P3D	B,C,D	
	IEE.E605.L			Practical Training at Companies (Industrial Engineering) F	0-0-2	A0D, A3D, P0D, P1D, P2D, P3D	B,C,D	
To satisfy the Career Development requirement, credits may be acquired from courses listed above as well as from those listed under Career Development Courses (see the Liberal Arts and Basic Science Courses Guide). **＊GA : Graduate Attribute**								