

International Program on Earthquake Engineering

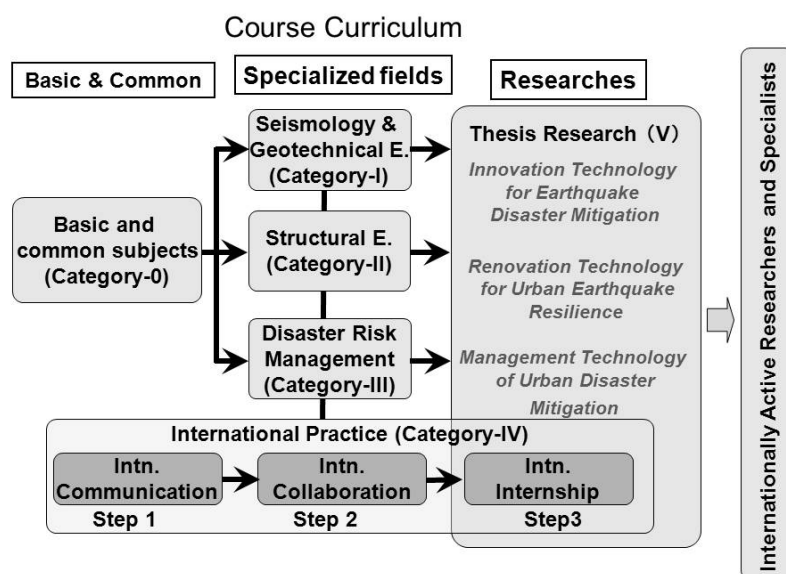
1. IGP (A) Outline

The Earthquake Engineering Program (EEP) offers courses and research opportunities leading to both Master's and doctoral degrees in Earthquake Engineering. Our graduates find employment in industry, governments and universities and are expected to be highly skilled engineers or researchers who will make significant contributions to earthquake hazard mitigation world-wide.

This is a combined Master's and Doctoral Program, and is considered to be one continuous course of study, which cannot be divided into two separate programs, i.e., even for the student who has already earned Master's degree in the other institution, study has to be started from Master's level at Tokyo Institute of Technology. This combined Master's and Doctoral program can be completed within three to five years.

Students who enroll in this program belong to either Department of Architecture and Building Engineering or Department of Civil and Environmental Engineering. Graduate Major of the enrolled student is one of the followings; Architecture and Building Engineering, Civil Engineering, or Urban Design and Built Environment.

All courses are systematically classified from Category-0 to Category-V as shown in the figure below. In particular, the courses in Category-IV are intended to diversify its educational mission for Japanese/international students and professionals, through course exercises, practical training and participation in international workshops and research collaborations with other institutions.



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

Graduate Major in Architecture and Building Engineering

Graduate Major in Civil Engineering

Graduate Major in Urban Design and Built Environment

2. Competencies Developed

In this Program, students are trained to develop cutting-edge technical engineering skills in a diverse and international environment, giving them the tools to become tomorrow's global leaders in the earthquake engineering industry and in academia. To achieve this goal, the Department seeks to confer the following skills to students:

- Theoretical understanding of the fundamentals of engineering necessary for professional practice and research.
- Technical skills and knowledge required for cutting-edge research in their field of earthquake engineering, and the ability to apply this research to practical use.
- Creativity required for producing, communicating, and applying new research ideas and knowledge.
- Understanding and appreciation of cultural diversity, necessary for the international practice of earthquake engineering.
- Communication and leadership skills needed for the international practice of earthquake engineering.

3. Learning Goals

Students engage in the following program of study:

- In-depth courses focused on specific fields within earthquake engineering
Students may take in-depth courses in specific fields within earthquake engineering, in order to acquire a deep understanding of the profession.
- Practical education for cutting-edge research and practice
By engaging in research toward a doctoral dissertation, students work together with a faculty advisor to develop cutting-edge experimental and analytical methods that push the frontier of earthquake engineering research and practice.
- Communication training for participation in international projects
Coursework (including seminars and research presentations), writing of the dissertation, and presentation of the dissertation are all conducted in English. This gives students the communication ability necessary to engage successfully in overseas projects.
- Problem-solving and leadership training
By engaging in research, students learn how to be a leader in their field and to solve problems in an ethical manner. Students will participate in field-specific and interdisciplinary seminars, and will interact with international students, researchers, and earthquake engineering practitioners via conferences and collaborative research. This will impart students with skills to further their ambitions to engage in international business or collaboration.

4. IGP (A) Completion Requirements and Courses

【For Master's degree】

【1.】 IGP (A) Completion Requirements

- 18 credits or more must be acquired from the subjects of the program listed in Table M1.
- Three credits or more must be taken from the subjects of the category IV (International Practice) in the table.

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	Graduate Major*	Category**
400-level	CVE.L401	Advanced Technical Communication Skills I	1-1-0	C	IV
	CVE.L402	Advanced Technical Communication Skills II	1-1-0	C	IV
	CVE.P431	International Collaboration I	0-1-0	C	IV
	CVE.P432	International Collaboration II	0-1-0	C	IV
	CVE.P433	International Internship I	0-1-0	C	IV
	CVE.P434	International Internship II	0-1-0	C	IV
	ARC.A403	Experiment on Building Engineering S1	0-0-1	B	V
	ARC.A404	Experiment on Building Engineering F1	0-0-1	B	V
	ARC.D443	Structural Planning in Architecture	1-0-0	B	II
	ARC.P442	Theories in Urban Analysis and Planning II	2-0-0	B	III
	ARC.S403 UDE.S463	Advanced Course on Design of Prestressed Concrete Structure	2-0-0	B, U	II
	ARC.S421 UDE.S461	Applied Building Structural Design	2-0-0	B, U	II
	CVE.A401	Introduction to Solid Mechanics	2-0-0	C	0
	CVE.A402	Advanced Course on Elasticity Theory	2-0-0	C	0
	CVE.A403	Analysis of Vibrations and Elastic Waves	2-0-0	C	0
	CVE.A431	Fracture Control Design of Steel Structures	2-0-0	C	II
	CVE.C401	Mechanics of Geomaterials	2-0-0	C	I
	CVE.C402	Stability Problems in Geotechnical Engineering	2-0-0	C	I
	CVE.C403	Geo-environmental Engineering	2-0-0	C	0, I
	CVE.C431	Physical Modeling in Geotechnics	2-0-0	C	0, I
	CVE.D401 UDE.P421	Mathematical Modeling of Individual Choice Behavior	2-0-0	C, U	0, III
	CVE.D402 UDE.P422	Transportation Network Analysis	2-0-0	C, U	III

	CVE.D403 UDE.P423	Transportation Economics	1-0-0	C, U	III
	CVE.E401	Mechanics of Structural Concrete	2-0-0	C	II
	CVE.E431	Integrated Modeling of Reinforced Concrete Structure	2-0-0	C	II
	CVE.F431	Maintenance of Infrastructure	2-0-0	C	II, III
	CVE.F432	Principles of Construction Management	2-0-0	C	0, III
	CVE.M401	Civil Engineering Analysis	2-0-0	C	0
	CVE.M431	Probabilistic Concepts in Engineering Design	2-0-0	C	0
	UDE.E402	GIS and Digital Image Processing for Built Environment	1-0-0	U	III
	UDE.P402 CVE.D441	Theory of Regional Planning and Process	2-0-0	U, C	III
	UDE.P404 CVE.D443	City/Transport Planning and the Environment	1-0-0	U, C	III
	UDE.P406 CVE.D444	Environmental Transport Engineering	1-0-0	U, C	III
	UDE.S401 ARC.S441	Dynamics of Structures	2-0-0	U, B	0, II
	UDE.S402 ARC.S442	Nonlinear Behavior of Concrete and Concrete Members	2-0-0	U, B	II
	UDE.S403 ARC.S443	Earthquake Resistant Limit State Design for Building Structures	2-0-0	U, B	II
	UDE.S404 ARC.S444	Damper-installed Structures and Base-isolated Structures against Earthquakes	2-0-0	U, B	II
	UDE.S405 ARC.S445	Post-earthquake Damage Evaluation and Rehabilitation of Steel Structures	2-0-0	U, B	II
	UDE.S431 CVE.A441	Basics of Stochastic Process for Earthquake Engineering	1-0-0	U, C	0, I
	UDE.S432	Seismic Hazard and Risk Assessment	1-0-0	U	III
	UDE.S433	Introduction on Theory of Earthquake Ground Motion	1-0-0	U	0, I
	UDE.S435	Earthquake and Tsunami Disaster Reduction	1-0-0	U	0
	ARC.Z491	Seminar in Architecture and Building Engineering S1	0-2-0	B	V
	ARC.Z492	Seminar in Architecture and Building Engineering F1	0-2-0	B	V
	CVE.Z491	Seminar in Civil Engineering S1	0-2-0	C	V
	CVE.Z492	Seminar in Civil Engineering F1	0-2-0	C	V
	UDE.Z491	Urban Design and Built Environment Seminar S1	0-2-0	U	V
	UDE.Z492	Urban Design and Built Environment Seminar F1	0-2-0	U	V
	UDE.Z493	Urban Design and Built Environment Laboratory S1	0-0-1	U	V
	UDE.Z494	Urban Design and Built Environment Laboratory F1	0-0-1	U	V
500-level	ARC.A503	Experiment on Building Engineering S2	0-0-1	B	V
	ARC.A504	Experiment on Building Engineering F2	0-0-1	B	V
	ARC.P501	Theories in Architectural Planning II	2-0-0	B	III
	CVE.N531	Advanced Topics in Civil Engineering I	2-0-0	C	III
	CVE.N532	Advanced Topics in Civil Engineering II	2-0-0	C	III
	GEG.I501 CVE.B542	Coastal Disaster Mitigation for Engineers and Planners	1-0-0	G, C	0, III

	UDE.S501 ARC.S541	Disaster Mitigation for Building Structures	2-0-0	U, B	0, II
	UDE.S502 ARC.S542	Mathematical Design of Structures	2-0-0	U, B	0, I
	UDE.S531 CVE.A541	Microtremor Survey Techniques using Theory of Stochastic Process	1-0-0	U, C	I
	UDE.S532	Application of Theory of Earthquake Ground Motion in Earthquake Engineering	1-0-0	U	I
	UDE.S534	Remote Sensing for Disaster Management	1-0-0	U	III
	ARC.Z591	Seminar in Architecture and Building Engineering S2	0-2-0	B	V
	ARC.Z592	Seminar in Architecture and Building Engineering F2	0-2-0	B	V
	CVE.Z591	Seminar in Civil Engineering S2	0-2-0	C	V
	CVE.Z592	Seminar in Civil Engineering F2	0-2-0	C	V
	UDE.Z591	Urban Design and Built Environment Seminar S2	0-2-0	U	V
	UDE.Z592	Urban Design and Built Environment Seminar F2	0-2-0	U	V
	UDE.Y493	IPISE Academic Presentation (ENVENG) F1	0-1-0	U	V
	UDE.Y494	IPISE Academic Presentation (ENVENG) S1	0-1-0	U	V
* B: Architecture and Building Engineering, C: Civil Engineering, U: Urban Design and Built Environment, G: Global Engineering for Development Environment and Society. ** 0: Basic and Common subject, I: Seismology and Geotechnical Engineering, II: Structural Engineering, III: Disaster Risk Management, IV: International Practice, V: Research Projects.					

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

- Off-Campus Project (one of the courses listed in Table D1 with symbol ‘O’) must be taken.
- Four credits or more including the credits acquired in Master’s study must be taken from the subjects of the category IV (International Practice) in Table M1.

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 D1. Courses of IGP (A)

Course category	Course Number	Course	Credits	Graduate Major	Category
600-level Off campus project	ARC.A622 UDE.A622	Architectural Design Practice S3B	0-0-4	B, U	IV, O
	ARC.A624 UDE.A624	Architectural Design Practice F3B	0-0-4	B, U	IV, O
	CVE.P621	Off Campus Project in Civil Engineering I	0-0-4	C	IV, O
	CVE.P622	Off Campus Project in Civil Engineering II	0-0-4	C	IV, O
	UDE.A601	Off Campus Project in Urban Design and Built Environment I	0-0-4	U	IV, O
	UDE.A602	Off Campus Project in Urban Design and Built Environment II	0-0-4	U	IV, O
600-level	CVE.N635	Disaster Investigation and Restoration Practice A	0-0-1	C	V
	CVE.N636	Disaster Investigation and Restoration Practice B	0-0-1	C	V
	CVE.N637	Disaster Investigation and Restoration Practice C	0-0-1	C	V
	CVE.N638	Disaster Investigation and Restoration Practice D	0-0-1	C	V
* B: Architecture and Building Engineering, C: Civil Engineering, U: Urban Design and Built Environment. ** O: Basic and Common subject, I: Seismology and Geotechnical Engineering, II: Structural Engineering, III: Disaster Risk Management, IV: International Practice, V: Research Projects.					

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)”.