

[Master Course]

2.1 Department of Civil and Earth Resources Engineering

(1) Educational Policy

1) Necessity of Research and Education in the Department

Our department aims to create a safe, secure, vital and sustainable society harmonizing with the environment for the living space for all living things. Our challenge is a necessary technological innovation to establish new industries and civilizations supported by social infrastructures as well as the promotion of the science technology for integrative establishment of social infrastructure (architecture) and sustainable utilization of resource energy.

2) Purpose of Education

Our purpose of education is to cultivate engineers with basic skills of engineering to deeply understand environmental problems and energy issues on a global scale and to develop technologies related to new infrastructure from international and multiple view points.

3) Goal of Education

Our goal is to foster high basic skills of engineering and nurture applied skills to solve problems in the real society, setting the theme toward the following: 1) Upgrading of state-of-the-art technology based on science engineering 2) Elucidation of natural disaster mechanisms and improvements on disaster mitigation technologies 3) Integrative social infrastructure architecture and improvements on its management technology, 4) Utilization of the Earth's crust and resource energy in a developmental and sustainable society and 5) Contribution to the solution of various problems for realizing low carbon societies.

(2) Credits required for Master degree

Subject category	Number of credits
Core (Basically compulsory)	2 credits
Major	10 or more credits
Minor	Not especially designated
Seminar, Internship of collaborative project, ORT subjects	8 or more credits
Others	Take under your supervisor's approval
Total number of credits	30 or more credits

[NOTE]

- 1) to complete the program, you must acquire the number of the credits designated for each subject category and the total number of credits listed above.
- 2) excluding the ones above, additional requirements to take Major subjects have been set depending on the educational program that you have selected. For the details, see Note (4) below.
- 3) Seminar, ORT, Internship of collaborative project, ORT subjects are specified "ORT Subject" in "Subject List."

(3) Registration Model

To be explained based on the material at the Guidance in April.

[NOTE]

- (1) For the details (syllabus) of each subject, please refer to the website of the Graduate School of Engineering. URL:<http://www.t.kyoto-u.ac.jp/syllabus-gs/>
- (2) The subjects without a circle (○) in the Subject category are regarded as “Minor subjects”.
- (3) “Exercise on Project Planning” and “Seminars on Infrastructure Engineering A/B” are compulsory. Students of International Course in Management of Civil Infrastructure will be lectured in English and the subject will be regarded as “English Subject (◎)”.
- (4) For Major subjects, you must satisfy the requirements for one of the 5 educational divisions below. For the selection of your educational program, obtain your supervisor’s approval in advance.

Structural Division Education Program:

Must take all “Continuum Mechanics”, “Structural Stability”, “Material and Structural System & Management”, “Earthquake Engineering/Lifeline Engineering”, and “Infrastructural Structure Engineering”.

Hydrologic Division Education Program:

● Must take all “Hydrodynamics and Turbulence Mechanics”, “Hydrologic Design and Management”, “River Management”, and “Sediment Hydraulics”.

● Must take at least 3 subjects among , “Hydrology” “Open Channel Hydraulics”, “Coastal Wave Dynamics”, “Hydro-meteorologically based Disaster Prevention”, “Water Resources Systems”, “River Basin Management of Flood and Sediment”, “Coastal and Urban Water Disasters Engineering”, “Disaster Mitigation for Sustainable Basin Environment”, “Computational Fluid Dynamics”, “Hydraulic Engineering for Infrastructure Development and Management”, “Applied Hydrology”, “Case Studies Harmonizing Disaster Management” and “Integrated Disasters and Resources Management in Watersheds”.

Geomechanics Division Education Program:

Consult with your supervisor for which subjects you take among “Geomechanics”, “Computational Geotechnics”, “Seminar on Geotechnics”, “Management of Geotechnical Infrastructures”, “Construction of Geotechnical Infrastructures”, “Geo-Risk Engineering”, “Fundamental Geofront Engineering”, “Geofront Environmental Design”, “Environmental Geotechnics”, “Numerical Methods in Geomechanics”, and “Disaster Prevention through Geotechnics”.

Planning Division Education Program:

Must take at least 2 subjects among “Governance for Regional and Transportation Planning”, “Public Finance”, “Urban Environmental Policy”, “City Logistics”, “Quantitative Methods for Behavioral Analysis”, “Intelligent Transportation Systems”, “Advanced Geoinformatics”, “Civic and Landscape Design”, “Risk Management”, “Disaster Information”, “Disaster Risk Management”, and “Theory & Practice of Environmental Design Research”.

Earth Resources and Energy Division Education Program:

Must take at least 3 subjects among “Resources Development Systems”, “Applied Mathematics in Civil & Earth Resources Engineering”, “Computational Mechanics and Simulation”, “Environmental Geosphere Engineering”, “Modeling of Geology”, “Applied Elasticity for Rock Mechanics”, “Fundamental Theories in Geophysical Exploration”, “Design of Underground Structures”, “Lecture on Exploration Geophysics”, “Measurement in the Earth’s Crust Environment”, “Time Series Analysis”, and “Energy System Management”.

“International Course in Management of Civil Infrastructure” Program:

Must complete 10 credits or more from English-lectured classes provided on the Subject List. Consult with your supervisor which classes to take.

(5) You must acquire 20 credits or more in total from the subjects listed in Subject List, among the 30 credits of completion requirement. Students of International Course in Management of Civil Infrastructure must take the 20 credits (including “Exercise on Project Planning” and “Seminars on Infrastructure Engineering A/B”) in English. The other 10 credits must be English classes from the Subject List or English classes equivalent to the ones on (6) below.

(6) For the subjects not listed on the Subject List, you can select from Common Subjects of Graduate School of Engineering (excluding Japanese course subjects) and/or the subjects of other Departments/Graduate School which your supervisor approves. For the students who passed the Joint Degree System of the Graduate School of Management, apply (7) below. However, the credits will be regarded as “Minor subjects” in any of these cases.

(7) If the students who passed the Joint Degree System of the Graduate School of Management have completed the subjects offered by the Graduate School of Management, credits are to be admitted as the credits of the subjects of the Department of Civil and Earth Resources Engineering under the approval of the supervisor. However, the number of obtainable credits must not exceed 10 credits.

(8) As for taking “Urban Transport Policy”, “Policy for Low-Carbon Society”, “Urban Transport Management”, “Policy for Low-Carbon Society, Advanced”; “Urban Transport Management, Advanced”; “Capstone Project Practice”; contact **the Low-Carbon Society Unit** prior to registering for the classes.

(9) As for taking “Dialog/Liveable Cities”, “Dialog/ Design of Liveable Cities” “Basic Civil Engineering & Health Science I” “Basic Civil Engineering & Health Science II” “Policy for Liveable Cities” “Methodology for Liveable Cities” “Seminar on Liveable Cities A” “Seminar on Liveable Cities B” “Disaster and Health Risk Management” “KANSEI urban spaces” and “Exercise on Project planning”; contact **Liveable Cities Unit** prior to registering for the classes.

(10) The courses below have also been set in the Department of Civil and Earth Resources Engineering:

- Structural Design Engineer/Researcher Training Course
- Hydrologic Design Engineer/Researcher Training Course
- Geo Design Engineer/Researcher Training Course
- Urban Design Engineer/Researcher Training Course
- Earth Resources and Energy Engineer/Researcher Training Course
- International Course on Disaster Resilient Countries

If you have completed the subjects designated for each course and applied for the completion of the subject, you will obtain a certificate to prove that you have completed that course.

3.1 Department of Civil and Earth Resources Engineering

(1) Educational Policy

1) Necessity of Research and Education in the Department

Our department aims to create a safe, secure, vital and sustainable society harmonizing with the environment for the living space for all living things. Our challenge is a necessary technological innovation to establish new industries and civilizations supported by social infrastructures as well as the promotion of the science technology for integrative establishment of social infrastructure (architecture) and sustainable utilization of resource energy.

2) Purpose of Education

Our purpose of education is to cultivate engineers and researchers with basic skills of engineering to deeply understand environmental problems and energy issues on a global scale and to develop new technologies from international and multiple view points.

3) Goal of Education

Our goal is to foster deep basic skills of engineering through advanced and cutting-edge research or applied technology research to deal with various problems in the real society and nurture applied skills to solve problems in the real society and advanced technologies and applied skills on internationally-accepted level, setting the theme toward the following: 1) Upgrading of state-of-the-art technology based on science engineering 2) Elucidation of natural disaster mechanisms and improvements on disaster mitigation technologies 3) Integrative social infrastructure architecture and improvements on its management technology, 4) Utilization of the Earth's crust and resource energy in a developmental and sustainable society and 5) Contribution to the solution of various problems for realizing low carbon societies.

(2) Credits required for Master degree

Subject Category	Number of Credit		
	5-year course		3 year course
	Master	Doctoral	Doctoral
Core Subject	2 or more credits	6 or more credits	4 credits
Major Subject	10 or more credits	12 credits or more	2 credits or more
Minor Subject	Not especially designated	Not especially designated	Not especially designated
Seminar • ORT • Internship of collaborative research	8 or more credits	12 credits or more	4 credits or more
Other subject	Take under the approval of your supervisor		
Total	30 or more credits	40 or more credits	10 credits or more

[NOTE]

- 1) The 30 credits to complete the Master's Program are included in the 40 which are necessary to complete the Doctoral Program (5-year course). To continue on with the Doctoral Program (5-year course), you must complete the Master's Program.
- 2) To complete the program, you must acquire the number of the credits designated for each subject category and the total number of credits listed above as well.
- 3) To take Major subjects, additional requirements have been set besides the ones above, depending on the educational program that you have selected. For details, see Note (5) below.
- 4) You can take the English subjects with double circles on the Subject List as Core subjects if your supervisor approves.
- 5) Seminar, Internship of collaborative project, ORT subjects are specified "ORT Subject" in "Subject List."

(3) Registration Model

To be explained based on the material at the Guidance in April.

[Note for 5-year Course]

- (1) For the details (syllabus) of each subject, please refer to the website of the Graduate School of Engineering. URL:<http://www.t.kyoto-u.ac.jp/syllabus-gs/>.
- (2) The subjects with white circles(○) on the Subject List are obtainable.
- (3) The subjects without circles in the Subject category are regarded as “Minor subjects”.
- (4) “Exercise on Project Planning” and “Seminars on Infrastructure Engineering A/B” are compulsory during Master’s Program.
- (5) As for taking Major subjects during “Master’s Program”, you must satisfy the requirements for one of the 5 educational divisions below. For the selection of your educational program, obtain your supervisor’s approval in advance.

Structural Division Education Program:

Must take all “Continuum Mechanics”, “Structural Stability”, “Material and Structural System & Management”, “Earthquake Engineering/Lifeline Engineering”, and “Infrastructural Structure Engineering”.

Hydrologic Division Education Program:

- Must take all “Hydrodynamics and Turbulence Mechanics”, “Hydrologic Design and Management”, “River Management”, and “Sediment Hydraulics”.
- Must take at least 3 subjects among , “Hydrology” “Open Channel Hydraulics”, “Coastal Wave Dynamics”, “Hydro-meteorologically based Disaster Prevention”, “Water Resources Systems”, “River basin management of flood and sediment”, “Coastal and Urban Water Disasters Engineering”, “Disaster Mitigation for Sustainable Basin Environment”, “Computational Fluid Dynamics”, “Hydraulic Engineering for Infrastructure Development and Management”, “Applied Hydrology”, “Case Studies Harmonizing Disaster Management” and “Integrated Disasters and Resources Management in Watersheds”.

Geomechanics Division Education Program:

Consult with your supervisor for which subjects you take among “Geomechanics”, “Computational Geotechnics”, “Seminar on Geotechnics”, “Management of Geotechnical Infrastructures”, “Construction of Geotechnical Infrastructures”, “Geo-Risk Engineering”, “Fundamental Geofront Engineering”, “Geofront Environmental Design”, “Environmental Geotechnics”, “Numerical Methods in Geomechanics”, and “Disaster Prevention through Geotechnics”.

Planning Division Education Program:

Must take at least 2 subjects among “Governance for regional and transportation planning”, “Public Finance”, “Urban Environmental Policy”, “City Logistics”, “Quantitative Methods for Behavioral Analysis”, “Intelligent Transportation Systems”, “Advanced Geoinformatics”, “Civic and Landscape Design”, “Risk Management”, “Disaster Information”, “Disaster Risk Management”, and “Theory & Practice of Environmental Design Research”.

Earth Resources and Energy Division Education Program:

Must take at least 3 subjects among “Resources Development Systems”, “Applied Mathematics in Civil & Earth Resources Engineering”, “Computational Mechanics and Simulation”, “Environmental Geosphere Engineering”, “Modeling of Geology”, “Applied Elasticity for Rock Mechanics”, “Fundamental Theories in Geophysical Exploration”, “Design of Underground Structures”, “Lecture on Exploration Geophysics”, “Measurement in the Earth’s crust environment”, “Time Series Analysis”, and “Energy System Management”.

- (6) You must acquire 20 credits or more in total from the subjects listed in Subject List, among the 30 credits of completion requirement of Master's Program.
- (7) During "Master's Program", for the subjects not listed on the Subject List, you can select from Common Subjects of Graduate School of Engineering (excluding Japanese course subjects) and/or the subjects of other Departments/Graduate School which your supervisor approves. For the students who passed the Joint Degree System of the Graduate School of Management, apply (8) below. However, the credits will be regarded as "Minor subjects" in any of these cases.
- (8) If the students who passed the Joint Degree System of the Graduate School of Management have completed the subjects offered by the Graduate School of Management, credits are to be admitted as the credits of the subjects of the Department of Civil and Earth Resources Engineering under the approval of the supervisor. However, the number of obtainable credits must not exceed 10 credits.
- (9) If you have not completed the subjects with white circle provided for both Master's and Doctoral Programs in the "Registration Designation" during your Master's Program, you can add to the credits for your Doctoral Program.
- (10) Both Seminars on "Integrated Infrastructure Engineering A and B" are compulsory in Doctoral Program.
- (11) Your course registration plan at the time of admission and change of the plan during your study will be approved at the Guidance Committee consisting of one supervisor and 2 sub-supervisors.
- (12) As for taking "Urban Transport Policy", "Policy for Low-Carbon Society", "Urban Transport Management", "Policy for Low-Carbon Society, Advanced"; "Urban Transport Management, Advanced"; "Capstone Project Practice"; contact **the Low-Carbon Society Unit** prior to registering for the classes.
- (13) As for taking "Dialog/Liveable Cities", "Dialog/ Design of Liveable Cities" "Basic Civil Engineering & Health Science I" "Basic Civil Engineering & Health Science II" "Policy for Liveable Cities" "Methodology for Liveable Cities" "Seminar on Liveable Cities A" "Seminar on Liveable Cities B" "Disaster and Health Risk Management" "KANSEI urban spaces" and "Exercise on Project planning"; contact **Liveable Cities Unit** prior to registering for the classes.
- (14) The courses below have also been set in the Department of Civil and Earth Resources Engineering:
 - Structural Design Engineer/Researcher Training Course
 - Hydrologic Design Engineer/Researcher Training Course
 - Geo Design Engineer/Researcher Training Course
 - Urban Design Engineer/Researcher Training Course
 - Earth Resources and Energy Engineer/Researcher Training Course
 - International Course on Disaster Resilient Countries

If you have completed the subjects designated for each course and applied for the completion of the subject during your Master's Program, you will obtain a certificate to prove that you have completed that course.

[Note for 3-year Course]

- (1) For the details (syllabus) of each subject, please refer to the website of the Graduate School of Engineering. URL:<http://www.t.kyoto-u.ac.jp/syllabus-gs/>.
- (2) The subjects with white circles(○) on the Subject List are obtainable.
- (3) The subjects without circles in the Subject category are regarded as "Minor subjects".
- (4) "Integrated Seminars on Infrastructure Engineering A/B" are compulsory.
- (5) For the subjects not listed on the Subject List, you can select Common Subjects of Graduate School of Engineering (excluding Japanese course subjects) and/or the subjects of other Departments/Graduate School which your supervisor approves
- (6) Your course registration plan at the time of admission and change of the plan during

your study must be approved at the Guidance Committee consisting of one supervisor and 2 sub-supervisors.

- (7) As for taking “Urban Transport Policy”, “Policy for Low-Carbon Society”, “Urban Transport Management”, “Policy for Low-Carbon Society, Advanced”; “Urban Transport Management, Advanced”; “Capstone Project Practice”; contact **the Low-Carbon Society Unit** prior to registering for the classes.
- (8) As for taking “Dialog/Liveable Cities”, “Dialog/ Design of Liveable Cities” “Basic Civil Engineering & Health Science I” “Basic Civil Engineering & Health Science II” “Policy for Liveable Cities” “Methodology for Liveable Cities” “Seminar on Liveable Cities A” “Seminar on Liveable Cities B” “Disaster and Health Risk Management” “KANSEI urban spaces” and “Exercise on Project planning”; contact **Liveable Cities Unit** prior to registering for the classes.