

Graduate Major in Urban Design and Built Environment

【Master's Degree Program】

1. Outline

Graduate Major in Urban Design and Built Environment offers a comprehensive academic program for studying the current status of urban design and built environment, and for solving relevant emerging issues and social concerns. In this program, students study “safety,” “functionality,” “comfort,” “history,” and “environmental-friendliness” in urban environment which are necessary for proposing urban design and built environment in the future.

In the Urban Design and Built Environment program, students are trained to acquire broad knowledge, and develop capacity to build and maintain resilient urban design and built environment which are human- and environmentally-friendly, invulnerable against disaster, and well-coordinated with local culture and climate. Students are also trained to be engineers and researchers with well-rounded education and international communication skills who are aware of their responsibilities as leaders, and active internationally in the field of the urban design and built environment.

In order to attain this goal, the program is composed of two subjects: courses and researches. Students learn foundations for understanding urban design and built environment at advanced level by taking courses, and acquire necessary knowledge for expert engineers through research works.

The graduate major of Urban Design and Built Environment is jointly offered by Department of Architecture and Building Engineering, and Department of Civil and Environmental Engineering, and prospective students are expected to have prior knowledge about foundations of Architecture and Building Engineering, or of Civil and Environmental Engineering at undergraduate level.

In the Master’s Degree program, students are trained to acquire broad range of necessary knowledge and engineering for understanding urban design and built environment in an interdisciplinary and well-organized way, and hence to contribute to generation, regeneration and utilization of resilient urban design and built environment.

2. Competencies Developed

The graduate major of Urban Design and Built Environment seeks to confer the following skills to students:

- Logical thinking and analytical methods for understanding urban design and built environment comprehensively
- Insight for finding problems and spirit of inquiry for solving them concerning urban design and built environment
- Ability to develop a diverse view of things with well-rounded education and engineering ethics
- Communication ability to convey unique ideas and proposals to others appropriately
- Ability to planning and implementing a project by collaborating with others
- Communication skills to write, discuss, and make presentations analytically in English

3. Learning Goals

For the Master’s degree of Urban Design and Built Environment, students engage in the following program of study:

(A) Fundamental courses focused on the foundations of urban design and built environment

Required courses with practical work, and elective courses of broad range of subjects are offered to convey the foundation for the theory of urban design and built environment.

(B) Practical courses focused on the applications of the theory of urban design and built environment

Courses of practice in coordination with the fundamental courses, and elective courses of broad subjects are offered to convey the application of the theory of urban design and built environment.

(C) Courses for developing a broad vision of urban design and built environment taken by students proactively

Courses of creative experiments and practices where subjects are developed and proposed by students proactively, with a regular orientation, a face-to-face advice from a supervisor and an open laboratory.

(D) Courses for learning the relationship between society, and urban design and built environment

Courses for learning practice in society and engineering ethics offered by invited lecturers who are socially acknowledged.

(E) Courses for training communication skills

Courses for developing the abilities to complete a Master's thesis, and to make presentations of the thesis at seminars and conferences.

4. IGP Completion Requirements

The following requirements must be met to complete the Master's Degree Program of this major.

1. A total of 34 credits or more acquired from 400- and 500-level courses.
2. From the courses specified in the Graduate Major in Urban Design and Built Environment curriculum,
 - 8 credits acquired from Research Seminars;
 - Minimum of 9 credits acquired from Major Courses; and
 - Minimum of 5 credits acquired from Liberal Arts and Basic Science Courses
(3 credits from the Humanities and Social Science Courses of which 2 credits must be from 400-level courses and 1 credit from 500-level courses, and 2 credits from Career Development Courses).
3. Pass the master's thesis review and defense.

Table M1. Graduate Major in Urban Design and Built Environment Completion Requirements

Course category		<Required courses> Required credits	<Electives> Minimum credits required	Minimum credits required	Associated learning goals	Comments
Liberal arts and basic science courses	Humanities and social science courses		•2 credits from 400-level •1 credit from 500-level	5 credits	C, E	
	Career development courses		2 credits		C, D	
	Other courses					
Core courses	Research seminars	Urban Design and Built Environment Seminar S1 Urban Design and Built Environment Seminar F1 Urban Design and Built Environment Seminar S2 S Urban Design and Built Environment Seminar F2 A total of 8 credits, 2 credits each from the above courses.		22 credits	A, B, C, D, E	
	Research-related courses				B, C	
	Major courses	4 credits	5 credits		A, B, C, D	
	Major courses and Research-related courses <u>outside</u> the Graduate Major in Urban Design and Built Environment standard curriculum					
Total required credits		A minimum of 34 credits in addition to meeting the above conditions				
Note		<ul style="list-style-type: none"> • Japanese Language and Culture Courses offered to International Students can be recognized as Humanities and Social Science Courses of the corresponding course level. • As for Liberal Arts and Basic Science Courses, please refer to the relevant pages. • For the details of Humanities and Social Science Courses and Career Development Courses, please refer to the relevant chapters. • 10 credits acquired at other university can be transferred after submission of the designated form, and approval by supervisor, lecturer and program head. • More than 2 credits of Research-related are NOT included for completing the Master's Degree Program of this major. • IPISE Academic Presentation (ENVENG) is required for the IGP student. 				

5. IGP Courses

Table M2. Core Courses of the Graduate Major in Urban Design and Built Environment

Course category		Course Number	Course			Credits	Comp tencie s	Learning goals	Comments	
Research seminars	400 level	UDE.Z491.R	⊙		Urban Design and Built Environment Seminar S1	0-2-0	2,3,5	A,B,C,E		
		UDE.Z492.R	⊙		Urban Design and Built Environment Seminar F1	0-2-0	2,3,5	A,B,C,E		
	500 level	UDE.Z591.R	⊙		Urban Design and Built Environment Seminar S2	0-2-0	2,3,5	A,B,C,E		
		UDE.Z592.R	⊙		Urban Design and Built Environment Seminar F2	0-2-0	2,3,5	A,B,C,E		
Major courses	400 level	UDE.E401.L		O □	Basics of Design Theory of Visual Environment	1-0-0	3	A,B	ACEEES	
		UDE.E402.L			GIS and Digital Image Processing for Built Environment	1-0-0	3,5	A,B		
		UDE.E403.L			Introduction to Atmospheric Urban Environment	1-0-0	3,4,5	A,B		
		UDE.E404.L		□	Basic Engineering on Thermal Environment	1-0-0	3,4,5	A,B	ACEEES	
		UDE.P402.L		□	Theory of Regional Planning and Process	2-0-0	2,3,4,5	A,B	ACEEES	
		UDE.P404.L		□	City/Transport Planning and the Environment	1-0-0	3,5	A,B	ACEEES	
		UDE.P406.L		□	Environmental Transport Engineering	1-0-0	1,3,4	A,B	ACEEES	
		UDE.S401.L		O	Dynamics of Structures	2-0-0	3,4,5	A,B		
		UDE.S402.L			Nonlinear Behavior of Concrete and Concrete Members	2-0-0	1,3,5	A,B		
		UDE.S403.L			Earthquake Resistant Limit State Design for Building Structures	2-0-0	3	A,B		
		UDE.S404.L			Damper-installed Structures and Base-isolated Structures against Earthquakes	2-0-0	3,4,5	A,B		
		UDE.S405.L			Post-earthquake Damage Evaluation and Rehabilitation of Steel Structures	2-0-0	3,5	B,D		
		UDE.S431.L			Basics of Stochastic Process for Earthquake Engineering	1-0-0	3,4,5	A,B		
		UDE.S432.L			Seismic Hazard and Risk Assessment	1-0-0	3,5	A,B		
		UDE.S433.L			Introduction on Theory of Earthquake Ground Motion	1-0-0	3,4,5	A,B		
		UDE.S435.L			Earthquake and Tsunami Disaster Reduction	1-0-0	1,3	A,B		
		UDE.Y471.L			IPISE International Communication (ENVENG) F1	0-1-0	1,2	E		
		UDE.Y472.L			IPISE International Communication (ENVENG) S1	0-1-0	1,2	E		
		UDE.Y473.L			IPISE International Communication (ENVENG) F2	0-1-0	1,2	E		
		UDE.Y474.L			IPISE International Communication (ENVENG) S2	0-1-0	1,2	E		
		UDE.Y495.L			IPISE Internship (ENVENG) IA	0-0-1	2,3,5	D		
		UDE.Y496.L			IPISE Internship (ENVENG) IB	0-0-1	2,3,5	D		
		UDE.Y497.L			IPISE Internship (ENVENG) IIA	0-0-2	2,3,5	D		
		UDE.Y498.L			IPISE Internship (ENVENG) IIB	0-0-2	2,3,5	D		
		UDE.Y493.L		⊙		IPISE Academic Presentation (ENVENG) F1	0-1-0	2,3	E	Required for IGP students
		UDE.Y494.L		⊙		IPISE Academic Presentation (ENVENG) S1	0-1-0	2,3	E	Required for IGP students

		UDE.P421.L		<input type="checkbox"/>	Mathematical Modeling of Individual Choice Behavior	2-0-0	3	A,B	【Civil Engineering】 (CVE.D401) ACEEES
		UDE.P422.L		<input type="checkbox"/>	Transportation Network Analysis	2-0-0	3	A,B	【Civil Engineering】 (CVE.D402) ACEEES
		UDE.P423.L		<input type="checkbox"/>	Transportation Economics	1-0-0	3	A,B	【Civil Engineering】 (CVE.D403) ACEEES
		UDE.E421.L		<input type="checkbox"/>	Urban Environment	2-0-0	3,5	A,B	【Global Engineering for Development Environment and Society】 (GEG.E402) ACEEES
		UDE.E451.L		O	Theories in Urban Analysis and Planning II	2-0-0	1,3,5	A,B	【Architecture and Building Engineering】 (ARC.P442)
		UDE.D462.L			Architectural Preservation and Renovation	2-0-0	1,3,4,5	A,B	【Architecture and Building Engineering】 (ARC.D402)
		UDE.E464.L			Theory of Architectural Design II	2-0-0	1,2,3,4,5	A,B	【Architecture and Building Engineering】 (ARC.D446)
		UDE.S461.L		E	Applied Building Structural Design	2-0-0	1,2,3,4,5	A,B	【Architecture and Building Engineering】 (ARC.S421)
		UDE.S463.L		O	Advanced Course on Design of Prestressed Concrete Structure	2-0-0	3,5	A,B	【Architecture and Building Engineering】 (ARC.S403)
		UDE.P424.L			Principles of Construction Management	2-0-0	1,3	A,B	【Civil Engineering】 (CVE.F432)
	500 level	UDE.E503.L		O <input type="checkbox"/>	Design Theory of Urban Visual Environment	1-0-0	3,4	A,B	ACEEES
		UDE.E504.L			Applied Atmospheric Urban Environment	1-0-0	3,4,5	A,B	
		UDE.E505.L		<input type="checkbox"/>	Applied Engineering on Thermal Environment	1-0-0	3,4,5	A,B	ACEEES
		UDE.E507.L			Applied Environmental Turbulence	1-0-0	3,4,5	A,B	
		UDE.S501.L			Disaster Mitigation for Building Structures	2-0-0	1,3,5	A,B	
		UDE.S502.L			Mathematical Design of Structures	2-0-0	4	A,B	
		UDE.S531.L			Microtremor Survey Techniques using Theory of Stochastic Process	1-0-0	3,4,5	A,B	
		UDE.S532.L			Application of Theory of Earthquake Ground Motion in Earthquake Engineering	1-0-0	3,4,5	A,B	
		UDE.S534.L			Remote Sensing for Disaster Management	1-0-0	3,5	A,B	
		UDE.Y593.L	◎		IPISE Academic Presentation (ENVENG) F2	0-1-0	2,3	E	Required for IGP students
		UDE.Y594.L	◎		IPISE Academic Presentation (ENVENG) S2	0-1-0	2,3	E	Required for IGP students

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
- 【 】 Course offered under another graduate major.
- 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 UDE.D.400.R): A: Common, D: Urban and Community Design, E: Urban Environmental System, P: Urban Planning and Transportation Planning, S: Urban Disaster Management, Y: IPISE, Z: Urban Design and Built Environment Seminar and Laboratory.

6. IGP Courses That Can be Recognized as Humanities and Social Science Courses

None

7. IGP Courses That Can be Recognized as Career Development Courses

As a general rule, students who would like their Career Development Courses to contribute to completion requirements of their master's degree program need to satisfy all of the specified Graduate Attributes ("GA"), including the attainment of at least two course credits, listed in Table MA-1 of the "Guide to Graduate Education and International Graduate Program (Liberal Arts and Basic Science Courses) - Career Development Courses". The status of the GA will be evaluated at the time of degree completion.

In addition to Career Development Courses, there are Major Courses that can also be recognized as such — shown below in Table M3 — which may go toward fulfilling the GA requirements.

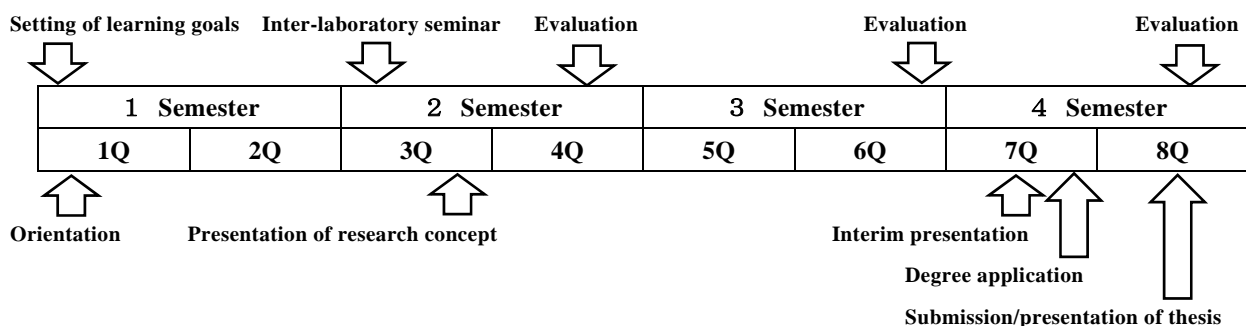
However, note that when the corresponding Major Courses are recognized and accredited as Career Development Courses, their credits cannot be counted a second time (as Major Courses) towards degree completion requirements.

Table M3. Courses of the Graduate Major in Urban Design and Built Environment that can be recognized as Career Development Courses

Course category	Course number	Course	Credits	GA*	Learning goals	Comments
can be recognized as Career Development Courses	UDE.P401.L	プロジェクト管理 (Project Management)	1-0-0	COM	B,D	In Japanese
	UDE.E432.L	人間環境デザイン研究の実践第一 (Practice of Environmental Design based on Environment-Behavior Study I)	1-0-0	C1M	B,D	In Japanese
	UDE.E433.L	人間環境デザイン研究の実践第二 (Practice of Environmental Design based on Environment-Behavior Study II)	1-0-0	C1M	B,D	In Japanese
<p>To satisfy the Career Development Courses 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).</p> <p>The courses listed on Table M3 can be included as credits acquired from Major Courses or from Career Development Courses exclusively.</p> <p>* GA: Graduate Attribute</p>						

8. Research Related to the Completion of Master Theses

In research related to the completion of Master thesis, students need to experience a series of research process, and to improve the ability of solving problems and communication skills. The process of the completion of Master thesis is indicated below.



- Presentation of research concept and Interim presentation

Students need to conduct presentation of research concept in 3Q and interim presentation in 7Q in order to clearly set their own research background and objectives from the viewpoint of career development.

After the presentation of research concept, students can register 600-level major courses on the condition that they satisfy 'the requirements.' However, it is noted that 600-level major courses cannot be included into the required credits for the completion of the Master's Degree Program of this major.

- Examination guidelines of Master thesis

Master thesis should contain new academic insights in Urban Design and Built Environment, or useful evidences that contribute to development of technology in Urban Design and Built Environment. Master thesis must include students' own unique ideas, written by students themselves.

- Examination process of Master thesis

The committee for Master thesis is composed of three or more panels. After the review by the panels, students must conduct oral presentation and pass the final examination and evaluation. For Master thesis submitted by students who continue to Doctoral Degree Program, the committee for the Master thesis is composed of five or more panels.

【Doctoral Degree Program】

1. Outline

In the program of Urban Design and Built Environment, in addition to the acquired knowledge and engineering at Master's course level, students are trained to develop research capacity and creativity by which they conduct the most advanced research by themselves, and to take international leadership in contribution to generation, regeneration and utilization of future urban design and built environment.

The graduate major of Urban Design and Built Environment is jointly offered by Department of Architecture and Building Engineering, and Department of Civil and Environmental Engineering, and prospective students are expected to have prior knowledge about foundations of Architecture and Building Engineering, or of Civil and Environmental Engineering at undergraduate and Master's course level.

The program of Urban Design and Built Environment offers courses for learning the most advanced knowledge and technologies concerning functionality, comfort and safety of urban design and built environmental system. The program is also designed to train professional researchers with necessary creativity and research ability through seminars and courses through which students conduct the most advanced research by themselves.

2. Competencies Developed

The graduate major of Urban Design and Built Environment seeks to confer the following skills to students:

- Ability to think flexibly toward new value creation
- Imagination for taking an international view of urban design and built environment and relevant issues, founded on relevant broad expertise, knowledge, and engineering
- Ability to take leadership in planning and implementing a project by collaborating with others
- Comprehensive ability to make research proposals which respect humanity and ethics
- Communication skills to write, discuss, and make presentations analytically in English

3. Learning Goals

For the Doctor's degree of Urban Design and Built Environment, students engage in the following program of study:

(A) Courses focused on the academic application of the theories of urban design and built environment

Courses for developing ability to propose solutions to the issues by students themselves, where the subjects are also found by students themselves.

(B) Courses focused on the practical application of the theories of urban design and built environment

Courses for developing ability to propose solutions to the issues in society based on the expert knowledge acquired by students themselves.

(C) Courses for training communication skills

Courses for training the abilities to complete a Doctoral thesis, and to make presentations of the thesis at seminars and national and international conferences.

4. IGP Completion Requirements

The following requirements must be met to complete the Doctoral Degree Program of this major.

1. A total of 24 credits or more acquired from 600-level courses.
2. From the courses specified in the Graduate Major in Urban Design and Built Environment curriculum,
 - 12 credits acquired from Research Seminars;
 - Minimum of 6 credits acquired from Major Courses; and
 - Minimum of 6 credits acquired from Liberal Arts and Basic Science Courses (2 credits from the 600-level Humanities and Social Science Courses, and 4 credits from Career Development Courses).
3. Pass the doctoral thesis review and defense.

Table D1. Graduate Major in Urban Design and Built Environment Completion Requirements

Course category		<Required courses> Required credits	<Electives> Minimum credits required	Minimum credits required	Associated learning goals	Comments
Liberal arts and basic science courses	Humanities and social science courses		2 credits	6 credits	C	
	Career development courses		4 credits		B, C	
	Other courses					
Core courses	Research seminars	Urban Design and Built Environment Seminar S3 Urban Design and Built Environment Seminar F3 Urban Design and Built Environment Seminar S4 S Urban Design and Built Environment Seminar F4 Urban Design and Built Environment Seminar S5 Urban Design and Built Environment Seminar F5 A total of 12 credits, 2 credits each from the above courses.		18 credits	A, B, C	
	Research-related courses					
	Major courses	6 credits			A, B, C	
	Major Courses and Research-related courses <u>outside</u> the Graduate Major in Urban Design and Built Environment standard curriculum					
Total required credits		A minimum of 24 credits in addition to meeting the above conditions				
Note		<ul style="list-style-type: none"> • Japanese Language and Culture Courses offered to International Students can be recognized as Humanities and Social Science Courses of the corresponding course level. • As for Liberal Arts and Basic Science Courses, please refer to the relevant pages. • For the details of Humanities and Social Sciences Courses and Career Development Courses, please refer to the relevant chapters. • 10 credits acquired at other university can be transferred after submission of the designated form, and approval by supervisor, lecturer and program head. 				

	<ul style="list-style-type: none"> • More than 2 credits of Research-related are NOT included for completing the Master's Degree Program of this major. • IPISE Academic Presentation (ENVENG) is required for the IGP student.
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5. IGP Courses

Table D2. Core Courses of the Graduate Major in Urban Design and Built Environment

Course category		Course Number	Course		Credits	Competencies	Learning goals	Comments	
Research seminars	600 level	UDE.Z691.R	◎		Urban Design and Built Environment Seminar S3	0-2-0	2,3,4,5	A,B,C	
		UDE.Z692.R	◎		Urban Design and Built Environment Seminar F3	0-2-0	2,3,4,5	A,B,C	
		UDE.Z693.R	◎		Urban Design and Built Environment Seminar S4	0-2-0	2,3,4,5	A,B,C	
		UDE.Z694.R	◎		Urban Design and Built Environment Seminar F4	0-2-0	2,3,4,5	A,B,C	
		UDE.Z695.R	◎		Urban Design and Built Environment Seminar S5	0-2-0	2,3,4,5	A,B,C	
		UDE.Z696.R	◎		Urban Design and Built Environment Seminar F5	0-2-0	2,3,4,5	A,B,C	
Major courses	600 level	UDE.A601.L			Off Campus Project in Urban Design and Built Environment I	0-0-4	2,3,5	B	
		UDE.A602.L			Off Campus Project in Urban Design and Built Environment II	0-0-4	2,3,5	B	
		UDE.Y681.L	◎		IPISE Academic Presentation (ENVENG) F3	0-1-0	2,3	A,C	Required for IGP students
		UDE.Y682.L	◎		IPISE Academic Presentation (ENVENG) S3	0-1-0	2,3	A,C	Required for IGP students
		UDE.Y683.L	◎		IPISE Academic Presentation (ENVENG) F4	0-1-0	2,3	A,C	Required for IGP students
		UDE.Y684.L	◎		IPISE Academic Presentation (ENVENG) S4	0-1-0	2,3	A,C	Required for IGP students
		UDE.Y685.L	◎		IPISE Academic Presentation (ENVENG) F5	0-1-0	2,3	A,C	Required for IGP students
		UDE.Y686.L	◎		IPISE Academic Presentation (ENVENG) S5	0-1-0	2,3	A,C	Required for IGP students
		UDE.Z681.L			Urban Design and Built Environment Project S3 • 1	0-0-1	2,3,4,5	A,B	
		UDE.Z682.L			Urban Design and Built Environment Project S3 • 2	0-0-1	2,3,4,5	A,B	
		UDE.Z683.L			Urban Design and Built Environment Project F3 • 1	0-0-1	2,3,4,5	A,B	
		UDE.Z684.L			Urban Design and Built Environment Project F3 • 2	0-0-1	2,3,4,5	A,B	
		UDE.Z685.L			Urban Design and Built Environment Project S4 • 1	0-0-1	2,3,4,5	A,B	
		UDE.Z686.L			Urban Design and Built Environment Project S4 • 2	0-0-1	2,3,4,5	A,B	
		UDE.Z687.L			Urban Design and Built Environment Project F4 • 1	0-0-1	2,3,4,5	A,B	
		UDE.Z688.L			Urban Design and Built Environment Project F4 • 2	0-0-1	2,3,4,5	A,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 • 【 】 Course offered under another graduate major.									

• 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 UDE.D.400.R): A: Common, D: Urban and Community Design, E: Urban Environmental System, P: Urban Planning and Transportation Planning, S: Urban Disaster Management, Y: IPISE, Z: Urban Design and Built Environment Seminar and Laboratory.

6. IGP Courses That Can be Recognized as Humanities and Social Science Courses

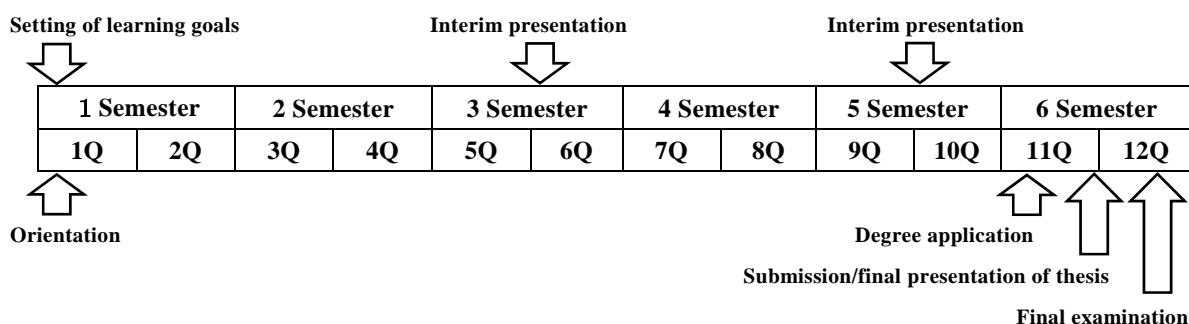
None

7. IGP Courses That Can be Recognized as Career Development Courses

None

8. Research Related to the Completion of Doctoral Theses

In research related to the completion of Doctoral thesis, students need to improve the ability of setting problems and communication skills as well as the ability of solving problems. Students obtain these abilities during setting of learning goals and their evaluations. As the diagram below indicates, the research of Doctoral thesis is evaluated through the first and second interim presentations and final presentation of thesis in the consistent way of Urban Design and Built Environment toward the completion of Doctoral thesis. Students must also pass the final examination of expertise and foreign language before obtaining Doctoral degree.



- Examination guidelines of Doctoral thesis

Doctoral thesis should contain new unique insights and sufficient academic values in Urban Design and Built Environment, written by students themselves. The major parts of Doctoral thesis must be published in well-established international academic journals, or admitted as the same quality.

- Examination process of Doctoral thesis

The committee for Doctoral thesis is composed of five or more panels. It is recommended to invite panels from other universities, institutes and companies positively. After passing interim examination and preparatory examination, students must submit Doctoral thesis and conduct oral presentation. Doctoral thesis must pass review in advance by panels and final examination and evaluation. In final examination, students must prove the ability in Urban Design and Built Environment by reading relevant English papers.