



April 2nd, 2019



Orientation for Graduate Major in Global Engineering for Development, Environment and Society (GEDES)

Takehiko Murayama
Chair of GEDES
(AY2018-2019)

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Aim of the educational program

1. To create a new technology, value, and concept required in the society
2. To solve the numerous problems faced by the international society with an accurate understanding
3. To equip global engineers with the “ability to co-create” including,
 - communication skills to work effectively in cooperation with an engineer from a different field
 - management skills to operate multiple projects or an organization.

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Faculty Members



Professors

氏名	Name	Campus
神田 学	Manabu KANDA	O
木内 豪	Tsuyoshi KINOUCHI	S
高田 潤一	Jun-ichi TAKADA	O
高橋 邦夫	Kunio TAKAHASHI	O
中崎 清彦	Kiyohiko NAKASAKI	O
野原 佳代子	Kayoko NOHARA	O
花岡 伸也	Shinya HANAOKA	O
日野出 洋文	Hirofumi HINODE	O
村山 武彦	Takehiko MURAYAMA	S
山口 しのぶ	Shinobu YAMAGUCHI	O

Associate Professors

氏名	Name	Campus
秋田 大輔	Daisuke AKITA	O
阿部 直也	Naoya ABE	O
江頭 竜一	Ryuichi EGASHIRA	O
佐藤 由利子	Yuriko SATO	O
高木 泰士	Hiroshi TAKAGI	O
高橋 史武	Fumitake TAKAHASHI	S
時松 宏治	Koji TOKIMATSU	S
中村 隆志	Takashi NAKAMURA	O
中村 恭志	Takashi NAKAMURA	S
錦澤 滋雄	Shigeo NISHIKIZAWA	S
	Tom HOPE	O
山下 幸彦	Yukihiko YAMASHITA	O

(Campus O: Ookayama, S: Suzukake-Dai)

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Faculty Members



Assistant Professors

氏名	Name	Campus
稲垣 厚至	Atsushi INAGAKI	O
飯島 怜	Rei Itsukushima	S
川崎 智也	Tomoya KAWASAKI	O
	Winarto KURNIAWAN	O
小山 光彦	Mitsuhiko KOYAMA	O
齋藤 健太郎	Kentaro SAITO	O
辻 潔	Kiyoshi TSUJI	O
はばき 広頭	Hiroaki HABAKI	O
平野 拓一	Takuichi HIRANO	O
	Pasomphone HEMTHAVY	O
渡邊 敦	Atsushi WATANABE	O

Professors (Sub-members)

氏名	Name	Campus
吉田 尚弘	Naohiro YOSHIDA	O
鼎 信次郎	Shinjiro AGATA	O
齋藤 滋規	Shigeki SAITO	O
	Jeffrey Scott CROSS	O
屋井 鉄雄	Tetsuo YAI	S
竹下 健二	Kenji TAKESHITA	O
浅輪 貴史	Takashi ASAWA	S
吉村 千洋	Chihiro YOSHIMURA	O
青柳 貴洋	Takahiro AOYAGI	O

(Campus O: Ookayama, S: Suzukake-Dai)

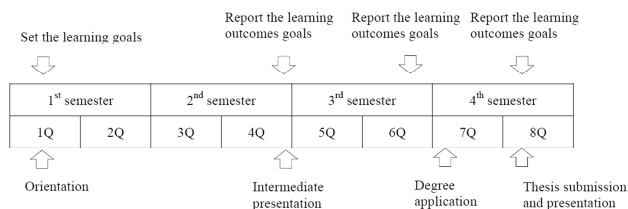


Master's Course - Brief Introduction -

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Outline procedures for 2 years



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Completion Requirements

1. A total of 30 credits or more acquired from 400- and 500-level courses.
2. Meet the completion requirements indicated in Table M1. below.
3. Pass the master's thesis review and defense.

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Table M1.

Course category		<Required courses> Required credits	<Electives> Minimum credits required	Minimum credits required
Liberal arts and basic science courses	Humanities and social science courses		• 2 credits from 400-level • 1 credit from 500-level	5 credits
	Career development courses		2 credits	
	Other courses			
Core courses	Research seminars	• Seminar for Global Engineering S1 • Seminar for Global Engineering F1 • Seminar for Global Engineering S2 • Seminar for Global Engineering F2 A total of 8 credits, 2 credits each from the above courses.		24 credits
	Research-related courses			
	Major courses	Project Design & Management S Project Design & Management F A total of 4 credits, 2 credits each from the above courses.	12 credits	
	Major courses and Research-related courses <u>outside</u> the Graduate Major in Global Engineering for Development, Environment and Society standard curriculum			8

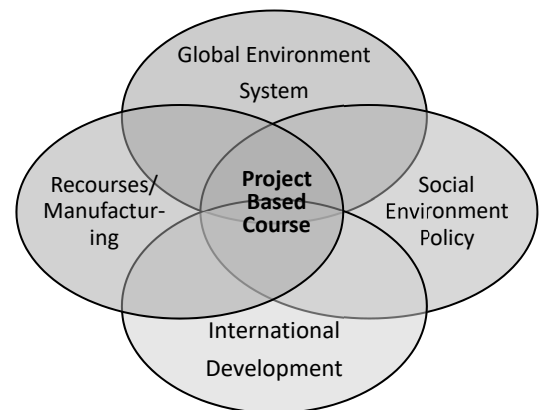
Table M2. Core Courses of GEDES

400 level	GEG.Z491.R	⊙	Seminar for Global Engineering S1	0-2-0
	GEG.Z492.R	⊙	Seminar for Global Engineering F1	0-2-0
500 level	GEG.Z591.R	⊙	Seminar for Global Engineering S2	0-2-0
	GEG.Z592.R	⊙	Seminar for Global Engineering F2	0-2-0

⊙: Required course

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Groups of major courses



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Required

Core Courses for 1st half year

	Project Based	Global Env.	Social Env. Policy	International Dev.	Resource/Manufacturing
Q1	Project Design & Management S	Atmospheric Environment in Megacities	Environmental Policy	Sustainable Development and Integrated Management	Environmental Cleanup and Pollution Control Technology
			Global Science Communication and Engagement	Development Economics and Appropriate Technology	Technologies for Energy and Resource Utilization
Q2		Hydrology and Water Resources Conservation	Basic Behaviormetrics: Theory and Methods	Case Method for International Development and Human Resources	Introduction to Systems Engineering
		Global Environmental System and Ecosystem Dynamics	Environmental Impact Assessment	Concept Designing	Utilization of Resources and Wastes for Environment
					Energy&Environment -1 (Intensive)

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Course Example of Global and Regional Environmental Systems									
School year		1st year							
Course category		1Q		2Q		3Q		4Q	
		Humanities and social science courses		Leadership Workshop	1			Peer Review Practicum	1
		English language course							
Liberal arts and basic science courses	2nd foreign language courses								
	Career development courses	Master's Career Design	1			Master's Career Design Practice	1		
	Major courses	Project Design & Management S	2	Coastal Disaster Mitigation for Engineers and Planners	1	Project Design & Management F	2	Socio-ecological systems in changing global and local environments	2
		Atmospheric Environment in Megacities	2	Hydrology and Water Resources Conservation	1	Global Environmental System and Ecosystem Dynamics	2		
						Environmental Hydraulics (Global Environmental System and Ecosystem Dynamics)	1		
Core courses	Research-related courses								
	Research seminars	Seminar for Global Engineering S1			2	Seminar for Global Engineering F1			2
	Credits	10				13			
					23				

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Some Core Courses of GEDES (400s)



400 level	GEG.E401.L	<input type="checkbox"/>	Global Environmental System and Ecosystem Dynamics	2-0-0
	GEG.E402.L	<input type="checkbox"/>	Urban Environment	2-0-0
	GEG.E403.L	<input type="checkbox"/>	Environmental Cleanup and Pollution Control Technology	1-0-0
	GEG.E404.L	<input type="checkbox"/>	Technologies for Energy and Resource Utilization	1-0-0
	GEG.E411.L	<input type="checkbox"/>	Atmospheric Environment in Megacities	2-0-0
	GEG.E412.L	<input type="checkbox"/>	Hydrology and Water Resources Conservation	1-0-0
	GEG.E421.L	<input type="checkbox"/>	Energy&Environment-1	1-0-0
	GEG.I401.L	<input type="checkbox"/>	Sustainable Development and Integrated Management	1-0-0
	GEG.I402.L	<input type="checkbox"/>	Development Economics and Appropriate Technology	2-0-0
	GEG.P451.R	◎	Project Design & Management S	0-1-1
	GEG.P452.R	◎	Project Design & Management F	0-1-1

◎: Required courses □: Elective courses

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Course numbering Rule



- GEG.T413.L 1-0-0 (Lecture-Exercise-Experiment/Training)

R: Required, L: Elective

E (Environment),
S (Social environmental policy)
I (International development)
T (Technology),
F (Fieldwork, internship)
L (Lecture method)
P (Project)

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Specific Info on each course



- Study Guide (学修案内), Timetable (時間割表)
- OCW (Tokyo Tech OpenCourseWare)
 - Course materials, such as lecture notes and course syllabi, for both internal and external visitors.
- OCW-i (Tokyo Tech OpenCourseWare internal)
 - only be accessed by students who have registered courses.
 - Students can confirm the course schedules, lecture cancellations, and get individual tasks.

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Links for study guide



- Japanese
- https://www.titech.ac.jp/guide/guide_30/graduate/pdf/03-17.pdf
- English
- <http://www.eng3.e.titech.ac.jp/~ses/#2>

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Table M1.



Course category		<Required courses> Required credits	<Electives> Minimum credits required	Minimum credits required
Liberal arts and basic science courses	Humanities and social science courses		• 2 credits from 400-level • 1 credit from 500-level	5 credits
	Career development courses		2 credits	
	Other courses			
Core courses	Research seminars	• Seminar for Global Engineering S1 • Seminar for Global Engineering F1 • Seminar for Global Engineering S2 • Seminar for Global Engineering F2 A total of 8 credits, 2 credits each from the above courses.		24 credits
	Research-related courses			
	Major courses	Project Design & Management S Project Design & Management F A total of 4 credits, 2 credits each from the above courses.	16 credits	
	Major courses and Research-related courses outside the Graduate Major in Global Engineering for Development, Environment and Society standard curriculum			17

Liberal arts and basic science courses



- For International Students
 - Japanese Language and Culture Courses can be recognized as Humanities and Social Science Courses of the corresponding course level
- For other Liberal Arts and Basic Science Courses
 - Please refer to the relevant pages

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Career Development Course

- Master's students are required to acquire the necessary credits in the career development courses
 - with fulfilling ALL of the Graduate Attributes (GA) shown in Table MA-1,
 - by the end of your master's degree program.

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Table MA-1 Master's Degree Program Graduate Attributes

COM	able to delineate one's career plan clearly and recognize the skills necessary to materialize the plan, also considering its relations to the society
C1M	able to utilize its own expertise to the development of academia and technology, and work with others with different expertise to contribute to problem-solving

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Specific courses for each GA

COM	C1M
<ul style="list-style-type: none"> Master's Career Design Master's Career Plan Strategies for Balancing Career, Personality and Lifestyle Master's Career Design Practice Ethics of Scientists Ethics of Engineers 	<ul style="list-style-type: none"> Master's Critical Thinking Master's Technical Discussion Master's Technical Writing Smart Business Career Development Ethics of Scientists • Ethics of Engineers Pre ALP Practice Social Contributions through Research Master's Scientific Communication

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Table M3. Courses of the Graduate Major in GEDES that can be recognized as Career Development Courses

Course category	Course number	Course	Credits	GA*
can be recognized as Career Development Courses	GEG.F541.L - 544.L	Global Engineering Fieldwork A, B, C, D	0-0-1	C1M
	GEG.F551.L - 554.L	Global Engineering Internship A, B, C, D	0-0-2	C1M
	GEG.F531.L - 534.L	Global Engineering International Workshop A, B, C, D (Master course)	0-0-1	C1M

* GA: Graduate Attributes

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Doctoral Course

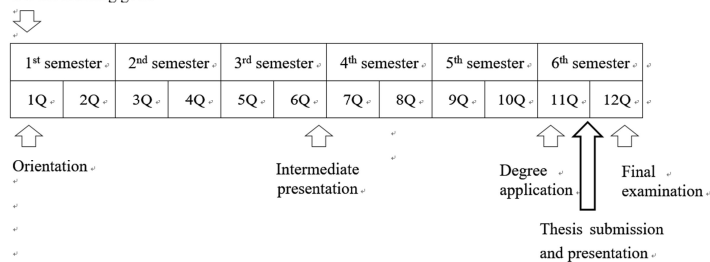
- Brief Introduction -

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Outline procedures for 3 years

Set the learning goals



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Completion Requirements

1. A total of 24 credits or more acquired from 600-level courses.
2. Meet the completion requirements indicated in Table D1. below.
3. Pass the doctoral thesis review and defense.

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Table D1.

Liberal arts and basic science courses	Humanities and social science courses		2 credits	6 credits
	Career development courses		4 credits	
	Other courses			
Core courses	Research seminars	<ul style="list-style-type: none"> •Seminar for Global Engineering S3 •Seminar for Global Engineering F3 •Seminar for Global Engineering S4 •Seminar for Global Engineering F4 •Seminar for Global Engineering S5 •Seminar for Global Engineering F5 A total of 12 credits, 2 credits each from the above courses.		18 credits
	Research-related courses		6 credits	
	Major courses			

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Table D1.

Research seminars	600 level	GEG.Z691.R	◎ Seminar for Global Engineering S3	0-2-0
		GEG.Z692.R	◎ Seminar for Global Engineering F3	0-2-0
		GEG.Z693.R	◎ Seminar for Global Engineering S4	0-2-0
		GEG.Z694.R	◎ Seminar for Global Engineering F4	0-2-0
		GEG.Z695.R	◎ Seminar for Global Engineering S5	0-2-0
		GEG.Z696.R	◎ Seminar for Global Engineering F5	0-2-0
Research-related courses	600 level	GEG.L631.L	Advanced Theory of Teaching Method 1A	0-1-1
		GEG.L632.L	Advanced Theory of Teaching Method 1B	0-1-1
		GEG.L633.L	Advanced Theory of Teaching Method 1C	0-1-1
		GEG.L634.L	Advanced Theory of Teaching Method 1D	0-1-1
		GEG.L635.L	Advanced Theory of Teaching Method 2A	0-1-1
		GEG.L636.L	Advanced Theory of Teaching Method 2B	0-1-1
		GEG.L637.L	Advanced Theory of Teaching Method 2C	0-1-1
		GEG.L638.L	Advanced Theory of Teaching Method 2D	0-1-1
		GEG.L639.L	Advanced Theory of Teaching Method 3A	0-1-1
		GEG.L640.L	Advanced Theory of Teaching Method 3B	0-1-1
		GEG.L641.L	Advanced Theory of Teaching Method 3C	0-1-1
		GEG.L642.L	Advanced Theory of Teaching Method 3D	0-1-1
		GEG.F651.L	Practice in Company 1A (Global Engineering)	0-1-1
		GEG.F652.L	Practice in Company 1B (Global Engineering)	0-1-1

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Career Development Courses

- Register in either the Academic Leader Program (ALP) or the Productive Leader Program (PLP) based on their individual career plans.
- Innovator and Inventor Development Platform (IIDP) will ask you the registration of the programs 6 months after your doctoral degree program started.
- Students are required to earn 4 credits which should meet the 4 Graduate Attributes (GAs).

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Table A-1 Academic Leader Program (ALP) Graduate Attributes

A0D	You will be able to precisely draw your own career plan and self-train yourself to acquire the skills required for attaining your goals in the academic field
A1D	You will be able to ascertain the true nature of phenomena, master the secret of learning, and lead the pioneering of a new academic discipline or research area
A2D	You will be able to understand the position of academia in society, and adequately explain the academic progress to members of society
A3D	You will be able to nurture junior students in educational institutions, inculcating in them an interest in academics and enabling them to later join in the pioneering of new academic disciplines or research areas

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Table A-2 Productive Leader Program (PLP) Graduate Attributes

P0D	You will be able to precisely draw your own career plan and self-train yourself to acquire the skills required for attaining your goals in the industry, etc.
P1D	You will be able to precisely grasp the needs of society and detect its problems, and lead the future developments in science and technology
P2D	While leading teams consisting of members with varied specialties and value systems, you will be able to create products and enterprises that bring forth new values in the society
P3D	Through the project, you will be able to nurture junior students, enabling them to later join in the development of next generation society and industry

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Specific courses for ALP

A0D	A1D	A2D	A3D
<ul style="list-style-type: none"> •Doctoral Career Design •Doctoral Career Plan •Strategies for Balancing Career, Personality and Lifestyle •ALP Practice I(Teaching Practice) •ALP Practice II(Overseas Training) 	<ul style="list-style-type: none"> •ALP Introduction •ALP Advanced Practice I •ALP Advanced Practice II •ALP Advanced Practice III •ALP Advanced Practice IV •Technical Writing 	<ul style="list-style-type: none"> •ALP Advanced Practice I •ALP Advanced Practice II •ALP Advanced Practice III •ALP Advanced Practice IV •Developing Career Adaptability for Global Competitiveness •Critical Thinking •Technical Discussion •Scientific Communication 	<ul style="list-style-type: none"> •ALP Practice I (Teaching Practice) •ALP Practice II (Overseas Training) •ALP Advanced Practice I •ALP Advanced Practice II •ALP Advanced Practice III •ALP Advanced Practice IV •Developing Career Adaptability for Global Competitiveness •Critical Thinking •Technical Discussion •Scientific Communication

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Table D3-1. GEDES that can be recognized as Career

Development Courses in the Academic Leader Program (ALP)

Course category	Course number	Course	Credits	GA*
can be recognized as Career Development Courses	GEG.L631.L-642.L	Advanced Theory of Teaching Method 1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D, 3A, 3B, 3C,3D	0-1-1	A2D, A3D
	GEG.F651.L-662.L	Practice in Company (Global Engineering) 1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D, 3A, 3B,3C, 3D	0-1-1	A2D, A3D
	GEG.P651.L-662.L	Advanced Theory of Co-creation 1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D, 3A, 3B, 3C, 3D	0-0-1	A2D, A3D
	GEG.P631.L-642.L	Global Engineering Off-Campus Project (Global Engineering) 1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D, 3A, 3B, 3C, 3D	0-0-1	A2D, A3D
	GEG.F631.L-642.L	Global Engineering International Workshop (Doctor course) 1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D, 3A, 3B, 3C, 3D	0-0-1	A2D, A3D
	GEG.P671.L, GEG.P672.L	Sustainable Engineering Program Off-Campus Project (GEDES) S,F	0-0-4	A2D, A3D

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Specific courses for PLP

P0D	P1D	P2D	P3D
<ul style="list-style-type: none"> •Doctoral Career Design •Doctoral Career Plan •Strategies for Balancing Career, Personality and Lifestyle •Recurrent Program Advanced Practice 1 •Recurrent Program Advanced Practice 2 •Recurrent Program Advanced Practice 3 •Recurrent Program Advanced Practice 4 	<ul style="list-style-type: none"> •Technical Writing •PLP Introduction •PLP Advanced Practice •R&D Activities of Global companies I •R&D Activities of Global companies II •Technology Management •Recurrent Program Advanced Practice 1 •Recurrent Program Advanced Practice 2 •Recurrent Program Advanced Practice 3 •Recurrent Program Advanced Practice 4 	<ul style="list-style-type: none"> •Developing Career Adaptability for Global Competitiveness •Critical Thinking •Technical Discussion •Scientific Communication •PLP Practice •PLP Advanced Practice •Recurrent Program Advanced Practice 1 •Recurrent Program Advanced Practice 2 •Recurrent Program Advanced Practice 3 •Recurrent Program Advanced Practice 4 	<ul style="list-style-type: none"> •Developing Career Adaptability for Global Competitiveness •Critical Thinking •Technical Discussion •Scientific Communication •PLP Practice •PLP Advanced Practice •Recurrent Program Advanced Practice 1 •Recurrent Program Advanced Practice 2 •Recurrent Program Advanced Practice 3 •Recurrent Program Advanced Practice 4

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Table D3-2. GEDES that can be recognized as Career

Development Courses in the Productive Leader Program (PLP)

Course category	Course number	Course	Credits	GA*
can be recognized as Career Development Courses	GEG.F651.L-662.L	Practice in Company (Global Engineering) 1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D, 3A, 3B, 3C, 3D	0-1-1	P2D, P3D
	GEG.P651.L-662.L	Advanced Theory of Co-creation 1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D, 3A, 3B, 3C, 3D	0-1-1	P2D, P3D
	GEG.P631.L-642.L	Global Engineering Off-Campus Project 1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D, 3A, 3B, 3C, 3D	0-0-1	P2D, P3D
	GEG.F631.L-642.L	Global Engineering International Workshop (Doctor course) 1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D, 3A, 3B, 3C, 3D	0-0-1	P2D, P3D

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Important site for all students

<http://www.tse.ens.titech.ac.jp/ja/>