Graduate Major in Mechanical Engineering

【Master's Degree Program】

1. Outline

This major aims at fostering of human resources who possess systematic expertise constituting basic academic principles of mechanical engineering and creative abilities to resolve problems from societal viewpoint using these academic principles, and at its ultimate end, contribute to the evolutions of advanced science and technology and resolutions of broad societal problems.

2. Competencies Developed

This major aims to develop the following competencies to:

- Think and understand an essence that underlies a problem.
- Resolve problems using broad engineering knowledge and skills related to the field of mechanical engineering.
- Explore forefront of science and technology.
- Fulfill R&D activities with international perspective and strong scene of ethics.
- Explain and convey one’s ideas and results to others logically.
- Present logical discussions and compile them in written documents.

3. Learning Goals

To have those who enroll in this major acquire the competences above, this major provides them with the following learnings:

A) Specialized subjects in the field of mechanical engineering
B) Subjects of the peripheral and related fields
C) Broad abilities regarding thinking and resolving problems
D) Skills of logical communication
E) International perspective and sense of ethics

4. IGP Completion Requirements

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

1. Attain a total of 30 credits or more from 400- and 500-level courses.
2. Fulfill requirements in Table M1 below.
3. Pass the master's thesis review and defense.

Table M1 shows course categories and the number of credits required to complete the Master's Degree Program of this major. It also shows the required minimum credits in each course category and points to be noted when selecting the required courses and electives.

The learning goals to be obtained by students through courses are listed as “associated learning goals”. Prior to registering courses, students need to fully understand the course goals.

Table M1. Graduate Major in Mechanical Engineering 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	B,C	
	Career development courses		2 credits		C,D	All Graduate Attributes (GA, i.e.C0M & C1M) should be acquired. (Refer to Section 7 for the definition of GA.)
	Other courses					
Core courses	**Research seminars**	Seminar in Mechanical Engineering S1 Seminar in Mechanical Engineering F1 Seminar in Mechanical Engineering S2 Seminar in Mechanical Engineering F2 A total of 8 credits, 2 credits each from the above courses.		18 credits	C,D,E	
	Research-related courses		10 credits		C,D,E	
	Major courses				A,B,C,D,E	
	Major courses and Research-related courses <u>outside</u> the Graduate Major in Mechanical					

	Engineering standard curriculum					
Total required credits		**A minimum of 30 credits including those attained according to the above conditions**				
Note		**・Japanese Language and Culture Courses offered to international students can be recognized as equivalent to the Humanities and Social Science Courses of the corresponding course level.** **・For details of the Liberal Arts and Basic Science Courses, please refer to the relevant sections.**				

5. IGP Courses

Table M2 shows the Core Courses of the Master's Degree Program in this major. Graduate Majors listed in the Comments column offer core courses that are recognized as equivalent to the corresponding Major Courses or Research-related Courses in the standard curriculum of this major.

Table M2. Core Courses of the Graduate Major in Mechanical Engineering

Course category		**Course number**	**Course title**			**Credits**	**Competencies**	**Learning goals**	**Comments**
Research seminars	**400 level**	MEC.Z491.R	◎		Seminar in Mechanical Engineering S1	0-2-0	2,3,5	C,D	
		MEC.Z492.R	◎		Seminar in Mechanical Engineering F1	0-2-0	2,3,5	C,D	
	500 level	MEC.Z591.R	◎		Seminar in Mechanical Engineering S2	0-2-0	2,3,5	C,D	
		MEC.Z592.R	◎		Seminar in Mechanical Engineering F2	0-2-0	2,3,5	C,D	
Research-related courses	**500 level**	MEC.S531.L			Overseas Research Project M1c	0-0-1	1,2,4,5	E	
		MEC.S532.L			Overseas Research Project M2c	0-0-2	1,2,4,5	E	
		MEC.S533.L			Overseas Research Project M3c	0-0-3	1,2,4,5	E	
		MEC.S534.L			Overseas Research Project M4c	0-0-4	1,2,4,5	E	
Major courses	**400 level**	MEC.C431.L			Mechanics of Composite Materials	1-0-0	3	A	
		MEC.C432.L		□	Structural Integrity Assessment	1-0-0	3,5	A	
		MEC.C433.L			Solid Dynamics	1-0-0	3,5	A	
		MEC.D431.L		□	Advanced Sound and Vibration Measurement	1-0-0	3	A	

		MEC.D432.L			Rotor Dynamics	1-0-0	3,5	A	
		MEC.D433.L			Self-excited Vibration	1-0-0	3,5	A	
		MEC.E431.L		□	Thermodynamics of Nonequilibrium Systems	1-0-0	3	A	
		MEC.E432.L		□	Properties of Solid Materials	1-0-0	3	A	
		MEC.E433.L		□	Advanced Thermal-Fluids Measurement	1-0-0	3,5	A	
		MEC.F431.L		□	Computational Thermo-Fluid Dynamics	1-0-0	3	A	
		MEC.G431.L			Mechanical Processing	1-0-0	3	A	
		MEC.G432.L			Metalforming	1-0-0	3	A	
		MEC.G433.L			Joining	1-0-0	3,4	A	
		MEC.H431.L			Advanced Mechanical Elements	1-0-0	3,5	A	
		MEC.E451.L		□	Advanced Course of Radiation Transfer	1-0-0	3,5	A	【Energy Science and Engineering】(ENR.K440)
		MEC.E452.L	O	□	Advanced Course of Combustion Physics	1-0-0	3,5	A	【Energy Science and Engineering】(ENR.K450)
		MEC.F451.L	O	□	Advanced Course of Turbulent Flow and Control	1-0-0	3,5	A	【Energy Science and Engineering】(ENR.K430)
		MEC.H432.L			Multibody Systems	2-0-0	3	A	
		MEC.H433.L			Mechatronics Device and Control	1-0-0	2,3	A,B	
		MEC.H434.L		□	Advanced Course of Actuator Engineering	1-0-0	3,5	A,B	
		MEC.H435.L			Machine Dynamics of Rigid Systems	1-0-0	1,3,5	A,B	
		MEC.J431.L		□	Ultra-precision Measurement	1-0-0	3	A,B	
		MEC.J432.L		□	Mechanism and Control for Ultra-precision Motion	1-0-0	3,5	A,B	

		MEC.L431.L			Human Brain Functions and Their Measurements	1-0-0	2,3	B	
		MEC.L432.L		□	Human-Centered Design	1-0-0	1,2,3,4,5	B	
		MEC.M433.L			Space Systems Analysis A	1-0-0	3	B	
		MEC.M434.L			Space Robotics	1-0-0	3	B	
		MEC.R431.L			Off-campus Project M1c	0-0-1	2,4,5	C,D	
		MEC.R432.L			Off-campus Project M2c	0-0-2	2,4,5	C,D	
		MEC.U431.L		□	Automotive Structural System Engineering A	3-0-0	1,2,3,4	A	
		MEC.U432.L		□	Automotive Comfort Mechanics Engineering A	3-0-0	1,2,3	A	
		MEC.U433.L		□	Advanced Production Engineering A	3-0-0	1,2,3	A	
		MEC.U434.L		□	Advanced Internal Combustion Engine Engineering and Future Power Train A	3-0-0	1,2,3	A	
		MEC.U436.L			Combustion Engineering	3-0-0	3	A	
		MEC.U441.L			Automotive Structural System Engineering B	1-1-0	1,2,3,4	A,C	
		MEC.U442.L			Automotive Comfort Mechanics Engineering B	1-1-0	1,2,3,4,5	A,C	
		MEC.U443.L			Advanced Production Engineering B	1-1-0	1,2,3,4,5	A,C	
		MEC.U444.L		□	Advanced Internal Combustion Engine Engineering and Future Power Train B	1-1-0	1,2,3,4,5	A,C	
		MEC.U447.L			Advanced Material Science and Engineering B	1-1-0	1,2,3,4	A,C	
	500 level	MEC.C531.L			Mechanics of High Temperature Materials	1-0-0	3,5	A,B	
		MEC.D531.L			Experimental Modal Analysis for Structural Dynamics	1-0-0	3,5	A	
		MEC.D532.L			Silent Engineering	1-0-0	3,5	A	
		MEC.E531.L		□	Plasma Physics	1-0-0	3,5	B	
		MEC.E551.L		□	Advanced course of multiscale thermal-fluid sciences	1-0-0	3	B	【Energy Science and Engineering】(ENR.K530)

		MEC.E552.L		□	Leading Edge Energy Technology	1-0-0	1,3	B	【Energy Science and Engineering】(ENR.K580)
		MEC.F531.L		□	Flying Object Engineering	1-0-0	3,5	B	
		MEC.F532.L		□	Rarefied Gas Dynamics	1-0-0	3,5	B	
		MEC.G531.L			Precision Manufacturing Processes	1-0-0	3,5	A,B	
		MEC.H531.L			Robot Control System Design	1-0-0	3	A,B	
		MEC.H532.L			Kinematic Analysis and Synthesis of Robots	1-0-0	3	A	
		MEC.I531.L			Mechanical biomimetics	1-0-0	3	B	
		MEC.J531.L		□	Micro and Nano Systems	2-0-0	3	A,B	
		MEC.M531.L			Space Systems Analysis B	1-0-0	3	B	
		MEC.N531.L			Advanced Mechanical Engineering S	1-0-0	1,3,5	A	
		MEC.N532.L			Advanced Mechanical Engineering F	1-0-0	1,3,5	A	
		MEC.N534.L			Fundamentals of electrochemistry and the application to energy conversion materials	1-0-0	1,2,3,4,5	B	【Materials Science and Engineering】(MAT.P506)
		MEC.N533.L			Analytical and analogical methods to solve the heat transfer equation and the application to infrared image processing	1-0-0	1,2,3,4,5	B	【Materials Science and Engineering】(MAT.P507)

Note：

- ◎：Required course, ○：Restricted elective, O：odd academic years, E：even academic years
- □：Course recognized as equivalent to that of the Academy for Co-creative Education of Environment and Energy Science (ACEEES).
- Competencies: 1 = Intercultural skills; 2 = Communication skills; 3 = Specialist skills; 4 = Critical thinking skills; 5 = Practical and/or problem-solving skills
- 【 】Course offered by 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 ABC.D400.R): C (Mechanics of Materials), D (Mechanical Dynamics), E (Thermodynamics), F (Fluid Dynamics), H (Design and Drawing, Information Processing, Courses for Developing Creativity), L (Bioengineering), M (Space Engineering), Q (IGP relating lectures), R (Off-campus Project), S (Overseas Research Project), U (TAIST), Z (Research Seminars)

6. IGP Courses That Can Be Counted as Humanities and Social Science Courses

None

7. IGP Courses That Can Be Counted as Career Development Courses

In order to fulfill the completion requirements for the master's degree program, students must attain at least 2 credits in Career Development Courses, and should satisfy all of the Graduate Attributes (GA) specified in Table MA-1 of the "Career Development Courses" (Liberal Arts and Basic Science Courses) in the Guide to Graduate Education and International Graduate Program. Students will be evaluated in regards to GA achievements at the time of their degree completion. As to the courses with more than one GA, the number of GA stipulated for the courses is considered to be acquired regardless of the credits received for the courses.

Major Courses that enable students to acquire GA and that are recognized as equivalent to Career Development Courses are listed in Table M3 below.

However, it must be noted that credits attained from these courses cannot be counted more than once as Major Courses or Career Development Courses towards the completion requirements for the master's degree program.

For Graduate Attributes, refer to the Guide to the Career Development Courses.
The Graduate Attributes of the Master's Degree Program are listed in Table MA-1 as follows:

C0M: 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

Table M3. Courses of the Graduate Major in Mechanical Engineering recognized as equivalent to Career Development Courses

Course category	Course number	Course title			Credits	GA*	Learning goals	Comments
Courses that can be counted as Career Development Courses	MEC.R431.L			Off Campus Project M1c	0-0-1	C1M	C,D	
	MEC.R432.L			Off Campus Project M2c	0-0-2	C1M	C,D	
	MEC.S531.L			Overseas Research Project M1c	0-0-1	C1M	E	
	MEC.S532.L			Overseas Research Project M2c	0-0-2	C1M	E	
	MEC.S533.L			Overseas Research Project M3c	0-0-3	C1M	E	
	MEC.S534.L			Overseas Research Project M4c	0-0-4	C1M	E	

Credits in Career Development Courses must be attained from among the above-listed courses and those listed as such in the Liberal Arts and Basic Science Courses Guide.

＊GA: Graduate Attributes

8. Research Related to the Completion of Master Theses

A student aims at learning of the ability that is listed in the “Learning Goals” by accomplishing the research activities of Master Thesis. A model schedule for a student who is graduating at the 8th quarter is shown below.

The 1st semester		The 2nd semester		The 3rd semester		The 4th semester	
1Q	2Q	3Q	4Q	5Q	6Q	7Q	8Q

Announcement of Research Plan

Application of the Master degree

The master thesis submission and the final defense

*** Announcement of Research Plan**

A student conducts “Announcement of Research Plan” in the 2nd quarter so as to clearly understand the background and objectives of his/her research project, and makes use of these to his/her carrier formation.

* Judgement criterion of the final defense of Master Thesis

Master degree thesis has to be an own thesis including original discussion, and to contain new knowledge of the mechanical engineering from academic aspect, or to contain useful knowledge contributing to the development of technologies relating to the mechanical engineering.

* Implementation manner of the final defense of Master Thesis

The judgement committee consists of 3 judges or more. After the preliminary peer review by the judges, the oral presentation is put into effect for the final examination and evaluation. In case of a student going to the doctoral degree program, the judgement is done by at least 5 judges.

【Doctoral Degree Program】

1. Outline

This major aims at fostering of human resources who possess leadership and capability to propose research projects for resolving societal problems from global perspectives, promote advanced research projects that lead to an innovation of mechanical engineering, and return the profit obtained from research activities to society with new values, based on the systematic expertise of mechanical engineering and broad knowledge of its surrounding academic fields.

2. Competencies Developed

This major aims to develop the following advanced-level competencies to:

- Think and understand an essence that underlies a problem.
- Propose and develop new mechanical engineering systems by organizing broad engineering knowledge and skills related to the field of mechanical engineering.
- Lead and pioneer forefront of science and technology.
- Enterprise and fulfill R&D projects as a leader.
- Fulfill R&D activities with international perspective and strong scene of ethics.
- Explain and convey one's ideas and results to others logically.
- Present logical discussions and compile them in written documents.

3. Learning Goals

To have those who enroll in this major acquire the competences above, this major provides them with the following learnings:

A) Specialized subjects in the field of mechanical engineering
B) Subjects of the peripheral and related fields
C) Broad abilities including abilities for being a leader and creatively proposing new ideas and projects.
D) Skills of logical communication
E) International perspective and sense of ethics

4. IGP Completion Requirements

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

1. Attain a total of 24 credits or more from 600-level courses.
2. Fulfill requirements in Table D1 below.
3. Pass the Doctoral Dissertation review and defense.

Table D1 shows course categories and the number of credits required to complete the Doctoral Degree Program of this major. It also shows the required minimum credits in each course category and points to be noted when selecting the required courses and electives.

The learning goals to be obtained by students through courses are listed as “associated learning goals”. Prior to registering courses, students need to fully understand the course goals.

Table D1. Graduate Major in Mechanical Engineering 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	B,C	
	Career development courses		4 credits		C,D	All Graduate Attributes (GA) should be acquired. (Refer to Section 7 for the definition of GA.)
	Other courses					
Core courses	Research seminars	Seminar in Mechanical Engineering S3 Seminar in Mechanical Engineering F3 Seminar in Mechanical Engineering S4 Seminar in Mechanical Engineering F4 Seminar in Mechanical Engineering S5 Seminar in Mechanical Engineering F5 A total of 12 credits, 2 credits each from the above courses.		14 credits	C,D,E	
	Research-related courses		2 credits		C,D,E	
	Major courses				A,B,C,D,E	
	Major courses and Research-related courses <u>outside</u> the Graduate Major in Mechanical Engineering standard curriculum					

Total required credits	**A minimum of 24 credits including those attained according to the above conditions**
Note	**・Japanese Language and Culture Courses offered to international students can be recognized as equivalent to the Humanities and Social Science Courses of the corresponding course level.** **・For details of the Liberal Arts and Basic Science Courses, please refer to the relevant sections.**

5. IGP Courses

Table D2 shows the Core Courses of the Doctoral Degree Program of this major. Graduate Majors listed in the Comments column offer core courses that are recognized as equivalent to the corresponding Major Courses or Research-related Courses in the standard curriculum of this major.

Table D2. Core Courses of the Graduate Major in Mechanical Engineering

Course category		Course number	Course title			Credits	Competencies	Learning goals	Comments
Research seminars	600 level	MEC.Z691.R	◎		Seminar in Mechanical Engineering S3	0-2-0	2,3,4,5	C,D	
		MEC.Z692.R	◎		Seminar in Mechanical Engineering F3	0-2-0	2,3,4,5	C,D	
		MEC.Z693.R	◎		Seminar in Mechanical Engineering S4	0-2-0	2,3,4,5	C,D	
		MEC.Z694.R	◎		Seminar in Mechanical Engineering F4	0-2-0	2,3,4,5	C,D	
		MEC.Z695.R	◎		Seminar in Mechanical Engineering S5	0-2-0	2,3,4,5	C,D	
		MEC.Z696.R	◎		Seminar in Mechanical Engineering F5	0-2-0	2,3,4,5	C,D	
Research-related courses	600 level	MEC.Q611.L			Planning of Off-campus Project SEP	0-2-0	1,2,4,5	C,D,E	For IGP(A) (SEP) students only
		MEC.Q612.L			Off-campus Project SEP	0-4-0	1,2,4,5	C,D,E	For IGP(A) (SEP) students only
		MEC.Q613.L			Off-campus Project SSSEP	0-0-4	1,2,4,5	C,D,E	For IGP(A) (SSSEP) students only
		MEC.S631.L			Overseas Research Project D1c	0-0-1	1,2,4,5	E	
		MEC.S632.L			Overseas Research Project D2c	0-0-2	1,2,4,5	E	
		MEC.S633.L			Overseas Research Project D3c	0-0-3	1,2,4,5	E	

		MEC.S634.L			Overseas Research Project D4c	0-0-4	1,2,4,5	E	
		MEC.S635.L			Overseas Research Project D5c	0-0-5	1,2,4,5	E	
		MEC.S636.L			Overseas Research Project D6c	0-0-6	1,2,4,5	E	
Major courses	**600 level**	MEC.N631.L			Special Lecture in Mechanical Engineering I	1-0-0	1,3	B	
		MEC.N632.L			Special Lecture in Mechanical Engineering II	1-0-0	1,3	B	
		MEC.N633.L			Special Lecture in Mechanical Engineering III	1-0-0	1,3	B	
		MEC.N634.L			Special Lecture in Mechanical Engineering IV	1-0-0	1,3	B	
		MEC.N635.L			Analytical and analogical methods to solve the heat transfer equation and the application to infrared image processing (Advanced)	1-0-0	1,2,3,4,5	B	【Materials Science and Engineering】(MAT.P601)
		MEC.T631.L			Teaching Practice in Mechanical Engineering	0-0-2	2,3,5	D	
		MEC.R631.L			Off Campus Project D1c	0-0-1	2,4,5	C,D	
		MEC.R632.L			Off Campus Project D2c	0-0-2	2,4,5	C,D	
		MEC.R633.L			Off Campus Project D3c	0-0-3	2,4,5	C,D	
		MEC.R634.L			Off Campus Project D4c	0-0-4	2,4,5	C,D	
		MEC.R635.L			Off Campus Project D5c	0-0-5	2,4,5	C,D	
		MEC.R636.L			Off Campus Project D6c	0-0-6	2,4,5	C,D	

Note：

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

• □：Course recognized as equivalent to that of the Academy for Co-creative Education of Environment and Energy Science (ACEEES).

• Competencies: 1 = Intercultural skills; 2 = Communication skills; 3 = Specialist skills; 4 = Critical thinking skills; 5 = Practical and/or problem-solving skills

• 【 】Course offered by 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 ABC.D600.R): N (Special Lecture in Mechanical Engineering), Q (IGP relating lectures), R (Off campus project), S (Overseas research project), T (Teaching practice), Z (Research Seminars).

6. IGP Courses That Can Be Counted as Humanities and Social Science Courses

None

7. IGP Courses That Can Be Counted as Career Development Courses

In order to fulfill the completion requirements for the doctoral degree program, students must attain at least 4 credits in Career Development Courses, and should satisfy all of the Graduate Attributes (GA) specified in Table A-1 or A-2 of the "Career Development Courses" (Liberal Arts and Basic Science Courses) in the Guide to Graduate Education and International Graduate Program. Students will be evaluated in regards to GA achievements at the time of their degree completion. As to the courses with more than one GA, the number of GA stipulated for the courses is considered to be acquired regardless of the credits received for the courses.

Major Courses that enable students to acquire GA and that are recognized as equivalent to Career Development Courses are listed in Tables D3-1 and D3-2 below.

However, it must be noted that credits attained from these courses cannot be counted more than once as Major Courses or Career Development Courses towards the completion requirements for the doctoral degree program.

For Graduate Attributes, refer to the Guide to the Career Development Courses.
The Graduate Attributes of the Academic Leader Program (ALP) are listed in Table A-1 as follows:

- 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, which is the stakeholder
- 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

The Graduate Attributes of the Productive Leader Program (PLP) are listed in Table A-2 as follows:

- 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

Table D3-1. Courses of the Graduate Major in Mechanical Engineering recognized as equivalent to Career Development Courses in the Academic Leader Program (ALP)

Course category	Course number	Course title	Credits	GA*	Learning goals	Comments
Courses that can be counted as Career Development Courses	MEC.T631.L	Teaching Practice in Mechanical Engineering	0-0-2	A2D, A3D	D	
	MEC.R631.L	Off Campus Project D1c	0-0-1	A2D, A3D	C,D	
	MEC.R632.L	Off Campus Project D2c	0-0-2	A2D, A3D	C,D	
	MEC.R633.L	Off Campus Project D3c	0-0-3	A2D, A3D	C,D	
	MEC.R634.L	Off Campus Project D4c	0-0-4	A2D, A3D	C,D	
	MEC.R635.L	Off Campus Project D5c	0-0-5	A2D, A3D	C,D	
	MEC.R636.L	Off Campus Project D6c	0-0-6	A2D, A3D	C,D	
	MEC.S631.L	Overseas Research Project D1c	0-0-1	A2D, A3D	E	
	MEC.S632.L	Overseas Research Project D2c	0-0-2	A2D, A3D	E	
	MEC.S633.L	Overseas Research Project D3c	0-0-3	A2D, A3D	E	
	MEC.S634.L	Overseas Research Project D4c	0-0-4	A2D, A3D	E	
	MEC.S635.L	Overseas Research Project D5c	0-0-5	A2D, A3D	E	
	MEC.S636.L	Overseas Research Project D6c	0-0-6	A2D, A3D	E	

Credits in Career Development Courses must be attained from among the above-listed courses and those listed as such in the Liberal Arts and Basic Science Courses Guide.

＊GA: Graduate Attributes

Table D3-2. Courses of the Graduate Major in Mechanical Engineering recognized as equivalent to Career Development Courses in the Productive Leader Program (PLP)

Course category	Course number	Course title	Credits	GA*	Learning goals	Comments
Courses that can be counted as Career Development Courses	MEC.R631.L	Off Campus Project D1c	0-0-1	P2D, P3D	C,D	
	MEC.R632.L	Off Campus Project D2c	0-0-2	P2D, P3D	C,D	
	MEC.R633.L	Off Campus Project D3c	0-0-3	P2D, P3D	C,D	
	MEC.R634.L	Off Campus Project D4c	0-0-4	P2D, P3D	C,D	
	MEC.R635.L	Off Campus Project D5c	0-0-5	P2D, P3D	C,D	
	MEC.R636.L	Off Campus Project D6c	0-0-6	P2D, P3D	C,D	
	MEC.S631.L	Overseas Research Project D1c	0-0-1	P2D, P3D	E	
	MEC.S632.L	Overseas Research Project D2c	0-0-2	P2D, P3D	E	
	MEC.S633.L	Overseas Research Project D3c	0-0-3	P2D, P3D	E	
	MEC.S634.L	Overseas Research Project D4c	0-0-4	P2D, P3D	E	
	MEC.S635.L	Overseas Research Project D5c	0-0-5	P2D P3D	E	
	MEC.S636.L	Overseas Research Project D6c	0-0-6	P2D, P3D	E	

Credits in Career Development Courses must be attained from among the above-listed courses and those listed as such in the Liberal Arts and Basic Science Courses Guide.

＊GA: Graduate Attributes

Students enrolled in the educational program for leading graduate schools or in the Tokyo Tech Academy for Leadership (ToTAL) may be offered courses recognized as equivalent to Career Development Courses besides those listed as such in the "Liberal Arts and Basic Science Courses" in the Guide to Graduate Education and International Graduate Program. For details about available courses or completion requirements, please refer to the Study Guide of the Academy that offers the relevant program.

8. Research Related to the Completion of Doctoral Theses

A student aims at learning of the ability that is listed in the "Learning Goals" by accomplishing the research activities of Doctoral Thesis. A model schedule for a student who is graduating at the 12th quarter is shown below.

The 1st semester		The 2nd semester		The 3rd semester		The 4th semester		The 5th semester		The 6th semester	
1Q	2Q	3Q	4Q	5Q	6Q	7Q	8Q	9Q	10Q	11Q	12Q

1. Application of the Doctoral degree
2. The doctoral thesis submission and the final defense
3. The final examination and evaluation

* Judgement criterion of the final defense of Doctoral Thesis

Doctoral degree thesis has to be an own thesis that has novelty, originality, and sufficient academic value in the mechanical engineering and relating fields. In addition, main part of the thesis has to have been published in a scientific journal which is in the international standard, or to reach to the similar level to the publication.

* Implementation manner of the final defense of Doctoral Thesis

The judgement committee consists of 5 judges or more, and it is recommended to actively include the external judges from other research institute or company. After the application of the Doctoral degree, the thesis submission and the oral presentation is put into effect. The judgement of appropriateness for the Doctoral degree giving is done after the final examination and evaluation.