# Graduate Major in Electrical and Electronic Engineering

The department of electrical and electronic engineering offers a broad range of advanced courses as well as fundamental subjects in the field of electrical and electronic engineering. These courses cover basic topics necessary for understanding electrical and electronic engineering, which provide the state-of-the-art science and technology in the field: “electronic materials,” “electron devices,” “wave, photonics and communication,” “electronic circuit,” and “power, energy and environment” and pragmatical courses, in which students acquire practical skills of electrical and electronic engineering. Along with master’s and doctoral research activities, students are expected to enhance the abilities of problem identification and resolution.

## 【Master's Degree Program】

### 1. Outline

The aim of this program is to foster researchers and engineers able to play a global active role with fundamental understanding, ability of application and development, and originality through the course work and research project in the field of electrical and electronic engineering, mainly focused on the social infrastructure, such as “electronic materials,” “electron devices,” “wave, photonics and communication,” “electronic circuit,” and “power, energy and environment.”

### 2. Competencies Developed

This graduate major expects students in the master’s degree program to acquire the following abilities:

- Basic expertise acquisition to understand essentials in the field of electrical and electronic engineering.
- Problem setting and solving abilities in the interdisciplinary research fields.
- Maneuvering ability to solve problems and to propose creative proposals in the field of electrical and electronic engineering with the basic and expertise acquisition.
- Ability to perform research projects with understating of future trends from a global point of view.
- Ability for communication and documentation with logical explanation.

### 3. Learning Goals

In this master’s degree program, each student is required to study the following contents, in order to obtain the abilities mentioned above.

A) Basic expertise acquisition
Study necessary basics for understanding research fields of “electronic materials,” “electron devices,” “wave, photonics and communication,” “electronic circuit” and “power, energy and environment.”

B) High expertise in the above fields and adaptivity to interdisciplinary research areas
Broaden the knowledge of the above research fields to cultivate the ability to solve problems in interdisciplinary research areas around electrical and electronic engineering.

C) Ability to identify and solve problems and master’s thesis research
Students are expected to acquire the ability of problem identification and solution through the own research project

for master’s thesis.

D) Acquisition of creativity and practical research ability
Students are expected to learn how to conduct their research projects proactively. For this purpose, it is required to realize their inventive ideas in the master’s thesis project and research courses and to make presentation and discussion in technical conferences and/or workshops.

E) Ability of logical explanation in communication and documentation
Acquire the ability of logical explanation and communication to exchange the own view, idea, and opinion with researchers and/or engineers in various research fields through the own master’s thesis project and/or research courses.

## 4. IGP Completion Requirements

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

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

**Table M1. Graduate Major in Electrical and Electronic Engineering Completion Requirements**

| Course category | | <Required courses><br>Required credits | <Electives><br>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<br>•1 credit from 500-level | 5 credits | B, E | |
| | Career development Courses | | 2 credits | | C, D, E | |
| | Other courses | | | | | |
| Core courses | Research seminars | Seminar S1 on Electrical and Electronic Engineering<br>Seminar F1 on Electrical and Electronic Engineering<br>Seminar S2 on Electrical and Electronic Engineering<br>Seminar F2 on Electrical and Electronic Engineering<br>A total of 8 credits, 2 credits each from the above courses. | | 21 credits | A, B, C, D, E | |
| | Research-related courses | | | | B, D, E | |
| | Major courses | | 13 credits | | A, B | |
| | Major courses and Research-related courses <u>outside</u> the Graduate Major in Electrical and Electronic Engineering standard curriculum | | | | B, E | |
| Total required credits | | A minimum of 30 credits in addition to meeting the above conditions | | | | |

| Note | • Japanese Language and Culture Courses offered to International Students can be recognized as Humanities and Social Science Courses of the corresponding course level.<br>• As for Liberal Arts and Basic Science Courses, please refer to the relevant pages. |
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## 5. IGP Courses

**Table M2. Core Courses of the Graduate Major in Electrical and Electronic Engineering**

| Course Category | | Course number | Course | | | Credits | Competencies | Learning goals | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Research seminars | 400 level | EEE.Z491.R | ◎ | | Seminar S1 on Electrical and Electronic Engineering | 0-0-2 | 2,3,4,5 | A,B,C,D,E | |
| | | EEE.Z492.R | ◎ | | Seminar F1 on Electrical and Electronic Engineering | 0-0-2 | 2,3,4,5 | A,B,C,D,E | |
| | 500 level | EEE.Z591.R | ◎ | | Seminar S2 on Electrical and Electronic Engineering | 0-0-2 | 2,3,4,5 | A,B,C,D,E | |
| | | EEE.Z592.R | ◎ | | Seminar F2 on Electrical and Electronic Engineering | 0-0-2 | 2,3,4,5 | A,B,C,D,E | |
| Research-related courses | 500 level | EEE.R551.L | | ★ | Study Abroad (Master Course) A | 0-0-1 | 1,2,5 | B,E | |
| | | EEE.R552.L | | ★ | Study Abroad (Master Course) B | 0-0-2 | 1,2,5 | B,E | |
| | | EEE.R553.L | | ★ | Study Abroad (Master Course) C | 0-0-4 | 1,2,5 | B,E | |
| | | EEE.R554.L | | ★ | Study Abroad (Master Course) D | 0-0-6 | 1,2,5 | B,E | |
| | | EEE.R561.L | | | Internship (Master Course) A | 0-0-1 | 1,2,5 | D,E | |
| | | EEE.R562.L | | | Internship (Master Course) B | 0-0-2 | 1,2,5 | D,E | |
| | | EEE.R563.L | | | Internship (Master Course) C | 0-0-4 | 1,2,5 | D,E | |
| | | EEE.R564.L | | | Internship (Master Course) D | 0-0-6 | 1,2,5 | D,E | |
| Major courses | 400 level | EEE.C401.L | | | Analog Integrated Circuits | 2-0-0 | 3,4,5 | A | 【Information and Communications Engineering】(ICT.I408) |
| | | EEE.C411.L | | □<br>★ | Mixed Signal Circuits | 2-0-0 | 3,5 | A | |
| | | EEE.C441.L | | □ | VLSI Technology I | 2-0-0 | 3 | A | |
| | | EEE.C442.L | | □ | VLSI Technology II | 2-0-0 | 3,5 | A | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | ★ | | | | | |
| | | EEE.C451.L | | | RF Measurement Engineering | 1-0-1 | 3,5 | A | |
| | | EEE.C461.L | | ★ | VLSI System Design | 2-0-0 | 3,4,5 | A | 【Information and Communications Engineering】(ICT.I415) |
| | | EEE.D401.L | | □<br>★ | Fundamentals of Electronic Materials | 2-0-0 | 3,5 | A | |
| | | EEE.D411.L | | □<br>★ | Semiconductor Physics | 2-0-0 | 3,5 | A | |
| | | EEE.D421.L | | □ | Imaging Materials | 2-0-0 | 3,5 | A | |
| | | EEE.D431.L | | □ | Fundamentals of Light and Matter I | 2-0-0 | 3 | A | |
| | | EEE.D441.L | | □ | Information Storage Engineering | 2-0-0 | 1,2,3,4,5 | A | |
| | | EEE.D451.L | | □<br>★ | Bipolar Transistors and Compound Semiconductor Devices | 2-0-0 | 3,5 | A | |
| | | EEE.D461.L | | □ | Optoelectronics | 2-0-0 | 3,4,5 | A | |
| | | EEE.D481.L | | □ | Advanced Power Semiconductor Devices | 2-0-0 | 5 | A | |
| | | EEE.D491.L | | ★ | Introduction to Photovoltaics | 2-0-0 | 3,5 | A | 【Energy Science and Engineering】(ENR.L410) |
| | | EEE.G401.L | | □ | Utilization of Intelligent Information Resources and Patents | 1-0-0 | 3,5 | A | |
| | | EEE.G411.L | | □ | Electrical Modeling and Simulation | 2-0-0 | 3,5 | A | |
| | | EEE.P401.L | | □<br>★ | Electric Power and Motor Drive System Analysis | 2-0-0 | 3,5 | A | |
| | | EEE.P411.L | | □<br>★ | Advanced Course of Power Electronics | 2-0-0 | 3,5 | A | |
| | | EEE.P421.L | | □<br>★ | Advanced Electric Power Engineering | 2-0-0 | 2,3 | A | |
| | | EEE.P451.L | | □<br>★ | Plasma Engineering | 2-0-0 | 3 | A | |
| | | EEE.P461.L | | □<br>★ | Pulsed Power Technology | 2-0-0 | 3,4,5 | A | |
| | | EEE.S401.L | | □<br>★ | Advanced Electromagnetic Waves | 2-0-0 | 3,5 | A | |

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|---|---|---|---|---|---|---|---|---|---|
| | | EEE.S411.L | | □<br>★ | Guided Wave Circuit Theory | 2-0-0 | 3,5 | A | |
| | | EEE.S451.L | | □<br>★ | Wireless Communication Engineering | 2-0-0 | 3,5 | A | |
| | | EEE.S461.L | | □ | Optical Communication Systems | 2-0-0 | 3,5 | A | |
| | | EEE.D501.L | | □<br>★ | Dielectric Property and Organic Devices | 2-0-0 | 3 | B | |
| | | EEE.D511.L | | □<br>★ | Magnetism and Spintronics | 2-0-0 | 3,5 | B | |
| | | EEE.D521.L | | □ | Advanced Materials in Information Technologies | 2-0-0 | 3,5 | B | |
| | | EEE.D531.L | | □ | Fundamentals of Light and Matter IIa | 1-0-0 | 3 | B | |
| | | EEE.D532.L | | □<br>★ | Fundamentals of Light and Matter IIb | 1-0-0 | 3 | B | |
| | | EEE.D533.L | | □<br>O<br>★ | Fundamentals of Light and Matter IIc | 1-0-0 | 3 | B | O: Odd year in English<br>E: Even year in Japanese |
| | | EEE.D541.L | | □ | Fundamental of Spectroscopic Measurements and its Development | 1-0-0 | 3 | B | |
| | | EEE.D546.L | | | Semiconductor device simulation | 0.5-0.5-0 | 3,5 | B | |
| | **500 level** | EEE.D551.L | | □ | Nano-Structure Devices | 2-0-0 | 3,5 | B | |
| | | EEE.D561.L | | □<br>★ | Terahertz Devices and Systems | 2-0-0 | 3,4,5 | B | |
| | | EEE.D571.L | | ★ | Nano-Materials Electronics | 2-0-0 | 3,4 | B | |
| | | EEE.D581.L | | ★ | Advanced functional electron devices | 2-0-0 | 1,2,3,4,5 | B | 【Energy Science and Engineering】(ENR.L530) |
| | | EEE.P501.L | | □<br>★ | Magnetic Levitation and Magnetic Suspension | 2-0-0 | 3 | B | |
| | | EEE.P511.L | | | Environment and Electric Energy | 2-0-0 | 2,4,5 | B | |
| | | EEE.S551.L | | ★ | Introduction to Information and Communication Technologies for Development | 1-0-0 | 3 | B | 【Global Engineering for Development, Environment and Society】(GEG.T501) |

Note：

・◎: Required course, ○: Restricted elective, ★: Classes in English, 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 ABC.D400.R): C (Electronic Circuit), D (Electron Devices and Electronic Materials), P (Electric Power, Energy, and Environment), S (Wave, Photonics, and Communication), G (General Subjects), R (Off-Campus Projects), and Z (Research Seminars).

## 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.

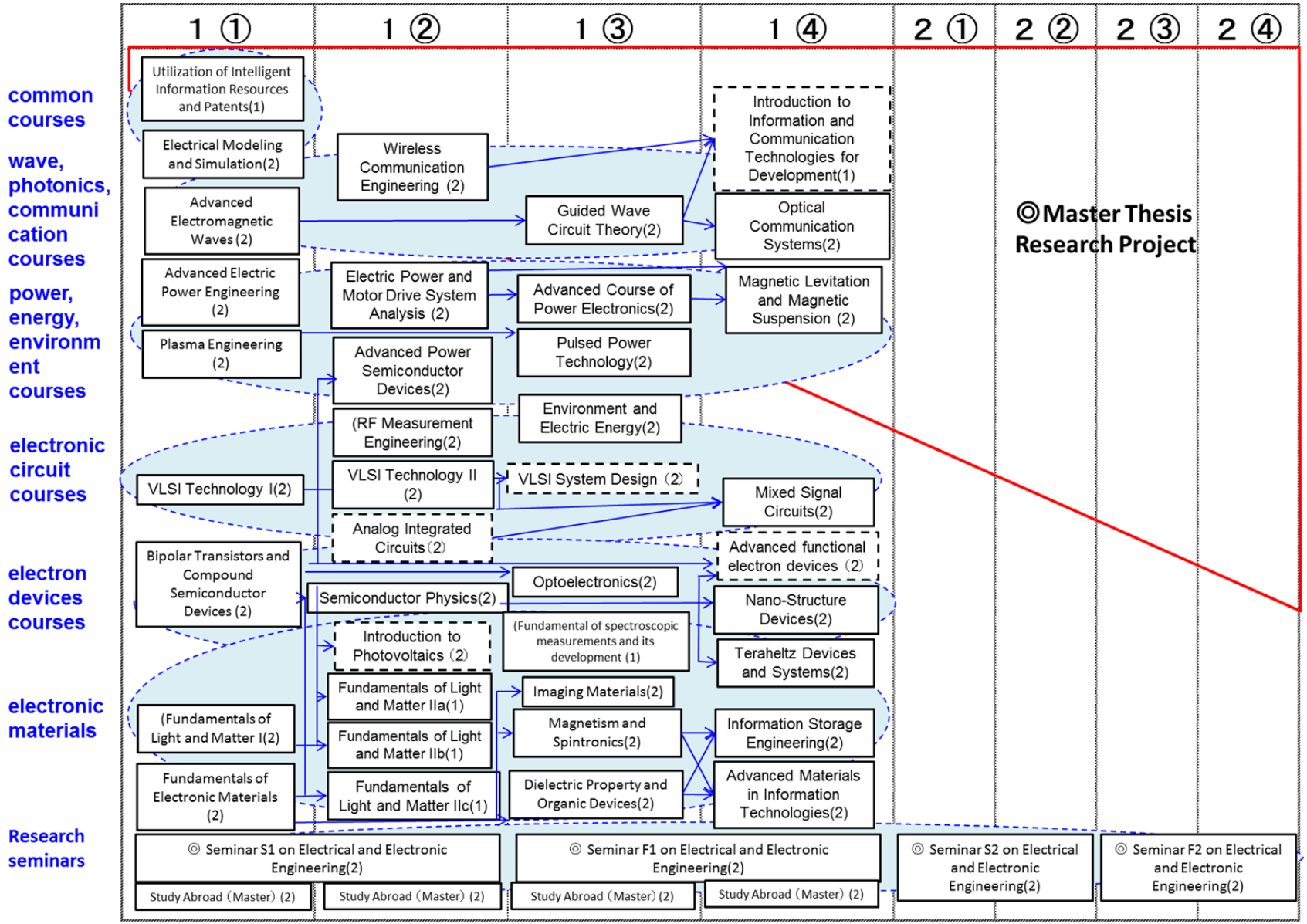
**Table M3. Courses of the Graduate Major in Electrical and Electronic Engineering that can be recognized as Career Development Courses**

| Course category | Course number | Course | | | Credits | GA* | Learning goals | Comments |
|---|---|---|---|---|---|---|---|---|
| can be recognized as Career Development Courses | EEE.R561.L | | | Internship (Master Course) A | 0-0-1 | C1M | B, D, E | |
| | EEE.R562.L | | | Internship (Master Course) B | 0-0-2 | C1M | B, D, E | |
| | EEE.R563.L | | | Internship (Master Course) C | 0-0-4 | C1M | B, D, E | |
| | EEE.R564.L | | | Internship (Master Course) D | 0-0-6 | C1M | B, D, E | |
| | EEE.G401.L | | | Utilization of Intelligent Information Resources and Patents | 1-0-0 | C1M | B, E | |

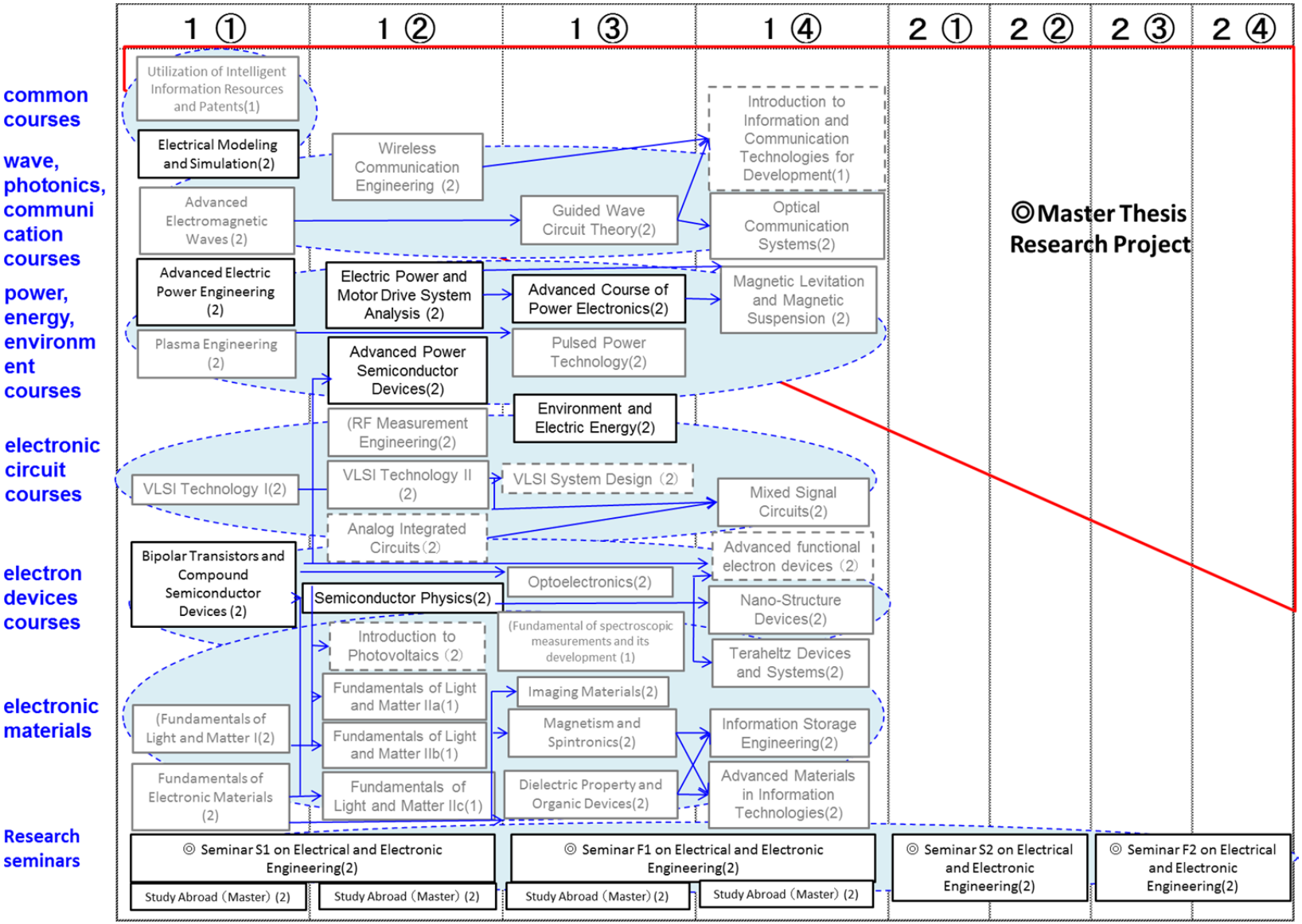
**To satisfy the Career Development Courses requirement, credits may be acquired from courses listed above as well as from those listed under Career Development Courses (see the Liberal Arts and Basic Science Courses Guide).**

**＊GA: Graduate Attribute**

## 8. Overview of Curriculum System

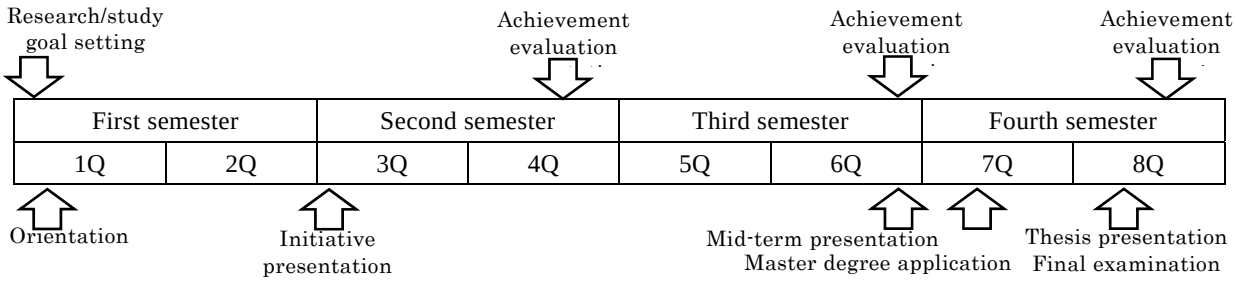


## 9. Example of a Standard Curriculum



## 10. Research Related to the Completion of Master Theses

Our master research project aims to improve the problem setting and solving abilities and communication and presentation skills through experience of a series of study and research processes. Fig. 1 shows the standard study and research flow to achieve the above aim. Each student confirms own study/research plan and its effectiveness in every semester through interviews with the academic supervisor and/or advisor, and then, records the self-evaluation and the review result from the advisors on study and research achievements. In initiative, mid-term, and thesis presentations, it is expected to improve not only the presentation and communication skills but also the ability for practical problem solution with the help of the comments and suggestions from the supervisor and/or other faculties. These study/research activities toward the master degree achieve acquisition of the abilities "to identify and solve problems" and "creativity and practical research ability" as presented in the items C and D of the aforementioned "Learning Goals."




App.Fig.1 A standard flow for the master degree in the Graduate Major in Electrical and Electronic Engineering.

**Initiative presentation and mid-term presentation**

The initiative presentation aims to develop students' clear awareness of research background, objective, motivation, and so on in their own master thesis research project. It is held in the third quarter after their admission. The mid-term presentation is held in the sixth quarter to confirm the progress of their research project. After the initiative presentation, the student should submit a course work study plan to the faculty for the graduate major. And then, the student can register 600-level courses which is mainly for doctoral program students, with the allowance of the faculty. It should be noted that 600-level courses are excluded from the master program completion requirements as shown in Table M1.

**Master thesis criteria**

Master thesis for this graduate major should be an article written by the student him/her-self. The thesis should be able to present original considerations and/or discussions, including a new knowledge in the academic field of electrical and electronics engineering or a usefulness contributing to the evolution of electrical and electronics technology. Thesis abstract should be written in English.

**Master thesis examination procedure**

The committee for master thesis examination consists of three or more examiners. Each student has to make a thesis presentation after the examiners' review of the submitted master thesis. The committee decides the final evaluation based on the thesis review and presentation. Five or more examiners will review and evaluate the master thesis in case of students who wish to enter the doctoral degree program.

## 【Doctoral Degree Program】

### 1. Outline

The aim of this program is to foster researchers and engineers able to play an active role as a global leader with fundamental understanding, ability of application and development, originality, and international communication skills through the course work and research project in the field of electrical and electronic engineering, mainly focused on the social infrastructure, such as “electronic materials,” “electron devices,” “wave, photonics and communication,” “electronic circuit,” and “power, energy and environment.”

### 2. Competencies Developed

This doctoral degree program expects students to acquire the following abilities at a higher level than the master’s degree program:

- Cutting-edge expertise acquisition to understand essentials in the field of electrical and electronic engineering.
- Problem setting and solving ability in the interdisciplinary research fields.
- Maneuvering ability to solve problems and to propose creative proposals in the field of electrical and electronic engineering with the basic and expertise acquisition.
- Ability to perform research projects with understating of future trends from a global point of view.
- Ability for communication and documentation with logical explanation.

### 3. Learning Goals

In this doctoral degree program, each student is required to study the following contents, in order to obtain the abilities mentioned above.

A) Cutting-edge expertise acquisition
To study the cutting-edge expertise to understand the essentials in a specific field of “electronic materials,” “electron devices,” “wave, photonics and communication,” “electronic circuit” or “power, energy and environment.”

B) Understanding of interdisciplinary research areas and practical ability to solve technical problems
To cultivate the ability to conduct the own research based on the suggestions and values of the other fields through the own study of interdisciplinary research areas, and doctor’s dissertation review and defense.

C) Ability to solve problems and to propose a new idea based on the expertise
To acquire the ability of technical problem solution through research seminars on electrical and electronic engineering and research project for doctoral dissertation.

D) Acquisition of leadership accepted in a worldwide activity
Students are expected to acquire the ability to play an active role as a leader through participation and presentation in international conferences, objective evaluations of the own research, international student exchange programs.

E) Ability of logical explanation in communication and documentation
Acquire the ability of logical explanation and communication to exchange the own view, idea, and opinion with researchers and/or engineers in various research fields through the own doctoral dissertation project and/or research courses.

## 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. Meet the completion requirement indicated in Table D1 below.
3. Pass the doctoral dissertation review and defense.

**Table D1. Graduate Major in Electrical and Electronic Engineering Completion Requirements**

| Course category | | <Required courses><br>Required credits | <Electives><br>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, D, E | |
| | Career development courses | | 4 credits | | C, D, E | |
| | Other courses | | | | | |
| Core courses | Research seminars | Seminar S3 on Electrical and Electronic Engineering<br>Seminar F3 on Electrical and Electronic Engineering<br>Seminar S4 on Electrical and Electronic Engineering<br>Seminar F4 on Electrical and Electronic Engineering<br>Seminar S5 on Electrical and Electronic Engineering<br>Seminar F5 on Electrical and Electronic Engineering<br>A total of 12 credits, 2 credits each from the above courses. | | 18 credits | A, B, C, D, E | |
| | Research-related courses | | | | B, C, D, E | |
| | Major courses | | | | A, B, C, D, E | |
| | Major courses and Research-related courses outside the Graduate Major in Electrical and Electronic Engineering standard curriculum | | | | | |
| Total required credits | | A minimum of 24 credits in addition to meeting the above conditions | | | | |

| Note | • Japanese Language and Culture Courses offered to International Students can be recognized as Humanities and Social Science Courses of the corresponding course level.<br>• As for Liberal Arts and Basic Science Courses, please refer to the relevant pages. |
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## 5. IGP Courses

**Table D2. Core Courses of the Graduate Major in Electrical and Electronic Engineering**

| Course Category | | Course number | Course | | | Credits | Competencies | Learning goals | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Research seminars | 600 level | EEE.Z691.R | ◎ | | Seminar S3 on Electrical and Electronic Engineering | 0-0-2 | 2,3,4,5 | A,B,C,D,E | |
| | | EEE.Z692.R | ◎ | | Seminar F3 on Electrical and Electronic Engineering | 0-0-2 | 2,3,4,5 | A,B,C,D,E | |
| | | EEE.Z693.R | ◎ | | Seminar S4 on Electrical and Electronic Engineering | 0-0-2 | 2,3,4,5 | A,B,C,D,E | |
| | | EEE.Z694.R | ◎ | | Seminar F4 on Electrical and Electronic Engineering | 0-0-2 | 2,3,4,5 | A,B,C,D,E | |
| | | EEE.Z695.R | ◎ | | Seminar S5 on Electrical and Electronic Engineering | 0-0-2 | 2,3,4,5 | A,B,C,D,E | |
| | | EEE.Z696.R | ◎ | | Seminar F5 on Electrical and Electronic Engineering | 0-0-2 | 2,3,4,5 | A,B,C,D,E | |
| Research-related courses | 600 level | EEE.R601.L | | | Training on Teaching Technique | 0-1-0 | 2,3 | D,E | |
| | | EEE.R611.L | | | Doctor Course Colloquium | 0-1-0 | 2,3 | C,D,E | |
| | | EEE.R621.L | | ★ | International Presentations | 0-1-0 | 2,3 | C,D,E | |
| | | EEE.R631.L | | | Special Analysis on Electrical and Electronic Engineering | 0-1-1 | 3,4,5 | B,C,D | |
| | | EEE.R641.L | | | Practical Research on Electrical and Electronic Engineering | 0-1-1 | 3,4 | B,C,D | |
| | | EEE.R651.L | | ★ | Study Abroad (Doctor Course) A | 0-0-1 | 1,2,4,5 | B,D,E | |
| | | EEE.R652.L | | ★ | Study Abroad (Doctor Course) B | 0-0-2 | 1,2,4,5 | B,D,E | |
| | | EEE.R653.L | | ★ | Study Abroad (Doctor Course) C | 0-0-4 | 1,2,4,5 | B,D,E | |
| | | EEE.R654.L | | ★ | Study Abroad (Doctor Course) D | 0-0-6 | 1,2,4,5 | B,D,E | |
| | | EEE.R661.L | | | Internship (Doctor Course) A | 0-0-1 | 1,2,4,5 | B,C,D,E | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | EEE.R662.L | | | Internship (Doctor Course) B | 0-0-2 | 1,2,4,5 | B,C,D,E | |
| | | EEE.R663.L | | | Internship (Doctor Course) C | 0-0-4 | 1,2,4,5 | B,C,D,E | |
| | | EEE.R664.L | | | Internship (Doctor Course) D | 0-0-6 | 1,2,4,5 | B,C,D,E | |
| **Major courses** | **600 level** | EEE.G601.L | | ★ | Teaching Skills in English for Doctoral Course Students | 0-1-0 | 1,2,3,4,5 | D,E | |
| | | EEE.G611.L | | | Special Lecture I on Electrical and Electronic Engineering | 1-0-0 | 1,3 | A,B,C | |
| | | EEE.G612.L | | | Special Lecture II on Electrical and Electronic Engineering | 1-0-0 | 1,3 | A,B,C | |

Note：

・◎: Required course, ○: Restricted elective, ★: Classes in English, 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 ABC.D400.R): G (General Subjects), R (Off-Campus Projects), and Z (Research seminars).

## 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 doctoral degree program need to satisfy all of the specified Graduate Attributes (“GA”), including the attainment of at least four course credits, listed in Table A-1 or A-2 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 D3 — 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 D3-1. Courses of the Graduate Major in Electrical and Electronic Engineering that can be recognized as Career Development Courses in the Academic Leader Program (ALP)**

| Course category | Course number | Course | | | Credits | GA* | Learning goals | Comments |
|---|---|---|---|---|---|---|---|---|
| can be recognized as Career Development Courses | EEE.G601.L | | ★ | Teaching Skills in English for Doctoral Course Students | 0-1-0 | A1D | B, D, E | |
| | EEE.R611.L | | | Doctor Course Colloquium | 0-1-0 | A2D<br>A3D | B, D, E | |
| | EEE.R621.L | | ★ | International Presentations | 0-1-0 | A2D<br>A3D | B, C, D, E | |
| | EEE.R601.L | | | Training on Teaching Technique | 0-1-0 | A1D<br>A2D<br>A3D | B, D, E | |
| | EEE.R651.L | | ★ | Study Abroad (Doctor Course) A | 0-0-1 | A1D<br>A2D<br>A3D | B, D, E | |
| | EEE.R652.L | | ★ | Study Abroad (Doctor Course) B | 0-0-2 | A1D<br>A2D<br>A3D | B, D, E | |
| | EEE.R653.L | | ★ | Study Abroad (Doctor Course) C | 0-0-4 | A1D<br>A2D<br>A3D | B, D, E | |
| | EEE.R654.L | | ★ | Study Abroad (Doctor Course) D | 0-0-6 | A1D<br>A2D<br>A3D | B, D, E | |
| | EEE.R661.L | | | Internship (Doctor Course) A | 0-0-1 | A1D<br>A2D<br>A3D | B, D, E | |
| | EEE.R662.L | | | Internship (Doctor Course) B | 0-0-2 | A1D<br>A2D<br>A3D | B, D, E | |
| | EEE.R663.L | | | Internship (Doctor Course) C | 0-0-4 | A1D<br>A2D<br>A3D | B, D, E | |
| | EEE.R664.L | | | Internship (Doctor Course) D | 0-0-6 | A1D | B, D, E | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | A2D<br>A3D | | |

**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).**

**＊GA: Graduate Attribute**

**Table D3-2. Courses of the Graduate Major in Electrical and Electronic Engineering that can be recognized as Career Development Courses in the Productive Leader Program (PLP)**

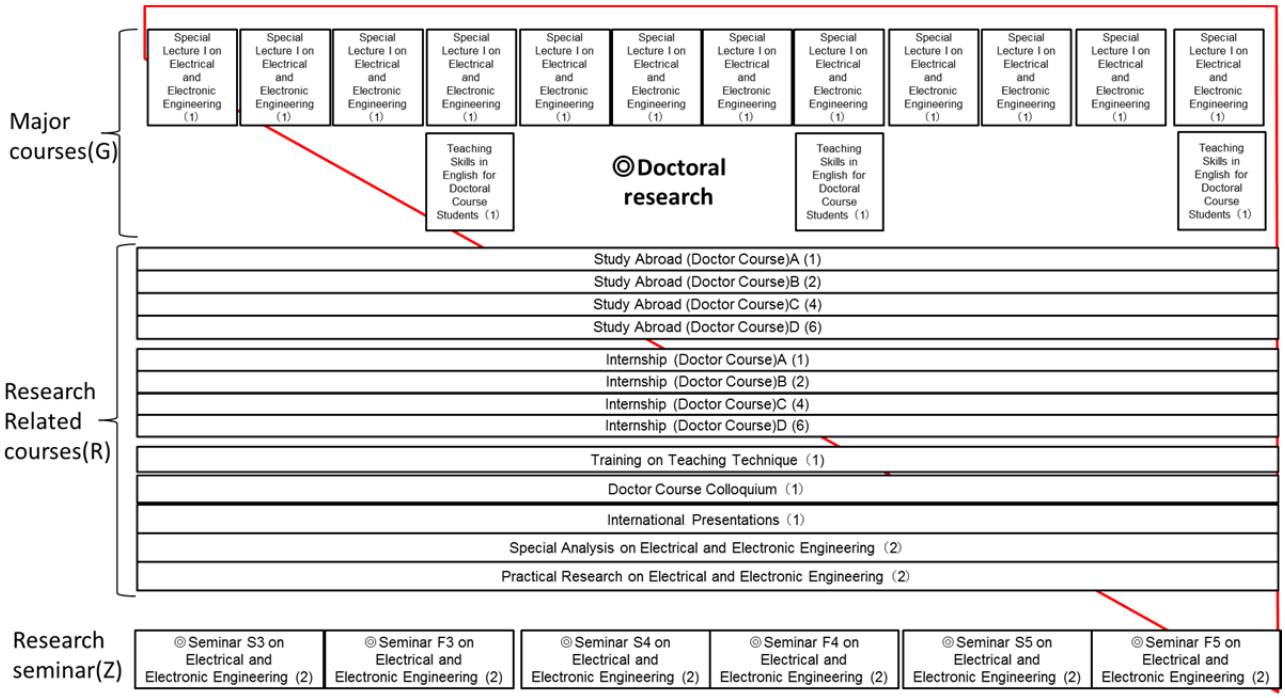
| Course category | Course number | Course | | | Credits | GA* | Learning goals | Comments |
|---|---|---|---|---|---|---|---|---|
| can be recognized as Career Development Courses | EEE.G601.L | | ★ | Teaching Skills in English for Doctoral Course Students | 0-1-0 | P1D | B, D, E | |
| | EEE.R611.L | | | Doctor Course Colloquium | 0-1-0 | P2D<br>P3D | B, D, E | |
| | EEE.R621.L | | ★ | International Presentations | 0-1-0 | P2D<br>P3D | B, C, D, E | |
| | EEE.R601.L | | | Training on Teaching Technique | 0-1-0 | P1D<br>P2D<br>P3D | B, D, E | |
| | EEE.R651.L | | ★ | Study Abroad (Doctor Course) A | 0-0-1 | P1D<br>P2D<br>P3D | B, D, E | |
| | EEE.R652.L | | ★ | Study Abroad (Doctor Course) B | 0-0-2 | P1D<br>P2D<br>P3D | B, D, E | |
| | EEE.R653.L | | ★ | Study Abroad (Doctor Course) C | 0-0-4 | P1D<br>P2D<br>P3D | B, D, E | |
| | EEE.R654.L | | ★ | Study Abroad (Doctor Course) D | 0-0-6 | P1D<br>P2D<br>P3D | B, D, E | |
| | EEE.R661.L | | | Internship (Doctor Course) A | 0-0-1 | P1D<br>P2D<br>P3D | B, D, E | |
| | EEE.R662.L | | | Internship (Doctor Course) B | 0-0-2 | P1D | B, D, E | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | P2D<br>P3D | | |
| | EEE.R663.L | | | Internship (Doctor Course) C | 0-0-4 | P1D<br>P2D<br>P3D | B, D, E | |
| | EEE.R664.L | | | Internship (Doctor Course) D | 0-0-6 | P1D<br>P2D<br>P3D | B, D, E | |

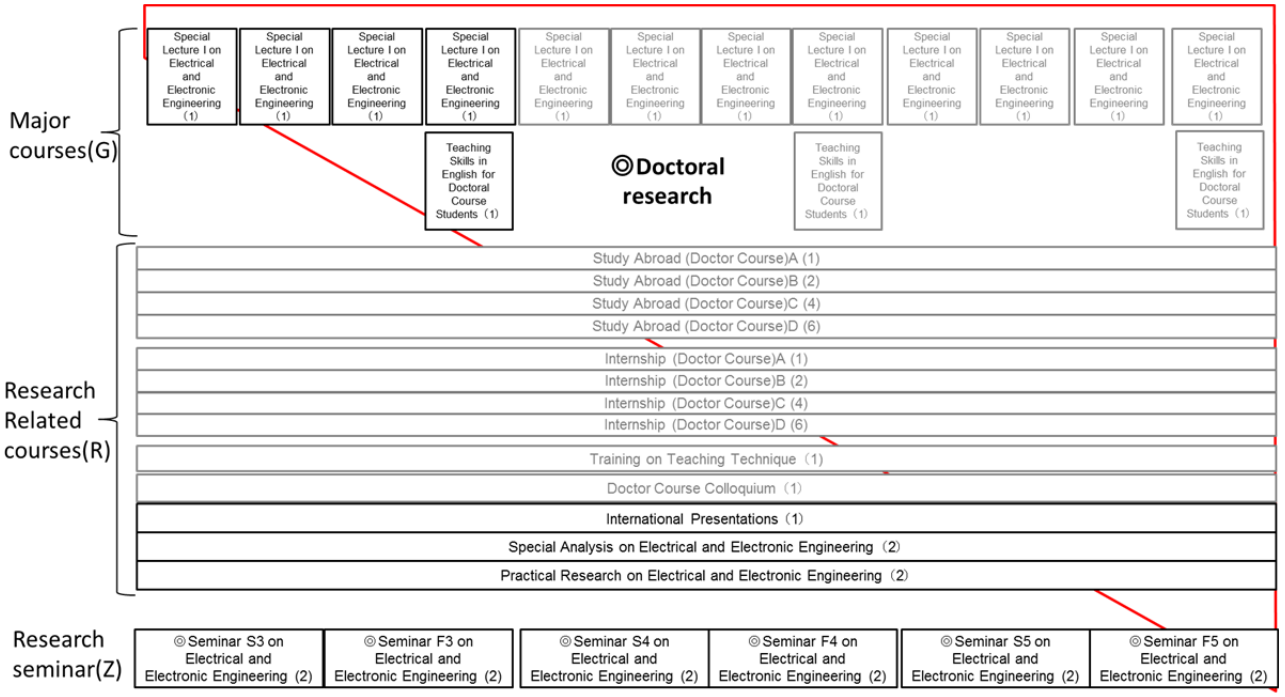
**To satisfy the Career Development Courses requirement, credits may be acquired from courses listed above as well as from those listed under Career Development Courses (see the Liberal Arts and Basic Science Courses Guide).**

**∗GA: Graduate Attribute**

## 8. Overview of Curriculum System

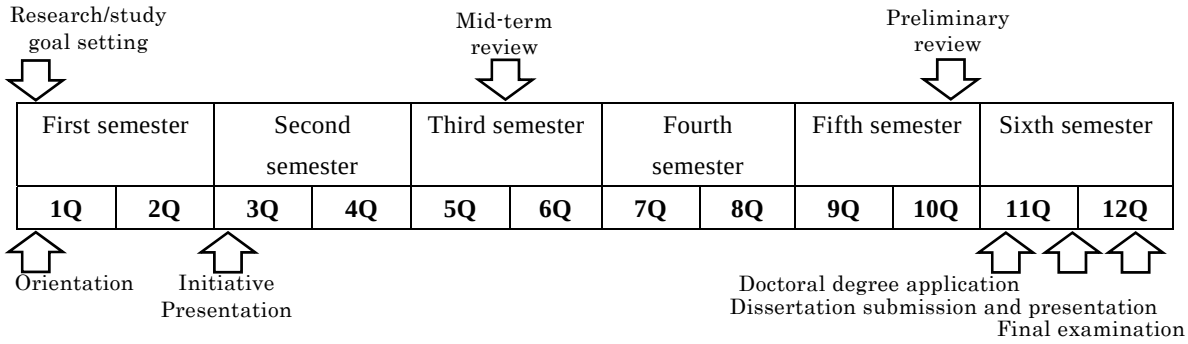



## 9. Example of a Standard Curriculum



## 10. Research Related to the Completion of Doctoral Theses

The doctoral degree program aims to cultivate the problem setting ability as well as the problem solving ability and to improve the communication and presentation skills, especially in English. These abilities and skills can be acquired through the processes of the study and/or research goal setting and the achievement evaluation. App.Fig.3 shows a standard flow in the doctoral degree program. As shown in the figure, initiative presentation should be made one semester after the enrollment. Each student has to take mid-term review one and half year prior to the completion, or during the third semester in the standard flow, and preliminary review a half year before, during the fifth semester. After the reviews, the student can be allowed to submit the doctoral degree application and his/her doctoral dissertation. The examination committee reviews the doctoral dissertation after the oral dissertation presentation. The doctoral degree can finally be recognized based on the results of the final examination on the doctoral dissertation.




App.Fig.3 A standard flow for the doctoral degree in the Graduate Major in Electrical and Electronic Engineering.

**Dissertation review criteria**

Each student has to submit his/her doctoral dissertation which must be written by him/herself. The dissertation should have novelty, creativity, and enough high academic value in the field of electrical and electronics engineering. The main part of the dissertation should already be issued in an academic journal with an international standard, or the dissertation must be recognized as an equivalent level. The doctoral dissertation should be written in English in principle.

**Doctoral dissertation examination procedure**

The examination committee consists of five or more faculty members and an external examiner from another university, research institute, or company in principle. The committee reviews the dissertation submitted from the doctoral candidate who has passed the mid-term and preliminary reviews. After the oral dissertation presentation, the committee examines and evaluates the dissertation as the final review. The committee confirms the comprehensive ability in the corresponding field and English communication and presentation skills in the final examination.