

# Subject Guide (SIPOP)

## Description of the Doctor Course and Guidance of course registration

### Course registration and requirements for the degree

#### (1) Philosophy of foundation

With remarkable development in Science and Technology, there is a great demand for researchers or engineers who not only achieve high quality research in a special field but also have extensive knowledge of many fields of science.

Thus, it is of most importance to develop a new educational curriculum and educational methodologies to meet these needs.

The goal of the Doctor Course program is to develop students being new style of scientific researchers and/or engineers with following features.

- High knowledge and logically composed thought for each major field.
- Academic knowledge and indifferent judgment of different fields.
- Application for unknowing issues through logic and technical based.
- High research ability with flexibility for the technology of these days.
- Abilities on analyzing recent issues, on bringing forward and on solving problems.

#### (2) Research Supervisor

The school selects three instructors composed of one advisory professor (credentialed associate professor) and two vice-advisory professors (associate professors) for each student with reference to student's requests. This advisory system enhances the research activity of the students. Also, the students will receive a course registration guidance by the main advisory professor.

#### (3) Requirements for the degree

##### 1) Requirements for completion of the doctor's degree

- The period of course study should be normally within three years.
- The number of credits earned should be more than 7.
- The students should follow proper research advises and guidelines and pass final examinations and faculty evaluation of doctor thesis.

\* In certain cases, those students who show superior results in their research are able to finish the Doctor Course requirements in one year.

##### 2) Those students who completed the Master course for one year are required to take Doctor Course at least two years.

Thus, the total period of course studies is at least three years for the Master and the Doctor courses as a whole.

##### 3) Those students who admitted to enroll Doctor course without Master Degree are required that

- The period of course study should be within three years. The number of credits earned should be more than 7.
- The students should follow proper research advises and guidelines and pass the final examinations and faculty evaluation of doctor thesis.

#### (4) Degree

Degree titles are as follows;

- Doctor of Philosophy in Science
- Doctor of Philosophy in Engineering

\* Doctor of Philosophy in principle and degree title depends on field of one's research.

The degree is conferred twice a year, on March and on September. Students are required to apply for the faculty evaluation of the thesis to the Dean of Doctor course in the Graduate School.

- Degree conferred on march is required to apply from January 5 to 10
- Degree conferred on September is required to apply from June 21 to 30 both in same year.

The thesis is required as same value as that of international scientific journal with referee system and/or domestic (Japan) journal of scientific society.

#### (5) Subjects and Credits

For the purpose of attaining academic ideology, the Doctor course opens not only the lectures for course major subjects but also the special lectures as “SIPOP Special Lecture on Environmental / SIPOP Special Lecture on Energy Science, SIPOP Special Lecture, SIPOP Synthetic seminar and Project seminar.

Students are required to take 7 credits in total, one from course major subjects, one from SIPOP Special Lecture, one from SIPOP Special Lecture on Environmental or SIPOP Special Lecture on Energy Science, two from SIPOP Synthetic seminar, and two from Project seminar.

Academic Affairs Section for the Graduate School of Science and Engineering informs the date and time of lecture through bulletin board, however students are required to keep in touch with their supervisors.

##### 1) Course Major subjects with 1 credit

Advanced lectures in the specific field are given by each specific professor or instructor.

##### 2) SIPOP Special Lecture with 1 credit.

The lecture is open for the purpose to acquire a wide range of knowledge about science and engineering. The lecture encompasses mathematics, information science, mechanical energy engineering, electrical energy engineering, urban engineering, bio-material engineering, which include both the basics and current issues.

##### 3) SIPOP Special Lecture on Environmental Science / SIPOP Special Lecture on Energy Science with each 1 credit.

The lecture is opened under the purpose to develop students not only to become specialist but also to have interest in extensive field and knowledge, flexibility and synthetic consideration. **Students take one which is outside of his/her special field.**

##### 4) SIPOP Synthetic Seminar with 2 credits

For the purpose of self-enlightenment and academically synthetic, students are required to report their research and discuss with professors and other students. One seminar group consists of approximately five students and some academic staffs.

##### 5) Project seminar with 2 credits.

The seminar is open for the purpose to acquire the ability to collaborate as a team, solve problems, and practice problem solving by participating in a joint research project. This seminar has some possibilities. One is joining in the lectures that will be held by the overseas guest researchers, the second is joining in International partnership program to take lectures and to present one's presentations.

The third is joining in "Specific project research team" which consists of the different academic groups of Saga University and researchers and engineers outside of Saga University through academic exchange program.

#### (6) Registration of classes

Students are required to submit registration notices on line at the commencement of the new semester. Students earn credits by attending classes, passing regular examinations and/or submitting reports.

#### (7) Lectures at other universities

When Saga University admits that some lectures are beneficial for students, students can attend the lectures at other universities and research institutes. Some credits are counted in the requirements.

These lectures are carried out based on universities mutual agreement. Rules are settled in another part.

## Outline of subjects

### ***Course of Mathematical and Information Science***

<Advanced Mathematical and Information Science> (数理・情報サイエンス特論)

In this course, the faculty members will lecture advanced expertise and skills in mathematics, information science, information engineering, and data science in the omnibus style. The purpose of this course is to get in touch with the specialized knowledge of the peripheral fields of mathematical and information science. The goal of this course is to acquire the essential qualifications for your doctoral research.

### ***Course of Mechanical and Electrical Energy Engineering***

<Advanced Mechanical and Electrical Energy Engineering> (機械・電気エネルギー工学特論)

Advanced specialized knowledge and technology in the fields of mechanical engineering, electrical and electronic engineering related to industrial technologies ranging from energy creation to energy utilization, including energy conversion, transportation, and storage will be lectured in omnibus form.

### ***Course of Civil Engineering and Architectural Design***

<Advanced Lecture on Civil Engineering and Architectural Design> (社会基盤建築デザイン特論)

Conditions for a comfortable and safe living environment, and the highly specialized knowledge of the environment creation and global examples will be lectured in omnibus form.

### ***Course of Biological and Material Engineering***

<Advanced Biomaterial Systems> (生体物質システム学特論)

Based on materials science, materials engineering, electrical engineering, and mechanics, advanced and specialized knowledge and techniques of functional materials, such as bio-, optical, and electrical/magnetic-related materials and nanomaterials, or the interaction between organisms and systems will be lectured in omnibus form.

## Course registration and requirements for the degree

Doctor students are required to take 7 credits in total.

| Subject                                                                                                                                                                     | credit | Outline of subject                                                                                                                                                                                                                                                                                                                                     | Registration                                                                                                                                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Course Major Subjects<br>※Selective compulsory                                                                                                                              | 1      | Advanced lectures in the specific field given from one's course.                                                                                                                                                                                                                                                                                       | Students register online or submit registration form to the Academic Affairs Section for the Graduate School of Science and Engineering at the beginning of the semester.                                               |
| SIPOP Special Lecture<br>※Compulsory                                                                                                                                        | 1      | Topics given from 5 outside of his/her major fields                                                                                                                                                                                                                                                                                                    | Students register online or submit registration form to the Academic Affairs Section for the Graduate School of Science and Engineering at the beginning of the semester.                                               |
| <ul style="list-style-type: none"> <li>• SIPOP Special Lecture on Environmental Science</li> <li>• SIPOP Special Lecture on Energy Science</li> </ul> ※Selective compulsory | 1      | Special lectures about Environment or Energy.<br><b><u>Students choose a lecture outside of his/her major field.</u></b> Please see the notice of the attached sheet. (how to choose the lecture)<br>The class will be held in Dec.                                                                                                                    | Academic Affairs Section for the Graduate School of Science and Engineering informs the date and time of lecture.<br>Students register online.                                                                          |
| SIPOP Synthetic Seminar<br>※Compulsory                                                                                                                                      | 2      | Students are required to report their research and discuss with professors and other students.                                                                                                                                                                                                                                                         | Supervisor will inform the participants of the seminar to the Academic Affairs Section for the Graduate School of Science and Engineering. Students do not need to register.                                            |
| Project seminar<br>※Compulsory                                                                                                                                              | 2      | Students participate in lectures by overseas researchers, or participate in international partnership program to take lectures and to present own researches, or participate in "Specific project research team" to conduct researches with the different academic groups of Saga University and researchers and engineers outside of Saga University. | Academic Affairs Section for the Graduate School of Science and Engineering informs the date and time of lecture.<br>Students apply to the Academic Affairs Section for the Graduate School of Science and Engineering. |

## 履修方法及び修了要件について

博士後期課程を修了するためには、合計7単位を履修しなければならない。

| 科目                                                                                                     | 単位数 | 科目の概要                                                                                  | 登録方法                                        |
|--------------------------------------------------------------------------------------------------------|-----|----------------------------------------------------------------------------------------|---------------------------------------------|
| コース専門科目<br>(選択必修)                                                                                      | 1   | 所属コースから開講される高度の専門的内容を持つ科目。                                                             | 学期の始めにWEBで登録するか、履修届を理工学研究科教務担当に提出する。        |
| SIPOP 特別講義(必修)                                                                                         | 1   | 所属コース以外の5つの分野から開講されるトピックス                                                              | 学期の始めにWEBで登録するか、履修届を理工学研究科教務担当に提出する。        |
| <ul style="list-style-type: none"> <li>• SIPOP 環境科学特別講義</li> <li>• SIPOP エネルギー科学特別講義</li> </ul> (選択必修) | 1   | 環境科学又はエネルギー科学分野の諸問題を中心とする特別講義。学生 <b>の主な研究分野ではない方の講義を履修する。</b> 科目の選び方は別紙参照。<br>12月に実施予定 | 理工学研究科教務担当が日時を通知するので、WEBで登録すること。            |
| SIPOP 総合セミナー<br>(必修)                                                                                   | 2   | 受講生が本人の研究分野を中心に発表を行い、他の学生や教員と討議を行う。                                                    | 指導教員が受講者を理工学研究科教務担当に知らせるので、受講生は手続きをする必要はない。 |
| プロジェクトセミナー(必修)                                                                                         | 2   | 海外からの研究者による英語の講演聴講や、国際パートナーシップに参加し講演聴講しポスター発表を行う。または、理工学系研究科の教員が実施しているプロジェクト研究に参加する。   | 理工学研究科教務担当が日時を通知するので、理工学研究科教務担当に申し出ること。     |

Strategic International Postgraduate Program (SIPOP)

Please follow Classification below when you choose SIPOP Special Lecture on Environmental Science / SIPOP Special Lecture on Energy Science.

| Course                                                 | Supervisor's affiliation Major                                  | <b><u>Lecture outside of his/her major field</u></b>                                    |
|--------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Course of Mathematical and Information Science         | Mathematical Science<br>Information Science                     | SIPOP Special Lecture on Environmental<br>or<br>SIPOP Special Lecture on Energy Science |
| Course of Mechanical and Electrical Energy Engineering | Electrical and Electronic Engineering<br>Mechanical Engineering | SIPOP Special Lecture on Environmental Science                                          |
| Course of Civil Engineering and Architectural Design   | Civil Engineering and Architecture                              | SIPOP Special Lecture on Energy Science                                                 |
| Course of Biological and Material Engineering          | Physics                                                         | SIPOP Special Lecture on Environmental<br>or<br>SIPOP Special Lecture on Energy Science |
|                                                        | Chemistry and Applied Chemistry                                 | SIPOP Special Lecture on Energy Science                                                 |
|                                                        | Mechanical Engineering                                          | SIPOP Special Lecture on Environmental Science                                          |
|                                                        | Electrical and Electronic Engineering                           | SIPOP Special Lecture on Environmental Science                                          |

※Please consult with the Academic Affairs Section for the Graduate School of Science and Engineering if it is difficult to follow above classification due to unavoidable situation.

「SIPOP 環境科学特別講義」「SIPOP エネルギー科学特別講義」の選択方法は、学生の主指導教員が所属する部門により、次のように区分します。

| コース                  | 主指導教員が属する部門    | 学生の主な研究領域の分野ではない講義                        |
|----------------------|----------------|-------------------------------------------|
| 数理・情報サイエンスコース        | 数理<br>情報       | SIPOP 環境科学特別講義<br>又は<br>SIPOP エネルギー科学特別講義 |
| 機械・電気エネルギー工学コース      | 機械工学<br>電気電子工学 | SIPOP 環境科学特別講義                            |
| 社会基盤・建築デザインコース       | 都市工学           | SIPOP エネルギー科学特別講義                         |
| バイオ・マテリアルエンジニアリングコース | 物理学            | SIPOP 環境科学特別講義<br>又は<br>SIPOP エネルギー科学特別講義 |
|                      | 化学             | SIPOP エネルギー科学特別講義                         |
|                      | 機械工学           | SIPOP 環境科学特別講義                            |
|                      | 電気電子工学         | SIPOP 環境科学特別講義                            |

※やむを得ない事情により、指定された講義の履修が困難な場合は、理工学研究科教務担当にご相談ください。