

## 4. Academic and Research Procedures in Environmental Engineering for Symbiosis Major

### 4.1. Research Guided Schedule (Environmental Engineering for Symbiosis Major)

#### 4.1.1. Master's Program

In the first and second years, students take elective courses in the four fields of "Global Environmental Chemistry," "Biosphere Science," "Environmental Response Engineering," and "Sustainable Environmental Engineering" and elective common courses. In each semester, students also take required research guidance courses, "Advanced Seminar in Environmental Engineering for Symbiosis" and "Advanced Research in Environmental Engineering for Symbiosis," to deepen their research step by step under the guidance of their supervisors and to prepare their theses. The coursework and research procedures are explained at the orientation at the time of enrollment.

In the second semester, students submit a "research plan" and make a presentation, and receive guidance from faculty members other than their supervisors and have discussions among themselves to support their independent research activities. The thesis is reviewed by a primary supervisor and two secondary supervisors.

\*Schedule for students enrolled in September will slide for half a year.

First Year	Apr	<ul style="list-style-type: none"> <li>Receive course and research guidance during Orientation, discuss research guided plan with advisor.</li> <li>Course registration under supervision of advisor.</li> </ul>
	Apr – Jul	<ul style="list-style-type: none"> <li>Course registration for elective courses.</li> <li>Course registration for research guided courses (Advanced Seminar 1 and Advanced Research 2).</li> </ul>
	Sep	<ul style="list-style-type: none"> <li>Submit Research Plan with the permission by advisor. Presentation on current research progress and future actions. Receive advice from advisor and faculty members.</li> </ul>
	Sep	<ul style="list-style-type: none"> <li>Course registration under supervision of advisor.</li> </ul>
	Sep – Jan	<ul style="list-style-type: none"> <li>Course registration for elective courses.</li> <li>Course registration for research guided courses (Advanced Seminar 2 and Advanced Research 2).</li> </ul>
Second Year	Apr	<ul style="list-style-type: none"> <li>Course registration under supervision of advisor.</li> </ul>
	Apr – Jul	<ul style="list-style-type: none"> <li>Course registration for elective courses.</li> <li>Course registration for research guided courses (Advanced Seminar 3 and Advanced Research 3).</li> </ul>
	Jul	<ul style="list-style-type: none"> <li>Submit Interim Abstract with the permission by advisor.</li> <li>Interim presentation to report current research progress and future actions. Receive advice from advisor and faculty members.</li> </ul>
	Sep – Jan	<ul style="list-style-type: none"> <li>Course registration under supervision of advisor.</li> <li>Course registration for elective courses.</li> <li>Course registration for research guided courses (Advanced Seminar 4 and Advanced Research 4).</li> </ul>
	Dec	<ul style="list-style-type: none"> <li>Appoint the examiner committee for thesis evaluation.</li> <li>Meeting with examiners for questions and receive appropriate advice.</li> </ul>
	Jan	<ul style="list-style-type: none"> <li>Thesis submission.</li> <li>Conduct a thesis evaluation and final oral examination.</li> </ul>
	Mar	<ul style="list-style-type: none"> <li>Degree conferral.</li> </ul>

### 4.1.2. Doctoral Program

In each semester from the first to the third year, students take the required research guidance courses of "Advanced Seminar in Environmental Engineering for Symbiosis" and "Advanced Research in Environmental Engineering for Symbiosis" to deepen their research step by step under the guidance of their supervisors and to prepare their dissertation. The coursework and research procedures will be explained at the orientation at the time of enrollment. The main guidance until the completion of the dissertation will be provided by the supervisor. A preliminary review is conducted for the dissertation review, and the main supervisor and two or more associate supervisors will review the dissertation to determine whether it is acceptable to proceed to the full review or not. In addition, as part of the preliminary examination, a doctoral thesis presentation meeting will be held and guidance will be provided by faculty members other than the primary and secondary advisors. The final examination of the doctoral dissertation will be conducted by the primary supervisor and two secondary supervisors.

\*Schedule for students enrolled in September will slide for half a year.

First Year	Apr	<ul style="list-style-type: none"> <li>Receive course and research guidance during Orientation, discuss research guided plan with advisor.</li> <li>Course registration under supervision of advisor.</li> </ul>
	Apr - Jul	<ul style="list-style-type: none"> <li>Course registration for research guided courses (Advanced Seminar 5 and Advanced Research 5).</li> </ul>
	Sep	<ul style="list-style-type: none"> <li>Course registration under supervision of advisor.</li> </ul>
	Sep – Jan	<ul style="list-style-type: none"> <li>Course registration for research guided courses (Advanced Seminar 6 and Advanced Research 6).</li> </ul>
Second Year	Apr	<ul style="list-style-type: none"> <li>Course registration under supervision of advisor.</li> </ul>
	Apr - Jul	<ul style="list-style-type: none"> <li>Course registration for research guided courses (Advanced Seminar 7 and Advanced Research 7).</li> </ul>
	Sep	<ul style="list-style-type: none"> <li>Course registration under supervision of advisor.</li> </ul>
	Sep – Jan	<ul style="list-style-type: none"> <li>Course registration for research guided courses (Advanced Seminar 8 and Advanced Research 8).</li> </ul>
Third Year	Apr	<ul style="list-style-type: none"> <li>Course registration under supervision of advisor.</li> </ul>
	Apr – Jul	<ul style="list-style-type: none"> <li>Course registration for research guided courses (Advanced Seminar 9 and Advanced Research 9).</li> </ul>
	Sep	<ul style="list-style-type: none"> <li>Course registration under supervision of advisor.</li> <li>Submission for preliminary review of dissertation.</li> </ul>
	Sep – Jan	<ul style="list-style-type: none"> <li>Course registration for research guided courses (Advanced Seminar 10 and Advanced Research 10).</li> </ul>
	Oct – Nov	<ul style="list-style-type: none"> <li>Dissertation acceptance by the Graduate School Committee, evaluation by Preliminary review committee to decide on whether to proceed with a full review.</li> </ul>
	Jan	<ul style="list-style-type: none"> <li>Submission of a dissertation.</li> </ul>
	Jan – Feb	<ul style="list-style-type: none"> <li>Dissertation acceptance by the Graduate School Committee. The Review Committee conducts an evaluation and final examination for the dissertation.</li> </ul>
	Mar	<ul style="list-style-type: none"> <li>Degree conferral.</li> </ul>

## 4.2. Thesis Review Criteria (Environmental Engineering for Symbiosis Major)

### 4.2.1. Master's Thesis

A master's thesis is the result of a research that an applicant has worked on independently and must be original. The review will examine the following points:

- Whether the background and significance of the research are appropriately described using excerpts from related theses.
- Whether the purpose and research method are sufficiently explained
- Whether the data and the analysis of experimental results has been carried out logically and reasonably.
- Whether it include the research results that are considered sufficient to be presented in academic conferences.

The chief reviewer and two sub-reviewers will score achievement levels for the respective evaluation items based on the following table. The average score of all items given by the said reviewers are calculated, and then the base point of 50 is added. If the total score is 70 or more, the review result will be "pass."

#### ○ Evaluation Item 1

- Whether the purpose of the research is appropriately described.

Achievement level	Evaluation	Score
5	Highly clear and appropriately described.	50
4	Clear and appropriately described.	40
3	Appropriately described.	30
2	Mostly appropriately described.	20
1	The purpose of the research is unsound and many unclear parts.	10

#### ○ Evaluation Item 2

- Whether the research method is sufficiently explained.

Achievement level	Evaluation	Score
5	Highly accurate and appropriately explained.	50
4	Accurate and appropriately explained.	40
3	Appropriately explained.	30
2	Mostly appropriately described.	20
1	The explanation of the research method includes many insufficient or unclear parts.	10

#### ○ Evaluation Item 3

- Whether the experimental results are appropriately represented graphically, and the analysis has been carried out sufficiently and reasonably.

Achievement level	Evaluation	Score
5	The graphical representation of experimental results is highly appropriate, and the analysis has been carried out sufficiently and in a detailed manner.	50
4	The graphical representation of experimental results is appropriate, and the analysis has been carried out sufficiently.	40
3	The graphical representation of experimental results is almost appropriate, and the necessary analysis has been carried out.	30
2	The graphical representation of experimental results is almost appropriate, and the minimum required analysis has been carried out.	20
1	Some graphical representation of the experimental results is considerably inappropriate, and the analysis is insufficient.	10

#### ○ **Evaluation Item 4**

- Whether the discussions of obtained results have been developed sufficiently.

Achievement level	Evaluation	Score
5	Discussions have been developed sufficiently and are highly appropriate.	50
4	Discussions have been developed sufficiently and are appropriate.	40
3	Discussions have been developed and are appropriate.	30
2	The minimum required discussions have been provided.	20
1	A significant portion of the discussions is insufficient or inappropriate.	10

#### ○ **Evaluation Item 5**

- Whether the thesis is logically structured and the notations and wording are appropriate and clear.

Achievement level	Evaluation	Score
5	The structure of the thesis is highly logical, and the notations and wording are appropriate and clear.	50
4	The structure of the thesis is logical, and the notations and wording are appropriate and clear.	40
3	The structure of the thesis is logical, and the notations and wording are appropriate.	30
2	The structure of the thesis is mostly logical, and the notations and wording are almost appropriate.	20
1	The structure of the thesis is illogical, and a significant portion of notations and wording is unclear.	10

#### ○ **Evaluation Item 6**

- Whether the oral presentation for the thesis was given appropriately and the defense was sufficient.

Achievement level	Evaluation	Score
5	The oral presentation was highly appropriate, and the defense was excellent.	50
4	The oral presentation was appropriate, and the defense was sufficient.	40
3	The oral presentation was appropriate, and the defense was good.	30
2	The oral presentation was mostly appropriate, and the defense was mostly decent.	20
1	Many parts of the oral presentation were inappropriate, and the defense was insufficient.	10

### **4.2.2. Doctoral Dissertation**

A doctoral dissertation is the result of a research that an applicant has worked on independently and must be original. The review will examine the following points:

- Whether the background and significance of the research are appropriately described using excerpts from related theses.
- Whether the purpose and research method are sufficiently explained
- Whether the data and the analysis of experimental results has been carried out logically and reasonably.
- Whether it include the research results that are considered sufficient to be presented in domestic and overseas academic conferences.
- Whether it include the research results that has been published (or to be published) in high impact academic journals with a peer-review system.

The chief reviewer and two sub-reviewers will score achievement levels for the respective evaluation items based on the following table. The average score of all items given by the said reviewers are calculated, and then the base point of 50 is added. If the total score is 70 or more, the review result will be "pass."

**○ Evaluation Item 1**

- Whether the purpose of the research is appropriately described using excerpts from theses.

Achievement level	Evaluation	Score
5	The description of the purpose of the research using excerpts from theses is highly accurate and appropriate.	50
4	The description of the purpose of the research using excerpts from theses is accurate and appropriate.	40
3	The description of the purpose of the research using excerpts from theses is appropriate.	30
2	The description of the purpose of the research using excerpts from theses is mostly appropriate.	20
1	A significant portion of the purpose of the research using excerpts from theses is inappropriate.	10

**○ Evaluation Item 2**

- Whether the research method is specifically explained.

Achievement level	Evaluation	Score
5	The explanation of the research method is highly specific.	50
4	The explanation of the research method is specific.	40
3	The explanation of the research method is mostly specific.	30
2	The research method is explained specifically to a minimum extent.	20
1	The explanation of the research method includes many insufficient or unclear parts.	10

**○ Evaluation Item 3**

- Whether the experimental results are appropriately represented, and the analysis has been carried out sufficiently.

Achievement level	Evaluation	Score
5	The representation of experimental results is highly appropriate, and the analysis has been carried out in detail and sufficiently.	50
4	The representation of experimental results is appropriate, and the analysis has been carried out sufficiently.	40
3	The representation of experimental results is almost appropriate, and the analysis has been carried out almost sufficiently.	30
2	The representation of experimental results is almost appropriate, and the minimum required analysis has been carried out.	20
1	Many parts of the representation of the experimental results are inappropriate, and the analysis is largely insufficient.	10

**○ Evaluation Item 4**

- Whether the discussions of obtained results have been developed sufficiently

Achievement level	Evaluation	Score
5	Discussions have been developed sufficiently and are highly appropriate.	50
4	Discussions have been developed sufficiently and are appropriate.	40
3	Appropriate discussions have been provided.	30
2	Mostly appropriate discussions have been provided.	20
1	A significant portion of the discussions is inappropriate.	10

**○ Evaluation Item 5**

- Whether the thesis is logically structured and the notations and wording are appropriate and clear.

Achievement level	Evaluation	Score
5	The structure of the thesis is highly logical, and the notations and wording are highly appropriate and clear.	50
4	The structure of the thesis is logical, and the notations and wording are appropriate and clear.	40
3	The structure of the thesis is logical, and the notations and wording are almost appropriate and clear.	30
2	The structure of the thesis is mostly logical, and the notations and wording are almost appropriate.	20
1	The structure of the thesis is illogical, and a significant portion of notations and wording is inappropriate and unclear.	10

**○ Evaluation Item 6**

- Whether the novelty, importance, or impact (applicability) of the research is described

Achievement level	Evaluation	Score
5	The description of the novelty, importance, or impact of the research is highly appropriate.	50
4	The description of the novelty, importance, or impact of the research is appropriate.	40
3	The description of the novelty, importance, or impact of research is mostly appropriate.	30
2	The novelty, importance, or impact of research is described to a minimum extent.	20
1	The novelty, importance, or impact of research is rarely described.	10

**○ Evaluation Item 7**

- Whether the oral presentation for the thesis was given appropriately and the defense was sufficient

Achievement level	Evaluation	Score
5	The oral presentation was highly appropriate, and the defense was excellent.	50
4	The oral presentation was appropriate, and the defense was sufficient.	40
3	The oral presentation was appropriate, and the defense was good.	30
2	The oral presentation was mostly appropriate, and the defense was mostly decent.	20
1	Many parts of the oral presentation were inappropriate, and the defense was considerably insufficient.	10