SCOPE OF THE DISSERTATION
DOCTORAL PROGRAM IN ENVIRONMENTAL SCIENCE

Environmental science is an interdisciplinary academic field that integrates physical, biological, and information sciences (ecology, physics, chemistry, zoology, mineralogy, oceanology, limnology, soil science, geology, atmospheric science, geodesy, etc) to the study of the environment and the solution of environmental problems. Environmental studies incorporate more of the social sciences for understanding human relationships, perceptions, and policies toward the environment. Environmental engineering focuses on design and technology for improving environmental quality. The study can be categorized as environmental management which includes the internalization of the carrying capacity of the environment in spatial planning. Research related to environmental science is based on these two aspects. The environmental dimension or content of the research topic should be oriented towards an approach to a multidisciplinary perspective.

In the realm of dissertation research which is the highest level in level of scientific research, the work required is the creation of concepts and theories as a novelty. The research conducted is expected to produce a new model, both in terms of substance and procedure being developed. The urgency of the problem in dissertation research must come from an environmental perspective. Because it requires mastery of research methodology in the field of environment. To guarantee mastery of the theory that supports the dissertation, supporting courses that are relevant to the research topic are needed. The existence of the Philosophy of Science and Research Methodology course is the main support for students in mastering research methodology in a comprehensive manner. Ecology and Global Environmental Change course can provide additional insight to students regarding the search for solutions to the impact of global environmental problems, pressure on ecosystems, and the solutions including changes in quality and composition on a global scale with an energy and technology approach. The System Analysis and Environmental Modeling course emphasizes case studies with an analysis of environmental fields using software-based mathematical, statistical, and engineering models.

Mastery of theory from the application studied in dissertation research also needs to be supported by other courses that are relevant to student research topics. Therefore, other courses are also provided to support the dissertation. The results of student dissertation research must be disseminated in the form of scientific publications, both in peer-reviewed international journals and reputable international conferences. Therefore, students' ability to compile scientific work in the form of articles or manuscripts needs to be supported through the Scientific Article Writing course. Through this course, the process of preparing scientific publications which is one of the mandatory requirements/outputs of the dissertation is expected to run more smoothly.

The stages of carrying out dissertation research have been detailed in Research courses which also serve as a form of monitoring and controlling the progress of the student's dissertation. The entire process has been designed to guarantee the completion of a dissertation that meets quality standards, both in terms of the scientific aspects of

environmental science and the timeframe for completion of the dissertation and its publications.

After completing writing the dissertation, students are expected to be able to:

1). Have the ability to develop science and technology concepts through research in the environmental field.
2). Have the ability to manage, lead and develop research programs in the environmental field.
3). Have the ability of an interdisciplinary approach including abiotic, biotic, and culture.

The abilities possessed by students after completing the dissertation are in line with the learning outcomes of the Doctor of Environmental Sciences Program.

To describe the linkages between stages of education, the educational program stages in the Doctor of Environmental Sciences can be seen in Figure 1.

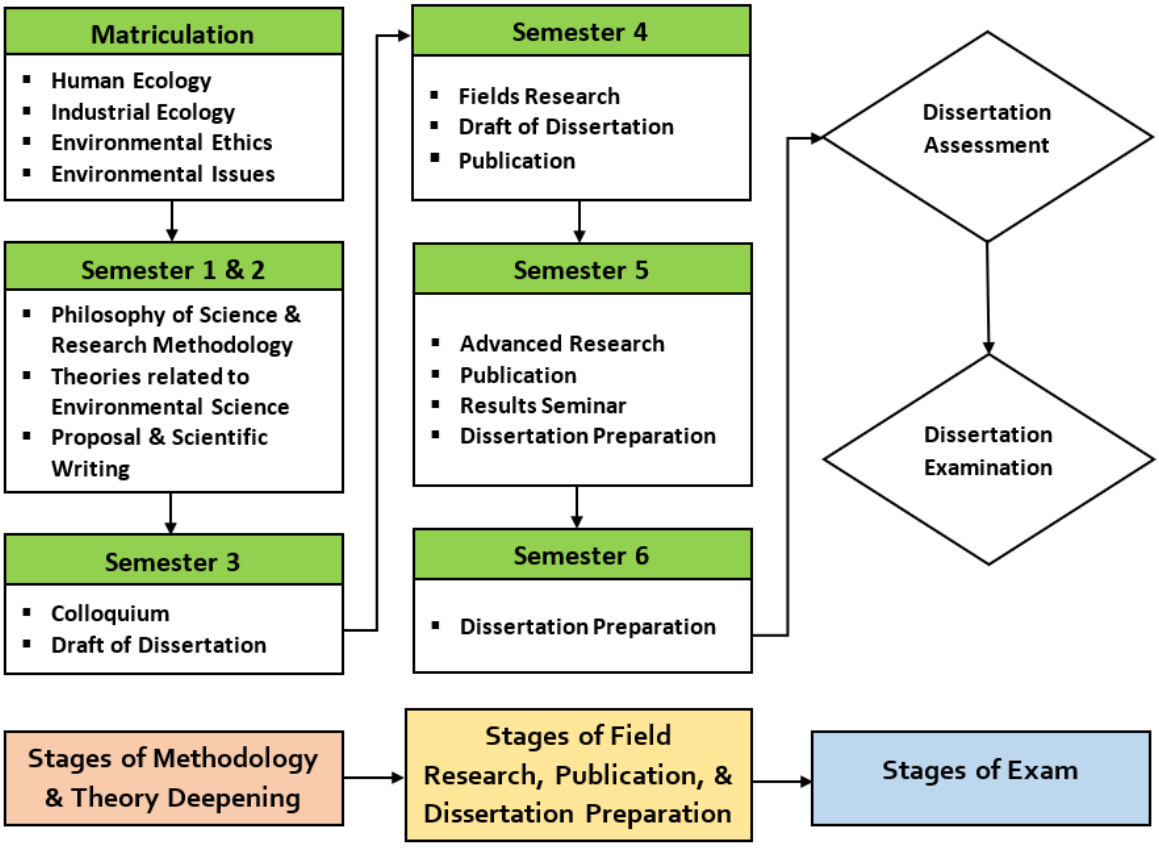

Figure 1 Educational Program Stages in the Doctor of Environmental Sciences