DOCTOR OF PHILOSOPHY IN ENVIRONMENTAL SCIENCE (PhD in ES)

The program consists of two major components: (A) Coursework and (B) Research. The Coursework proper consists of 10 units of required courses and 15 units of electives, to be decided on by the adviser based on the training needed by the student. For the Research component, students will be awarded 12 units of dissertation upon completion of two Dissertation Writing and three dissertation Research courses.

CURRICULUM DESIGN

A. COURSEWORK PROPER (25 units)

Required Courses (10 units)

1. ENVI 311.01 Advanced Techniques in Environmental Science Research (4 units)
2. ENVI 311.02 Advanced Techniques in Environmental Science Research: Instrumentation (2 units)
3. ENVI 340 Contemporary Challenges in Environmental Science and Management (3 units)
4. ENVI 390 Graduate Seminar (1 unit)

Electives (15 units)

There are 2 categories of electives: ENVI Electives, to be taken within the ES Department; and Free Electives, to be taken among the PhD courses offered by any department within LS, with the consent of the adviser and Chair.

Available courses for the ENVI Electives are:

- ENVI 312. Principles of Tropical Ecology
- ENVI 312.03 Coastal and Marine Ecology
- ENVI 312.04 Systems Ecology
- ENVI 312.05 Climate, Ecosystems and Sustainability
- ENVI 313. Chemistry of the Environment
- ENVI 314. Resource Geology
- ENVI 315. Physics of the Earth System
- ENVI 320 Urban Ecology
- ENVI 321 Industrial Ecology and Sustainability
- ENVI 323. Environmental Standards and Technologies
- ENVI 324. Green Technologies
- ENVI 325. GIS and Remote Sensing for Environmental Applications
- ENVI 330. Computational Methods in Environmental Science
- ENVI 331. Modeling Human-Environment System Dynamics
- ENVI 341. Principles of Environmental Remediation
- ENVI 342. Environmental Toxicology
- ENVI 343. Environmental Soil Science
• ENVI 344. Environmental Hydrology
• ENVI 345. Fate and Transport of Pollutants
• ENVI 346. Environmental Conservation and Biodiversity
• ENVI 357. Hazard Assessment
• ENVI 365. Advanced Environmental Health and Safety
• ENVI 371. Environmental Communication
• ENVI 376. Environmental Impact Assessment
• ENVI 378. Natural Resource Management
• ENVI 379. Environmental Risk Assessment and Management
• ENVI 380. Special Topics

More electives may be made available in the future.

Available courses for the Free Electives (aside from electives offered by the ES department) include, but are not limited to:

Biology
• BIO 311.01 Special Topics in Entomology (2 units) + BIO 311.02 Special Topics in Entomology (1 unit)
• BIO 352 Special Topics in Conservation Biology (3 units)
• BIO 371 Sociobiology (3 units)
• BIO 372 Diversity of Form and Function of Organisms (3 units)

Sociology and Anthropology
• SOCIO 390 Seminar on Issues in Sociological Theory (3 units)
• SOCIO 392.2 Seminar on Advanced Research Methods (3 units)
• SOCIO 392.4 Proseminar on Methodology (3 units)
• SOCIO 390.13 Seminar on Anthropological Analysis (3 units)

Economics
• ECON 385.60 Environmental Policy (no prerequisite) (3 units)
• ECON 385.58 Special Topics in Economics: Economic Demography/Economics of Population (no prerequisite) (3 units)
• ECON 259/359 Economics of Natural Resources and Environment (but with pre-req ECON 271: Applied Economics for Managers) (3 units)

Philosophy
• PHILO 344 Philosophy of Ecology (3 units)
• PHILO 355 Philosophy of Science (3 units)
• PHILO 357 Philosophy of Nature (3 units)
• English
• ENLL 320: Graduate Seminar: Narratives of Nationalism (3 units)
• ENLL 323: Graduate Seminar: Social Thought and Philippine Literature (3 units)

B. RESEARCH PROPER (12 units)

The research courses are divided into three stages taken between Dissertation Writing I, when the student defends a proposal, and Dissertation Writing II, when the student defends a final dissertation. These non-graded courses are to ensure the development and implementation of the student’s proposed research, as approved by his/her dissertation panelists. Students need to satisfy all requirements for Dissertation Research before advancing to Dissertation Writing II. Exceptional students, under advisement of the department, may be allowed to
forego certain dissertation research classes. Dissertation writing fees and lab fees apply to these research courses.

1. ENVI399.11 Dissertation Research I (0 units)
2. ENVI399.12 Dissertation Research II (0 units)
3. ENVI399.13 Dissertation Research III (0 units)

Dissertation (12 units)
1. ENVI399.1 Dissertation Writing I (6 units)
2. ENVI399.2 Dissertation Writing II (6 units)
3. ENVI399.3 ES Publications and Conferences (0 units)
4. ENVI399.4 Oral Defense (0 units)

POLICIES

DELIVERY OF COURSES

The 3-unit graduate courses in the Ateneo de Manila University are generally delivered once a week (i.e. three hours per week) for 18 weeks (for a regular semester). Classes may be scheduled in the evenings or on Saturdays to accommodate working students, but this is subject to the availability of the instructors and facilities. It is also expected that PhD students intend to pursue a career in the academe and research and hence, should involve themselves in department activities.

COMPREHENSIVE EXAM

The Comprehensive Exam is taken after the Coursework proper of the PhD program, which consists of the required courses and the free electives. Upon successful completion of the Coursework proper and upon the endorsement of the adviser/s, the student may apply to take the comprehensive exam. The student must pass the comprehensive exam before s/he may proceed to enrolling in the Research stage. The purpose of the exam is to assess the students’ knowledge and understanding of the specific areas in environmental science.

To conduct the exam, the adviser, in consultation with the Chair and in compliance with the guidelines set forth in the Graduate Handbook for selection of panelists, convenes an examination committee. The committee is composed of a committee chair/moderator and three exam panelists (these may or may not be the same panelists as those evaluating the dissertation proposal and final dissertation). While the adviser recommends the panelists, the final approval is made by the Chair.

The comprehensive exam will be conducted as an oral exam consisting of 5 questions: one question based on ENVI 340 Contemporary Challenges in Environmental Science and Management; one question based on ENVI 311.01/311.02 Advanced Techniques in Environmental Science Research; 3 questions based on electives selected by the student in consultation with the Adviser and with the approval of the panel and Chair. The panelists will be responsible for developing/selecting the questions to be posed to the student and grading the answers. In cases when the panelists were not the faculty in charge of the coursework taken by the students, the instructors of those courses will be consulted to develop appropriate questions prior to the exam.

Each question will carry a weight of 20% such that the total score of all the 5 questions must reach a passing grade in order for the student to successfully complete the comprehensive exam. The
The English language will be used as the primary medium of instruction for the PhD in ES program. Students are therefore expected to be proficient in both spoken and written English.

OTHER REQUIREMENTS FOR GRADUATION

Prior to graduation, in alignment with the guidelines published by CHED, the student is expected to have at least one article accepted for publication in a peer-reviewed venue, and one article submitted for publication to a peer-reviewed journal. The adviser will supervise the student in the selection of appropriate publication venues.

The student is also expected to have presented or have an abstract accepted in at least one conference, national or international, and in either oral or poster format. In addition, recognizing the importance of communicating science to the larger public, the student must deliver a presentation in a public forum, or submit evidence of adoption of the dissertation results into policy by a national or local government agency, or industry, or other relevant stakeholder (e.g., NGO, community, etc.).

Lastly, the student must comply with the submission requirements of the OADGP for graduation as well as requirements of the department (soft copy of dissertation, soft copy of journal manuscripts, poster, presentations, and any data from the research project).
### Table 1. Program of Study for a Fulltime Student

<table>
<thead>
<tr>
<th>Year 1: First Semester</th>
<th>Year 1: Second Semester</th>
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<tbody>
<tr>
<td>ENVI 340. Contemporary Challenges in Environmental Science and Management</td>
<td>ENVI 311.01 Advanced Techniques in Environmental Science Research</td>
</tr>
<tr>
<td>ENVI Elective</td>
<td>ENVI 311.02 Advanced Techniques in ES Research: Instrumentation</td>
</tr>
<tr>
<td>ENVI Elective</td>
<td>ENVI 390. Graduate Seminar</td>
</tr>
<tr>
<td>ENVI Elective</td>
<td>Free Elective</td>
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#### Intersession: ENVI 396.0 Comprehensive Exam

<table>
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<th>Year 2: First Semester</th>
<th>Year 2: Second Semester</th>
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<tr>
<td>ENVI 399.1 Dissertation Writing I</td>
<td>ENVI 399.11 Dissertation Research I</td>
</tr>
<tr>
<td>Total: 6 units</td>
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#### Intersession: ENVI 399.12 Dissertation Research II (0 units)

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<thead>
<tr>
<th>Year 3: First Semester</th>
<th>Year 3: Second Semester</th>
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</thead>
<tbody>
<tr>
<td>ENVI 399.13 Dissertation Research III</td>
<td>ENVI 399.2 Dissertation Writing II</td>
</tr>
<tr>
<td>ENVI 399.3 ES Publications and Conferences</td>
<td>ENVI 399.4 Oral Defense</td>
</tr>
<tr>
<td>Total: 0 units</td>
<td>Total: 6 units</td>
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