# Environmental Science

# By Course Path


MASTER PROGRAM OF ENVIRONMENTAL SCIENCE
SCHOOL OF POSTGRADUATE STUDIES
DIPONEGORO UNIVERSITY

# List of contents

# 1 Title, affiliation and language

Curriculum guide applicable to all Master of Environment (MES) Programs

## 1.1 Title

Master Program in Environmental Science leading to Master in Environment (MES)

## 1.2 Affiliate

This program is affiliated with PEPSILI (Association of All Indonesian Environmental Science Study Programs)

## 1.3 Language

The languages in the learning process of the Environmental Science Masters Program are Indonesian and English.

# 2 Academic Profile

## 2.1 Objective

The educational objective of the Environmental Science Masters Program is to produce graduates who have the following abilities:

1. Able to demonstrate knowledge of environmental science to the public;
2. Able to conduct research for the development of environmental science;
3. Able to formulate environmental management policies;
4. Able to be professional in applying knowledge and methods of controlling environmental damage, both in work and in business development.

## 2.2 General program profile

The Environmental Science Masters Program has four areas of concentration, namely:

1. ENVIRONMENTAL PLANNING

Produce graduates who are able to analyze environmental conditions, propose alternative environmental policies and conduct environmental implementation studies and evaluations

2. ENVIRONMENTAL ENGINEERING

Produce graduates who are able to solve environmental problems with a technical engineering approach

3. ENVIRONMENTAL MANAGEMENT

Produce graduates who are able to solve problems of environmental pollution/damage with a management approach

4. DISASTER MANAGEMENT

Produce graduates who are able to analyze Disaster Mitigation and adaptation.

## 2.3 General structure of the program

The Environmental Master Program by Course is set at 41 credits or the equivalent of 116 ECTS (European Credit Transfer and Accumulation System).

The MES program in Environmental Science consists of the following elements:

- Specialization: 41 credits or equivalent to 116 ECTS, including thesis

Students can choose one of the following specializations:

- Environmental Planning
- Environmental Engineering
- Environmental Management
- Disaster Management

### 2.4 Career opportunities

The MES program in Environmental Science qualifies students to become professionals in business, management and research functions and/or fields such as:

- Research function in academic institutions
- Research and communications in industry working with developing more environmentally friendly products, better waste management, and more sustainable production processes
- National and international advisory, consulting and project management in environmental science, with a solid foundation in environmental pollution, effects and impacts, and solutions for environmental, ecosystem and human health protection.
- The clean technology industry and related sectors develop new solutions and methodologies for clean technologies and remediation technologies to clean air, soil and water.
- Government officials
- Policy development, implementation and administration related to nature, environment and related technologies in the public sector (ministries and municipalities) and in private stakeholder organizations, including NGOs.

## 3 Competency Profile Description

Students pursuing the MES Program acquire the competencies listed below. Students will also gain other qualifications through elective subject elements and other study activities.

### 3.1 General Competency Profile

Graduates holding an MES degree in Environmental Science have acquired the following competencies regardless of the chosen specialization:

1. Able to formulate environmental management theory;
2. Able to formulate and carry out scientific research to solve environmental problems;
3. Able to formulate environmental management policies;
4. Able to formulate rules, methods and thoughts on environmental management to improve the quality of life, and save them in the form of theses, national and international journals or in the form of reputable seminar proceedings.

| No | Description | Scope | | |
|---|---|---|---|---|
| | | Attitude | Knowledge | Skills |
| 1 | Able to formulate environmental management theory | √ | √ | √ |
| 2 | Able to formulate and carry out scientific research to completeenvironmental problems | √ | √ | √ |
| 3 | Able to formulate environmental management policies | √ | √ | √ |
| 4 | Able to formulate rules, methods andthoughts on environmental management to improve the quality of life, and save them in the form of theses, national and international journals or in the form of proceedings of reputable seminars | √ | √ | √ |

### 3.2 Spesific Competensi Profile with Spesialization in Environmental Planning

Spesific competency profile, graduates holding an MES degree in Environmental Science with a specialization in Environmental Planning is: Able to analyze environmental conditions, propose alternative environmental policies and carry out implementation studies and environmental evaluations

| No | Description | Scope | | |
|---|---|---|---|---|
| | | Attitude | Knowledge | Skill |
| 3.2 | Able to analyze environmental conditions, propose alternative environmental policies and carry out implementation studies and environmental evaluations | √ | √ | √ |

### 3.3 Spesific Competensi Profile with Spesialization in Environmental Engineering

Spesific competency profile, graduates holding an MES degree in Environmental Science with a specialization in enviromenta Engineering is : Able to solve environmental problems with a technical engineering approach

| No | Description | Scope | | |
|---|---|---|---|---|
| | | Attitude | Knowledge | Skill |
| 3.3 | Able to solve environmental problems with a technical engineering approach | √ | √ | √ |

### 3.4 Spesific Competensi Profile with Spesialization in Environmental Management

Spesific competency profile, graduates holding an MES degree in Environmental Science with a specialization in Environmental Management is: able to conduct quick studies to solve problems of pollution/environmental damage as a result of disaster events with management approaches.

| No | Description | Scope | | |
|---|---|---|---|---|
| | | Attitude | Knowledge | Skill |
| 3.4 | Able to solve problems of pollution/environmental damage with a management approach.. | √ | √ | √ |

### 3.5 Spesific Competensi Profile with Spesialization in Disaster Management

Spesific competency profile, graduates holding an MES degree in Environmental Science with a specialization in disaster management is able to conduct quick studies to solve problems of pollution/environmental damage as a result of disaster events with management and/or technical approaches

| No | Description | Scope | | |
|---|---|---|---|---|
| | | Attitude | Knowledge | Skill |
| 3.5 | Able to solve problems of pollution/environmental damage as a result of disaster events with management and/or technical approaches | √ | √ | √ |

## 4. General Terms of Entry Terms

The general requirements for applicants for Master of Environmental Sciences are as follows:

1. Bachelor Degree Graduates and Diploma IV
2. Minimum GPA of 2.75 from an accredited university (except Master of Notary and Linguistics which requires a 3.0 GPA)
3. Diplomas and transcripts
4. Academic recommendation from 2 people (may be supervisor S1, D4/direct supervisor with minimum qualification of S2) (Filling out online)
5. Statement of ability to complete the study (format has been provided)
6. Certificate of guarantee for payment of study fees (stamped 10000) (format has been provided)
7. Permission letter from work agency (for those who are already working) (format has been provided)
8. Projection/Overview of the Thesis research to be taken (if any)

### 4.1 Provisions of Special Terms

Applicants for the Master of Environmental Science program by course are graduates from various fields of science / have worked in fields related to the environment

## 5. Program structure

Determination of the elements of compulsory subjects, elements of elective courses, elements of free-choice courses and theses are the main parts of the Master of Environmental Science program in accordance with the Decree of the Chancellor of Diponegoro University Number: 2426/UN7.P/HK/2020 concerning Determination of Curriculum for the Masters Program at Diponegoro University 2020

### 5.1 Environmental Planning

The specialization is set at 41 credits or 116 ECTS and consists of the following:

- Elements of compulsory subjects, 31 credits or 78 ECTS.
- Elements of elective subjects, 4 credits or 8 ECTS.
- Thesis, 6 credits or 30 ECTS

The elements of compulsory subjects consist of the following:

| **Code** | **Courses (Mandatory)** | **CREDIT POINS** | **ECTS** |
|---|---|---|---|
| | **Semester I** | | |
| P-CIL-8-101 | Philosophy of Science and Research Methodology | 3 | 6 |
| P-CIL-8-102 | Environmental and Natural Resources Economics | 3 | 6 |
| P-CIL-8-103 | Environmental Statistics | 2 | 4 |
| P-CIL-8-104 | Ecology and Environmental Pollution | 3 | 6 |
| P-CIL-8-105 | Computer Applications and Environmental Modeling | 3 | 6 |
| | TOTAL CREDITS OF SEMESTER I | 14 | 28 |
| **Code** | **Courses (Mandatory)** | **CREDIT POINS** | **ECTS** |
| | **Semester II** | | |
| P-CIL-8-201 | Environmental Law and Policy | 2 | 4 |
| P-CIL-8-202 | Environmental Impact Analysis | 3 | 6 |
| P-CIL-8-204 | Environmental Planning Theories | 3 | 6 |
| P-CIL-8-207 | Spatial Planning and Environment | 2 | 4 |
| | Elective Course I* | 2 | 4 |
| | Elective Course II* | 2 | 4 |
| | TOTAL CREDITS OF SEMESTER II | 14 | 28 |
| **Code** | **Courses (Mandatory)** | **CREDIT POINS** | **ECTS** |
| | **Semester III** | | |
| P-CIL-8-301 | Capita Selecta | 2 | 4 |
| P-CIL-8-302 | Field Work | 1 | 2 |
| P-CIL-8-303 | Thesis Proposal | 2 | 12 |

| | | | |
|---|---|---|---|
| P-CIL-8-304 | Seminar and Scientific Publication | 2 | 12 |
| | TOTAL CREDITS OF SEMESTER III | 7 | 30 |
| | **Courses (Mandatory)** | **CREDIT POINS** | **ECTS** |
| **Code** | **Semester IV** | | |
| P-CIL-8-401 | Thesis | 6 | 30 |
| | TOTAL CREDITS OF SEMESTER IV | 6 | 30 |
| | **TOTAL** | **41** | **116** |

## 5.2 Environmental Engineering

The specialization is set at 41 credits or 116 ECTS and consists of the following:

- Elements of compulsory subjects, 31 credits or 78 ECTS.
- Elements of elective subjects, 4 credits or 8 ECTS.
- Thesis, 6 credits or 30 ECTS

The elements of compulsory subjects consist of the following:

| **Code** | **Courses (Mandatory)** | **credits** | **ECTS** |
|---|---|---|---|
| | **Semester I** | | |
| P-CIL-8-101 | Philosophy of Science and Research Methodology | 3 | 6 |
| P-CIL-8-102 | Environmental and Natural Resources Economics | 3 | 6 |
| P-CIL-8-103 | Environmental Statistics | 2 | 4 |
| P-CIL-8-104 | Ecology and Environmental Pollution | 3 | 6 |
| P-CIL-8-105 | Computer Applications and Environmental Modeling | 3 | 6 |
| | TOTAL CREDITS OF SEMESTER I | 14 | 28 |
| **Code** | **Courses (Mandatory)** | **credits** | **ECTS** |
| | **Semester II** | | |
| P-CIL-8-201 | Environmental Law and Policy | 2 | 4 |
| P-CIL-8-202 | Environmental Impact Analysis | 3 | 6 |
| P-CIL-8-205 | Natural Resources and Environment Conservation | 3 | 6 |
| P-CIL-8-208 | Environmental System Analysis | 2 | 4 |
| | Elective Course I* | 2 | 4 |
| | Elective Course II* | 2 | 4 |
| | NUMBER OF SEMESTER II CREDITS | 14 | 28 |
| **Code** | **Courses (Mandatory)** | **credits** | **ECTS** |
| | **Semester III** | | |
| P-CIL-8-301 | Capita Selecta | 2 | 4 |
| P-CIL-8-302 | Field Work | 1 | 2 |
| P-CIL-8-303 | Thesis Proposal | 2 | 12 |
| P-CIL-8-304 | Seminar and Scientific Publication | 2 | 12 |
| | NUMBER OF SEMESTER III CREDITS | 7 | 30 |
| | **Courses (Mandatory)** | **credits** | **ECTS** |
| **Code** | **Semester IV** | | |
| P-CIL-8-401 | Thesis | 6 | 30 |
| | TOTAL CREDITS SEMESTER IV | 6 | 30 |
| | **TOTAL** | **41** | **116** |

## 5.3 Environmental Management

The specialization is set at 41 credits or 116 ECTS and consists of the following:

- Elements of compulsory subjects, 31 credits or 78 ECTS.
- Elements of elective subjects, 4 credits or 8 ECTS.
- Thesis, 6 credits or 30 ECTS

The elements of compulsory subjects consist of the following:

| Code | Courses (Mandatory)<br>Semester I | credits | ECTS |
|---|---|---|---|
| P-CIL-8-101 | Philosophy of Science and Research Methodology | 3 | 6 |
| P-CIL-8-102 | Environmental and Natural Resources Economics | 3 | 6 |
| P-CIL-8-103 | Environmental Statistics | 2 | 4 |
| P-CIL-8-104 | Ecology and Environmental Pollution | 3 | 6 |
| P-CIL-8-105 | Computer Applications and Environmental Modeling | 3 | 6 |
| | TOTAL CREDITS OF SEMESTER I | 1 | 2 |
| **Code** | **Courses (Mandatory)**<br>**Semester II** | **credits** | **ECTS** |
| P-CIL-8-201 | Environmental Law and Policy | 2 | 4 |
| P-CIL-8-202 | Environmental Impact Analysis | 3 | 6 |
| P-CIL-8-205 | Natural Resources and Environment Conservation | 3 | 6 |
| P-CIL-8-209 | Environmental Pollution Control | 2 | 4 |
| | Elective Course I* | 2 | 4 |
| | Elective Course II* | 2 | 4 |
| | NUMBER OF SEMESTER II CREDITS | 1 | 2 |
| **Code** | **Courses (Mandatory)**<br>**Semester III** | **credits** | **ECTS** |
| P-CIL-8-301 | Capita Selecta | 2 | 4 |
| P-CIL-8-302 | Field Work | 1 | 2 |
| P-CIL-8-303 | Thesis Proposal | 2 | 1 |
| P-CIL-8-304 | Seminar and Scientific Publication | 2 | 1 |
| | NUMBER OF SEMESTER III CREDITS | 7 | 3 |
| **Code** | **Courses (Mandatory)**<br>**Semester IV** | **credits** | **ECTS** |
| P-CIL-8-401 | Thesis | 6 | 3 |
| | TOTAL CREDITS SEMESTER IV | 6 | 3 |
| | **TOTAL** | **41** | **116** |

## 5.4 Disaster Management

The specialization is set at 41 credits or 116 ECTS and consists of the following:

- Elements of compulsory subjects, 31 credits or 78 ECTS.
- Elements of elective subjects, 4 credits or 8 ECTS.
- Thesis, 6 credits or 30 ECTS

The elements of compulsory subjects consist of the following:

| Code | Courses (Mandatory)<br>Semester I | credits | ECTS |
|---|---|---|---|
| P-CIL-8-101 | Philosophy of Science and Research Methodology | 3 | 6 |
| P-CIL-8-102 | Environmental and Natural Resources Economics | 3 | 6 |
| P-CIL-8-103 | Environmental Statistics | 2 | 4 |
| P-CIL-8-104 | Ecology and Environmental Pollution | 3 | 6 |
| P-CIL-8-105 | Computer Applications and Environmental Modeling | 3 | 6 |
| | TOTAL CREDITS OF SEMESTER I | 14 | 28 |
| **Code** | **Courses (Mandatory)**<br>**Semester II** | **credits** | **ECTS** |
| P-CIL-8-201 | Environmental Law and Policy | 2 | 4 |
| P-CIL-8-202 | Environmental Impact Analysis | 3 | 6 |
| P-CIL-8-203 | Environmental and Disaster Risk | 2 | 4 |
| P-CIL-8-206 | Disaster Mitigation and Adaptation | 3 | 6 |
| | Elective Course I* | 2 | 4 |
| | Elective Course II* | 2 | 4 |
| | NUMBER OF SEMESTER II CREDITS | 14 | 28 |
| **Code** | **Courses (Mandatory)**<br>**Semester III** | **credits** | **ECTS** |
| P-CIL-8-301 | Capita Selecta | 2 | 4 |
| P-CIL-8-302 | Field Work | 1 | 2 |
| P-CIL-8-303 | Thesis Proposal | 2 | 12 |
| P-CIL-8-304 | Seminar and Scientific Publication | 2 | 12 |
| | NUMBER OF SEMESTER III CREDITS | 7 | 30 |
| **Code** | **Courses (Mandatory)**<br>**Semester IV** | **credits** | **ECTS** |
| P-CIL-8-401 | Thesis | 6 | 30 |
| | TOTAL CREDITS SEMESTER IV | 6 | 30 |
| | **TOTAL** | **41** | **116** |

*List of Elective Subjects for Master of Environmental Sciences

| Code | Elective Courses (I) | Credits Points | ECTS |
|---|---|---|---|
| P-CIL-8-212 | Solid and Hazardous Waste Management | 2 | 4 |
| P-CIL-8-214 | Environmental Geografic Information System (GIS) | 2 | 4 |
| P-CIL-8-215 | Hydroclimatology | 2 | 4 |
| P-CIL-8-216 | Environmental Communication and Anthropology | 2 | 4 |
| P-CIL-8-220 | Coastal Zone Management | 2 | 4 |
| P-CIL-8-320 | Mass Transfer and Transformation | 2 | 4 |
| P-CIL-8-326 | Regional Development and Environmental Management | 2 | 4 |