



**INTERDISCIPLINARY GRADUATE SCHOOL OF EARTH SYSTEM SCIENCE
AND ANDAMAN NATURAL DISASTER MANAGEMENT**

PRINCE OF SONGKLA UNIVERSITY, PHUKET, THAILAND

www.essand.psu.ac.th



Master of Science Program in Earth System Science

<p>Curricular Title</p> <p>Master of Science Program in Earth System Science</p> <p>Degree Title</p> <p>Master of Science (Earth System Science)</p> <p>Abbreviation</p> <p>M.Sc. (Earth System Science)</p> <p>Curricular Philosophy and Goals</p> <p>The Master of Science Program in Earth System Science aims to produce graduates, who are fully equipped with high-level knowledge and research skills in the field of Earth System Science, and can create new knowledge and integrate interdisciplinary knowledge for preventing and solving natural disaster problems and managing natural resources and environment.</p> <p>Global change has occurred rapidly. Natural resources and environment have been degraded quickly. Natural disasters become more intense and occur more often globally leading to invaluable economic, environmental, and social losses. Environmental and natural disaster problems are major causes that threaten global development in many aspects. Understanding these issues requires the integration of knowledge across many disciplines. Developing new knowledge and technologies that will help solve these problems are the goals of this curriculum.</p> <p>Admission Requirements</p> <p>1) Plan A-1</p> <p>⇒ The applicant must hold</p> <ul style="list-style-type: none"> ▪ A bachelor's degree within the 1st quartile or ▪ Must have an experience in publications and/or a good quality of senior project. ▪ The applicant must submit a TOEFL or an IELTS or official English test scores. ▪ Other applicants may be admitted on conditions that they receive approval from the program committee. <p>⇒ The applicant must submit a TOEFL or an IELTS or official English test scores.</p>	<p>2) Plan A-2-1</p> <p>⇒ The applicant must hold</p> <ul style="list-style-type: none"> ▪ A bachelor's degree within top 50 percent ▪ A graduate diploma with cumulative GPA not less than 3.50 or ▪ A graduate certificate with cumulative GPA not less than 3.75 or ▪ After entering the program, the GPA in the first semester must not be less than 3.25. Otherwise, the student has to switch to Plan A-2-2 degree program ▪ The applicant must submit a TOEFL or an IELTS or official English test scores. ▪ Other applicants may be admitted on conditions that they receive approval from the program committee. <p>⇒ The applicant must submit a TOEFL or an IELTS or official English test scores.</p> <p>3) Plan A-2-2</p> <p>⇒ The applicant must hold</p> <ul style="list-style-type: none"> ▪ A bachelor's degree within three upper quartiles ▪ A graduate diploma with cumulative GPA not less than 3.25 or ▪ A graduate certificate with cumulative GPA not less than 3.50 or ▪ Other applicants may be admitted on conditions that they receive approval from the program committee. <p>⇒ The applicant must submit a TOEFL or an IELTS or official English test scores.</p> <p>Curriculum Structure</p> <p>1) Plan A-1</p> <p>Total credits: 36</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 80%;">▪ Course Works (2 courses)</td> <td style="width: 20%;">S/U credits</td> </tr> <tr> <td>▪ Pre-Research Course (2 courses)</td> <td>S/U credits</td> </tr> <tr> <td>▪ Thesis</td> <td>36 credits</td> </tr> </table> <p>2) Plan A-2-1</p> <p>Total credits: 36</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 80%;">▪ Course Works (4 courses)</td> <td style="width: 20%;">12 credits</td> </tr> <tr> <td>▪ Course Works (1 courses)</td> <td>S/U credits</td> </tr> <tr> <td>▪ Thesis</td> <td>24 credits</td> </tr> </table>	▪ Course Works (2 courses)	S/U credits	▪ Pre-Research Course (2 courses)	S/U credits	▪ Thesis	36 credits	▪ Course Works (4 courses)	12 credits	▪ Course Works (1 courses)	S/U credits	▪ Thesis	24 credits
▪ Course Works (2 courses)	S/U credits												
▪ Pre-Research Course (2 courses)	S/U credits												
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Plan A-2-2

Total credits: 36

- Core Courses (5 courses) 15 credits
- Elective Course (1 courses) 3 credits
- Special Studies (1 courses) S/U credits
- Thesis 18 credits

Course works

1) Core Courses

964-501	Earth System Science
964-502	Data Sciences for Earth Science and Disaster Management
964-503	Disaster Risk Management
964-504	Research Methodology
964-505	Scientific Tools for Research

2) Elective Courses

2.1) Earth Science Module

964-511	Geo-Mechanics Characterization
964-512	Exploration Geophysics
964-513	Environmental Modeling and Management
964-514	Marine Biotechnology
964-515	Environmental Toxicology
964-516	Selected Topic of ESS & NDM II
979-531	Advanced Remote Sensing

2.2) Disaster and Management Module

964-521	Hazard Mitigation
964-522	Investing in environmental and disaster management
964-523	Life Cycle Sustainability Assessment
964-524	Selected Topic of ESS & NDM I
979-572	Policy Planning and Participatory Approach

2.3) Technology and Technique Module

964-531	Sensor Technology and the Internet of Things
964-532	Data Management and Knowledge Discovery
964-533	Selected Topic of ESS & NDM III
979-532	Geographic Information System

2.4) Pre-Research Module

964-601	Special Study I
964-602	Special Study II

3) Thesis

964-701	Thesis
964-702	Thesis
964-703	Thesis

All courses are conducted in English. Selection of course works is advised by the thesis advisor.

Thesis Committee

The thesis committee is composed of at least 4 members, including an advisor, two faculty members, an external examiner, and co-advisors (if any). In the thesis defence, thesis advisor and co-advisor cannot answer questions and vote for the student.

Main Thesis Advisor and Co-Advisor

The main thesis advisor must be programme's lecturer and must have Ph.D. degree or Associate Professor at least, and have 3 academic achievements excluding his/her graduated achievements in last 5 year. At least one achievement must be a research and the journal publications.

External Examiner

- The External Examiner is assigned by the ESSAND Steering Committee.
- The thesis committee proposes two candidates to the ESSAND Steering Committee as soon as the student completes all required courses. The committee chooses one to serve as the External Examiner.
- The External Examiner's academic qualification has to be at least Associate Professor, and has published at least two papers in journals listed in the ISI database.
- The External Examiner can veto the quality of the thesis.



Graduation Requirements

1) Plan A-1

- 1.1) Have completed all required courses of the curriculum.
- 1.2) Have passed the thesis proposal defence.
- 1.3) Have passed the thesis final defence.
- 1.4) Have the thesis published or have obtained acceptance of publication for a paper in a journal listed in the ISI or Scopus databases.
- 1.5) Have satisfied one of the following English proficiency requirements:
 - IELTS test score 5.5 or higher overall for the Academic Test or
 - TOEFL test score:
 - For the TOEFL IBT 59 or higher or
 - For the TOEFL Paper-Delivered Testing:
 - Reading 10 or higher, and
 - Listening 9 or higher, and
 - Writing 18 or higher
 - For the TOEFL ITP:
 - Listening Comprehension 50 or higher, and
 - Structure & Written Expression 60 or higher, and
 - Reading Comprehension 52 or higher
 - CU-TEP score not less than 75
 - PSU-TEP score not less than 68

2) Plan A-2-1

- 2.1) Have completed all required courses of the curriculum with GPA > 3.00.
- 2.2) Have passed the thesis proposal defence.
- 2.3) Have passed the thesis final defence.
- 2.4) Have the thesis published or have obtained acceptance of publication for a paper in a journal listed in the first two upper groups of the TCI database.
- 2.5) Have satisfied one of the following English proficiency requirements:
 - IELTS test score 5.5 or higher overall for the Academic Test or
 - A TOEFL test score:
 - For the TOEFL IBT 59 or higher or
 - For the TOEFL Paper-Delivered Testing:
 - Reading 10 or higher, and
 - Listening 9 or higher, and
 - Writing 18 or higher
 - For the TOEFL ITP:
 - Listening Comprehension 50 or higher, and

- Structure & Written Expression 60 or higher, and
- Reading Comprehension 52 or higher
- CU-TEP score not less than 75
- PSU-TEP score not less than 68

3) Plan A-2-2

- 3.1) Have completed all required courses of the curriculum with GPA > 3.00.
- 3.2) Have passed the thesis proposal defence.
- 3.3) Have passed the thesis final defence.
- 3.4) Have the thesis published or have obtained acceptance of publication for a paper in a full paper of international proceeding.
- 3.5) Have satisfied one of the following English proficiency requirements:
 - IELTS test score 5.5 or higher overall for the Academic Test or
 - TOEFL test score:
 - For the TOEFL IBT 59 or higher or
 - For the TOEFL Paper-Delivered Testing:
 - Reading 10 or higher, and
 - Listening 9 or higher, and
 - Writing 18 or higher
 - For the TOEFL ITP:
 - Listening Comprehension 50 or higher, and
 - Structure & Written Expression 60 or higher, and
 - Reading Comprehension 52 or higher
 - CU-TEP score not less than 75
 - PSU-TEP score not less than 68

Faculty Members Responsible for the Programme

- Dr. Avirut Puttiwongrak
 - D.Phil. (Environment and Resource System Engineering) from Kyoto University
 - Responsible courses: 964-501, 964-504, 964-505, 964-511, 964-512, 964-516, 964-521, 964-524, 964-533, 964-601, 964-602, 964-701, 964-702, 964-703
- Dr. Kritana Prueksakorn
 - D.Eng. (Environmental Engineering) from Changwon National University, South Korea



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▪ **Dr. Tanwa Arpornthip**

- Ph.D. (Experimental Physics) from University of Virginia, USA
- Responsible courses: 964-501, 964-503, 964-504, 964-505, 964-522, 964-514, 964-516, 964-523, 964-524, 964-533, 964-601, 964-602, 964-701, 964-702, 964-703

Programme Lecturers

▪ **Prof. Dr. Kiyota Hashimoto**

- D.Eng. (Information Science) Nara Institute of Science and Technology, Japan
- Responsible courses: 964-502, 964-504, 964-505, 964-516, 964-524, 964-531, 964-532, 964-533, 964-601, 964-602, 964-701, 964-702, 964-703

▪ **Assoc. Prof. Dr. Raymond James Ritchie**

- Ph.D. (Plant Physiology) from University of Sydney, Australia
- Responsible courses: 964-514, 964-515, 964-601, 964-602, 964-701, 964-702, 964-703

▪ **Asst. Prof. Dr. Werapong Koedsin**

- Ph.D. (Survey Engineering) from Chulalongkorn University, Thailand
- Responsible courses: 979-531, 964-504, 964-505, 964-532, 964-601, 964-602, 964-701, 964-702, 964-703

▪ **Dr. Avirut Puttiwongrak**

- D.Phil. (Environment and Resource System Engineering) from Kyoto University
- Responsible courses: 964-501, 964-504, 964-505, 964-511, 964-512, 964-516, 964-521, 964-524, 964-533, 964-601, 964-602, 964-701, 964-702, 964-703

▪ **Dr. Kritana Prueksakorn**

- D.Eng. (Environmental Engineering) from Changwon National University, South Korea
- Responsible courses: 964-501, 964-504, 964-505, 964-513, 964-516, 964-523, 964-524, 964-533, 964-601, 964-602, 964-701, 964-702, 964-703

▪ **Dr. Tanwa Arpornthip**

- Ph.D. (Experimental Physics) from University of Virginia, USA
- Responsible courses: 964-501, 964-503, 964-504, 964-505, 964-514, 964-516, 964-522, 964-523, 964-524, 964-533, 964-601, 964-602, 964-701, 964-702, 964-703

▪ **Dr. Vipawee Dumme**

- Ph.D. in Biology (International Program) from Mahidol University, Thailand
- Responsible courses: 964-514, 964-515, 964-516, 964-524, 964-534, 964-601, 964-602, 964-701, 964-702, 964-703

▪ **Dr. Chantinee Boonchai**

- Ph.D. (Environmental Management), University of Queensland, Australia
- Responsible courses: 979-572, 964-601, 964-602, 964-701, 964-702, 964-703

Adjunct Program Lecturers

▪ **Dr. Somkiat Khokiattiwong**

- Ph.D. (Ecotoxicology) from University of Southern Denmark, Denmark
- Responsible courses: 964-501