

National Institute of Development Administration
Master of Science Program
in Environmental Management
(Revised Program B.E.2560)

Name of Institute National Institute of Development Administration
Name of School Graduate School of Environmental Development Administration

Section 1. General Information

1. Name of Program

Master of Science Program in Environmental Management

2. Name of Degree and Field of Study

Full Name : Master of Science (Environmental Management)

Abbreviation : M.S. (Environmental Management)

3. Major Course

None

4. Total Credits Required

39 Credits

5. Curriculum

5.1 Degree Level

Master program in accordance with Higher Education Program Standard Criteria

5.2 Language

Thai and/or English

5.3 Admission

Thai and international students who hold a bachelor's degree or equivalent in any field from a university or an academic institution either inside or outside of Thailand accredited by Office of the Higher Education Commission (OHEC)

5.4 Collaboration with Other Institutions

This program belongs to the Institute, providing teaching and learning directly; working in academic collaboration with higher education institutions as well as public and private organizations both inside and outside of Thailand.

5.5 Degree Conferred

The only field of study and degree shall be conferred from the National Institute of Development Administration is Master of Science (Environmental Management).

6. Record of Program Status and Approval/ Endorsement

The Revised Program B.E.2560 has been implemented instead of the Master of Science Program in Environmental Management (Revised Program B.E.2555). It has been initially implemented since the first semester of the academic year 2017.

- NIDA Academic Council Committee approved the program in NIDA Council's Meeting No. 1/2560, dated the 21st of February B.E. 2560.

- NIDA Council approved the program in NIDA Council's Meeting No. 3/2560, dated the 15th of March B.E. 2560.

7. Preparation for the Implementation of Program under the Thai Qualifications Register (TQR) Record

The program has been prepared for the implementation under the indicator No. 1.1 of Thai Qualifications Register (TQR) record, regarding the program management in compliance with Program Standard Criteria stipulated by the Office of the Higher Education Commission in section 1-11, and the development of program quality in accordance with AUN-QA (AUN.1-AUN.15 Thai version) Criteria in Academic Year 2018.

8. Occupational Opportunities after Graduation

8.1 Public Sector

- Working as a civil servant/a government employee in the position of an environmental manager/scientist for the central governments: Ministry of Natural Resources and Environment, Ministry of Industry, Ministry of Agriculture and Cooperatives, Ministry of Interior, Ministry of Science and Technology as well as Ministry of Social Development and Human Security; or for the provincial governments: Provincial Office of Natural Resources and Environment; or for the local governments: Provincial Administration Organization, Subdistrict Administration Organization and all levels of Municipality.
- Working as an environmental scientist/lecturer for an academic institution.
- Working as an environmental scientist, responsible for environmental standards, for a public enterprise.
- Working as an environmental scientist, responsible for environmental standards, for a public organization.

8.2 Industrial Sector/Private Sector/Self-Employed Business

- Working as an environmental consultant/scientist/manager or an operator for the pollution prevention systems for a private company.
- Working as an environmental scientist/lecturer for a private academic institution.
- Running or working for a small/medium-sized enterprise or a self-employed business involving an environment such as a hazardous waste disposal business, a recycling business, a waste management business, or an electric power industry with the utilization of solar/biomass energy for power generation.

8.3 Community Sector/Independent Organization

- Working as an independent scholar for a civil society or a personnel officer for a non-profit organization: NGO (Non-governmental Organization).

9. Name-Surname, Personal Identification Number, Academic Position, Highest Qualification, Field of Study and Name of Higher Academic Institution of the Faculty Members Responsible for the Program

- Bangkok

Personal Identification Number	Academic Position Name-Surname	Highest Qualification	Fields of Study	Name of Institution

xxxxxxxxxxxx	Associate Professor Dr. Wisakha Phoochinda	Ph.D.	<ul style="list-style-type: none"> - Ph.D. (Chemical Engineering) - M.S. (Petroleum Geoscience) (International Program) - B.Sc. (Chemical Technology) (First Class Honor) 	<ul style="list-style-type: none"> - Imperial College London, UK (B.E.2546) - Chulalongkorn University (B.E.2542) - Chulalongkorn University (B.E.2540)
xxxxxxxxxxxx	Assistant Professor Dr. Pakpong Pochanart	Ph.D.	<ul style="list-style-type: none"> - Ph.D. (Interdisciplinary Course on Advanced Science and Technology) - M.Eng. (Environmental Chemistry Engineering) - B.S. (Chemistry) (First Class Honor) 	<ul style="list-style-type: none"> - University of Tokyo, Japan (B.E.2541) - Saitama University, Japan (B.E.2538) - Chiang Mai University (B.E.2535)
xxxxxxxxxxxx	Assistant Professor Dr. Witchuda Srang-iam	Ph.D.	<ul style="list-style-type: none"> - Ph.D. (Natural Resources and Environment) - M.Sc. (Urban Environment Management) - B.A. 	<ul style="list-style-type: none"> - University of Michigan, USA (B.E.2552) - Asian Institute of Technology (B.E.2545) - Sukhothai Thammathirat Open

			- B.Arch. (Second Class Honor)	University (B.E.2547) - Silpakorn University (B.E.2539)
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- Non-formal Education Center, Rayong Province

Personal Identification Number	Academic Position Name-Surname	Highest Qualification	Fields of Study	Name of Institution
xxxxxxxxxxxx	Associate Professor Dr. Chamlong Poboorn	Ph.D.	- Ph.D. (Environmental Policy and Management) - Master of Science (Environmental Science) - Bachelor of Public Health (B.P.H.) (Occupational Health and Safety) - Bachelor of Education (English)	- Murdoch University, Australia (B.E.2540) - Kasetsart University (B.E.2528) - Sukhothai Thammathirat Open University (B.E.2547) - Phranakhon Rajabhat University (B.E.2524) -
xxxxxxxxxxxx	Assistant Professor Dr. Chutarat Chompunth	Ph.D.	- Ph.D. (Environmental Management) - Master of Science	- University of East Anglia, UK (B.E.2554) - National Institute of Development

			(Environmental Management)	Administration (B.E.2545)
			- Bachelor of Engineering (Industrial Engineering)	- Burapha University (B.E.2541)
xxxxxxxxxxxx	Associate Professor Dr. Sompote Kunnoot	Ph.D.	- Ph.D. (Environmental and Public Policy)	- Monash University, Australia (B.E.2540)
			- Master of Economics (Economics)	- University of New England, Australia (B.E.2532)
			- Bachelor of Arts (Economics)	- Aligarh Muslim University, India (B.E.2518)

10. Study Site Location

- Graduate School of Environmental Development Administration, National Institute of Development Administration at No.118, Moo.3, Serithai Road, Klong-Chan, Bangkapi, Bangkok, Thailand 10240.

- Non-formal Education Center, Rayong Province at WHA Eastern Industrial Estate (Map Ta Phut), Muang District, Rayong.

11. External Factors and/or Development Considered in Program Planning

Recent national development contributes to economic growth and development of people’s quality of life. Nevertheless, the more the nation has been developed, the more severe environmental problems occur. Examples of environmental concerns are water pollution, air pollution, residual municipal solid waste, illegal hazardous-waste smuggling, a chemical accident, occupational disease and accident as well as environmental degradation. Several environmental issues have not been resolved yet, leading to subsequent environmental problems both at a national level and at a global level. Examples of consequential issues can be viewed from global warming, biodiversity decline, ozone depletion, desertification, tropical rainforest deforestation, and marine life decline. These issues lead to accumulation and complexity of the problems, which are more difficult to resolve. Therefore, these environmental concerns cannot be neglected since they have impacts on the public including people’s health, security and living as people encounter nowadays.

Every sector must conserve and solve the environmental problems collaboratively. To achieve the goal of sustainable development, environmental problems cannot be solely solved by the public sector. Other sectors must collaborate with the public sector: the industrial sector, the private sector, Civil Society Organizations (CSOs), Non-governmental Organizations (NGOs), academic institutions and relevant environmental organizations. Since the third national economic and social development plan (1972-1976) was promulgated, many people have increasingly become aware of the environmental issues. Several preceding Thai cabinets advocated environmental development for the nation by establishing the institutes and promulgating the laws relevant to the environment. Their objectives are for environmental conservation, remediation, and rehabilitation. However, the environmental problems still have existed, and become worse. The significant impediment is the insufficiency of good environmental governance.

Currently, the government promulgates the laws, which support non-governmental organizations to participate in environmental conservation and remediation. Moreover, the government assumes a role of a superintendent instead of a public officer. Furthermore, the government allows the third parties from non-governmental organizations to assume the roles of public officers in environmental analysis and investigation, including waste management service. This alteration contributes to the multitudinous opportunities of various environmental businesses, which tends to be flourished in the future. Therefore, the private sector and other non-governmental organizations must arrange sufficient and qualified human resources conforming to the demand of environmental labor market.

Meanwhile, many academic institutions envision the significance of environmental conservation and remediation. They have participated in producing environmental graduates at all degree levels, which mainly specialize in environmental technology for working in various institutions. This field is suitable for a student who has a basic knowledge of science, technology, and engineering in environmental management. Nevertheless, some institutions' teaching and learning relating to administration and management are not implemented. Therefore, a field of environmental management, which is an integration of Management Sciences into Environmental Science and Technology, is required to resolve the environmental issues. This field is similar to the current revised environmental management program.

12. Impacts of Factors in No.11 on Curriculum Development and Related Institutional Missions

National Institute of Development Administration is a high-quality Institute, especially in administration and management. The Institute's missions are to produce graduates at postgraduate level with leadership skills, to develop a body of knowledge and research, and to provide the academic service of development administration with the intention of producing proficient national personnel officers for sustainable national development. For this reason, NIDA offers Master of Science Program in Environmental Management under the supervision of the Graduate School of Environmental Development Administration. The objectives are to produce environmental management personnel officers for coping with the expansion of environmental problems and to fulfill the increasing requirement of personnel officers who specialize in environmental management. This program can further benefit general environmental quality improvement in Thailand. Former graduates of the program are able to perform the jobs in a position of an environmental scientist or administrator for the public, industrial, private and community sectors, self-employed businesses as well as independent organizations associated with environmental management effectively.

However, since Master of Science Program in Environmental Management B.E.2555 had been implemented until now, it was considered that the more the program has been revised, the higher qualities of program management and graduates have been enhanced. Graduate School of Environmental Development Administration, National Institute of Development Administration; therefore, approves a revision for Master of Science Program in Environmental Management. Details of the Revised Program B.E.2560 are as follows.

13. Relations to Other Programs Offered by Other Graduate Schools/Programs in the Institute

13.1 The Course Offered by the Office of the President is as follows:

The Course offered in Remedial Course

Code	Course Title	Credits
ND 4000	Foundation for Graduate Studies	3 Credits

The Courses Offered by Graduate School of Language and Communication are as follows:

The Courses offered in Remedial Courses

Code	Course Title	Credits
LC 4001	Reading Skills Development in English for Graduate Studies	3 Credits
LC 4002	Integrated English Language Skills Development	3 Credits
LC 4011	Remedial Reading Skills Development in English for Graduate Studies	3 Credits
LC 4012	Remedial Integrated English Language Skills Development	3 Credits

13.2 The Courses Offered for Other Graduate Schools/Programs

Students of other programs of the Institute are able to attend any course of Master of Science Program in Environmental Management, excluding Independent Study and Thesis. This process; however, shall be in accordance with criteria of each program and shall be approved from an advisor as well as a course lecturer.

13.3 Management Administration

The program has been implemented under the supervision of the curriculum administrative committee of Master of Science Program in Environmental Management, Graduate School of Environmental Development Administration as well as under the supervision of faculty members responsible for the program, and/or full-time faculty members. The curriculum administrative committee is responsible for setting policies, frameworks for implementation and criteria in order to produce a quality program. Regarding the elective courses of the program, students are able to attend any course from the following three categories: 1) Environmental Development Administration 2) Environmental Management in Business and Industrial Organizations 3) Issue-based Environmental Management, and other elective courses including courses of other programs offered by both internal and external graduate school. Students are able to enroll in the aforementioned courses, which the credits of those courses can be counted towards their program plans. In addition, students' advisors or a program director must offer advice to students who are willing to attend courses of other programs

and count those courses as their elective courses. Moreover, the lecturer responsible for that course must grant approval, and educators of each graduate school must coordinate and validate this process in accordance with The National Institute of Development Administration Bylaw on Education.

Section 2. Specific Data of the Program

1. Program Philosophy, Significance and Objectives

1.1 Program Philosophy

The program is a national leading program, aimed at producing graduates who are excellent at environmental management administration. The program; additionally, emphasizes development for the balance of economics, a society and an environment with the integration of collaboration between public sector/industrial sector/private sector/self-employed businesses and civil society/community sector/independent organizations.

1.2 Program Objectives

To produce environmental management holders of a master’s degree who are knowledgeable and competent in the following skills:

- Implementation, administration, policy setting, planning, monitoring, analysis, assessment and evaluation of environmental projects; analysis, invention and application of appropriate technology for environmental management; and the ability to intertwine benefits from resource costs for development with environmental conservation.
- Undertaking environmental research and studies by integrating and applying technological science along with management science for environmental management at local, national and international levels.
- Raising self and social awareness in national environmental protection and remediation, and taking action in compliance with government policies for sustainable environmental quality development along with the development of other fields.

2. Improvement Plan

Improvement/ Modification Plan	Strategy	Evidence/Indicators
- Revising curriculum in accordance with the	- Applying Student Assessment to	- Student Assessment in Teaching and Learning

<p>curriculum standards of Office of the Higher Education Commission (OHEC).</p> <ul style="list-style-type: none"> - Revising curriculum in accordance with Thai Qualifications Framework for Higher Education (TQF: HEd). - Revising curriculum in order to implement AUN-QA international standard criteria (Thai version). 	<p>Teaching and Learning for each course per semester.</p> <ul style="list-style-type: none"> - Holding an annual seminar for the development of teaching and learning. - Assessing and revising curriculum every three to five years. 	<ul style="list-style-type: none"> - Seminar Report - Curriculum Assessment Report
<ul style="list-style-type: none"> - Revising curriculum in order to meet the needs of employers of graduates, including technological, environmental, economic, social and political changes. 	<ul style="list-style-type: none"> - Following up the Employers' Satisfaction with Graduates annually. 	<ul style="list-style-type: none"> - Employers' Satisfaction with Graduates Survey Report
<ul style="list-style-type: none"> - Enhancing faculty members' skills and body of knowledge relating to teaching and learning as well as research undertaking via various case studies, documents, and textbooks. 	<ul style="list-style-type: none"> - Supporting in both national and international research publishing. - Supporting in convening academic conferences, and supporting faculty members and students to present their academic work both inside and outside of Thailand. 	<ul style="list-style-type: none"> - The number of published research articles - The number of organized national/international academic conferences, and the number of faculty members as well as students presenting their academic work both inside and outside of Thailand

Section 3. Educational Management System, Program Implementation and Structure

1. Educational Management System

1.1 System

The Institute adopts a credit-based and two-semester educational system. One academic year consists of two regular semesters: the first semester and the second semester. However, the third semester (summer session) is optional. Each of regular semesters is fifteen weeks long at a minimum while the summer session is eight weeks long at a minimum. Nevertheless, NIDA has a summer session of which a certain length of time and credits are equivalent to one regular semester.

1.2 Summer Session

Teaching and learning in the summer session is based on consideration of the curriculum administrative committee.

1.3 Credit Equivalence Ratio (In Reference to Semester System)

None

2. Program Implementation

2.1 Academic Calendar

The program begins in the first semester of the academic year 2017. The semesters are divided as follows:

First Semester	August to December
Second Semester	January to May
Summer Session	June to July

2.2 Admission Requirements

- Applicants for the program must have completed a bachelor's degree or equivalent in any field from a public/private university or academic institution either inside or outside of Thailand accredited by the Office of the Higher Education Commission (OHEC), or applicants must hold accreditation approved by NIDA Council. Regarding the requirement of work experience, it must be in accordance with the announcement of the Institute.

- Applicants for the program must be qualified according to the Institute's selective criteria of a written examination and/or an interview.

- The requirement of qualifications for applicants might be altered, or the selection criteria might be added. In any case, they must be in accordance with the announcement of the National Institute of Development Administration or the announcement of the Graduate School of Environmental Development Administration.

2.3 Limitations for Certain Groups of Newly Enrolled Students

The environmental management program is an interdisciplinary study with the integration and application of science, technology as well as management administration knowledge. As a result, qualified students are various and have different educational backgrounds. Some students might be knowledgeable in a foundation of science; however, their basic knowledge of society and management administration might not be extensive, and vice versa. In addition, the majority of students are not proficient in English language skill, which is essential for the study in this program.

2.4 Strategies to Resolve Students' Limitations in 2.3

- To apply the integration of management administration as well as science and technology knowledge to the content of core courses in order to enable students to acquire both pieces of knowledge equally.

- To provide a written examination and/or an interview for testing English proficiency skill for student admission.

- To provide remedial courses for the reinforcement of English language skill.

- To apply the utilization of English language skill to teaching and learning, report writing and academic document research.

2.5 A Five-year Plan for Admission and Graduation

Student Number	Student Number in Each Academic Year				
2560	2561	2562	2563	2564	

Regular Program, Bangkok	20	20	20	20	20
Special Program Bangkok	55	55	55	55	55
Rayong	30	30	30	30	30
Total Number	105	105	105	105	105
Expected Number of Graduates	-	-	90	90	90

2.6 Budget Plan

- The National Budget
- NIDA Budget
- Program Budget and Budget from Graduate School of Environment Development Administration

2.7 Academic System

- In Class
- Distance Learning Mainly through Printed Materials
- Distance Learning Mainly through Broadcast Media
- Distance Learning Mainly through Electronic Media (E-learning)
- Distance Learning through the Internet
- Others (Please Specify)

2.8 Credit Transfer and Cross-Institutional Enrollment

Credit transfer criteria must be in accordance with National Institute of Development Administration Bylaw on Education and/or the announcement of Graduate School of Environmental Development Administration.

3. Program Structure

3.1 Curriculum

3.1.1 Number of Credits

The required number of credits in total is 39 credits.

3.1.2 Program Structure

Course Requirements	Program Plan	Program Plan
	Plan A2 (Thesis)	Plan B Independent Study
1. Remedial Courses	9 credits (non-credits)	9 credits (non-credits)
2. Core Courses	24 credits	24 credits
3. Elective Courses	3 credits	12 credits

4. Thesis	12 credits	-
5. Independent Study	-	3 credits
6. Comprehensive Examination	Yes	Yes
7. Thesis Examination	Yes	-
8. Oral Examination	-	Yes
Total	39 credits	39 credits

3.1.3 Course Requirements

Remedial Courses

These courses are aimed at enhancing students' foundation of knowledge in order to be prepared for study in the program of the Graduate School. Remedial courses are non-credit, which are not counted for GPA. Students must take the following remedial courses:

Code	Course Title	Credits
ND 4000	Foundation for Graduate Studies	3 (Non-credits)
LC 4001	Reading Skills Development in English for Graduate Studies	3 (Non-credits)
LC 4002	Integrated English Language Skills Development	3 (Non-credits)
LC 4011	Remedial Reading Skills Development in English for Graduate Studies	3 (Non-credits)
LC 4012	Remedial Integrated English Language Skills Development	3 (Non-credits)

***Remarks** 1) Requirements and exemptions for remedial courses shall be in accordance with NIDA's/GSEDA's announcement. However, the exclusions of requirements and exemptions for remedial courses for NIDA's graduate studies as well as Graduate School of Language and Communication's foundation of English Language must conform to the conditions of English language curriculum for graduate studies.

2) In the case of the revision to the English language curriculum for graduate studies, remedial English courses specified by the program must be modified in compliance with the revised curriculum of English language for graduate studies.

Core Courses

These courses are aimed at training students to have specialization. Students who apply for Plan A2 and Plan B must enroll in 8 courses (24 credits) as follows:

Code	Course Title	Credits
EM 6001	Environmental Ethics and Ideologies	3(3-0-6)
EM 6002	Environment, Ecology and Management Technology	3(3-0-6)
EM 6003	Principle of Environmental Development Administration for Sustainability	3(3-0-6)
EM 6004	Environmental Research Methodology and Statistics	3(3-0-6)
EM 6005	Environmental Policy and Planning for Sustainability	3(3-0-6)
EM 6006	Environmental Justice and Law	3(3-0-6)
EM 6007	Environmental and Natural Resources Economics	3(3-0-6)
EM 6008	Environmental Information Technology	3(3-0-6)

Elective Courses

Students who apply for Plan A2 must attend one course while students who apply for Plan B must attend four courses as follows: (Students are able to attend all of the three-course categories.)

Environmental Development Administration

Code	Course Title	Credits
EM 7101	Environmental Management through the King's Initiatives	3(3-0-6)
EM 7102	Sufficiency Economy Philosophy and Environmental Management	3(3-0-6)
EM 7103	Leadership and Change Management for Sustainability	3(3-0-6)
EM 7104	Project Management for Sustainability	3(3-0-6)
EM 7105	Environmental Governance	3(3-0-6)
EM 7106	International Environmental Management	3(3-0-6)
EM 7107	Environmental and Health Impact Assessment	3(3-0-6)
EM 7108	Social Impact Assessment	3(3-0-6)
EM 7109	Environmental Risk Assessment and Decision Making	3(3-0-6)
EM 7110	Environmental Conflict Management and Public Participation	3(3-0-6)
EM 7111	Environmental Data Collection and Analysis	3(3-0-6)

Environmental Management in Business and Industrial Organizations

Code	Course Title	Credits
EM 7201	Clean Technology	3(3-0-6)
EM 7202	Pollution Control and Management	3(3-0-6)
EM 7203	Eco-Industrial Management	3(3-0-6)
EM 7204	Energy Management and Conservation	3(3-0-6)
EM 7205	Life Cycle Assessment	3(3-0-6)
EM 7206	Environmental Management and Safety Standards	3(3-0-6)
EM 7207	Environmental Business	3(3-0-6)
EM 7208	Environmental and Social Responsibility	3(3-0-6)

Issue-based Environmental Management

Code	Course Title	Credits
EM 7301	Climate Change Management	3(3-0-6)
EM 7302	Disaster Management	3(3-0-6)
EM 7303	Soil and Water Resources Management	3(3-0-6)
EM 7304	Natural Resources and Biodiversity Resource Management	3(3-0-6)
EM 7305	Marine and Coastal Resource Management	3(3-0-6)
EM 7306	Social and Hazardous Waste Management	3(3-0-6)
EM 7307	Air Quality Management	3(3-0-6)
EM 7308	Urban and Community Environmental Management for Sustainability	3(3-0-6)

EM 7309	Land Use and Urban Planning	3(3-0-6)
EM 7310	Environmental Health Management	3(3-0-6)

Other Elective Courses

Code	Course Title	Credits
EM 8001	Environmental Management Seminar	3(3-0-6)
EM 8002	Environmental Practicum	3(1-0-8)
EM 8003	Special Topics in Environmental Management	3(3-0-6)
EM 8004	Directed Study	3(1-0-8)

Remark Apart from the aforementioned elective courses, students are able to enroll in a minimum of 6 credits for other elective courses, which might be core courses, major courses or other elective courses for graduate studies of other programs both inside and outside of Graduate School of Environmental Development Administration. Nevertheless, faculty members responsible for the program must approve teaching and learning management for elective courses.

Independent Study (Plan B)

Code	Course Title	Credits
EM 9900	Independent Study	3(0-0-9)

Thesis (Plan A2)

Code	Course Title	Credits
EM 9004	Thesis	12 Credits

3.1.4 Study Plan

1) Graduate Students of Regular Semester

1.1) Students who begin an initial semester in the first semester of the academic year

First Year, First Semester

ND 4000	Foundation for Graduate Studies	3 Credits*
LC 4001	Reading Skills Development in English for Graduate Studies	3 Credits**
EM 6001	Environmental Ethics and Ideologies	3 Credits
EM 6002	Environment, Ecology and Management Technology	3 Credits
EM 6003	Principle of Environmental Development Administration	3 Credits

	for Sustainability	
EM 6005	Environmental Policy and Planning for Sustainability	3 Credits

First Year, Second Semester

LC 4002	Integrated English Language Skills Development	3 Credits**
EM 6004	Environmental Research Methodology and Statistics	3 Credits
EM 6006	Environmental Justice and Law	3 Credits
EM 6007	Environmental and Natural Resources Economics	3 Credits
EM 6008	Environmental Information Technology	3 Credits

First Year, Summer Session

EM 7XXX-EM 8XXX	Selective Course	3 Credits***
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Second Year, First Semester

EM 7XXX-EM 8XXX	Selective Course	3 Credits***
EM 7XXX-EM 8XXX	Selective Course	3 Credits***
EM 7XXX-EM 8XXX	Selective Course	3 Credits***
EM 9000	Independent Study (Plan B) <u>or</u>	3 Credits
EM 9004	Thesis (Plan A2)	3 Credits

Second Year, Second Semester

EM 9004	Thesis (Plan A2)	9 Credits
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1.2) Students who begin an initial semester in the second semester of the academic year

First Year, Second Semester

ND 4000	Foundation for Graduate Studies	3 Credits*
LC 4001	Reading Skills Development in English for Graduate Studies	3 Credits**
EM 6001	Environmental Ethics and Ideologies	3 Credits
EM 6002	Environment, Ecology and Management Technology	3 Credits
EM 6003	Principle of Environmental Development Administration for Sustainability	3 Credits
EM 6005	Environmental Policy and Planning for Sustainability	3 Credits

First Year, Summer Session

EM 7XXX-EM 8XXX	Selective Course	3 Credits***
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First Year, First Semester

LC 4002	Integrated English Language Skills Development	3 Credits**
EM 6004	Environmental Research Methodology and Statistics	3 Credits
EM 6006	Environmental Justice and Law	3 Credits
EM 6007	Environmental and Natural Resources Economics	3 Credits
EM 6008	Environmental Information Technology	3 Credits

Second Year, Second Semester

EM 7XXX-EM 8XXX	Selective Course	3 Credits***
EM 7XXX-EM 8XXX	Selective Course	3 Credits***
EM 7XXX-EM 8XXX	Selective Course	3 Credits***
EM 9000	Independent Study (Plan B) <u>or</u>	3 Credits
EM 9004	Thesis (Plan A2)	3 Credits

Second Year, First Semester

EM 9004	Thesis (Plan A2)	9 Credits
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2) Graduate Students of Special Program (Saturday - Sunday)

2.1) Students of the special program (Bangkok) who begin an initial semester in the first semester of the academic year

First Year, First Semester

EM 6001	Environmental Ethics and Ideologies	3 Credits
EM 6002	Environment, Ecology and Management Technology	3 Credits
EM 6003	Principle of Environmental Development Administration for Sustainability	3 Credits

First Year, Second Semester

EM 6004	Environmental Research Methodology and Statistics	3 Credits
EM 6005	Environmental Policy and Planning for Sustainability	3 Credits
EM 6006	Environmental Justice and Law	3 Credits

First Year, Summer Session

EM 6007	Environmental and Natural Resources Economics	3 Credits
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Second Year, First Semester

EM 6008	Environmental Information Technology	3 Credits
EM 7XXX-EM 8XXX	Selective Course	3 Credits***

EM 7XXX-EM 8XXX	Selective Course	3 Credits***
EM 9004	Thesis (Plan A2)	3 Credits

Second Year, Second Semester

EM 7XXX-EM 8XXX	Selective Course	3 Credits***
EM 7XXX-EM 8XXX	Selective Course	3 Credits***
EM 9000	Independent Study (Plan B)	3 Credits
EM 9004	Thesis (Plan A2)	9 Credits

2.2) Students of the special program (Rayong) who begin an initial semester in the second semester of the academic year

First Year, Second Semester

EM 6001	Environmental Ethics and Ideologies	3 Credits
EM 6002	Environment, Ecology and Management Technology	3 Credits
EM 6003	Principle of Environmental Development Administration for Sustainability	3 Credits

First Year, Summer Session

EM 6005	Environmental Policy and Planning for Sustainability	3 Credits
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First Year, First Semester

EM 6004	Environmental Research Methodology and Statistics	3 Credits
EM 6006	Environmental Justice and Law	3 Credits
EM 6007	Environmental and Natural Resources Economics	3 Credits

Second Year, Second Semester

EM 6008	Environmental Information Technology	3 Credits
EM 7XXX-EM 8XXX	Selective Course	3 Credits***
EM 7XXX-EM 8XXX	Selective Course	3 Credits***
EM 9004	Thesis (Plan A2)	3 Credits

Second Year, Summer Session

EM 7XXX-EM 8XXX	Selective Course	3 Credits***
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Second Year, First Semester

EM 7XXX-EM 8XXX	Selective Course	3 Credits***
EM 9000	Independent Study (Plan B)	3 Credits
EM 9004	Thesis (Plan A2)	9 Credits

Remark Students, who begin an initial semester in the first semester of the academic year and apply for Plan A2, are able to enroll in a minimum of one elective course.

* Students must attend these courses with non-credit before the beginning of the initial semester.

** Non-credit

If students fail the LC 4001 course of Reading Skills Development in English for Graduate Studies, they must enroll in the LC 4011 course of Remedial Reading Skills Development in English for Graduate Studies in the following semester.

Likewise, if students fail the LC 4002 course of Integrated English Language Skills Development, they must enroll in the LC 4012 course of Remedial Integrated English Language Skills Development in the following semester.

*** Students who apply for Plan A2 are able to attend a minimum of one elective course with 3 credits (Code EM 7XXX or 8XXX), or

Students who apply for Plan B are able to attend a minimum of 4 elective courses with 12 credits (Code EM 7XXX or 8XXX).

3.1.5 Course Descriptions

Remedial Courses

ND 4000 Foundation for Graduate Studies 3 Credits

An overview of Thai government, Thai economy, Thai business, Thai society, codes of ethics for executives and academics, personality development, physical and mental health, the Constitution of the Kingdom of Thailand, Thai for communication, academic report writing, and sufficiency economy and development.

LC 4001 Reading Skills Development in English for Graduate Studies 3 Credits

This course is aimed at enhancing students' understanding of English structure such as sentence types, core parts, headwords and modifiers. This will enable students to develop their English reading skills necessary for academic texts and research papers. Emphasis is placed on developing students' skills in reading for main ideas, drawing conclusions and making inferences, using context clues to arrive at the meanings of unknown words, skimming and scanning, and developing their discourse competence, including critical reading skills.

LC 4002 Integrated English Language Skills Development 3 Credits

Course contents and teaching activities focus on the integrated skills of listening, speaking, reading and writing with particular emphasis on academic writing at the introductory level.

LC 4011 Remedial Reading Skills Development in English for Graduate Studies 3 Credits

The course is intended to provide additional practices in the reading skills and strategies covered in LC 4001. Students receive individualized attention to enhance their reading skills for academic purposes.

LC 4012 Remedial Integrated English Language Skills Development 3 Credits

This course is intended to provide additional practice in the listening, speaking, reading and writing skills and strategies covered in LC 4002. Students receive individualized attention to enhance their communication skills in English.

Core Courses

EM 6001 Environmental Ethics and Ideologies 3 Credits

Environmental awareness; environmental evolution; environmental discourses; ideologies, philosophies and ethics in an environment; economic, social and political impacts from development; development discourses; alternative developments; the alteration of concepts on development and technology throughout various epochs; sustainable development; and case studies.

EM 6002 Environment, Ecology and Management Technology 3 Credits

Fundamental knowledge about environment and ecology covering theoretical principles and defined technical terms; environmental parameters; the linkage between ecology and environmental management; knowledge necessary to understand the environmental and natural resources problems, causes and solutions; climate change, mitigation and adaptation measures; tools and technologies for environmental management.

EM 6003 Principle of Environmental Development Administration for Sustainability 3 Credits

Concepts and theories of administration and management; strategic management; administration and management tools; concepts and theories of development; application of concepts and theories of administration, management, and development to environmental management; principles and approaches in administration and management for sustainability such as corporate social responsibility, good governance, leadership, etc.; environmental management standards; monitoring and evaluation; case studies on environmental development administration.

EM 6004 Environmental Research Methodology and Statistics 3 Credits

Concepts, purpose and types of research; researches in environmental management; process and step of doing research; research objectives, literature review; conceptual framework and hypothesis; population and sampling; research design, tool development and quality of tool, data collection technique, data analysis for qualitative research, data analysis for quantitative research; statistics including descriptive statistics and inferential statistics; using statistics software for data analysis; results and discussions, writing research report.

EM 6005 Environmental Policy and Planning for Sustainability 3 Credits

Policy and planning theories; policy formulation and analysis; environmental and sustainability policymaking in for-profit and non-profit organizations; environmental and sustainability policymaking in the government sector; planning and strategic environmental and sustainability planning; plan and project analysis; implementation of policy and plan; monitoring and evaluation of policy and plan.

- EM 6006 Environmental Justice and Law 3 Credits**
 Environmental ethics; environmental justice movement; principles and concepts in environmental laws; general and specific characteristics of environmental laws; important issues of environmental laws; laws relating to pollution emission control; environmental impact assessment laws; international environmental agreement; environmental organization; relationships and roles of environmental organizations; environmental justice; environmental debate case studies.
- EM 6007 Environmental and Natural Resources Economics 3 Credits**
 Economic analyses for game theory, the tragedy of the common, role of state in resolving problem of the common; theories for market, demand, supply, price; market and the realization of efficiency of consumption, production and natural resources uses; cost management; emission control through price, cost, market, emission tax and charge, quota trading; theories for project evaluation, uses of non-renewable and renewable resources.
- EM 6008 Environmental Information Technology 3 Credits**
 Application of Information Technology (IT) systems, such as Geographic Information System (GIS) and Decision Support System (DSS) in management, particularly issues related to environmental management; sharing of experiences and knowledge concerning environmental information technology among students, instructors and experts.

Elective Courses

1) Environmental Development Administration

Theories, the body of knowledge and tools in development administration focusing on issues of natural resources and environment that are closely related to those of development. They highlight both environmental challenges from the conventional development paradigm to environmental management opportunities from the new development paradigm.

- EM7101 Environmental Management through the King's Initiatives 3 Credits**
 Concept of the King's Initiatives in environmental management; water resource management, soil management, watershed management; philosophy of sufficient economy; the New Theory; alternative agriculture; monkey cheek project; 3 forests and 4 benefits; land degradation protection by Vetiver grass; waste and wastewater management by natural methods; check dam; extension of the King's Initiatives in Thailand and abroad.
- EM 7102 Sufficiency Economy Philosophy and Environmental Management 3 Credits**
 Fundamental knowledge, theory, concept and tools on environmental management based on the Philosophy of Sufficiency Economy; cooperation between each human and economic activity based on the Philosophy of Sufficiency Economy, carry out environmental management relevant to natural resources, economic benefits and human development; management environmental impact of economic development; sustainable natural resources management.
- EM 7103 Leadership and Change Management for Sustainability 3 Credits**

Concepts and theories of leadership; theories of organizational development and change; organizational development and change for sustainability; the role of leadership in implementing change; process, strategies and success factors of change management, case studies.

EM 7104 Project Management for Sustainability 3 Credits

Origin and principle of sustainable development; general knowledge on project and project management; application of sustainable development for project management; project planning; project analysis and appraisal; project implementation; project monitoring and evaluation; case studies on project management.

EM 7105 Environmental Governance 3 Credits

Theories of environmental governance; developments of the governance concept in environmental management paradigms; key characteristics of environmental governance, integrated approaches in multi-scale and multi-sectorial governance; principle and practices of environmental governance, roles of authorities, markets and networks in environmental management; linkages across global environmental regimes, national environmental policies and local environmental institutions; the science-policy interface, good environmental governance, innovation in environmental governance in developed and developing countries; frameworks and tools in analyzing mechanisms driving environmental problems and the search for policy solutions.

EM 7106 International Environment Management 3 Credits

General knowledge about the entry of a nation into international environmental agreements, world environmental issues, conventions and protocols which Thailand signed in and ratified, financial and technical assistance, responsibilities of member nations, Thailand's implementations to accord respective international environmental agreements, use of environmental issues for trade protection, case studies.

EM 7107 Environmental and Health Impact Assessment 3 Credits

Development, definitions, and significance of environmental and health impact assessment; basic principles and concepts; EIA and HIA process and methodologies; public participation; report writing; EIA and HIA systems in Thailand and other countries; EIA and HIA problems and development; case studies.

EM 7108 Social Impact Assessment 3 Credits

The significance of Social Impact Assessment; SIA processes and methodologies; SIA case studies of development projects; problems and barriers to SIA practices in Thailand; suggestions for development and improvement to SIA systems in Thailand.

EM 7109 Environmental Risk Assessment and Decision Making 3 Credits

Fundamental knowledge and concept about risk; characteristics and types of risk; risk assessment; risk analysis and risk management in environments; environmental psychology; risk communication and decision-making; risk trade-off and its significance; understandings of environmental finance and its instruments in risk assessment; crisis failure and problem solving in risk management; global catastrophic risk; current situation and trends in the future; case studies in environmental risk assessment in Thailand and other countries.

EM 7110 Environmental Conflict Management and Public Participation 3 Credits

Concepts and theories of social and environmental conflicts; root causes of environmental conflict; rationale for conflict management; conditions of environmental conflict in Thai context; conflicts of interest; conflict analysis; conflict management strategies; alternatives and approaches to managing and resolving environmental conflict; public participation; participatory decision-making process; mediation process; arbitration process; case studies of successful and unsuccessful conflict management practices in Thailand and other countries.

EM 7111 Environmental Data Collection and Analysis 3 Credits

Scientific and social methodological approaches in environmental studies; data collection methods, including observation techniques, construction of questionnaires or interview form and systematic review; analytical methods which are appropriate with each study.

2) Environmental Management in Business and Industrial Organizations

Studying in environmental management in business and industrial organizations by analyzing and evaluating environmental issues as well as applying effective environmental management tools for business and industrial sector towards sustainable development.

EM 7201 Clean Technology 3 Credits

Clean technology concept; waste auditing; material and energy balances; estimating releases to the environment; methodology for the generation and implementation of clean technology options; opportunities for implementing clean technology options; evaluation of environmental benefits of clean technology; life cycle assessment; eco-design; market mechanism and environmental labeling; policy instruments for resource efficiency; roles of relevant stakeholders; case studies and study visit.

EM 7202 Pollution Control and Management 3 Credits

Definition, benefits and barriers to pollution prevention and control; implementing a pollution prevention and control program, recycle and waste exchange; water pollution reduction; air pollution reduction; hazardous waste minimization; tools for pollution prevention and control; economic evaluation in pollution prevention and control program; best practices and case studies.

EM 7203 Eco-Industrial Management 3 Credits

Ecology for Industry; eco-industrial design and management; application of other disciplines to eco-industrial management, evaluation of eco-industrial management; case studies in Thailand and other countries.

EM 7204 Energy Management and Conservation 3 Credits

Energy plan and policy of Thailand and other countries; concepts of energy management involving good house-keeping, value engineering, utility management, technology improvement and cogeneration; energy management techniques for business, industrial and transportation sectors; alternative energy and its management; demand and supply of energy; energy security; energy intensity and elasticity; energy scenario.

EM 7205 Life Cycle Assessment 3 Credits

Principle and concept of life cycle assessment (LCA); green input; process improvement; products design; green logistics and market; green consumer and safe final disposal; carbon credits; carbon footprint analysis; water footprint analysis; ecological footprint analysis; case studies.

EM 7206 Environmental Management and Safety Standards 3 Credits

Origin, principle and the concept of the International Environmental Management System and Safety Standards; environmental issues and priorities; benefits of EMS and safety standard applications; requirements of the environmental management system and safety standards; establishment and implementing of the environmental management system and safety standards; consultant selection; relevant standards.

EM 7207 Environmental Business 3 Credits

Prospects of environmental business; concept and history of environmental business; changing regulations, policies, and criteria for design and operation; the bottom line; models and aspects of sustainable business; environmental-based building practices; environmental marketing; facility management for sustainable operations; environmental - based procurement; eco-advantage strategy; environmental business ethics; organizational change management for sustainability; environmental accounting and sustainability.

EM 7208 Environmental and Social Responsibility 3 Credits

Social and environmental impacts from corporate's decision and activities; compulsory social responsibility, including laws, regulations and standards; voluntary social responsibility including organization culture, ethics and consciousness, safety and environment, human rights, social welfare, respect for stakeholder interests, good governance, business code of conduct; standards and guidance for social responsibility at national and international levels; designing of social, environmental and public affairs plans with consciousness; Social Return on Investment (SROI); Creating Shared Value: CSV; development and community participation; case studies.

3) Issue-based Environmental Management

Environmental Management involves critical resources and environmental issues or immersing environmental issues, which are of interests at global, national or local levels.

EM 7301 Climate Change Management 3 Credits

Global warming mechanism as a result of natural and anthropogenic activities; greenhouse gases; global warming potential definition; natural system in controlling of the temperatures of the atmosphere; pre-historic climate system variables and linkages to the present-day atmospheric temperatures; Background of climate change related organizations and their duties; underlying concept of climate change management; climate change impact mitigation and adaptation in Thailand perspectives.

EM 7302 Disaster Management 3 Credits

Nature, effects, and causes of disaster; concepts and principle of disaster management; planning, preparation, controlling, mitigation, practices during and after incidents; laws, regulations, and

waste, workplace, industrial chemical and farming; relevant laws on environmental health; strategies and planning for environmental health management; practices and suggestions for protection of human health.

4) Other Elective Courses

EM 8001 Environmental Management Seminar 3 Credits

Students are assigned to prepare a report on interesting topics in environmental issues and present for discussion in the class.

EM 8002 Environmental Practicum 3 Credits

This course provides the opportunities for students to attend a real circumstance in companies or organization related to environmental issues or problems in order to accumulate work experience and extend further environmental knowledge. In addition, the practicum helps develop skills and perceptions of the students in pursuing environmental tasks.

EM 8003 Special Topics in Environmental Management 3 Credits

Special topics selected to be taught as they are interesting environmental management issues.

EM 8004 Directed Study 3 Credits

A special topic not offered in regular courses for those with special interest on a certain topic. The course will be offered upon the request from students under the direction of an instructor and subject to the approval of their advisors.

5) Independent Study (Plan B)

EM 9000 Independent Study 3 Credits

Individual's study and research on a relevant environmental management topic.

6) Thesis (PlanA2)

EM 9004 Thesis 12 Credits

Self-study and research on environmental management after the thesis topic has been approved by the committee.

3.2 Faculty Members

3.2.1 Faculty Members Responsible for the Program

- Faculty Members Responsible for the Revised Program of Master of Science in Environmental Management B.E.2560 (Bangkok)

Personal Identification Number	Academic Position Name-Surname	Highest Qualification	Fields of Study	Name of Institution
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xxxxxxxxxxxx	Associate Professor Dr. Wisakha Phoochinda	Ph.D.	<ul style="list-style-type: none"> - Ph.D. (Chemical Engineering) - M.S. (Petroleum Geoscience) (International Program) - B.Sc. (Chemical Technology) (First Class Honor) 	<ul style="list-style-type: none"> - Imperial College London, UK (B.E.2546) - Chulalongkorn University (B.E.2542) - Chulalongkorn University (B.E.2540)
xxxxxxxxxxxx	Assistant Professor Dr. Pakpong Pochanart	Ph.D.	<ul style="list-style-type: none"> - Ph.D. (Interdisciplinary Course on Advanced Science and Technology) - M.Eng. (Environmental Chemistry Engineering) - B.S. (Chemistry) (First Class Honor) 	<ul style="list-style-type: none"> - University of Tokyo, Japan (B.E.2541) - Saitama University, Japan (B.E.2538) - Chiang Mai University (B.E.2535)
xxxxxxxxxxxx	Assistant Professor Dr. Witchuda Srang-iam	Ph.D.	<ul style="list-style-type: none"> - Ph.D. (Natural Resources and Environment) - M.Sc. (Urban Environment Management) - B.A. 	<ul style="list-style-type: none"> - University of Michigan, USA (B.E.2552) - Asian Institute of Technology (B.E.2545) - Sukhothai Thammathirat Open

			- B.Arch. (Second Class Honor)	University (B.E.2547) - Silpakorn University (B.E.2539)
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- Faculty Members Responsible for the Revised Program of Master of Science in Environmental Management B.E.2560 (Non-formal Education Center, Rayong Province)

Personal Identification Number	Academic Position Name-Surname	Highest Qualification	Fields of Study	Name of Institution
xxxxxxxxxxxx	Associate Professor Dr. Chamlong Poboorn	Ph.D.	- Ph.D. (Environmental Policy and Management) - Master of Science (Environmental Science) - Bachelor of Public Health (B.P.H.) (Occupational Health and Safety) - Bachelor of Education (English)	- Murdoch University, Australia (B.E.2540) - Kasetsart University (B.E.2528) - Sukhothai Thammathirat Open University (B.E.2547) - Phranakhon Rajabhat University (B.E.2524) -
xxxxxxxxxxxx	Assistant Professor Dr. Chutarat Chompunth	Ph.D.	- Ph.D. (Environmental Management)	- University of East Anglia, UK (B.E.2554)

			<ul style="list-style-type: none"> - Master of Science (Environmental Management) - Bachelor of Engineering (Industrial Engineering) 	<ul style="list-style-type: none"> - National Institute of Development Administration (B.E.2545) - Burapha University (B.E.2541)
xxxxxxxxxxxx	Associate Professor Dr. Sompote Kunnoot	Ph.D.	<ul style="list-style-type: none"> - Ph.D. (Environmental and Public Policy) - Master of Economics (Economics) - Bachelor of Arts (Economics) 	<ul style="list-style-type: none"> - Monash University, Australia (B.E.2540) - University of New England, Australia (B.E.2532) - Aligarh Muslim University, India (B.E.2518)

3.2.2 Full-time Faculty Members of the Program

- Revised Program of Master of Science in Environmental Management B.E.2560 (Bangkok) and Revised Program of Master of Science in Environmental Management B.E.2560 (Non-formal Education Center, Rayong Province)

Name-Surname	Personal Identification Number	Academic Position	Highest Qualification	Fields of Study	Name of Institution
Dr. Wisakha Phoochinda	xxxxxxxxxxxx	Associate Professor	Ph.D.	- Ph.D. (Chemical Engineering)	- Imperial College

				<ul style="list-style-type: none"> - M.S. (Petroleum Geoscience) (International Program) - B.Sc. (Chemical Technology) (First Class Honor) 	<ul style="list-style-type: none"> London, UK (B.E.2546) - Chulalongkorn University (B.E.2542) - Chulalongkorn University (B.E.2540)
Dr. Pakpong Pochanart	xxxxxxxxxxxx	Assistant Professor	Ph.D.	<ul style="list-style-type: none"> - Ph.D. (Interdisciplinary Course on Advanced Science and Technology) - M.Eng. (Environmental Chemistry Engineering) - B.S. (Chemistry) (First Class Honor) 	<ul style="list-style-type: none"> - University of Tokyo, Japan (B.E.2541) - Saitama University, Japan (B.E.2538) - Chiang Mai University (B.E.2535)
Dr. Witchuda Srang-iam	xxxxxxxxxxxx	Assistant Professor	Ph.D.	<ul style="list-style-type: none"> - Ph.D. (Natural Resources and Environment) - M.Sc. (Urban Environment Management) - B.A. 	<ul style="list-style-type: none"> - University of Michigan, USA (B.E.2552) - Asian Institute of Technology (B.E.2545) - Sukhothai Thammathirat Open University (B.E.2547)

				- B.Arch. (Second Class Honor)	- Silpakorn University (B.E.2539)
Dr. Chamlong Poboorn	xxxxxxxxxxxxx	Associate Professor	Ph.D.	- Ph.D. (Environmental Policy and Management) - Master of Science (Environmental Science) - Bachelor of Public Health (B.P.H.) (Occupational Health and Safety) - Bachelor of Education (English)	- Murdoch University, Australia (B.E.2540) - Kasetsart University (B.E.2528) - Sukhothai Thammathirat Open University (B.E.2547) - Phranakhon Rajabhat University (B.E.2524)
Dr. Chutarat Chompunth	xxxxxxxxxxxxx	Assistant Professor	Ph.D.	- Ph.D. (Environmental Management) - Master of Science (Environmental Management) - Bachelor of Engineering (Industrial Engineering)	- University of East Anglia, UK (B.E.2554) - National Institute of Development Administration (B.E.2545) - Burapha University (B.E.2541)

Dr. Sompote Kunnot	xxxxxxxxxxxx	Associate Professor	Ph.D.	<ul style="list-style-type: none"> - Ph.D. (Environmental and Public Policy) - Master of Economics (Economics) - Bachelor of Arts (Economics) 	<ul style="list-style-type: none"> - Monash University, Australia (B.E.2540) - University of New England, Australia (B.E.2532) - Aligarh Muslim University, India (B.E.2518)
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3.2.3 Course Lecturers

Name	Personal Identification Number	Academic Position	Highest Qualification	Field of Study	Name of Institution
Dr. Warangkana Sornil	xxxxxxxxxxxx	Assistant Professor	Ph.D.	<ul style="list-style-type: none"> - Ph.D. (Environmental Science and Engineering) - M.S. (Environmental Science and Engineering) - B.Sc. (Public Health) 	<ul style="list-style-type: none"> - Virginia Polytechnic Institute and State University, USA (B.E.2544) - Virginia Polytechnic Institute and State University, USA (B.E.2540) - Khonkaen University (B.E.2536)
Dr. Tangon Munjaiton	xxxxxxxxxxxx	Assistant Professor	Ph.D.	<ul style="list-style-type: none"> - Ph.D. (Economics) 	<ul style="list-style-type: none"> - University of Hawaii, USA (B.E.2528)

				<ul style="list-style-type: none"> - M.S. (Economics) - B.S. (Economics) 	<ul style="list-style-type: none"> - Hitotsubashi Tokyo University, Japan (B.E.2517) - Hitotsubashi Tokyo University, Japan (B.E.2515)
Dr. Wichai Roobkhamdee	xxxxxxxxxxxx	Lecturer	Ph.D.	<ul style="list-style-type: none"> - Ph.D. (Social, Economic and Political Sciences) - M.A. (Public Administration) - B.Ed. (Physics) 	<ul style="list-style-type: none"> - MAGADH UNIVERSITY (B.E.2550) - National Institute of Development Administration (B.E.2517) - Srinakharinwirot University (B.E.2512)
Dr. Tawadchai Suppadit	xxxxxxxxxxxx	Professor	Ph.D.	<ul style="list-style-type: none"> - Ph.D. (Tropical Medicine) - M.S. (Agriculture) - B.S. (Agriculture) 	<ul style="list-style-type: none"> - Mahidol University (B.E.2545) - Chiang Mai University (B.E.2539) - Chiang Mai University (B.E.2534)

4. Components Related to Field Training Experience (Training or Multi-Activity Education)

Consisting of EM 8001 Environmental Management Seminar and EM 8002 Environmental Practicum courses.

5. Requirements for Project or Research

5.1 Brief Description

The program specifies the students who apply for Plan A2 to do a thesis; on the other hand, the students who apply for Plan B must enroll in the course of Independent Study in order to do research relevant to their interested topics under the supervision of their advisors.

5.2 Standard of Learning Outcome

The objective of this program is to produce students with 5 Domains of Learning Outcomes according to Thai Qualifications Framework (TQF). Therefore, the students will have abilities to study, do research, analyze, synthesize, and publish their academic work in academic journals, or present their scholarly works.

5.3 Duration

Students must undertake research and prepare a report of thesis or independent study within the duration specified by the program.

5.4 Number of Credits

Students applying for Plan A2 must enroll in a thesis course for 12 credits; on the other hand, students applying for Plan B must enroll in an independent study course for 3 credits.

5.5 Preparation

1) To hold a special lecture in order to suggest students' research methodology and interesting topic selection before attending the course of thesis or independent study.

2) To designate a thesis advisor or an independent study advisor according to the National Institute of Development Administration Bylaw on Education.

3) To schedule an hour for consultation with an advisor and to prepare the report of the consultation.

4) To designate the committee of a thesis proposal topic examination in accordance with National Institute of Development Administration Bylaw on Education.

5) To designate the thesis defense committee in accordance with the National Institute of Development Administration Bylaw on Education.

6) To offer advice on the preparation for a report of a thesis or an independent study by an advisor.

7) To establish the office for advising and proofreading on a thesis report writing format before preparing a final draft.

8) To offer advice on writing, presenting and publishing students' academic work by an advisor.

5.6 Evaluation Procedure

1) Thesis

- A minimum of 3 committee members of a thesis proposal topic examination shall be hereby appointed according to the National Institute of Development Administration Bylaw on Education.

- The curriculum administrative committee must evaluate and monitor thesis progress.

- A minimum of 3 thesis defense committee members including qualified external experts shall be hereby appointed for a thesis defense oral examination according to National Institute of Development Administration Bylaw on Education.

- Date, time and a location for a thesis defense oral examination must be announced on GSEDA’s website and a bulletin board in order to enable outsiders to receive the information and engage in students’ thesis oral presentation towards the thesis defense committee.

- Thesis revision must be followed up and monitored in order to be conformed to the thesis defense committee’s advice.

- A thesis writing report format must be examined before a final draft is prepared.

- Thesis plagiarism, presentation and publication must be followed up and examined.

2) Independent Study

- Students must present their academic work in class towards their advisors, the committee, peers and participants.

- Students must revise the issues suggested by their advisors, the committee, peers and participants on the presentation day. Moreover, the advisors must examine, offer advice and evaluate students’ academic work repeatedly.

- Students must be reinforced to present their academic work on an independent study in the academic conferences convened by GSEDA as well as internal and external offices of National Institute of Development Administration, or to present for either academic journal publication or inclusive publication.

Section 4. Learning Outcome, Teaching Strategies and Evaluation

1. Development of Student Characteristics

Graduate School of Environmental Development Administration aims to enhance student characteristics in order to be knowledgeable, comprehensive and competent in environmental management administration integrated into interdisciplinary fields and in the public sector, the private sector as well as civil society.

Characteristics	Teaching Strategies or Student Activities
<ul style="list-style-type: none"> - Having leadership qualities and abilities to work as a team, to undertake work 	<ul style="list-style-type: none"> - To support in group work, allocation of responsibility as well as knowledge

of an interdisciplinary nature, and to collaborate with other institutions.	sharing, and to emphasize participation in work, brainstorming, idea acceptance, in-class discussion or discussion outside the classroom between experienced former students and current students.
- Being dedicated and altruistic.	- To support in learning activities both inside and outside of the classroom in order to raise awareness and promote the concept of social responsibility.
- Having cognitive skills relevant to environmental issues and holistic problem solving.	- To support in implementing a field study for each course in order to enable students to recognize a problem context and solutions from every sector, and to promote the process of analysis and synthesis for each problem inside the classroom in order to enable students to discuss the issues from field-based learning collaboratively.
- Having the ability to collaborate between organizations and every sector based on network building.	- To promote activities for network building among peers, former and current students, peers from other graduate schools and environmental agencies.

2. Learning Outcome Development

Expected Learning Outcomes (ELOs) of the program conforms to 5 Domains of Learning Outcomes according to Thai Qualifications Framework for Higher Education (TQF: HEd): 1) Morality and Ethics 2) Knowledge 3) Cognitive Skills 4) Interpersonal Skills and Responsibility, and 5) Numerical Analysis Skills, Communication and Information Technology Skills. The details are as follows:

Learning Outcomes		
Morality and Ethics	ELO1	Demonstrate a form of global environmental citizenship, and adhere to environmental values and ethics as environmental management professionals.
Knowledge	ELO2	Apply knowledge and tools relevant to environmental development administration in an interdisciplinary nature to adapt to a changing global environment.

Cognitive Skills	ELO3	Analyze complex real-world environmental problems and synthesize/propose solutions systematically and judgmentally.
	ELO4	Show proficiency in formulating, administering environmental policies/plans, and in evaluating environmental management performance.
Interpersonal Skills and Responsibility	ELO5	Portray leadership and accountability in the conduct of environmental-related decision-making and change.
Numerical Analysis Skills, Communication and Information Technology Skills	ELO6	Apply tools and techniques to analyze environmental-related data and information for discrete decision-making.
	ELO7	Communicate effectively orally and in writing in multidisciplinary teams and stakeholders, especially with specialists and professionals in development fields.

2.1 Morality and Ethics

2.1.1 Learning Outcome Related to Morality and Ethics

Regarding the program, remedial courses are provided for graduate studies. These courses provide general knowledge for students including the instruction of academic integrity and occupational ethics. The objectives of the courses are to raise students' awareness of the moral and ethical values in correspondence with the Institute's slogan that graduates of the Institute must have "Knowledge and Morality". Moreover, the core courses of this program include Environmental Ethics and Ideologies as well as Environmental Justice and Law, which cover environmental rule of law, ethics and good governance. In addition, moral and ethical frameworks, occupational and research ethics along with social awareness and responsibilities relevant to other courses are hereby embedded in the courses in order to enhance students' learning outcomes in morality and ethics, reflected global environmental citizenship.

1) Demonstrate a form of global environmental citizenship, and adhere to environmental values and ethics as environmental management professionals.

2.1.2 Teaching Strategies for Learning Development in Morality and Ethics

1) The organizational culture must be powered by "WISDOM" in order to cultivate students' discipline, morality and ethics as well as social responsibility. (S = Social Responsibility, D = Discipline, M = Morality)

2) Case studies relevant to environmental ethics must be applied to the course.

3) Students must have a responsibility, especially for group work. They must be trained to understand the roles of a leader as well as a group member.

4) Examination offenses and plagiarism are prohibited.

5) All of the lecturers must embed morality and ethics in every course.

6) Activities for promoting morality, ethics and social responsibility must be held.

2.1.3 Strategies for the Evaluation of Learning Outcome in Morality and Ethics

- 1) Evaluation of students' punctuality and attendance, assignment submission on the due date and activity engagement
- 2) Evaluation of students' discipline and unity in co-curricular activity participation, especially for social and environmental activities
- 3) The number of examination offenses
- 4) Evaluation of responsibilities assigned to students

2.2 Knowledge

2.2.1 Learning Outcome Related to Knowledge

Students must acquire knowledge and tools relevant to environmental and natural resources management from each course specified by the program. The objective is to apply knowledge and tools relevant to environmental development administration to an interdisciplinary nature in order to adapt to the global environmental change.

- 1) Apply knowledge and tools relevant to environmental development administration in an interdisciplinary nature to adapt to a changing global environment.

2.2.2 Teaching Strategies for Learning Development in Knowledge

Various teaching and learning methods are applied to the courses, placing the emphasis on philosophical, theoretical and conceptual understanding; essential principles of the course content; knowledge of policy setting, planning as well as natural resources and environmental management; independent study; research undertaking; issues of policy setting, planning as well as natural resources and environmental management, and academic presentation.

2.2.3 Strategies for the Evaluation of Learning Outcome in Knowledge

To evaluate from students' learning achievement in various aspects as follows:

- 1) Formative Assessment
- 2) Mid-term and Final Examinations
- 3) Evaluation of Students' Report Writing
- 4) Case Study Evaluation
- 5) Oral Presentation Evaluation

2.3 Cognitive Skills

2.3.1 Learning Outcome Related to Cognitive Skills

Students must be able to conceive, analyze and apply knowledge of policy setting, planning as well as natural resources and environmental management to the formulation of policies, strategies and plans, the administration of environmental policies and plans, and the evaluation of environmental management performance. Furthermore, they must be able to analyze complex real-world environmental issues and synthesize or propose solutions systematically and judgmentally with the capability to provide effective solutions to the problems or settlement of issues in correspondence with the following learning outcome in cognitive skills.

- 1) Analyze complex real-world environmental problems and synthesize/propose solutions systematically and judgmentally.

- 2) Show proficiency in formulating, administering environmental policies/plans, and in evaluating environmental management performance.

2.3.2 Teaching Strategies for Learning Development in Cognitive Skills

- 1) Case studies Relevant to Policy Setting, Planning as well as Natural Resources and Environmental Management
- 2) Group Discussion
- 3) Research Undertaking

2.3.3 Strategies for the Evaluation of Learning Outcome in Cognitive Skills

To evaluate from outcomes and participation in the group discussion, opinion expression in a classroom, oral presentation as well as the presentations of students' research articles or academic journals in academic conferences.

2.4 Interpersonal Skills and Responsibility

2.4.1 Learning Outcome Related to Interpersonal Skills and Responsibility

Master of Science Program in Environmental Management specifies a learning outcome in interpersonal skills and responsibility with the expectation of shaping students into qualified graduates who have leadership qualities, adaptability with the colleagues as a leader or a group member, responsibility of assigned tasks, and accountability in the conduct of environmental-related decision-making and change.

- 1) Portray leadership and accountability in the conduct of environmental-related decision-making and change.

2.4.2 Teaching Strategies for Interpersonal Skills and Responsibility

To apply activities to the instruction: group work, coordination, interview-based research on an experienced person or others, and community or institutional-based field studies.

2.4.3 Strategies for the Evaluation of Learning Outcome in Interpersonal Skills and Responsibility

To evaluate from students' behaviors and expression when they discuss, present group work in a classroom, and engage in activities along with completeness, explicitness and relevance of the data.

2.5 Numerical Analysis Skills, Communication and Information Technology Skills

2.5.1 Learning Outcome Related to Numerical Analysis Skills, Communication and Information Technology Skills

The expectation of this program is that students are able to apply tools to the analysis of environmental information technology in order to make insightful decisions relevant to environmental management, numerical analysis skills, communication and significant information technology skills, especially the current tools required for computer-based tasks. Furthermore, students are expected to utilize information technology properly as well as effective oral and written communication skills. Both an internal interdisciplinary team and external stakeholders can understand academic vocabulary relevant to interdisciplinary studies. In addition, they are able to utilize appropriate media for

presentation aids based on different audiences to communicate, especially with specialists and professionals in development fields.

1) Apply tools and techniques to analyze environmental-related data and information for discrete decision-making.

2) Communicate effectively orally and in writing in multidisciplinary teams and stakeholders, especially with specialists and professionals in development fields.

2.5.2 Teaching Strategies for Numerical Analysis Skills, Communication and Information Technology Skills

The strategies are based on practices both inside and outside the classroom. An in-class practice implements simulation-based learning, exercises or case studies written in recent situations. On the contrary, a practice outside the classroom is based on field studies. Students can take data collection practice in order to analyze data precisely. Furthermore, the Institute's Information Technology Center provides a service for offering advice on the utilization of information technology and a service for statistical software knowledge and training. The Institute also launched an internet system in order that students can utilize technology for accessing data and knowledge in every spot of the Institute. Additionally, the Institute transforms Library and Information Center into a digital library with the international database system, which enables students to utilize modern technology for doing research at any time. In addition, the National Institute of Development Administration provides remedial courses for English language skills development implemented by specialists from the Graduate School of Language and Communication. The instruction includes the utilization of language laboratory rooms, where students can utilize modern information technology.

2.5.3 Strategies for the Evaluation of Learning Outcome in Numerical Analysis Skills, Communication and Information Technology Skills

To evaluate from the abilities to discuss; express opinions; write the report, research and academic journal; cite documents, database as well as academic journals; and present academic work in the classroom as well as in academic conferences.

3. Curriculum Mapping

● Main Responsibility ◎ Subsidiary Responsibility

Course List	Expected Learning Outcomes (ELOs)						
	1.Morality and Ethics	2.Knowledge	3.Cognitive Skills		4.Interpersonal Skills and Responsibility	5.Numerical Analysis Skills, Communication and Information Technology Skills	
	ELO1	ELO2	ELO3	ELO4	ELO5	ELO6	ELO7
Remedial Courses							
ND 4000 Foundation for Graduate Studies	●	●	◎				●
LC 4001 Reading Skills Development in English for Graduate Studies	◎	●	◎		◎		●
LC 4002 Integrated English Language Skills Development	◎	●	◎		◎		●
LC 4011 Remedial Reading Skills Development in English for Graduate Studies	◎	●	◎		◎		●
LC 4012 Remedial Integrated English Language Skills Development	◎	●	◎		◎		●
Core Courses							
EM 6001 Environmental Ethics and Ideologies	●	●	◎		◎		
EM 6002 Environment, Ecology and Management Technology	◎	●	●			◎	
	Expected Learning Outcomes (ELOs)						

Course List	1.Morality and Ethics	2.Knowledge	3.Cognitive Skills		4.Interpersonal Skills and Responsibility	5.Numerical Analysis Skills, Communication and Information Technology Skills	
	ELO1	ELO2	ELO3	ELO4	ELO5	ELO6	ELO7
EM 6003 Principle of Environmental Development Administration for Sustainability	⊙	●		●	⊙		⊙
EM 6004 Environmental Research Methodology and Statistics	⊙	●	⊙			●	⊙
EM 6005 Environmental Policy and Planning for Sustainability	⊙	●		●	⊙		
EM 6006 Environmental Justice and Law	●	●	●		⊙		⊙
EM 6007 Environmental and Natural Resources Economics	⊙	●	●			●	
EM 6008 Environmental Information Technology	⊙	●	●			●	⊙
Elective Courses							
EM7101 Environmental Management through the King's Initiatives	●	●	⊙		⊙		
EM 7102 Sufficiency Economy Philosophy and Environmental Management	●	●	⊙		⊙		

Course List	Expected Learning Outcomes (ELOs)						
	1.Morality and Ethics	2.Knowledge	3.Cognitive Skills		4.Interpersonal Skills and Responsibility	5.Numerical Analysis Skills, Communication and Information Technology Skills	

	ELO1	ELO2	ELO3	ELO4	ELO5	ELO6	ELO7
EM 7103 Leadership and Change Management for Sustainability	●	●		●	●		◎
EM 7104 Project Management for Sustainability	◎	●		●	◎		
EM 7105 Environmental Governance	◎	●	●				◎
EM 7106 International Environment Management	◎	●	●				◎
EM 7107 Environmental and Health Impact Assessment	◎	●		●	◎	◎	◎
EM 7108 Social Impact Assessment	◎	●		●	◎	◎	◎
EM 7109 Environmental Risk Assessment and Decision Making	◎	●		●	◎	◎	◎
EM 7110 Environmental Conflict Management and Public Participation	◎	●	●		◎		◎
EM 7111 Environmental Data Collection and Analysis	◎	●	●		◎	●	

Course List	Expected Learning Outcomes (ELOs)						
	1.Morality and Ethics	2.Knowledge	3.Cognitive Skills		4.Interpersonal Skills and Responsibility	5.Numerical Analysis Skills, Communication and Information Technology Skills	
	ELO1	ELO2	ELO3	ELO4	ELO5	ELO6	ELO7
EM 7201 Clean Technology	◎	●	●		◎	◎	◎

EM 7202 Pollution Control and Management	⊙	●	●		⊙		⊙
EM 7203 Eco-Industrial Management	⊙	●	●		⊙	⊙	⊙
EM 7204 Energy Management and Conservation	⊙	●	●		⊙	⊙	⊙
EM 7205 Life Cycle Assessment	⊙	●	●			●	
EM 7206 Environmental Management and Safety Standards	⊙	●		●	⊙		⊙
EM 7207 Environmental Business	⊙	●	●		⊙	⊙	⊙
EM 7208 Environmental and Social Responsibility	⊙	●		⊙	●		⊙
EM 7301 Climate Change Management	⊙	●	●			⊙	

Course List	Expected Learning Outcomes (ELOs)						
	1.Morality and Ethics	2.Knowledge	3.Cognitive Skills		4.Interpersonal Skills and Responsibility	5.Numerical Analysis Skills, Communication and Information Technology Skills	
	ELO1	ELO2	ELO3	ELO4	ELO5	ELO6	ELO7
EM 7302 Disaster Management	⊙	●	●		⊙	⊙	⊙
EM 7303 Soil and Water Resources Management	⊙	●	●			⊙	⊙
EM 7304 Natural Resources and Biodiversity Resource Management	⊙	●	●			⊙	⊙

EM 7305 Marine and Coastal Resource Management	⊙	●	●			⊙	⊙
EM 7306 Solid and Hazardous Waste Management	⊙	●	●			⊙	⊙
EM 7307 Air Quality Management	⊙	●	●			⊙	⊙
EM 7308 Urban and Community Environmental Management for Sustainability	⊙	●		●	⊙		⊙
EM 7309 Land Use and Urban Planning	⊙	●		●	⊙	⊙	⊙
EM 7310 Environmental Health Management	⊙	●	●		⊙		⊙

Course List	Expected Learning Outcomes (ELOs)						
	1.Morality and Ethics	2.Knowledge	3.Cognitive Skills		4.Interpersonal Skills and Responsibility	5.Numerical Analysis Skills, Communication and Information Technology Skills	
	ELO1	ELO2	ELO3	ELO4	ELO5	ELO6	ELO7
EM 8001 Environmental Management Seminar							
EM 8002 Environmental Practicum	⊙	●	●		⊙	⊙	⊙
EM 8003 Special Topics in Environmental Management	⊙	●	●		⊙		
EM 8004 Directed Study	⊙	●	●		⊙		
EM 9000 Independent Study	⊙	●	●		⊙	●	●

EM 9001 Thesis	◎	●	●		◎	●	●
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Remark: The remedial courses of ND 4000 Foundation for Graduate Studies, LC 4001 Reading Skills Development in English for Graduate Studies, LC 4002 Integrated English Language Skills Development, LC 4011 Remedial Reading Skills Development in English for Graduate Studies, and LC 4012 Remedial Integrated English Language Skills Development are non-credits. Requirements and exemptions of remedial courses for graduate studies of the Institute as well as English foundation courses of Graduate School of Language and Communication must conform to the Institute’s conditions.

Section 5. Student Evaluation Criteria

1. Grading Rules/Guidelines

Course evaluation must be in accordance with the National Institute of Development Administration Bylaw on Education as follows:

Education records refer to a complete academic record of grades, exercises, report writing, written and critical examinations, field study, other tasks assigned by the lecturer, any other evaluation forms as assigned by the lecturer, and results of a thesis/dissertation as well as independent study.

The aforementioned education records shall be graded as follows:

A	=	4.0	meaning	Excellent
A -	=	3.7	meaning	Very good
B +	=	3.3	meaning	Good
B	=	3.0	meaning	Fairly good
B -	=	2.7	meaning	Almost good
C +	=	2.3	meaning	Fair
C	=	2.0	meaning	Almost fair
C -	=	1.7	meaning	Poor
D	=	1.0	meaning	Very poor
F	=	0	meaning	Failure
W			meaning	Withdraw
I			meaning	Incomplete
S			meaning	Satisfactory
U			meaning	Unsatisfactory
AU			meaning	Audit
P			meaning	Pass
IP			meaning	In progress
T			meaning	Terminated
TR			meaning	Transfer, work with which there is no comparable grade

2. Standard Verification Process for Student Achievement

2.1 Standard Verification for Student Achievement of Students who still have not Completed the Program

Standard verification process for student achievement of students who still have not completed the program:

- Regarding a course level, students must complete teaching and learning evaluation forms of each course and submit to the course lecturer, dean and president. The purposes of the evaluation are to resolve any difficulties in teaching and learning in each course and to cope with any limitations.

- Regarding a program level, internal quality assurance system both at the Graduate School level and at the Institute level are implemented for the program standard verification.

2.2 Standard Verification for Student Achievement of Graduates

- A program standard verification conference is convened by the GSEAD alumni and alumni association, accompanied by external experts with the intention of developing and revising the program intermittently.

- Graduates' occupational status, salary and evaluation of career preparation are surveyed.

- The survey of satisfaction of graduates' employers towards graduates' qualities; for example, graduates' strengths and weaknesses, are implemented with the intention of revising the program.

- The survey of the program interest, including GSDEA's image, is assessed by NIDA Poll intermittently.

3. Graduation Requirements

Master of Science (Environmental Management) shall be conferred according to the following requirements:

- Students shall follow graduation requirements according to the National Institute of Development Administration Bylaw on Education and the announcement of the Ministry of Education on the Graduate Program Standard Criteria B.E.2558.

- Students shall be proficient in English or foreign language skills and/or other specializations instead according to the Institute's requirements; exempt from the first clause. It shall be in accordance with program requirements or the announcement of the National Institute of Development Administration.

- Students shall complete all of the program requirements and achieve all of the enrolled courses with total credits specified by the program. Their GPA for the total credits must be more than 3.00. Nevertheless, the credits and GPA of the following courses are not calculated: ND 4000, LC 4001, LC 4002, LC 4011 and LC 4012; or the specific courses relevant to English or foreign language skills.

- Students shall achieve a minimum of 3.00 for GPA of the core course with the code 6xxx.

- Students shall "pass" a comprehensive examination specified by the program and/or other examinations in accordance with the requirements.

- Students shall "pass" an oral examination specified by the program.

- In the case of Independent Study (Plan B) selection, students shall prepare a final report and submit to the graduate school before the deadline. The advisor shall be a person grading an independent study final report. Moreover, the whole or part of it shall be published in any publications, which its data can be retrieved.

- In the case of Thesis (Plan A2) selection, students, shall initially submit and pass a thesis proposal with 3 credits. Consequently, they shall take thesis examinations, including submission of

a thesis report to the graduate school. The thesis report shall be detected for a plagiarism and examined its formatting by an office specified by the Institute.

- In the case of thesis selection, students shall prepare a thesis report in a form of an academic paper. The complete thesis report shall be published, or the whole or part of it shall be proceeded for approval for publication in academic journals or publications; or presented in academic conferences.

- Students shall complete the program within 5 years, counting from the start date of the first enrolled semester; however, duration of study can be, hereby, extended according to the announcement of the Institute on Extension of Study.

Section 6. Professional Development of Faculty Members

1. New Faculty Member Orientation

- New faculty member orientation is aimed at understanding new faculty members' backgrounds and personal information, vision, missions and duties. This orientation builds their organizational commitment and positive attitudes towards the organization, contributing to good relationships among the colleagues. Another objective of the orientation is to enable new faculty members to realize their roles, responsibilities and fringe benefits.

- New faculty members meet the Dean for understanding the Institute's expectations as well as performance-driven policies for new faculty members.

- Dean and senior faculty members address the history of the graduate school, philosophy, school administration, program objectives, program contents, learning management, activities as well as research undertaking coached by senior faculty members.

- New faculty members are supported in extending their existing knowledge and broadening their experiences through research undertaking in order to enhance their teaching and research skills progressively.

- New faculty members are supported in Postdoctoral Fellowship, training, seminars, study visits to organizations as well as national and/or international conferences.

2. Knowledge and Skill Development for Faculty Members

2.1 Skill Development of Teaching and Learning Management, Assessment and Evaluation

- Teaching and learning evaluation is provided for each course. Dean must follow up the results of the evaluation and pass on advice about instruction, assessment and evaluation.

- Faculty members are supported in extending the existing knowledge through research undertaking frequently. Additionally, faculty members are supported in integrating their research into instruction, or applying their research as case studies to students.

- Faculty members are supported in engaging in academic conferences both inside and outside Institute; or both in Thailand and in foreign countries. This support is aimed at developing faculty members' skills of instruction, research and academic services.

2.2 Other Academic and Professional Development

- Faculty members are supported in budgets for research undertaking.

- Faculty members are supported in budgets for textbook writing for the instruction.

- Faculty members are supported in academic paper presentation both inside and outside Thailand.

- Faculty members are supported in academic publication both in a national academic journal and in an international academic journal.

- Faculty members are supported in engaging in research with network organizations, environmental associations or relevant agencies.

- Faculty members are supported in academic position request.

- Faculty members are supported in international professor exchange. They might be on an exchange with faculty members of top universities in foreign countries.

Section 7. Program Quality Assurance

1. Standard Control

Program management and administration must be in accordance with the announcement of standards criteria for the program and Thai Qualifications Framework for Higher Education (TQF: HEd) or Level Qualification Framework in Field throughout the implementation of the program. For instance,

- The program must be widely disseminated.
- Student admission must be well-planned. Likewise, a student selection process must be systematic.
- Program structure and administration must be provided.
- Course Lists enrolled by students in each semester must be scheduled.
- Systematic examination and class schedule must be provided.
- Task-based teaching must be provided for faculty members properly and equitably, and must be in accordance with the Institute's rules/regulations.
- Assessment of each course must be standard and explicit. It can be investigated and informed to students.
- Teaching and Learning evaluation of all the course lecturers must be implemented in each course and every semester, along with the improvement.
- The opinion poll of graduates towards the program must be conducted, which is aimed at revising the program to be up-to-date and conformed to graduates' requirements of occupations.

2. Graduates

Qualified graduates must be in accordance with Thai Qualifications Framework for Higher Education (TQF: HEd), considering the following terms:

- Students' Learning Outcomes and Academic Work

- Graduates' Academic Publication

3. Students

Regarding student admission and preparation for the program, advice on a dissertation and an independent study are offered to students. Additionally, students are informed of the educational service process or outcomes (Student Retention, Graduation, Satisfaction and Results of Complaints Management for Students).

4. Faculty Members

Management and development of faculty members must be implemented from the beginning of new faculty member recruitment. The selection process of new faculty members must be appropriate and explicit. Faculty members of the program must be qualified and specialize in their fields of study. In addition, they must be progressive in conducting academic work. For instance,

- The announcement and recruitment of qualified faculty members who are proficient and meet the program requirements are implemented. This procedure must be in accordance with NIDA's rules and criteria for new faculty member selection.
- Faculty members of the program's skills must be enhanced frequently both in academic work and in external work experience.
- Faculty members of the program must collaborate to follow up, improve, review and revise the curriculum.
- Practical methods of faculty members' development through tasks as well as the evaluation of work performance for employment extension must be provided.
- Criteria for the academic promotion of faculty members must be explicit.
- Criteria for designation of part-time course lecturers must be established.
- Criteria for the academic promotion of part-time course lecturers must be established, or they must be received academic approval of, for example, Distinguished Scholar.

5. Program, Teaching and Learning, and Student Evaluation

Program management must be efficient and effective continuously with up-to-date program design and course contents. For instance,

- Lecturers' working assignment management system, as well as teaching and learning process, must be implemented in each course.
- Student assessment must be provided in various ways and must be veritable.
- Program performance in compliance with Thai Qualifications Framework for Higher Education (TQF: HEd) must be implemented.

6. Learning Support Facilities

- The implementation system of department, graduate school and the Institute must be arranged by full-time faculty members for the availability of learning support facilities. Examples of availability are the physical readiness, technological equipment as well as facilities or resources facilitating learning.
- A number of learning support facilities must be sufficient and suitable for teaching and learning management.
- The quality of learning support facilities must be improved based on the results of students and lecturers' evaluation of satisfaction towards learning support facilities.

- Instructors of the Graduate School must be employed to offer advice on the program, teaching and learning, enrollment as well as the Institute's rules and regulations. The advice is aimed at assisting students to graduate in compliance with program objectives.

- Alumni relations office is established for the purpose that the former students can have a proper location to pass the current students on advice about the program instruction.

7. Key Performance Indicators

Key Performance Indicators consist of 12 indicators as follows:

Key Performance Indicators	B.E. 2560	B.E. 2561	B.E. 2562
1. A minimum of 80 percent of full-time faculty members engages in the conference for planning, following up and reconsidering program implementation.	X	X	X
2. Form TQF2 Program Description are provided, conforming to Thai Qualifications Framework (TQR) or Level Qualification Framework in discipline/field (if any).	X	X	X
3. Form TQF3 Course Syllabus and Form TQF4 Experience Description (if any) are provided for all the courses at least before the start of the program each semester.	X	X	X
4. Form TQF5 Report of Course Implementation Result and Form TQF6 Report of Field Experience Implementation Result (if any) are provided for all the courses within 30 days after the end of the semester.	X	X	X
5. Form TQF7 Report of Program Implementation Result is provided within 60 days after the end of each academic year.	X	X	X
6. Standard Verification for Student Achievement in compliance with the standard of learning outcomes specified in TQF3 and TQF4 (if any) is implemented at least 25 percent of each available course in each academic year.	X	X	X
7. Teaching and Learning Management, Teaching Strategies or Learning Outcome Evaluation based on Performance Evaluation reported in TQF7 at the preceding year are developed and revised.		X	X

8. All of the new faculty members (if any) are engaged in orientation or offered advice about teaching and learning management.	X	X	X
Key Performance Indicators	B.E.2560	B.E.2561	B.E.2562
9. Academic and/or professional skills of the entire faculty member are enhanced at least once a year.	X	X	X
10. Academic and/or professional skills of supporting staff in teaching and learning (if any) are enhanced at least 50 percent per year.	X	X	X
11. The average of the final-year students/graduates' satisfaction level towards program quality is not lower than 3.5 from the full point of 5.0.		X	X
12. The average of the satisfaction level of employer's graduates towards graduates is not lower than 3.5 from the full point of 5.0.			X
Total Key Indicators (The Number of Indicators)	9	11	12
Total Target Value of Total Key Indicators (The Number of Indicators)	9	11	12

Section 8. Evaluation, Improvement and Implementation of the Program

1. Assessment of Teaching Effectiveness

1.1 Assessment of Teaching Strategy

- Observing students' self-confidence and attention in learning from their behaviors and reaction.
- Observing students' activity participation for monitoring students' performance progress in teamwork.
- Observing the establishment of a connection between students and external institutions for monitoring the ability to establish a connection for resolving environmental issues in the public, private and community sectors.
- Observing the public project that raises public awareness.
- Evaluating student inquiries.
- Evaluating instructional media/materials and learning development.
- Convening a faculty conference for teaching and learning evaluation, knowledge sharing as well as recommendations.

1.2 Assessment of the Lecturers' Skills in Applying Teaching Strategies

- Evaluation of course lecturers in every aspect of teaching based on students' perspectives: punctuality, teaching strategies, an explanation of course objectives, clarification of course description, criteria for assessment and evaluation, instructional media application and students' activity participation
- Research undertaking or academic writing developed to be instructional media and for students' learning

2. Overall Evaluation of the Program

- 2.1 Evaluated by the current students
- 2.2 Evaluated by the former students
- 2.3 Evaluated by qualified experts of relevant fields
- 2.4 Evaluated by employers' graduates
- 2.5 Evaluated by common people
- 2.6 Evaluated by faculty members and staff members

3. Assessment of Program Implementation Based on the Program Specification

Program implementation is evaluated based on Key Performance Indicators appeared on program specification and evaluated by internal assessment committee at the faculty level.

4. Review of Evaluation Results, and Plans for Program Revision and Teaching Strategies

Implemented by

- 4.1 Informing evaluation results of each course to course lecturers and submitting to Dean for consideration.
- 4.2 Reporting annual implementation results provided by the program director and submitting to the curriculum administrative committee.
- 4.3 Convening a conference between the curriculum administrative committee and faculty members of the graduate school for consideration of program implementation results along with program review and plans as well as plans for teaching strategies.

Appendix

Comparisons of program structures and course lists between Master of Science Program in Environmental Management B.E.2555 and Revised Program of Master of Science in Environmental Management B.E.2560

Program Details	Master of Science Program in Environmental Management B.E.2555	Revised Program for Master of Science in Environmental Management B.E.2560	Remarks
Plan A2 (Thesis)			
Remedial Courses	9 Credits (non-credits)	Remain Unchanged	-
Core Courses	12 Credits	24 Credits	Revised to draw the parallel between student achievement and NIDA's and GSEDA's rationale.
Major Courses	12 Credits	Cancelled	Revised to implement effective program management administration.
Elective Courses	3 Credits	Remain Unchanged	Revised to offer students more options for the courses interested.
Thesis	12 Credits	Remain Unchanged	
Independent Study	-	Remain Unchanged	
Comprehensive Examination	Taken	Remain Unchanged	
Thesis Examination	Taken	Remain Unchanged	
Oral Examination	-	Remain Unchanged	

Program Details	Master of Science Program in Environmental Management B.E.2555	Revised Program of Master of Science in Environmental Management B.E.2560	Remarks
Plan B (Independent Study)			
Remedial Courses	9 Credits (Non-credits)	Remain Unchanged	

Core Courses	12 Credits	24 Credits	Revised to draw the parallel between student achievement and NIDA's and GSEDA's rationale.
Major Courses	15 Credits	Cancelled	Revised to implement effective program management administration.
Elective Courses	9 Credits	12 Credits	Revised to offer students more options for their interested courses.
Thesis	-	Remain Unchanged	
Independent Study	3 Credits	Remain Unchanged	
Comprehensive Examination	Taken	Remain Unchanged	
Thesis Examination	-	Remain Unchanged	
Oral Examination	Taken	Remain Unchanged	

Program Details	Master of Science Program in Environmental Management B.E.2555	Revised Program of Master of Science in Environmental Management B.E.2560	Remarks
	Core Courses consist of 4 courses with 12 credits.	Core Courses consist of 8 courses with 24 credits.	
	EM 6001 Ecology and Environmental Ethics	EM 6001 Environmental Ethics and Ideologies	The former courses of EM 6001 and EM 7101 was integrated, and the content was revised to be in line with the current situations. The

	EM 7101 Politico-Socioeconomic Factors in Environmental Management		course title was also revised to be EM 6001 Environmental Ethics and Ideologies.
	EM 6001 Ecology and Environmental Ethics EM 6002 Environmental Science and Technology	EM 6002 Environment, Ecology and Management Technology	The former courses of EM 6001 and EM 6002 was integrated, and the content was revised to be in line with the current situations.
	EM 6003 Environmental Policy, Planning and Management	EM 6003 Principle of Environmental Development Administration for Sustainability	The content relevant to the Principle of Environmental Development Administration for Sustainability was separated from the former course. It was implemented as a new course, which the course title is named after the content: EM 6003 Principle of Environmental Development Administration for Sustainability.

Program Details	Master of Science Program in Environmental Management B.E.2555	Revised Program of Master of Science in Environmental Management B.E.2560	Remarks
	EM 6004 Environmental Research Methodology and Statistics	EM 6004 Environmental Research Methodology and Statistics	Remain Unchanged
	EM 6003 Environmental Policy, Planning and Management	EM 6005 Environmental Policy and Planning for Sustainability	The course title, description and content were revised in order to emphasize the peripheral vision of integrated sustainable development. The course was revised because of the connections between environmental

			management and all of the interdisciplinary fields.
	EM 7102 Environmental Laws and Organizations	EM 6006 Environmental Justice and Law	The former course of EM 7102 was integrated into this new course with the objective of providing students the tools for management administration. The course title and description were revised with the addition of “Justice” in order to enhance students’ understanding of environmental justice, the root cause of the problems and environmental justice litigation.

Program Details	Master of Science Program in Environmental Management B.E.2555	Revised Program of Master of Science in Environmental Management B.E.2560	Remarks
	EM 7103 Environmental and Natural Resources Economics EM 7511 Environmental Business Managerial Economics	EM 6007 Environmental and Natural Resources Economics	The former major course of EM 7103 and the former elective course of EM 7511 were integrated and become this new course. The purpose of this integration is to enhance students’ management administration skill and provide tools for management administration. Due to the impacts of the project implementation, an economic internal rate of return must be analyzed along with economic cost benefit.
	EM 7206 Environmental Information Technology	EM 6008 Environmental Information Technology	The former major course of EM 7206 was integrated into this new course. However, the

			course description and academic content were revised in order to apply various information technology systems to the process of environmental management administration and decision-making.
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Program Details	Master of Science Program in Environmental Management B.E.2555	Revised Program of Master of Science in Environmental Management B.E.2560	Remarks
	<p>Major courses consist of 3 courses with 12 credits:</p> <ol style="list-style-type: none"> 1. Environmental Management and Development 2. Environmental Science and Technology 3. Environmental Management in Business and Industrial Organizations 	Cancelled	Major courses were canceled and Integrated into elective courses with the intention of offering students more options for the courses interested.

Program Details	Master of Science Program in Environmental Management B.E.2555	Revised Program of Master of Science in Environmental Management B.E.2560	Remarks
	<p>Elective courses were not categorized.</p>	<p>Elective courses for Plan B consist of 4 courses with 12 credits; on the contrary, Elective courses for Plan A2 consist of 1 course with 3 credits.</p> <p>Elective courses are divided into 3 categories:</p> <ol style="list-style-type: none"> 1) Environmental Development Administration 2) Environmental Management in Business and Industrial Organizations 3) Issue-based Environmental Management 	<p>Major courses were changed into elective courses with 3 categories.</p> <ul style="list-style-type: none"> - Major courses were canceled and integrated into elective courses. The new elective courses are categorized into different fields with the purposes of providing flexibility in teaching and learning as well as offering students more options for their interested fields. - Students who apply for Plan B have more opportunity to attend their interested elective courses, instead of attending only major courses. - Plan A2 remains unchanged.

Program Details	Master of Science Program in Environmental Management B.E.2555	Revised Program of Master of Science in Environmental Management B.E.2560	Remarks
		1) Environmental Development Administration	
	-	EM 7101 Environmental Management through the King's Initiatives	An objective of this new course is to enable students to acquire knowledge from the application of the King's initiatives in environmental management, which is significant for the current environmental problem solving.
	EM 7501 Sufficiency Economy Approach in Environmental Management	EM 7102 Sufficiency Economy Philosophy and Environmental Management	The former elective course of EM 7501 was integrated into this new course. The course title and description were revised in order to apply philosophy to the implementation of fieldwork.
	-	EM 7103 Leadership and Change Management for Sustainability	This new course is aimed at attaching significance to leadership qualities as well as administration, which are the Institute's significant objectives.
	EM 7104 Project Management for Sustainability	EM 7104 Project Management for Sustainability	Remain Unchanged

Program Details	Master of Science Program in Environmental Management B.E.2555	Revised Program of Master of Science in Environmental Management B.E.2560	Remarks
	EM 7105 Environmental Governance EM 7512 Global Environmental Governance	EM 7105 Environmental Governance	The former major course of EM 7105 and the former elective course of EM 7512 were integrated and become this new course.
	-	EM 7106 International Environmental Management	This new course is aimed at attaching significance to international environmental management considering the current circumstance of the borderless world.
	EM 7106 Environmental and Health Impact Assessment EM 7508 Environmental Assessment	EM 7107 Environmental and Health Impact Assessment	The former major course of EM 7106 and the former elective course of EM 7508 were integrated and become this new course.
	-	EM 7108 Social Impact Assessment	This new course is aimed at attaching significance to the society considering impact assessment from project implementation.
	EM 7509 Environmental Risk Assessment	EM 7109 Environmental Risk Assessment and Decision Making	The former elective course of EM 7509 was integrated into this new course. The course title was revised with the objectives of implementing environmental risk management before decision-making.

Program Details	Master of Science Program in Environmental Management B.E.2555	Revised Program of Master of Science in Environmental Management B.E.2560	Remarks
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	EM 7107 Environmental Conflict Management EM 7510 Public Participation in Environmental Management	EM 7110 Environmental Conflict Management and Public Participation	The former major course of EM 7107 and the former elective course of EM 7510 were integrated and become this new course. The objective of the new course is to enhance the integrated environmental problem-solving skill.
	-	EM 7111 Environmental Data Collection and Analysis	This new course is aimed at attaching significance to environmental data, required collection and analysis in order to make decisions.

Program Details	Master of Science Program in Environmental Management B.E.2555	Revised Program of Master of Science in Environmental Management B.E.2560	Remarks
		2) Environmental Management in Business	

		and Industrial Organizations	
	EM 7301 Clean Technology	EM 7201 Clean Technology	The course code was revised.
	EM 7201 Applied Environmental Chemistry EM 7202 Pollution Control	EM 7202 Pollution Control and Management	The former major courses of EM 7201 and EM 7202 were integrated and become a new course. The course title was revised with the objective of emphasizing integrated management.
	EM 7302 Eco-Industrial Management	EM 7203 Eco-Industrial Management	The course code was revised.
	EM 7203 Environmental and Energy Technology EM 7503 Energy Conservation and Management	EM 7204 Energy Management and Conservation	The former major course of EM 7203 and the former elective course of EM 7503 were integrated and become a new course.
	EM 7303 Life Cycle Assessment	EM 7205 Life Cycle Assessment	The course code was revised.
	EM 7306 Environmental Management and Safety Standards	EM 7206 Environmental Management and Safety Standards	The course code was revised.

Program Details	Master of Science Program in Environmental Management B.E.2555	Revised Program of Master of Science in Environmental Management B.E.2560	Remarks
	EM 7305 Environmental Business	EM 7207 Environmental Business	The former major course of EM 7305 was integrated into this new course, and the course code was revised.
	EM 7304 Social Responsibility	EM 7208 Environmental and Social Responsibility	The former major course of EM 7304 was integrated into this new course. The course title was revised, including "Environment". In

			addition, this course attaches more significance to an academic content of environmental and social responsibility.
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Program Details	Master of Science Program in Environmental Management B.E.2555	Revised Program of Master of Science in Environmental Management B.E.2560	Remarks
		3) Issue-based Environmental Management	
	EM 7205 Science of Climate Change	EM 7301 Climate Change Management	The former course of EM 7205 Science of Climate Change was integrated into this new course.
	-	EM 7302 Disaster Management	The objective of this new course is to attach significance to disaster management, considering the current circumstances of a disaster that strikes terribly.
	EM 7307 Waste water Treatment EM 7506 Water Resource Management	EM 7303 Soil and Water Resources Management	The former major course of EM 7307 and the former elective course of EM 7506 were integrated and become this new course. The course content is the integration of

			knowledge of wastewater and water resources management.
	EM 7502 Biodiversity Resource Management	EM 7304 Natural Resources and Biodiversity Resource Management	The former major course of EM 7502 was integrated into this new course. The course title was revised with the addition of “Natural Resources”. The course is also aimed at attaching significance to natural resources management.

Program Details	Master of Science Program in Environmental Management B.E.2555	Revised Program of Master of Science in Environmental Management B.E.2560	Remarks
	-	EM 7305 Marine and Coastal Resource Management	A new course
	EM 7204 Waste Management Technology	EM 7306 Social and Hazardous Waste Management	The former major courses of EM 7204 and EM 7309 were integrated into this new course. In addition, the course title and code were revised.
	EM 7205 Science of Climate Change EM 7308 Air Pollution Control EM 7507 Air Quality Management	EM 7307 Air Quality Management	The former major courses of EM 7205 and EM 7308, and the former elective course of EM 7507 were integrated into the new course. The course content is the integration of the knowledge of air quality and air pollution management.
	EM 7504 Urban and Community Environmental Management	EM 7308 Urban and Community Environmental Management for Sustainability	The former elective course of EM 7504 was integrated into this new course. The course title and description were also revised.
	-	EM 7309 Land Use and Urban Planning	A new course

	EM 7505 Environmental Health Management	EM 7310 Environmental Health Management	The former elective course of EM 7505 was integrated into this new course.
	EM 7309 Industrial Waste Disposal and Management	-	Canceled

Program Details	Master of Science Program in Environmental Management B.E.2555	Revised Program of Master of Science in Environmental Management B.E.2560	Remarks
		Other elective courses consist of 4 courses:	
	EM 8000 Environmental Management Seminar	EM 8001 Environmental Management Seminar	The course code was revised.
	-	EM 8002 Environmental Practicum	The objective of this new course is to enhance the skills of new students who are inexperienced, especially for environmental management skill.
	EM 8001 Special Topics in Environmental Management	EM 8003 Special Topics in Environmental Management	The course code was revised.
	EM 8002 Directed Study	EM 8004 Directed Study	The course code was revised.
Plan B	EM 9000 Independent Study	EM 9000 Independent Study	Remain Unchanged
Plan A2	EM 9004 Thesis	EM 9004 Thesis	Remain Unchanged

Program Details	Master of Science Program in Environmental Management B.E.2555	Revised Program of Master of Science in Environmental Management B.E.2560	Remarks
Faculty Members Responsible for the Program	Revised Program of Master of Science in Environmental Management B.E.2555 (Bangkok) 1. Associate Professor Dr. Wisakha Phoochinda 2. Assistant Professor Dr. Pakpong Pochanart 3. Assistant Professor Dr. Witchuda Srang-iam	Revised Program of Master of Science in Environmental Management B.E.2560 (Bangkok) 1. Associate Professor Dr. Wisakha Phoochinda 2. Assistant Professor Dr. Pakpong Pochanart 3. Assistant Professor Dr. Witchuda Srang-iam	Remain Unchanged
	Revised Program of Master of Science in Environmental Management B.E.2555 (Non-formal Education Center, Rayong Province) 1. Associate Professor Dr. Chamlong Poboon 2. Assistant Professor Dr. Chutarat Chompunth 3. Associate Professor Dr. Sompote Kunnoot	Revised Program of Master of Science in Environmental Management B.E.2560 (Non-formal Education Center, Rayong Province) 1. Associate Professor Dr. Chamlong Poboon 2. Assistant Professor Dr. Chutarat Chompunth 3. Associate Professor Dr. Sompote Kunnoot	Remain Unchanged
Full-time Faculty Members of the Program	Revised Program of Master of Science in Environmental Management B.E.2555 (Bangkok) 1. Professor Dr. Tawadchai Suppadit 2. Assistant Professor Dr. Warangkana Sornil	Revised Program of Master of Science in Environmental Management B.E.2560 (Bangkok), and Revised Program of Master of Science in Environmental	A list of full-time faculty members of the program was modified according to the Graduate Program Standard Criteria B.E. 2558. In addition, it was modified due to retirement and

	<p>3. Associate Professor Dr. Wisakha Phoochinda</p> <p>4. Assistant Professor Dr. Pakpong Pochanart</p> <p>5. Assistant Professor Dr. Witchuda Srang-iam</p>	<p>Management B.E.2560 (Non-formal Education Center, Rayong Province)</p> <p>1. Associate Professor Dr. Wisakha Phoochinda</p> <p>2. Associate Professor Dr. Chamlong Poboorn</p>	<p>secondment of some faculty members.</p>
	<p>Revised Program of Master of Science in Environmental Management B.E.2555 (Non-formal Education Center, Rayong Province)</p> <p>1. Associate Professor Dr. Boonchong Chawsithiwong</p> <p>2. Assistant Professor Dr. Tangon Munjaiton</p> <p>3. Associate Professor Dr. Sompote Kunnot</p> <p>4. Associate Professor Dr. Chamlong Poboorn</p> <p>5. Assistant Professor Dr. Chutarat Chompunth</p>	<p>3. Assistant Professor Dr. Pakpong Pochanart</p> <p>4. Assistant Professor Dr. Witchuda Srang-iam</p> <p>5. Assistant Professor Dr. Chutarat Chompunth</p> <p>6. Associate Professor Dr. Sompote Kunnot</p>	