

Course Detail

Master of Science Program in Environmental Management and Technology

Course Title: Master of Science Program in Environmental Management and Technology (International Program)

Master Degree: Master of Science (Environmental Management and Technology)

Academic Institution: Faculty of Environment and Resource Studies, Mahidol University, Thailand

Duration: 2 years (August 2022 – May 2024)

Background and Rational:

In highly competitive job market internationally, graduates with the environmental management skills and knowledge have distinctive vision and interdisciplinary approach to harnessing the sustainability of natural resources and environmentally friendly. Several international conventions relevant to environmental exploitation across the globe have been embedded into a single national policy for further implementation including climate change or UNFCCC. Those evolve aspects of sharing resources and technologies including responsibilities and accountabilities on environmental problems among countries all over the world. In particular the environmental transboundary problems that become a common debate in the international meetings with an attempt to have global cooperation on several kinds of projects such as a goal-set for greenhouse gas reduction. Aside, all societies have similar social problems from local to international level that related to the environment such as pollution, natural resources deterioration, environmental justice, etc. With this respect, the principles of environmental management and technology can help graduates to learn how to systematically think and integrate all disciplinary to achieve sustainability in environmental exploitation.

The program of environmental management and technology is a pathway for graduates to learn and eventually transfer their knowledge and apply their skills to internationally enhance the better environmental conditions. Especially, the program also aware on the global paradigm shift with sustainable development goals (17 SDGs) which is embedded in the National Strategic Plan 20 years for Thailand (B.E. 2560-2580) and the National Plan of Economic and Social Development 13 (B.E. 2565-2569). Thus, courses provided by our program have been developed based on multidisciplinary approach by integrating between scientific and socio-economic approach from strong experience experts both at the faculty and from other international organizations. Students will learn how to plan, collect data in the field, analyze

data statistically and reliably, as well as well communicate and select appropriate technology to transfer environmental information to all stakeholders.

Our program has well equip and standard certified laboratory as well as other facilities e.g. computer pool, license software for study, a common room for students, etc. In addition, the Covid-19 pandemic has been an experience for a “New Normal” to be concerned along with the development in three major aspects: 1) balancing between human and nature; 2) balancing the relationship among people in societies; and 3) building the sufficient growth. Therefore, we have well adapted to online educational system, in case of locking down against pandemics, with necessary facilities including software for classroom teaching e.g. Microsoft team, Google classroom, Zoom, Webex, etc. We aim to serve environmentalist who have strong disciplines and competencies in environmental management and technology that wish to support the vision of Faculty of Environment and Resource Studies to be the number one institution for environmental study in Thailand by 2025, and the top three in ASEAN by 2031. This is also to full fill Mahidol’s mission to enhance graduates to integrate knowledge and skills of environmental management and technology to excel in health and sciences with integrity for the benefit of humankind.

Remark: The measures for teaching-studying management model under COVID-19 pandemic prevention/control will be followed the regulations and announcements by Faculty of Graduate Study and Mahidol University

Objectives:

To produce graduates who have the characteristics, knowledge and skill as follows:

6.1 They must be leaders with integrity who are devoted to public service and are able to perform their duties professionally;

6.2 They must have knowledge and professional skills in the field of environmental management and technology, system approach, and green industry at both the national and global levels;

6.3 They must have the analytical skills, creative thinking, and cognitive ability to evaluate and contribute to developing the knowledge of environmental management and environmental technology and science-related green industry;

6.4 They must have skills in working on the foundation of knowledge from different fields in order to manage conflicts and continuously improve. They must have a passion for knowledge and believe in lifelong learning;

6.5 They must have skills to apply technology and information technology for greater performance in research as well as presentation.

Course Synopsis and Methodology:**1. Study plan****Table 1 Preparation, Require, and Elective Courses for study in Plan A**

Plan A, A2			
Preparation course			
ENMT 630 1(1-0-2)	Fundamental of Environmental and Natural Resource Management		
Total = audit			
1 st semester/ Year 1		2 nd semester/ Year 1	
ENMT 631 3 (3-0-6)	Industrial Ecology and System Approach	ENMT 635 3 (0-6-3)	Environmental Management and Technology in Practicum
ENMT 632 3 (3-0-6)	Environmental Risk Management	ENMT 636 3 (3-0-6)	Integrated Research for Environmental Management and Technology
ENMT 633 3 (3-0-6)	Applied Economics for Natural Resource Sustainability	ENMT 6XX 3 (3-0-6)	Elective_1
ENMT 634 3 (3-0-6)	Holistic Resources Inventory and Environmental Survey	ENMT 6XX 3 (3-0-6)	Elective_2
Total=12 credits		Total=12 credits	
1 st semester/ Year 2		2 nd semester/ Year 2	
ENMT 698 9 (0-36-0)	Thesis	ENMT 698 3 (0-12-0)	Thesis
Total=9 credits		Total=3 credits	
TOTAL=36 CREDITS			

Table 2 Thesis Plan and Tentative Schedule/Activities

Activities	Year 2							
	Semester 1 (4 months)				Semester 2 (4 months)			
	1	2	3	4	5	6	7	8
1. Appointment for initial advisor	✓							
2. A proposal development	✓	✓						
3. Proposal defense and committee appointment			✓					
4. Data collection			✓	✓	✓			
5. Thesis writing	✓	✓	✓	✓	✓	✓	✓	✓
6. Attending in the international conference and published a full paper proceeding							✓	✓
7. Thesis defense							✓	✓
8. Submission required documents for graduate and other processes							✓	✓

Remark: Thesis is recommended to be in accordance with the philosophy of the program and related to climate change issue but not limited to other environmental issues.

2. Course Content

2.1 Preparation course (Audit)

Audit (lecture-practice-self-study)

ENMT630 Fundamental of Environmental and Natural Resource Management 1(1-0-2)

Fundamental of natural resources and environmental management, critical issues or problems, limitation of the natural resources exploitation, environmental management edges, ASEAN and international development impact on regional natural resources and environment, measures for sustainable development of natural resources and environment

2.2 Require course

Credit (lecture-practice-self-study)

ENMT 631 Industry Ecology and System Approach

3 (3-0-6)

Concept and principle of industrial ecology, natural system dynamic, components and functions of system, goal of system; boundary and characteristics of a system, system dynamics, system analysis, relationships of society to industry and development, material and energy flows in industrial and ecological systems, material flow analysis, life cycle assessment, supply chain management, clean technology, waste minimization, eco-efficiency; eco-design; carbon label and carbon footprint; eco-industry; green in industry

ENMT 632 Environmental Risk Management

3 (3-0-6)

Environmental risk assessment concepts and processes; risks affecting environment, community, stakeholder analysis; organizations; economic performance and professional reputation; risk assessment techniques; framework and a process for managing risk; risk control and treatment; risk management standard and clauses; related standards, guidelines for internal or external audit programs; principles for effective management and corporate governance; risk management practices

ENMT 633 Applied Economics for Natural Resource Sustainability

3 (3-0-6)

Concept of economics for natural resources; population and environment, agriculture and food; scarcity and abundance of resources; energy sector; renewable resources using in the fisheries and forestry sector; policy and industrial ecology; trade and development impacts to water resource; institutions for sustainable development and sufficiency economy; sustainable development goals; application of the principles of sustainable economic management to environmental and resource issues

ENMT 634 Holistic Resources Inventory and Environmental Survey

3 (3-0-6)

Learning process and integration of multidisciplinary and interdisciplinary; integration of theory and resources inventory and environmental survey; geography, geology and geomorphology; pedology; hydro- meteorology; forest and wildlife; socio- economic and population; sustainability of resource use issues; integrated approaches and survey methods; practical exercise

ENMT 635 Environmental Management and Technology in Practicum 3 (0-6-3)

Learning process and integration of concepts, principle and theory approach to environmental management and technology; field investigation and survey; natural resources and environmental quality analysis; investigation of the growth and development or change in the short-term and long-term of human and ecology; Instrument approach; procedure; systematic survey; analysis of natural resources and environment quality; field study

ENMT 636 Integrated Research for Environmental Management and Technology 3 (3-0-6)

Multi-disciplinary of research methodology for environmental management and technology; types of research, observational research, experimental research, qualitative research; research design; problem analysis; research question and hypothesis; data collection, data management and analysis; research proposal development; literature review; research ethics; ethics of environmentalist; the art of communication and presentation

2.3 Elective course

Credit (lecture-practice-self-study)

ENMT 637 Environmental Management Systems 3 (3-0-6)

Principle of environmental management systems (EMS); environmental aspect assessment; environmental legislation; environmental management systems standard and clauses; related standards; audits-definition and principles; audit planning; pre-audit process; audit review; conducting the main audit; audit report and follow-up; accreditation; certification and auditor competence; eco management and audit scheme regulation requirements

ENMT 638 Energy Management System Standard 3 (3-0-6)

Energy use and consumption; Tackle climate change; Conserve resources and integrated energy management; Development of an energy management system; Efficient use of energy policy development; Energy performance; Energy efficiency; Energy management systems standard and clause, related standards; Guidance for small and medium enterprises/ SMEs implementing energy management and efficiency measures; Management system model

ENMT 639 Occupational and Health Management System**3 (3-0-6)**

International occupational and health/ OH&S management system and development; importance and benefits; organizational performance enhancing challenges and improvement of stakeholder satisfaction; occupational and health management systems standard and clauses; related standards; an apply occupational and health management system for organization

ENMT 640 Food Safety Management System**3 (3-0-6)**

Food chain and aspects; the safety of the global food supply chain; food safety and its stated food safety policy; planning, implementation, operating; maintenance and updating a food safety management system; evaluating and assessment of customer requirements and satisfaction; effective communicating food safety issues to their suppliers; customers and relevant interested parties in the food chain; food safety management systems standard and clauses; related standards

ENMT 641 Sustainable Forest Management Standard System**3 (3-0-6)**

Concept of sustainable forest management standard system; the core values of the forest management or forest management system/ FM; systems and performance approach to FM certification; benefits of forest certification; indigenous peoples' rights; social and environmental impacts; high conservation value forests; stakeholder identifying and analysis; forest management systems standard and clauses; related standards, the role of auditors; auditing work; relating findings to standard elements; selecting sites for the field audit; compiling the audit documentation and the FM certification report; raising corrective action requests/ CARs; controlled wood in forest management; audit planning; follow up on CARs

ENMT 642 Social Responsibility Standardization and Sustainable Development Goals**3 (3-0-6)**

Concepts, terms and definitions related to social responsibility; background, trends and characteristics of social responsibility; principles and practice; the core subjects and issues of social responsibility; integrating, implementing and promoting socially responsible; identifying and engaging with stakeholders; internal and external communication; performance and other information related to social responsibility; sustainable development goals; social responsibility contribute to the sustainable development goals

ENMT 643 Sustainable Events Standard**3 (3-0-6)**

Concept and benefit of sustainable events; green meetings guideline and sustainable events; managing and communicating sustainable events; implementing sustainable events; Climate neutral and climate friendly events; generating of significant waste impact to local communities; socio-economic and environmental impact from sustainable events; sustainable events standard, clause and approach; sustainable events checklists and report; best practice of sustainable events

ENMT 644 Environmental communication for Social Change**3 (3-0-6)**

Concepts and elements in environmental communication; relationships between communication and environment; environmental communication psychology; communication for environmental and social change; sustainability communication; diffusion and adoption of environmental innovations; communication for low carbon society; climate change communication; integrated marketing communication and green industry; communication for environmental and natural resources conflict resolution

ENMT 645 Solid and Hazardous Waste Management**3 (3-0-6)**

Characteristics of solid and hazardous waste; principles of integrated waste management; waste minimization; reuse/ recycle, collection, storage, transfer and transport, separation, incineration, composting; disposal, landfill site selection; design, operation, monitoring; landfill closure; treatment processes for hazardous waste; regulation and techniques associated with the management of solid and hazardous waste; special waste management; construction and demolition waste management; disaster waste management

ENMT 646 Technology for Water Quality Management**3 (3-0-6)**

Fundamentals of organic chemistry in the environment; water quality and problems; water quality standard; laws and regulations for water quality management; water treatment system and design; wastewater treatment; technologies for water quality management; advance of wastewater treatment technologies; innovation treatment technologies

ENMT 647 Soil Resource and Land Use for Sustainable Industry**3 (3-0-6)**

Problems of soil resources; soil forming factors and processes; the human impact on soils; theories of land use; industrial location models; structure and location; Industry change; the

effects of rapid industrialization; industry and the environment; ecological and environmental impact of industrial land use; the concept of sustainable industrial land use; modeling of industrial land use planning; analysis and evaluation process of sustainable industrial land use

ENMT 648 Biodiversity Conservation and Management

3 (3-0-6)

Concepts and theories of biodiversity; biodiversity value; threats to biodiversity; habitat loss; exotic species; disease; population ecology overexploitation, small population; biodiversity management, protected area management and establishing, biodiversity conservation outside protected areas; biodiversity conventions, laws and regulations

ENMT 649 Ecosystem Restoration

3 (3-0-6)

Concepts and theories of ecosystem restoration; impacts of human on ecosystems; habitat destruction, degradation, and pollution in ecosystems; measurement and monitoring on ecosystem changes; rehabilitation in aquatic; forest and wetland ecosystems; wildlife captive breeding techniques and reintroduction; techniques in reforestation and corridor construction; project measurement and monitoring; synthesis on case study of ecosystem restoration

ENMT 650 Sustainability and Ecosystem Health

3 (3-0-6)

Principle conceptual of ecosystem health and sustainable human society based on the fluctuation of ecosystem health; flexibility of sustainable development by monitoring ecosystem health under the complex social adaptability; social adaptation to the vulnerable and changes in ecosystem health; indicators of human society sustainability reflected by the good health ecosystem

ENMT 651 Climate Change and its Impact

3 (3-0-6)

Climate change; natural forcing and human activities; industrial evolution, climate rapidly changed, natural phenomena; El Niño-La Niña; volcanic eruption, convention and protocol; impact on climate change to human being, natural resources and environment, mitigation options, adaptation and vulnerability

ENMT 652 Disaster Management

3 (3-0-6)

The evolving approaches in disaster management; global disaster trends; natural disaster trends, technological disaster trends, factors influencing disaster trends; paradigm shifts in

understanding and managing disasters; disaster management models; ethics; values and accountability; hazard assessment; vulnerability and capacity assessment; early warning system; disaster risk information system; public awareness and disaster risk communication; disaster management and development

2.4 Thesis

Credit (lecture-practice-self-study)

ENMT 698 Thesis

12 (0-48-0)

Research topic identification for environmental management and technology of research objectives; literature review; research design; validity and reliability of the research; data collection, data analysis and synthesis; research writhing; research presenting and publishing in standard journal or academic publication or presenting on the academic conference; ethics of academic presentation

Graduation Conditions:

8.1.1 Total time of study should not exceed the study plan.

8.1.2 Students must complete at least 24 course credits as stated in the curriculum as well as a thesis (12 credits) for a total of 36 credits with a minimum CUM-GPA of 3.00.

8.1.3 Students must meet the English Competence Standard of Graduate Students, Mahidol University defined by the Faculty of Graduate Studies, Mahidol University.

8.1.4 Students must participate in soft skill development activities of the Graduate Studies, Mahidol University.

8.1.5 Students must submit a thesis and pass a thesis defense by following the Regulations of Mahidol University on Graduate Studies.

8.1.6 These are required to be published in an international academic journal or a full paper of proceeding in international conference that is listed and accepted by the Faculty of Graduate Studies, Mahidol University.

Applicant Qualifications:

9.1 Hold a Bachelor's degree in any field of study;

9.2 Have a cumulative GPA not less than 2.50;

9.3 Have an English Proficiency Examination score as the requirement of Faculty of Graduate Studies;

9.4 Applicants with other qualifications may be considered by the Program Director, committee, and the Dean of Faculty of Graduate Studies.

Document Required:

Additional required documents for the program application are as follows:

1. A concept paper expected to do research (should be relevant to the philosophy of the program and/or Climate Change issues)
2. A motivation letter or purpose of study
3. A job expectation after graduate
4. Expectation from the program excluding financial issues
5. IELTS or TOEFL scores (If any)
6. Transcript (provide by TICA)
7. Recommendation Letter (provide by TICA)
8. English proficiency test (provide by TICA)
9. Application form (provide by TICA)

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***The application procedure will complete when TICA has received the hard copy of the application form and other related documents through the Royal Thai Embassy/Permanent Mission of Thailand to the United Nations/Royal Thai Consulate – General accredited to eligible countries/territories.