

## Course Detail

### Master of Science Program in Disaster Management

**Course Title:** Master of Science Program in Disaster Management

**Master Degree:** M.S. (Disaster Management)

**Academic Institution:** Faculty of Engineering, Naresuan University

**Duration:** 2 years (June 2022 – March 2024)

First Semester : June - October

Second Semester : November – March

### Background and Rational:

According to the Twelfth National Economic and Social Development Plan (NESDP) (2017 – 2021) developed by National Economic and Social Development Board (Office of the Prime Minister). In formulating the Twelfth Plan, the Office of the National Economic and Social Development Board (NESDB) adhered to the 20-year National Strategy framework (2017- 2036), the country's Sustainable Development Goals (SDGs), the Thailand 4.0 Policy, as well as other reform agendas. In order to set out development directions and strategies to achieve the objectives of “Security, Prosperity, and Sustainability”, the NESDB regards participation by a broad cross-section of society to be a crucial principle in this Plan.

Within the twelfth NESDP, one of the strategies pay attention to Environmentally-Friendly Growth for Sustainable Development (Strategy 4). From the fact that climate change and natural disasters have become more unpredictable and severe, particularly floods and droughts, causing impacts on the economic sectors and the domestic supply chain. Furthermore, international agreements on climate change and competitive trade have intensified, and Thailand needs to be ready to take responsibility of greenhouse gas reduction. Simultaneously, the post-2015 Sustainable Development Agenda has established the global direction for the next 15 years (2016-2030), and this too will have an influence on the development of the country. Therefore, the challenges that need to be addressed during the Twelfth Plan are the follows: to build security in the stock of natural resources and leverage environmental quality in order to support green growth (which is friendly to both the environment and the quality of life); solving the environmental crisis to reduce pollution from production and consumption; setting up a transparent and fair environmental management system; promoting and scaling up sustainable consumption and production; accelerating readiness for greenhouse gas reduction while enhancing capacity for climate change adaptation and management in order to reduce risks from natural disasters.

Worldwide, management of natural resources and the environment has often not been effective, and Thailand is no exception, and the conflict between environmental conservation and economic development has been made manifest. Nonetheless, Thailand's food security has remained adequate despite challenges from climate change and from increasing demand for fuel crops.

One of the missions of the Twelfth National Economic and Social Development Plan is to build secure natural resource and environmental bases through supporting community participation and improving resilience, based on Sufficiency Economy Philosophy that will

cushion impacts from climate change and disasters. Capacity and preparedness should be improved, and regional cooperation enhanced for dealing with natural disasters and emergencies, and in collaborating in the prevention of the spread of emerging and re-emerging diseases. Development guidelines for managing natural resources and the environmental sustainability include upgrading the ability to adapt to climate change and ensure preparedness to respond to natural disasters. Maps and priority lists of risk areas should be prepared at national, regional and provincial levels. Disaster management efficiency should be improved while database systems and telecommunication networks should be developed. Support is also needed to provide for the development of science and technology in disaster management. The national volunteer work system should be improved to meet international standards. Further, the private sector, government and semi-government enterprises and NGOs, schools and local authorities should be well prepared with action plans for disaster response.

### **Objectives:**

1. To Produce graduates with the knowledge, skills and ability in the area of Disaster Management in order to increase the capacity to cope with disaster impacts.
2. To Construct new knowledge related to Disaster Management in a context of the Asian region.

### **Course Synopsis and Methodology:**

#### **1. Study plan**

##### **(1) Plan A (Type A1)**

#### **Year I First Semester**

314581	Thesis 1, Type A1	9 Credits
314594	Research Methodology in Science and Technology (Non-credit)	3(3-0-6)
314595	Seminar 1 (Non-credit)	1(0-3-1)
<b>Total</b>		<b>9 Credits</b>

#### **Year I Second Semester**

314582	Thesis 2, Type A1	9 Credits
314596	Seminar 2 (Non-credit)	1(0-3-1)
<b>Total</b>		<b>9 Credits</b>

#### **Year II First Semester**

314583	Thesis 3, Type A1	9 Credits
<b>Total</b>		<b>9 Credits</b>

**Year II  
Second Semester**

314584	Thesis 4, Type A1	9 Credits
	<b>Total</b>	<b>9 Credits</b>

**(2) Plan A (Type A2)**

**Year I  
First Semester**

314501	Disaster Management and Disaster Risk Reduction	3(3-0-6)
3145xx	Elective Course	3(x-x-x)
3145xx	Elective Course	3(x-x-x)
314594	Research Methodology in Science and Technology (Non-credit)	3(3-0-6)
314595	Seminar 1 (Non-credit)	1(0-3-1)
	<b>Total</b>	<b>9 Credits</b>

**Year I  
Second Semester**

314503	GIS and Remote Sensing in Disaster Management	3(2-2-5)
3145xx	Elective Course	3(x-x-x)
3145xx	Elective Course	3(x-x-x)
314591	Thesis 1, Type A2	3 Credits
314596	Seminar 2 (Non-credit)	1(0-3-1)
	<b>Total</b>	<b>12 Credits</b>

**Year II  
First Semester**

314592	Thesis 2, Type A2	3 Credits
3145xx	Elective Course	3(x-x-x)
3145xx	Elective Course	3(x-x-x)
	<b>Total</b>	<b>9 Credits</b>

**Year II**  
**Second Semester**

314593	Thesis 3, Type A2	6 Credits
	<b>Total</b>	<b>6 Credits</b>

- Deadline for submitting thesis topic in March 2023
- Schedule for thesis proposal examination in October 2024
- Schedule for collecting fieldwork data in October 2024
- Thesis defense examination is scheduled for March 2025

**2. Course Content**

**Core Courses**

**314501      Disaster Management and Disaster Risk Reduction      3(3-0-6)**

Introduction to disaster and disaster management, disaster management terminology, evolution of disaster management, introduction to risk management, disaster risk management cycle, disaster risk identification and assessment, risk analysis and evaluation; risk transfer, disaster risk reduction, mainstreaming disaster risk reduction into development, crisis management.

**314503      GIS and Remote Sensing in Disaster Management      3(2-2-5)**

Basic principles of remote sensing (RS) and geographic information systems (GIS), information from weather radar, damage assessment, damage detection and disaster monitoring, disaster risk management, integration of several sources of information and applications for disaster monitoring and management.

**Elective Courses**

**a) Science Technology**

**314511      Meteorological Hazards      3(2-2-5)**

Atmospheric composition and structure, atmospheric instability, forecasting, types of meteorological hazards, meteorological data, meteorological risk assessment, meteorological phenomena, cyclones, thunderstorms, lightning, storm surge, monsoon surge, climate change/global warming, a case study on disaster management cycle due to meteorological hazards.

**314512 Geological Hazards 3(2-2-5)**

Understanding of geological causes, types and processes of slope movement, engineering methods for slope stabilisation and mitigation, landslide risk analysis using remote sensing, GIS and other techniques, preparation of landslide hazard zone maps, early warning system of landslide, identification of safe sites with community participation, awareness programs for community, geology of earthquakes, seismological studies, surface faulting and effects, landslides and liquefaction triggered by earthquake, earthquake resistant constructions, a case study on disaster management cycle due to geo hazards.

**314513 Hydrological Hazards 3(2-2-5)**

Hydrological system, types of hydrological hazards, hydrological data, hydrological risk assessment, drought, flooding, flood risk and its causes, hydrological hazards application in dam management and irrigation system, flood frequency analysis, mitigation procedures, hydrological hazards in a changing climate, a case study on disaster management cycle due to hydrological hazards.

**314514 Industrial Hazards 3(2-2-5)**

Types of industrial hazards, fire, explosion, toxic/chemical release, industrial pollution, chemical risk assessment, plant safety, process safety management, monitoring and protective measures, proper storage of hazardous materials, waste management, safe toxic waste disposal technologies, emergency planning, public awareness, a case study on disaster management cycle due to industrial hazards.

**314515      Fire Hazards      3(2-2-5)**

Combustion and fire dynamics, fire detection and warning, bush fires, forest fires, wild fires, high-rise building fires, control and safety measures, atmospheric smoke pollution, evacuation procedures, firefighting procedures, mitigating the effects of fire, land management, fire risk assessment, legislation , a case study on disaster management cycle due to fire hazards.

## 314516 Hazards Forecasting and Early Warning Systems 3(3-0-6)

Natural hazard analysis, natural hazard assessment, probability models, forecasting techniques, reliability analysis, early warning system, monitoring and warning service, coordination mechanisms, dissemination and communication, response capability.

<b>314517</b>	<b>Urban and Rural Planning and Hazards Mapping</b>	<b>3(2-2-5)</b>
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Characteristics of urban and rural systems and their complex inter-relations, land use, planning tools, hazard mapping and zoning, building regulations, building codes, performance standards, shelters, shelters management, route planning evacuation.

<b>314518</b>	<b>Climate Change Adaptation and Mitigation</b>	<b>3(3-0-6)</b>
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Introduction to the basic physical science of climate change, climate modelling, climate monitoring and evaluation frameworks, understanding of anthropogenic climate change and adaptation, current climate change scenarios and their impacts, adaptation and mitigation mechanisms, climate vulnerability, climate change impacts and adaptation practice for ecosystem, land use, water resources and human health, climate change mitigation strategies, technological and economic mitigation strategies, national and international policy frameworks, sustainable development.

**314519      Selected Topics in Disaster Management      3(2-2-5)**  
**(Science Technology)**  
Current interesting topics related to Disaster Management in sciences technology issue.

**b) Social Sciences**

**314521      Disaster Resilience Leadership      3(3-0-6)**  
Leadership characteristics for emergencies and disasters, ethical foundation of leadership, problem solving skills, decision-making skills, analysis of policing and public safety from a strategic leadership perspective, crisis leadership, managing routine emergencies, leadership competencies in managing catastrophes.

**314522      Community-Based Disaster Risk Reduction      3(2-2-5)**  
Community-based approaches to disaster risk reduction, design and conduct community based disaster risk assessments, identify measures for hazard, vulnerability reduction, community capacity building, implementation of community based risk reduction plans and its integration into developmental activities, role of local organisations and local authorities in community-based disaster risk management, early warning systems at community level.

**314523      Earthquake Vulnerability Reduction      3(3-0-6)**  
Principles of earthquake risk reduction, tools and techniques of earthquake risk assessment, earthquake vulnerability and risk reduction strategies, planning for earthquake risk reduction, relationship between rapid unstable development and earthquake vulnerability, vulnerability and risk assessment, effective strategies for earthquake vulnerability reduction and resistance, multi-sector partnership for implementing comprehensive earthquake vulnerability reduction strategies, capacity building on earthquake preparedness and response functions, planning and recovery for sustainable development.

**314524      Legal and Policy in Disaster Management      3(3-0-6)**  
Principles of the law of emergency management, emergency policy and operations, disaster planning and prevention, torts/compensation, environmental law, land use planning, social justice, tax and insurance, conflict management, common features and the differences of the law of emergency management across Asia, case study of Thai relevant laws and regulations.

**314525      Disaster Management in ASEAN Context      3(2-2-5)**  
Disaster management in ASEAN communities, disaster law of ASEAN communities, Transboundary problem, government policies related to disaster among ASEAN countries, non-government organisation network in ASEAN countries and their activities, development of networking.

**314526      Role of Media in Disaster Management      3(2-2-5)**  
Types of media, impact of the media, media strategies, capabilities of communications, data gathering, data management, role of media in pre, during and post-disaster, emergency broadcasts, information dispersal, integration of the media in disaster mitigation, communication technology related to disaster, role of social media in pre, during and post-disaster.

**314527      Business Continuity Management      3(2-2-5)**  
Introduction to business continuity management (BCM), ISO standard for business continuity management systems, fundamental of business continuity management planning methodology, fundamental of business impact analysis (BIA), business continuity (BC) strategy, crisis management, business impact assessments.

**314528      Selected Topics in Disaster Management      3(2-2-5)**  
**(Social Sciences)**  
Current interesting topics related to Disaster Management in social sciences issue.

**314529      Disaster Journalism      3(2-2-5)**  
Concepts of disaster journalism, development aspects, functions and practices, limitations and ethical concerns which are related to disaster risk lifecycle or its respect to public disaster planning, management, response, and recovery.

**c) Health Sciences**

**314530      Public Health and Conflict      3(2-2-5)**  
Health and conflict, international humanitarian law, planning and organizing services for refugees and IDPs, safe and healthy environment, camp management, sexual and reproductive health programing, mental health and psychosocial support programming, food supply and nutrition programming, protection and security.

**314531      Health Management      3(3-0-6)**  
Introduction to the evolving role of public health and epidemiology in disaster preparedness and response, standards of disaster health management and resources, ethical, cultural and legal aspects of disaster health care, principles of on-scene and hospital management, roles of emergency services, challenges of medical care in the disaster environment, epidemiology of disasters including types, severity and economic, human and societal impact, psychological impact of disasters on individual, populations and responders.

**314532      Nutrition in Emergencies      3(3-0-6)**  
Surveys and surveillance, therapeutic and supplementary feeding, infant and young child feeding in emergencies, general food distribution, micronutrient assessment and intervention, monitoring and evaluation, humanitarian standards and coordination, emergency preparedness.

**314533      Public Health in Complex Emergencies      3(3-0-6)**  
Context of emergencies, reproductive health, epidemiology, weapons, violence and trauma, communicable disease, protection and security, environmental health, nutrition, coordination.

**314534      Public Health Response in Disasters      3(3-0-6)**  
Pre-disaster context and global health, indirect and direct effects of disasters on health and health systems, assessment of public health needs in disasters, planning and implementation of curative and preventive public health, principles for and handling of mass-curative situations, epidemiological surveillance in disasters, control of infectious diseases, damage and lost assessment, international systems for disaster response and evaluation of public health response in disasters.

**314535      Selected Topics in Disaster Management      3(2-2-5)**  
**(Health Sciences)**  
Current interesting topics related to Disaster Management in health sciences issue.

**314536      Health Emergency and Disaster Risk Management      3(2-2-5)**  
**(HEDRM)**

Basic concepts and principles of risk management for health and disasters, health risk assessment, consequences of different hazards (natural, biological, social and technological), health indicators as vulnerabilities of people including vulnerable population and their specific needs during emergencies, capacities needed to manage health risks from emergencies and disasters including how you can strengthen normal public health and safety services to be able to respond to meet the increase demand during emergencies and disasters, information on the linkages of disasters, development and importance of enhancing health system resilience, international humanitarian system and coordination, communicating risk.

**314537      Outbreaks and Epidemics      3(2-2-5)**

Global system on disease outbreak management system, international health regulation, pandemic planning, outbreak communication, emerging and re-emerging infectious disease / animal-human interface of disease outbreak, vaccine preventable disease, early warning and response system (EWARS), tracking/contact tracing, case management.

**314538      Safe and Disaster Resilient Health Facilities and Hospitals      3(2-2-5)**

Safe hospital framework, risk assessment of hospitals using hospital safety index tool, hospital vulnerabilities (structural, nonstructural and emergency management), emergency response planning, hospital ICS, patient reception and triage, surge capacity, emergency medical team standards, continuity of operations, return to normal health operations.

**314539      Mass Casualty Management      3(2-2-5)**

Emergency medical service system, organizing onsite response and roles of different stakeholders, working with volunteers and other non-state actors, Incident command system, managing dead bodies, coordination with hospitals for regulated transport, mass casualty triage onsite, mass gathering planning and management, hospital response, crisis communication, CPR and First Aid Skills.

**314581      Thesis 1, Type A1      9 credits**

Studying the elements of a thesis, reviewing literature and related research, and determining the thesis title.

**314582      Thesis 2, Type A1      9 credits**

Developing a concept paper and preparing a summary of the literature and related synthesis.

**314583      Thesis 3, Type A1      9 credits**

Developing research instruments and research methodology and preparing a thesis proposal in order to present it to the committee.

**314584      Thesis 4, Type A1      9 credits**

Collecting data, analyzing data, preparing a progress report in order to present it to the thesis advisor, preparing the full-text thesis and a research article in order to get published according to the graduation criteria.

**314591      Thesis 1, Type A2      3 credits**

Studying the elements of a thesis or thesis examples in the related field of study, determining the thesis title, developing a concept paper; and preparing the summary of the literature and related research synthesis.



- 314592      Thesis 2, Type A2      3 credits**  
Developing research instruments and research methodology, preparing a thesis proposal in order to present it to the committee.
- 314593      Thesis 3, Type A2      6 credits**  
Collecting data, analyzing data, preparing a progress report in order to present it to the thesis advisor, preparing the full-text thesis and a research article in order to get published according to the graduation criteria.
- 314594      Research Methodology in Science and Technology      3(3-0-6)**  
Research definition, characteristics and goal, type and research process, research problem determination, variables and hypothesis, data collection, data analysis, proposal and research report writing, research evaluation, research application, ethics of researchers, and research techniques in science and technology.
- 314595      Seminar 1      1(0-3-1)**  
Report and discussion on topics related to Disaster Management, excursion.
- 314596      Seminar 2      1(0-3-1)**  
Report and discussion on topics in Disaster Management related to the research proposal, excursion.

### **Graduation Conditions:**

Accordance with Naresuan University Regulations for Graduate Studies B.E. 2016 and Naresuan University Regulations for Graduate Studies 3<sup>rd</sup> Addition Edition B.E. 2020. The criteria for graduation are as stated in the 2016 university regulations for graduated studies as described below:

#### **Curriculum Type A 1 Under Naresuan University Regulation**

1. Complete within the length of time required for the programme
2. Complete all the courses as required by the programme
3. Meet the English requirement stated by the university
4. Present and pass the oral examination
5. A work or part of work based on the student's thesis must be published as research paper or accepted for publication in national or international journal that meet with the quality standard as announce by Higher Education Commission.

#### **Curriculum Type A 2 Under Naresuan University Regulation**

1. Complete within the length of time required for the programme
2. Complete all the courses as required by the programme
3. Meet the English requirement stated by the university
4. Pass all the courses required by the curriculum
5. Minimum GPA of 3.00
6. Present and pass the oral examination
7. A work or part of work based on the student's thesis must be published as research paper or accepted for publication in national or international journal that meet with the quality standard as announce by Higher Education Commission or present as research paper in an academic conference with the full paper published in the conference proceedings.

**Applicant Qualifications:****Plan A, Type A1**

1) Students are required to have at least bachelor's degree with honour in Engineering or Science or a relevant degree with 3 years experiences in Disaster Management and a good level of the English language proficiency.

2) Students are required to have the characteristics and academic qualifications according to the regulations for Graduate Studies and addition regulations of Faculty of Engineering.

**Plan A, Type A2**

1) Students are required to have at least bachelor's degree in Engineering or Science or a relevant degree with the experiences in Disaster Management and a good level of the English language proficiency.

2) Students are required to have the characteristics and academic qualifications according to the regulations for Graduate Studies and addition regulations of Faculty of Engineering.

**Document Required:**

- Certificate of Employment

**Contact:****1. Curriculum Head:**

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**2. Curriculum coordinator:**

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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.