Master of Science Program in Disaster Management (International Program) New Curriculum, Year 2015

Faculty of Engineering
Naresuan University

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Master of Science Program in Disaster Management
(International Program)
New Curriculum, Academic Year 2015

Institution : Naresuan University
Campus/Faculty/Department : Faculty of Engineering

Section 1 General Information

1. Title of the Program

Thai หลักสูตรวิทยาศาสตรมหาบัณฑิต สาขาวิชาการจัดการภัยพิบัติ (หลักสูตรนานาชาติ)
English Master of Science Program in Disaster Management (International Program)

2. Title of the Degree

Full Title:
Thai วิทยาศาสตรมหาบัณฑิต (การจัดการภัยพิบัติ)
English Master of Science (Disaster Management)
Abbreviated Title:
Thai วท.ม. (การจัดการภัยพิบัติ)
English M.S. (Disaster Management)

3. Major Subject (if any)

-None-

4. Total Credits Needed for Completion of the Curriculum

36 credits

5. Curriculum Characteristics

5.1 Curriculum Type

Master's degree curriculum (2-year program), level 4, according to the 2009 Thai Qualifications Framework for Higher Education (TQF:HEd)

5.2 Language Used in the Program

English

5.3 Admission Requirement

Thai and foreign students with 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

5.4 Cooperation with Other Institutions

Inside University - Cooperation in giving a lecture in elective courses.

- Faculty of Public Health
- Faculty of Law
- Faculty of Business, Economics and Communications
- Faculty of Architecture
- Faculty of Agriculture, Natural Resources and Environment
- Faculty of Social Sciences

Outside University - Guest lecturers, special lectures, cooperation in research, internship.

- Asian Disaster Preparedness Centre (ADPC), Thailand
- Department of Disaster Prevention and Mitigation (DDPM), The Royal Thai Government

5.5 Degree Awarded on Completion of the Curriculum

Master of Science Program in Disaster Management

6. Curriculum Status and Curriculum Approval

This is a new curriculum, starts in the First Semester of the Academic Year 2015.

The Academic Committee approved the curriculum in the 5/2015 meeting on 18 May 2015.

The Academic Council approved the curriculum in the 6/2015 meeting on 2 June 2015.

The University Council approved the curriculum in the 208(6)/2015 meeting on 28 June 2015.

7. The Ability to Implement / Promote a Quality and Standard Curriculum

The curriculum is implemented and promoted according to the National Qualifications Framework for Higher Education in Thailand in the Academic Year 2016.

8. Potential Career for Graduates

1. Civil service (working within various government ministries, including the foreign office, international development office and local resilience forums)
2. International Institutions (The International Federation of Red Cross and Red Crescent Societies, The United Nations - The Office for the Coordination of Humanitarian Affairs (OCHA), The United Nations High Commission for Refugees (UNHCR), etc.)
3. National Organisations (AusAID, USAID, etc.)
4. NGO's (local and international)
5. Academia/Research Institutes/Think-Tanks
6. Emergency Management Specialist/Disaster Recovery Specialist/ Technological Hazards Program Specialist

9. Names, Positions and Degrees of the Lecturers Responsible for the Curriculum

No.	First Name and Last Name	Academic Position	Academic Degree (Major)	Institution	Year of Graduation	Teaching Load (Number of Hours/Week/ Academic Year)	
						Current	Future
1	Mrs. Sarintip Tantanee	Assoc. Prof.	Ph.D. (Water Resources Engineering)	Khonkaen University, Thailand	2005	9	15
			M.Eng. (Water Resources Engineering)	Kasetsart University, Thailand	1991		
			B.Eng (Civil Engineering)	Chiangmai University, Thailand	1983		
2	Mr. Panu Buranajarukorn	Asst. Prof.	Ph.D. (Engineering Management)	The University of Wollongong ,Australia	2006	17	20
			M.Eng. (Industrial Engineering)	Chulalongkorn University, Thailand	1997		
			B.Eng. (Industrial Engineering)	Chiangmai University, Thailand	1995		
3	Mr. Puripus Soonthornnonda	Lecturer	Ph.D. Environmental Engineering	University of Wisconsin-Milwaukee , USA	2005	9	15
			M.S. (Civil Engineering)	Bradley University, USA	2001		
			B. Eng. (Civil Engineering)	Sirindhorn International Institute of Technology, Thailand	1996		

10. Venue to Conduct the Study

Faculty of Engineering, Naresuan University, Phitsanulok, Thailand.

11. External Factors or Necessary Development to be Considered in Curriculum Planning

According to the Eleventh National Economic and Social Development Plan (2012 – 2016) developed by National Economic and Social Development Board (Office of the Prime Minister), the philosophy of the sufficiency economy was adopted and applied to every sector of Thai society with the vision of "A happy society with equality, fairness and resilience". Thailand faces both major global and internal changes. One of the major global changes, stated in Eleventh National Economic and Social Development Plan, is the effect of global warming and climate change. Global temperature has increased on average by 0.2 degrees Celsius per decade over the past 30 years, and has caused unpredictable alterations to climate as well as more frequent and severe natural disasters such as earthquakes, landslides, floods, storms, droughts, and forest fires. Ecosystems in many areas have become vulnerable and this has resulted in the loss of flora and fauna. The earth's surface has undergone physical changes, including coastal erosion and rising sea levels that have resulted in forced migration of coastal communities and damage to infrastructure, tourist areas, and coastal industrial zones where heavy investment has occurred. In addition, disease epidemics and outbreaks of insect pests have caused harm to human life, damage to agricultural products and threatens world food security. As well, poverty, migration and disputes over resources have occurred. For internal changes, there are the aspects of natural resources and the environment. Natural resources have been depleted and the environment has been degraded. Climate change has exacerbated problems involving natural resources and the environment, and has affected agricultural production and has exacerbated poverty. 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 Eleventh National Economic and Social Development Plan is to build secure natural resource and environmental bases through supporting community participation and improving resilience 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.

12. The Effects Mentioned in No.11 on Curriculum Development and Their Relevance to the Missions of the Institution

12.1 Curriculum Development

The curriculum development process focuses on enhancing students' knowledge, skills and abilities in Disaster Management including disaster preparedness, response and recovery, development of science and technology in disaster management. The theses and research work will also focus on science and technology related to disaster management applications in international, regional, national and local communities.

In addition, the curriculum also emphasises foreign language proficiency and the ability to employ technology for professional communication as well as for continual search for knowledge.

12.2 The Relevance to the Missions of the Institution

The curriculum features an integration of the missions concerning instruction and learning, research and academic services, aiming to respond to the demands of the government, private and community sectors. The focus is on making the students proficient at work, on human relations, thinking, living and problem solving as well as on doing practical training along with learning theories so that the students have direct experience and better understanding of the mechanisms of the disaster management. Finally, the instruction will emphasise morality and ethics, self-study and self-adjustment to the social and technological changes.

13. Relationship (if any) with Other Curricula Offered by the Faculty / Other Faculties / Departments in the University

13.1 Course(s) Offered by Other Faculties / Department / Programs

-None-

13.2 Course(s) Offered to Other Faculties / Department / Programs

-None-

13.3 Administration and Management

-None-

Section 2 Specific Information of the Curriculum

1. Philosophy, Significance and Objectives of the Curriculum

1.1 Philosophy of the Curriculum

Disaster is defined as a serious disruption of the functioning of a community or a society. A disaster can interrupt essential services such as transportation, communications, electricity, health care and so on. Poor planning of responses can have a significant negative impact. Disaster Management is needed to substantially reduce disaster losses. Disaster Management can be defined as the organisation and management of resources and responsibilities for dealing with all humanitarian aspects of emergencies, in particular preparedness, response and recovery in order to lessen the impact of disasters.

In order to meet these needs for a more holistic approach to Disaster Management, Naresuan University is offering a Master's program, based on the above philosophy.

1.2 Objectives of the Curriculum

1.2.1 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.

1.2.2 To Construct new knowledge related to Disaster Management in a context of the Asian region.

2. Plan for Development / Improvement

The plan for the new curriculum is designed based on the curriculum objectives and the 2013-2017 policy frameworks, goal-oriented strategies and operating plan according to the strategic development plan and its evidence/ indicators set by Naresuan University, as shown in the following table:

Developing Plan	Strategies	Evidences / Indicators
1. Developing appropriate system, administrative process, and supportive factors for educational and research system.	1. Developing fundamental factors which are indispensable for constructing qualitative graduates. (1) Classrooms: fully audio-visual aids, clean and being in suitable size. (2) Library: sufficiency of books and academic papers in the disaster management field; and a suitable information system for academic and research. (3) Laboratory room: supportive tools and instruments for basic and advanced research. (4) Working space: supportive environment for discussion and undertaking research.	1.1 Percentage of classrooms that meet the proposed characteristics in the Strategy 1(1) 1.2 Percentage of budget used for library maintenance and development. 1.3 Percentage of budget used for tools and instruments, following Strategy 1(3) 1.4 Number of offices which are relevant to the Strategy 1(4)

Developing Plan	Strategies	Evidences / Indicators
	2. Developing a quality learning process when following the curriculum by concentrating on competent research-graduates as a primary outcome. (1) Supportive environment for presenting, distributing and/or publishing academic works through a wide range of journals and/or scholarly conferences. (2) Encouraging and developing English language ability throughout the process of education and research. (3) Inviting well-known scholars and/or specialists from external institutions to lecture.	1.1 Percentage of academic articles which are published in relevant journals following the university criteria. 1.2 Providing a Faculty published journal in the field of engineering for distributing academic works. 1.3 Percentage of graduates who meet English qualification following the university criteria. 1.4 Invitation and related documents

Developing Plan	Strategies	Evidences / Indicators
2. Revising the curriculum which is up to date, relevant to technology development in field of disaster management, and meeting the MoE criteria.	(1) investigating and gathering information on technology development, current trends, entrepreneurs' needs and other related issues in organizations/institutes in the field of engineering for revising and developing an up-to-date and high standard curriculum. (2) Assessing curriculum regularly (3) Inviting well-known scholars and/or specialists from both governmental sectors and business sectors as participants in assessment processes. (4) Encouraging and developing academic networks and research collaborations with outside organizations / institutes in both governmental and business sectors.	1.1 Completed documents following the TQF. Criteria. 1.2 Number of organizations/institutions which participate in networks and collaborations.

Developing Plan	Strategies	Evidences / Indicators
3. Developing academic staff in range of knowledge, experiences, and skills for self-efficacy in qualitative instruction and research.	(1) Encouraging and empowering all staff in attending, distributing and publishing academic works. (2) Providing a series of developmental projects in a range of topics e.g. instruction, research, specific skills, for academic staff. (3) Assessing staff' performance and further using the data for developing efficient and quality instruction.	1.1 Number of academic articles which are published in international database (ISI, Scorpus) and subsequently cited. 1.2 Number of developmental projects for academic staff in relevant issues as referred in the Strategy (2) - see left 1.3 Report of staff performance assessment.

Section 3 Educational Management Systems, Curriculum Implementation and Structure

1. Educational Management System

The educational management system is a semester system consisting of 2 semesters per academic year according to Naresuan University Regulations for Graduate Studies.

2. Curriculum Implementation

2.1 Teaching Days-Times

Weekday based on the Regulations for Graduate Studies B.E. 2554 (Appendix A).
First Semester: August-December
Second Semester: January-May

2.2 Student Qualifications

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

Student Recruitment

Direct recruitment by Naresuan University and Faculty of Engineering

2.3 Problems Encountered by New Students

- None -

2.4 Strategies to Solve the Problems / Limitations in No.2.3

- None -

2.5 Five-Year Plan for Student Recruitment and Graduation

2.5.1 Curriculum Plan A,Type A2

Year of Study	Number of Students per Academic Year				
	2015	2016	2017	2018	2019
Year 1	5	10	10	15	15
Year 2	-	5	10	10	15
Total	5	15	20	25	30
Number of prospective graduates	-	5	10	10	15

2.6 Budget as Specified in the Plan

2.6.1 Income Budget (in Thai Baht)

Details of income	Academic Year				
	2015	2016	2017	2018	2019
1. Government Budget	-	-	-	-	-
2. Enrollment fee	350,000	1,050,000	1,400,000	1,750,000	2,100,000
Total	350,000	1,050,000	1,400,000	1,750,000	2,100,000

2.6.2 Expense Budget (in Thai baht)

Details of expense	Academic Year				
	2015	2016	2017	2018	2019
A. Operation cost	-	-	-	-	-
Special guest lecturer	135,000	135,000	135,000	135,000	135,000
Management cost	105,000	315,000	420,000	525,000	630,000
Scholarships	-	70,000	70,000	140,000	140,000
University payment	105,000	315,000	420,000	525,000	630,000
Total (A)	345,000	835,000	1,045,000	1,325,000	1,535,000

B. Investment cost	-	-	-	-	-
Instruments	-	-	100,000	100,000	100,000
Total (B)	0	0	100,000	100,000	100,000
Number of students	5	15	20	25	30
Total	345,000	835,000	1,145,000	1,425,000	1,635,000

2.6.3 Expense per head

The expense per head is approximately THB 56,684

2.7 Educational System

Classroom mode, according to the Naresuan University Regulations for Graduate Studies 2554 B.E.

2.8 Transfer of Credits, Course and Cross-University Registration (if any)

As specified in the Naresuan University Regulations for Graduate Studies 2554 B.E.

3. Details of Curriculum

3.1 Curriculum Structure

3.1.1 Total Number of credits

36 Credits

3.1.2 The structure of the curriculum is in accordance with the Ministry of Education's standards as follows.

No.	Description	Minimum credits required by MoE 2005, Plan A, Type A2	Number of credits in the new curriculum 2015, Plan A, Type A2
1	Course work - a minimum of 1.1 Core courses 1.2 Elective courses	12 - -	24 9 15
2	Thesis	12	12
3	Required Non-credit	-	5
Total number of credits - a minimum of		36	36

3.1.3 Courses

Curriculum Plan A, Type A2

Course work - a minimum of 24 credits

1) Core courses - Take all the following courses 9 credits

314501	Introduction to Disaster Management	3(3-0-6)
314502	Disaster Risk Management	3(3-0-6)
314503	GIS and Remote Sensing in Disaster Management	3(2-2-5)

2) Elective courses 15 credits

Select 9 credits within one of the following groups and any 6 credits,

a) Science Technology

314511	Meteorological Hazards	3(2-2-5)
314512	Geological Hazards	3(2-2-5)
314513	Hydrological Hazards	3(2-2-5)
314514	Industrial Hazards	3(2-2-5)
314515	Fire Hazards	3(2-2-5)
314516	Hazards Forecasting and Early Warning Systems	3(3-0-6)
314517	Urban and Rural Planning and Hazards Mapping	3(2-2-5)
314518	Climate Change Adaptation and Mitigation	3(3-0-6)
314519	Selected Topics in Disaster Management (Science Technology)	3(2-2-5)

b) Social Sciences

314521	Disaster Resilience Leadership	3(3-0-6)
314522	Community-Based Disaster Risk Reduction	3(2-2-5)
314523	Earthquake Vulnerability Reduction	3(3-0-6)
314524	Legal and Policy in Disaster Management	3(3-0-6)
314525	Disaster Management in ASEAN Context	3(2-2-5)
314526	Role of Media in Disaster Management	3(2-2-5)
314527	Business Continuity Management	3(2-2-5)
314528	Selected Topics in Disaster Management (Social Sciences)	3(2-2-5)

c) Health Sciences

314531	Health Management	3(3-0-6)
314532	Nutrition in Emergencies	3(3-0-6)
314533	Public Health in Complex Emergencies	3(3-0-6)
314534	Public Health Response in Disasters	3(3-0-6)
314535	Selected Topics in Disaster Management (Health Sciences)	3(2-2-5)

3) Thesis

314591	Thesis 1, Type A2	3 credits
314592	Thesis 2, Type A2	3 credits
314593	Thesis 3, Type A2	6 credits

4) Required Non-credits

314594	Research Methodology in Science and Technology	3(3-0-6)
314595	Seminar 1	1(0-3-1)
314596	Seminar 2	1(0-3-1)

3.1.4 Study Plan, Plan A (Type A2)

Year I
First Semester

314501	Introduction to Disaster Management	3(3-0-6)
314502	Disaster Risk Management	3(3-0-6)
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)
	Total	**9 Credits**

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)
	Total	**12 Credits**

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)
	Total	**9 Credits**

Year II
Second Semester

314593	Thesis 3, Type A2	6 Credits
	Total	**6 Credits**

3.1.5 Course Description

314501 Introduction to Disaster Management 3(3-0-6)

Introduction to disaster and disaster management, disaster management terminology, evolution of disaster management, basic relief needs, food, water, sanitation, health, hygiene and shelter; issues of coordination, field assessment and evaluation, disaster resilience, disaster preparedness planning process, emergency response management, information technology in disaster response and management, incident command system, disaster recovery, making disaster management work, reconstruction and sustainable development

314502 Disaster Risk Management 3(3-0-6)

Introduction to risk management, disaster risk management cycle, disaster risk identification and assessment, risk analysis and evaluation; risk transfer, disaster risk reduction (prevention and mitigation) and preparedness; 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 and geographic information systems, damage assessment, damage detection and disaster monitoring, disaster risk management, applications for disaster monitoring and management

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, lightning protection systems, 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, landslide early warning system, identification of safe sites with community participation, awareness programs for the 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 apply to 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, fire fighting 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

314517 Urban and Rural Planning and Hazards Mapping 3(2-2-5)

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, evacuation route planning

314518 Climate Change Adaptation and Mitigation 3(3-0-6)

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 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 (Science Technology) 3(2-2-5)

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 emergency management law, 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 emergency management law across Asia

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

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 into 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 (Social Sciences) 3(2-2-5)

Current interesting topics related to Disaster Management in social sciences issue

c) Health Sciences

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, international systems for disaster response and evaluation of public health response in disasters

314535 Selected Topics in Disaster Management (Health Sciences) 3(2-2-5)

Current interesting topics related to Disaster Management in health sciences issue

314591 Thesis 1, Type A2 3 credits

Literature review, which will generate new concepts following research work relating to the interested topics, summary report of the literature, progress report of the interested topics, prepare a draft proposal to present to the advisor

314592 Thesis 2, Type A2 3 credits

Conducting research, establishment of novel disaster management knowledge, discussion of obtained knowledge to prepare for the thesis proposal defence, summary report of the thesis progress to present to the advisor

314593 Thesis 3, Type A2 6 credits

Writing of complete thesis, preparing research contents for publication, passing thesis defence and publishing of the thesis in book form and submitted to the Graduate School

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

314596 Seminar 2 1(0-3-1)

Report and discussion on topics in Disaster Management related to the research proposal

3.2 Course Coding System

3.2.1. The first three digits

314 represents Disaster Management major

3.2.2. The last three digits (from left to right)

1 The first digit represents the academic level (5 for master degree)

2 The second digit represents the course categories as follows:

0 represents Core course

1 represents Science Technology

2 represents Social Sciences

3 represents Health Sciences

9 represents Seminar, Thesis

3 The last digit represents the course sequence in its own course

3.3 First Names, Last Names, ID Numbers, Positions and Academic Degrees of Lecturers

3.3.1 Full-Time Lecturers and Lecturers in Charge of the Curriculum

No.	First Name and Last Name	Academic Position	Academic Degree (Major)	Institution	Year of Graduation	Teaching Load (Number of Hours/Week/ Academic Year)	
						Current	Future
1*	Mrs. Sarintip Tantanee	Assoc. Prof.	Ph.D. (Water Resources Engineering)	Khonkaen University, Thailand	2005	9	15
			M.Eng. (Water Resources Engineering)	Kasetsart University, Thailand	1991		
			B.Eng (Civil Engineering)	Chiangmai University, Thailand	1983		
2	Mrs. Tipvimol Taekratok	Asst. Prof.	M.S. (Civil Engineering)	Case Western Reserve University ,USA	2000	7	10
			M. Eng (Civil Engineering)	Kasetsart University, Thailand	1994		
			B.Eng (Irrigation Engineering)	Kasetsart University, Thailand	1992		
3*	Mr. Panu Buranajarukorn	Asst. Prof.	Ph.D. (Engineering Management)	The University of Wollongong ,Australia	2006	17	20
			M.Eng.(Industrial Engineering)	Chulalongkorn University, Thailand	1997		
			B.Eng. (Industrial Engineering)	Chiangmai University, Thailand	1995		

No.	First Name and Last Name	Academic Position	Academic Degree (Major)	Institution	Year of Graduation	Teaching Load (Number of Hours/Week/ Academic Year)	
						Current	Future
4*	Mr. Puripus Soonthornnonda	Lecturer	Ph.D. (Environmental Engineering)	University of Wisconsin-Milwaukee , USA	2007	9	15
			M.S. (Civil Engineering)	Bradley University, USA	2001		
			B. Eng (Civil Engineering)	Sirindhorn International Institute of Technology, Thailand	1996		
5	Mr. Phisut Apichayakul	Lecturer	Ph.D. (Automatic Control and System Engineering)	The University of Sheffield ,UK	2010	15	18
			M.Eng (Electrical Engineering)	King Mongkut Institute of Technology Ladkrabang, Thailand	2002		
			B.Eng (Control Engineering)	King Mongkut Institute of Technology Ladkrabang, Thailand	1997		

Note * Lecturer responsible for the curriculum

3.3.2 Full-Time Lecturers of the Curriculum

No.	First Name – Last Name	Academic Position	Educational Degree	Educational Institution	Year of Graduation
1	Mrs. Sarintip Tantanee	Assoc. Prof.	Ph.D. (Water Resources Engineering)	Khonkaen University, Thailand	2005
			M.Eng. (Water Resources Engineering)	Kasetsart University, Thailand	1991
			B.Eng. (Civil Engineering)	Chiangmai University, Thailand	1983
2	Mr. Sombat Chuenchooklin	Assoc. Prof.	Ph.D. (Water resources Engineering)	Khon Kaen University , Thailand	2006
			M.Eng. (Water Resources Engineering)	Asian Institute of Technology, Thailand	1992
			B.B.A. (Construction Management)	Sukhothai Thammathirat University, Thailand	1985
			B.Eng. (Irrigation Engineering)	Kasetsart University, Thailand	1984
3	Mr. Taweeksak Taekratok	Asst. Prof.	Ph.D. (Civil Engineering)	Oregon State University ,USA	2002
			M.S. (Civil Engineering)	Oregon State University ,USA	1998
			B.Eng. (Civil Engineering)	Kasetsart University, Thailand	1992
4	Mr. Panu Buranajarukorn	Asst. Prof.	Ph.D. (Engineering Management)	The University of Wollongong ,Australia	2006
			M.Eng.(Industrial Engineering)	Chulalongkorn University, Thailand	1997
			B.Eng. (Industrial Engineering)	Chiangmai University, Thailand	1995
5	Mrs. Tipvimol Taekratok	Asst. Prof.	M.S. (Civil Engineering)	Case Western Reserve University ,USA	2000
			M. Eng. (Civil Engineering)	Kasetsart University, Thailand	1994
			B.Eng. (Irrigation Engineering)	Kasetsart University, Thailand	1992

No.	First Name – Last Name	Academic Position	Educational Degree	Educational Institution	Year of Graduation
6	Mr. Dondej Tungtakanpoung	Asst. Prof.	Ph.D. (Environmental Engineering)	University of Newcastle upon Tyne ,UK	2002
			M.Eng. (Environmental Engineering)	Chiangmai University, Thailand	1996
			B.Eng. (Civil Engineering)	Chiangmai University, Thailand	1991
7	Miss Pajaree Thongsanit	Asst. Prof.	D.Eng. (Environmental Engineering)	Chulalongkorn University, Thailand	2002
			M.Eng. (Civil Engineering)	Kasetsart University, Thailand	1996
			B.Sc. (Public Health)	Mahidol University, Thailand	1993
8	Mrs. Wanawan Doherty	Asst. Prof.	Ph.D. (Mass Communication)	The University of Alabama, USA	2001
			M.A. (Development Communication)	Chulalongkorn University, Thailand	1992
			B.A. (Advertising)	Chulalongkorn University, Thailand	1985
9	Mr. Halirak Lopattananon	Asst. Prof.	Master of Laws (International Commercial and European Law)	The University of Sheffield, UK	1998
			Bachelor of Laws	Chulalongkorn University, Thailand	1994
10	Ms. Suwanna Rongwiriyaphanich	Asst. Prof.	Ph.D. (Spatial Planning and Strategies)	Delft University of Technology, the Netherlands	2013
			M.I.P. (Master of Infrastructure Planning)	University of Stuttgart, Germany	2003
			B.Arch. (Bachelor of Architecture)	Chulalongkorn University, Thailand	1998

No.	First Name – Last Name	Academic Position	Educational Degree	Educational Institution	Year of Graduation
11	Mr. Phisut Apichayakul	Lecturer	Ph.D. (Automatic Control and System Engineering)	The University of Sheffield, UK	2010
			M.Eng (Electrical Engineering)	King Mongkut Institute of Technology Ladkrabang, Thailand	2002
			B.Eng (Control Engineering)	King Mongkut Institute of Technology Ladkrabang, Thailand	1997
12	Mr. Songsak Suthasupradit	Lecturer	Ph.D. Rural Engineering	Konkuk University, Korean	2008
			M.Eng. (Structural Engineering)	Asian Institute of Technology, Thailand	2005
			B. Eng. (Civil Engineering)	Srinakharinwirot University, Thailand	2003
13	Mr. Tanapon Phenrat	Lecturer	Ph.D. (Civil and Environmental Engineering)	Carnegie Mellon University ,USA	2008
			M.Sc. (Environmental Management)	Chulalongkorn University, Thailand	2004
			B. Eng. (Civil Engineering)	Kasetsart University, Thailand	2001
14	Mr. Puripus Soonthornnonda	Lecturer	Ph.D. Environmental Engineering	University of Wisconsin-Milwaukee , USA	2005
			M.S. (Civil Engineering)	Bradley University, USA	2001
			B. Eng. (Civil Engineering)	Sirindhorn International Institute of Technology, Thailand	1996
15	Ms. Piraya Aungudornpukdee	Lecturer	Ph.D. (Public Health)	Chulalongkorn University, Thailand	2009
			M.S. (Public Health)	Mahidol University, Thailand	2007
			B.S. (Health Science)	Thammasat University, Thailad	2004
16	Ms. Saranya Thiphom	Lecturer	Ph.D. (Environmental Science)	Chiangmai University, Thailand	2013
			B.S. (Environmental Science)	Chiangmai University, Thailand	2004

No.	First Name – Last Name	Academic Position	Educational Degree	Educational Institution	Year of Graduation
17	Ms. Pantip Hinhumpatch	Lecturer	Ph.D. Enviromental Toxicology	Chulabhorn Graduate Institute, Thailand	2014
			B.S. (Biology)	Naresuan University, Thailand	2008

3.2.3 External/Special Lecturers

Dr. Bhichit Rattakul (President of Navamindradhiraj University, Thailand, Industrial science and technology research in policy and management, disaster management and environmental education)

Dr. Buddhi Weerasinghe (Advisor, Asian Disaster Preparedness Centre (ADPC), Thailand, Curriculum Development Expert)

Dr. Peeranan Towashiraporn (Director, Advisor, Asian Disaster Preparedness Centre (ADPC), Thailand, Disaster Risk Assessment and Monitoring)

Dr. Senaka Basnayake (Head of Department, Advisor, Asian Disaster Preparedness Centre (ADPC), Thailand, Climate Change and Climate Risk Management)

4. Components of Field Experience (Professional Training or Co-Operative Education)(if any)

None

5. Specifications for Thesis

5.1 Short Description

Master of Science in Disaster Management (International Program) indicates that a graduate thesis is to be taken from year 1 to year 2 with the aim to give students experience in doing research in Disaster Management or in related fields according to the course details (314591 Thesis 1, 314592 Thesis 2, 314593 Thesis 3).

5.2 Standard Learning Outcomes

Students have knowledge and understanding of the research process, the responsibility for their assigned tasks, inter-personal communication and relationship skills with ability to work well with others and team work, the ability to solve problems and facilitate development, the ability to apply knowledge to disaster operations, and the knowledge and ability to employ IT for suitable research presentation and publication.

5.3 Time Frame

Starting from the second semester of year 1

5.4 Number of Credits

12 credits

5.5 Preparation

1. Advisors and co-advisors (if any) are appointed.
2. The advisors set up frameworks and operation plans for each student's Thesis.
3. The students' work on their theses is followed up:
    3.1 To get information regarding the operation plan from the advisors.
    3.2 To be aware of the problems faced by the students and by the advisors.

3.3 To help coordinate, give advice on, and provide solutions for the thesis works with the advisors.

4. Thesis presentation is held and evaluated by a committee.
5. Thesis is submitted by the students when the period set to complete the Thesis is over.

5.6 Evaluation Process

The assessment and evaluation criteria for a Graduate Thesis are based on the evaluation of the students' performance, presentations and the contents of research by a committee according to the regulations for graduate students of Naresuan University B.E. 2554 as shown in Appendix A.

Section 4: Learning Outcomes, Teaching Strategies and Assessment

1. Development of Student Special Characteristics

Special Characteristics	Strategy / Student Activity
Leadership and responsibility	• Students must be assigned the presentations and/or activities in order to build their leaderships and to train their responsibilities. • Students must be encouraged to ask questions and give their comments, and to regularly attend classes on time.
Ethical and professional conduct	• Inform students to be aware of the penalty on corruption, plagiarism or copy other works. • Teach students to have the knowledge of the impact on society.
Creativity	• Assign projects based assignments in order to train their problem solving ability. • Assign students to give presentations of their works

2. Development of the Learning Outcomes in Each Domain

2.1 Ethics and Moral Development

2.1.1 Ethics and Moral Learning Outcomes

Ethical and Moral Learning Outcomes	Teaching Strategies Employed to Develop Moral and Ethical Learning	Evaluation Strategies for Moral and Ethical Learning
(1) Have morality, ethics, honesty and have leadership in order to promote the principles of moral and ethical conduct.	Lecturers inform students on moral and ethical issues and act as a role model.	Evaluate based on the leadership and the use of moral principles and ethics in the assigned problems.
(2) Aware of professional ethics and academic ethics, and be able to manage and cope with moral and ethical problems.	Inform students regarding the law of professional ethics in relevant subjects.	Evaluate based on the student discussions and assignments of the relevant subjects.
(3) Have discipline, punctuality, responsibility to themselves and society, and respect for the rules and regulations of the organization and society.	Inform students regarding disciplined behavior and punctuality, and to behave according to the institutional and social rules and regulations. Clarify the students on the subject of correct referencing and citation of referred works as well as the penalties for plagiarism.	Evaluate based on the students' punctuality for classes and assignments, as well as the amount of fraud in exams and assignments. Evaluate based on the plagiarism and references in student reports, assignments, and presentations and thesis.

2.2 Knowledge

2.2.1 Knowledge Learning Outcomes

Learning Outcomes for Knowledge	Teaching Strategies Employed to Develop Knowledge Learning	Evaluation Strategies for Knowledge Learning
(1) Have basic knowledge and understanding of significant principles and theories.	Teach in a variety of formats including lectures, seminars, assignments, and student field trips in order to emphasize theoretical principles and practical application in a real environment.	Evaluate through quizzes, assignments, and examinations.
(2) Be able to understand and analyze specific problems, and have ability to apply knowledge and skills to cope with such problems.	Use seminar, class or group discussions as a forum for students to present, discuss, and exchange their ideas.	Evaluate based on assignments and students' presentation.
(3) Be able to apply and develop knowledge as well as understand the impact of the current research on knowledge in the field of their study	Provide opportunities for students to participate in selecting topics of study in each subject.	Evaluate based on seminar contributions, group discussions, and project presentations, including thesis proposals.

2.3 Cognitive Skills

2.3.1 Cognitive Skills Outcomes

Cognitive Learning Outcomes	Teaching Strategies Employed to Develop Cognitive Learning	Evaluation Strategies for Cognitive Learning
(1) Be able to carry out investigations, comprehend and evaluate new information, concepts and evidence from a range of sources, and apply conclusions to a wide range of issues and problems without external guidance.	Focus on teaching with the presentation and discussion of research findings.	Evaluate based on the students' performances in various forms such as assignments, case study presentations, and research studies.
(2) Have ability to analyze and synthesis research and academic publications by integrating with prior knowledge in order to develop their creativity and the concept in research.	Assign students to compose reports for their independent study or their thesis proposal.	Evaluate through reports for independent study or thesis proposal.
(3) Be able to think in a systematic manner and apply theoretical and practical knowledge to cope with unexpected problems and complex issues.	Provide examples of case studies to enable the students to practice.	Evaluate based on the students' performance showing the ability to cope with designated issues.

2.4 Interpersonal Skill and Responsibility

2.4.1 Interpersonal Skill and Responsibility Outcomes

Learning Outcomes for Interpersonal Skills and Responsibilities	Teaching Strategies Employed to Develop the Learning of Interpersonal Skills and Responsibilities	Evaluation Strategies for the Learning of Interpersonal Skills and Responsibilities
(1) Have responsibility for their own operations, including the ability to plan for their own self-assessment.	Assign students to prepare a plan of study and make a self-evaluation report submitted at the end of each semester.	Evaluate based on the students' reports.
(2) Appropriate self-adjustment to fit in the situations and organizations	Assign students to work in various forms of case study.	Evaluate from the students' assignments.
(3) Have leadership and ability for team-working to employ group mechanism to solve problems constructively and efficiently	Assign students to work in groups.	Evaluate from the student's performance in team-working and leadership skills according to the learning situations.

2.5 Numerical Analysis Skills in Communication and Information Technology

2.5.1 Numerical Analysis Skills in Communication and Information Technology Outcomes

Learning Outcomes for Numerical Analysis Skills in Communication and Information Technology	Teaching Strategies Employed to Develop the Learning of Numerical Analysis Skills in Communication and Information Technology	Evaluation Strategies for the Learning of Numerical Analysis Skills in Communication and Information Technology
(1) Be able to collect and organize numerical data in order to use in research and to summarize the complex issues and research problems.	Assigned students to practice using information technology, tools, and programs in numerical analysis, as appropriate, of each course.	Evaluate the students' ability to employ their numerical knowledge to analyze, interpret and present the data appropriately.
(2) Be able to analyze numerical data to efficiently provide solutions to complex problems.	Provide examples of case studies to enable the students to practice and make presentations.	Evaluate based on the assignments and students' presentation.
(3) Be able to effectively communicate and make presentations.	Assign students to present their progress report in seminar course and encourage them to present their research papers in the conferences.	Evaluate from the students' presentation of their progress report or their research papers.

3. Curriculum Mapping

Subject	1. Ethics and Moral Development			2. Knowledge			3. Cognitive Skills			4. Interpersonal Skill and Responsibility			5 Numerical Analysis Skills in Communication and Information Technology		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
314501 Introduction to Disaster Management	●	○	○	●			●	○	○	○		●			○
314502 Disaster Risk Management	●	○	○	●	●				○	○					○
314503 GIS and remote sensing in Disaster Management	●	○	○	●	●	○	●			○	○		●	●	●
314511 Meteorological Hazards		○	○	●	●	○	○			○	○		○	○	
314512 Geological Hazards		○	○	●	●	○	○			○	○		○	○	
314513 Hydrological Hazards		○	○	●	●	○	○			○	○		○	○	
314514 Industrial Hazards		○	○	●	●	○	○			○	○		○	○	
314515 Fire Hazards		○	○	●	●	○	○			○	○		○	○	
314516 Hazards Forecasting and Early Warning Systems			○		●	○	○	●		○			●	●	●
314517 Urban and Rural Planning and Hazards Mapping		○	○	●	○		○	●	○	○			●	●	●
314518 Climate Change Adaptation and Mitigation		○	○	●	○			●	○	○	○		○	○	○
314519 Selected Topics in Disaster Management (Science Technology)	○		○	●	●	○	●	○		●			○	○	

Subject	1. Ethics and Moral Development			2. Knowledge			3. Cognitive Skills			4. Interpersonal Skill and Responsibility			5 Numerical Analysis Skills in Communication and Information Technology		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
314521 Disaster Resilience Leadership	●		●	○	○		○		●	●	●	●			●
314522 Community-Based Disaster Risk Reduction			○	●	○			●	○	●					●
314523 Earthquake Vulnerability Reduction	○		○	●	○		○			○			○		
314524 Legal and Policy in Disaster Management	●		●	●	●	○			○	○	●				
314525 Disaster Management in ASEAN Context		○	○		●		○	●	○	○	●	○			○
314526 Role of Media in Disaster Management	○	○	●	●	○	○	○			○			○		●
314527 Business Continuity Management	○	●		●	○		●		●	○	●	○			○
314528 Selected Topics in Disaster Management (Social Sciences)	○		○	●	●	○	●	○		●			○	○	
314531 Health Management		○	○	●	○		●		●	○			○		
314532 Nutrition in Emergencies			○	●		●		○	○	○			○		
314533 Public Health in Complex Emergencies	○		○	●	○	○	○	●	○	○			○		○
314534 Public Health Response in Disasters	○		○	●	○	○	○	●	○	○			○		○

Subject	1. Ethics and Moral Development			2. Knowledge			3. Cognitive Skills			4. Interpersonal Skill and Responsibility			5 Numerical Analysis Skills in Communication and Information Technology		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
314535 Selected Topics in Disaster Management (Health Sciences)	○		○	●	●	○	●	○		●			○	○	
314591 Thesis 1, Type A2	●	●	●	●	●	●	○	○		●	●	●			●
314592 Thesis 2, Type A2	●	●	●	○	○	○	●	●	○	●	●	●	●	○	●
314593 Thesis 3, Type A2	●	●	●	○	○	○	●	●	●	●	●	●	●	●	●
314594 Research Methodology in Science and Technology	●	●	●	●	○	○	●	●	○	●	○	○	●	○	○
314595 Seminar 1	●	○	○	●	○	○	●		○	●	○	●		○	●
314596 Seminar 2	●	●	○	●	○	○		●	●	●	○	●	○	○	●

Section 5 Criteria for Evaluating Learners

1. Regulations and criteria for evaluating learners' achievement (grading)

Grading criteria must be in accordance with regulation for graduate students of Naresuan University as shown in Appendix A

2. The verification of learners' achievement

2.1 The verification of learners' achievement while learners are still studying

2.1.1 An academic committee should be appointed in order to verify and review course syllabus, TQF 3, examinations of each subject in each semester as well as evaluation of learners' achievement, TQF 5, so as to assure that teachers are complied with learning outcomes identified in each subject.

2.1.2 Learning outcomes should be evaluated from the external organisations proving professional training for learners and teachers supervising their professional training.

2.2 The verification of learners' achievement after learners graduated

A research on graduates' professional achievement can be conducted to verify learners' achievement after their graduation. The research should be conducted regularly so that the results of the research can enable the teaching and learning process to be more successful. Besides, the quality assurance of the curriculum should also be promoted to the international level. The process of the research should be preceded as follow

2.2.1 Graduates' employment should be evaluated from graduates each year in terms of the duration that they apply for a job, their opinions about the knowledge, abilities, and learners' confidence in working

2.2.2 Evaluation from employers in terms of learners' knowledge gained from their required courses and other courses in the curriculum relating to their professions. This also allows suggestions from the external sectors' opinion to help improving the curriculum.

3. Graduation criteria

Accordance with regulation for graduate students of Naresuan University as shown in Appendix A

Section 6 Faculty Developments

1. Preparation for New Faculty Members

1.1 Organise orientations or teaching guidance for new faculty members to ensure that they know and understand the policy of the university and that of the faculty as well as the courses in the curriculum they are to teach.

1.2 Encourage the faculties to increase their knowledge and experience in order to continually enhance their teaching and research works by furthering their studies, participating in trainings, academic and professional study visits in various organisations and academic conferences both in Thailand and abroad, and taking sabbatical leaves.

1.3 Assign experienced lecturers and/or lecturers with academic titles as mentors to new lecturers during their probation period.

2. Development of Knowledge and Skills for Faculty Members

2.1 Development of Skills in Teaching and Evaluation

2.1.1 Encourage the faculties to increase their knowledge and experience in order to continually enhance their teaching and research works by furthering their studies, participating in trainings, academic and professional study visits in various organisations and academic conferences both in Thailand and abroad, and taking sabbatical leaves.

2.2.2 Enhance the instruction and evaluation skills to make them up-to-date.

2.2 Development of Other Academic and Professional Skills

2.2.1 Participate in activities providing academic services to the community for the promotion of knowledge, morality and art and culture preservation.

2.2.2 Encourage the faculties to engage in producing academic works in Disaster Management and also the promotion of academic position.

2.2.3 Promote the faculties to do research studies primarily in order to produce new bodies of knowledge and to enhance their instruction, and secondarily to enhance their professional expertise.

2.2.4 Financially support the faculties to participate in seminar and academic presentations both domestically and abroad.

Section 7 Curriculum Quality Assurance

1. Curriculum Management

The curriculum is administered by the lecturers in charge of the curriculum according to the Thai Qualifications Framework for Higher Education and the university's Quality Assurance criteria as follows:

1.1 Submission of each TQF format is managed in accordance with university TQF management calendar of each semester. This is monitored by the dean or the director of each faculty as follow

- Format of TQF3, 4, 5, 6, 7 and key performance indicator must be uploaded via TQF management database
- Faculty reports the submission of format of TQF3, 4, 5, 6, 7 to university academic committee

1.2 Before the semester starts, lessons, course documents and teaching media are prepared, and laboratories and equipment are checked to see if they are ready to be used.

1.3 Course lecturers are assigned. The supporting staff conducts surveys of the students' satisfaction with the courses every semester and uses the results to improve the instruction and learning.

1.4 Report the students' study behaviours and performances, opportunities and obstacles of the lesson management, and provide opportunities for the stakeholders to give information as appropriate.

1.5 Invite experts from outside the institution as a lecturer or a guest speaker.

1.6 The curriculum is revised every 5 years according to the criteria of Office of the Higher Education Commission.

2. Management of Learning and Teaching Resources

2.1 Budget Management

The budget for the administration and management is from the annual government budget and the university income budget. The faculty committee is in charge of allocating the annual budget for the learning and teaching activities and professional skill development activities/

projects in each academic year in accordance with the curriculum development plan and with the approval of Faculty of Engineering and of Naresuan University respectively.

2.2 Available Resources for the Learning and Teaching

2.2.1 Premises and Teaching Equipment

The instruction, practice and research are conducted at Faculty of Engineering. Details of the teaching, laboratory and research equipment at Faculty of Engineering, EN building, are as follows:

No.	Rooms/Equipment	Amount	Unit
1	Classroom 150 seats	4	Room
2	Classroom 80 seats	12	Room
3	Classroom 50 seats	1	Room
4	Drawing Room 80 seats	1	Room
5	Computer Room 50 seats	1	Room
6	Computer Room 60 seats	1	Room
7	Computer System Network Control Room	1	Room
8	Library and Self-Study Room	1	Room
9	Server Room	1	Room
10	Dining Room 70 seats	2	Room
11	Closed-Circuit Television Control Room	1	Room
12	White Boards	29	Item
13	Amplifiers	30	Item
14	Projectors	17	Item
15	Televisions	28	Item
16	Visualizers	18	Item
17	DVD Players	12	Item
18	Student Club Room	5	Room
19	Public Relations Room	1	Room
20	Handheld wireless microphones	1	Set
21	Lecture chairs	1580	Item
22	Wireless Network	1	System

No.	Rooms/Equipment	Amount	Unit
23	Color laser printer	1	Item
24	Black and white laser printers	2	Item

2.2.2 Library

Naresuan University Library provides academic support in Engineering, Natural Sciences, Social Sciences, Business Management, Law, Environment, Mass Communication, Human Resource Management, Health Sciences and other related fields. The library offers over 24,411 textbooks in Science and Technology, over 85 academic journals, and over 58 online databases in the citation index.

Moreover, library of the Faculty of Engineering provides around 2,557 textbooks in related fields, including approximately 28 international journals and 1400 sets of educational CDs, audiovisual and video, for the students to study for their classes and outside their classes.

2.3 Provision of Additional Learning and Teaching Resources

Preparation of budgets by coordinating with the Office of the University Library for the purchase of books. Procurement is open to students and lecturers to suggest books as well as other necessary media. The library has prepared for the purchase of text books or technical journals. It also provides funds for the purchase of durable materials and laboratory equipment to support learning and teaching.

2.4 Evaluation of the Sufficiency of Resources

The sufficiency of the resources is evaluated using questionnaires surveying the needs for resources and class observations, with an aim to make the resources sufficient for the support of the teaching and learning in accordance with the declaration of Ministry of Education as follows:

2.4.1 Ministry of Education's Declaration of the 2005 Curriculum Standard Criteria, Item 15: Curriculum Quality Assurance

2.4.2 Ministry of Education's Declaration of the 2006 Curriculum Standard Criteria: The Standard of the Missions of Higher Education Administration and The Standard of the Creation and Development of the Knowledge-Based Society and the Learning Society

3. Faculty Management

3.1 Recruitment of New Faculty Members

3.1.1 The full-time lecturers must have academic qualifications as specified in the Ministry of Education's 2005 Declaration of Standard Criteria for Graduate Curricula.

3.1.2 Faculty of Engineering's faculties must have the understanding of the objectives and goals of Faculty of Engineering curricula.

3.1.3 Faculty of Engineering's faculties must have the knowledge and ability to use the English language for the instruction and learning and for the fulfilment of the faculty's missions.

3.1.4 Faculty of Engineering's faculties must have the knowledge and skills to administer the teaching and learning and to evaluate the students' achievement results, and the research and professional experience in the field they teach.

3.1.5 Faculty of Engineering's faculties are recruited and interviewed by the university committee for the understanding of the objectives and goals of the curriculum as well as the vision of the university.

3.2 Participation of Faculty Members in Planning, Following up, and reviewing the Curriculum

Meetings must be held for the lecturers in charge of the curriculum and other lecturers to plan the teaching and learning, evaluate the results, approve the assessment results of every course, collect the information for the curriculum revision, find ways to attain the goals set in the curriculum, and specify the desired student characteristics.

3.3 Part-Time and Guest Lecturers

The instructor-full-time student ratio must comply with Office of the Higher Education Commission's higher-education quality assurance criteria. Guest lecturers and guest speakers are valued as experts who can convey direct practical experience to the students. Faculty of Engineering, therefore, has a policy to invite guest lecturers to teach at least once in every course. The guest lecturers must have direct professional experience or at least a PhD's degree.

4. Supporting Staff Management

4.1 Qualification Specifications

The qualification specifications of Faculty of Engineering's supporting staff follow the standards of Office of the Civil Service Commission's personnel specifications. Qualified personnel are those with the knowledge, abilities and educational qualifications related to the professional responsibilities required by Faculty of Engineering.

4.2 Professional Skill and Knowledge Development

Faculty of Engineering has the policy to allocate its budget for the seminars, trainings and study visits of the supporting staff to enhance their skills and professional experience according to their fields of work and interests. The supporting staffs are also encouraged to do research studies with the academic staff as part of the continual support for efficient instructions and accurate and fast services to the lecturers and the students. Faculty of Engineering works with other work units in the university and allocates a budget especially for regular staff development. Faculty of Engineering's staff is promoted based primarily on their professional performances.

5. Student Support and Guidance

5.1 Academic Guidance and General Counselling for Students

Faculty of Engineering appoints an advisor to each student. Students who have problems with their studies can consult their academic advisors. Every lecturer is assigned an advisory role and required to provide office hours for student consultation. In addition, Faculty of Engineering has academic officers providing academic consultations, student affairs officers giving advice on student activities, qualified teachers providing guidance in the Guidance Centre, and invited medical doctors and/or nurses giving advice on students' health improvement and infirmary management.

5.2 Students' Rights to File Complaints

As stated in the 2554 B.E. Naresuan University Regulations for Graduate Studies, Appendix A

6. Needs of the Labor Market and the Society and/or Employers' Satisfaction

6.1 Surveys and research data related to the needs of the labor market are used in the curriculum revision.

6.2 When the curriculum has been implemented and has come full-circle, a survey of the stakeholders' perceptions towards the curriculum is conducted and the results are used for the curriculum revision.

7. Key Performance Indicators

The curriculum quality assurance and the instruction management are conducted in order to ensure that the graduates are qualified according to the specified standard learning outcomes, with the following key performance indicators:

7.1 Key Performance Indicators

Key Performance Indicators	Academic Year		
	2015	2016	2017
7.1 At least 80% of the lecturers in charge of the curriculum participate in planning, following up and revising the curriculum.	/	/	/
7.2 The program has the details of the curriculum in the TQF2 format in relevance to the Thai Qualifications Framework or the qualifications standards of the program/the major.	/	/	/
7.3 The program has the course specifications and field experience specifications (if any) according to the TQF3 and TQF4 formats prior to the beginning of all courses.	/	/	/
7.4 Course reports and field experience reports (if any) are produced according to the formats of TQF5 and TQF6 within 30 days after the end of the semester when all the courses in the curriculum have been implemented.	/	/	/

Key Performance Indicators	Academic Year		
	2015	2016	2017
7.5 The report of the curriculum implementation results must be done according to the format of TQF7 within 60 days after the end of the academic year.	/	/	/
7.6 The academic achievement results of the students are verified (by the curriculum committee) according to the standards of learning outcomes specified in TQF3 and TQF4 (if any) for at least 25 percent of the courses offered in each academic year.	/	/	/
7.7 The development / improvement of the learning and teaching management, teaching strategies or learning result evaluation must be assessed from the operating result evaluation reported in TQF7 of the previous year.	-	/	/
7.8 Every new lecturer (if any) has to participate in an orientation or receive adequate information on managing the learning and teaching.	/	/	/
7.9 Every full-time lecturer attends academic / professional development trainings at least once a year.	/	/	/
7.10 At least 50 percent of the supporting staff (if any) attends academic / professional development trainings each year.	/	/	/
7.11 The level of satisfaction towards the curriculum quality of students in the last year of study and of new graduates is of an average of no lower than 3.5 out of 5.0.	-	/	/
7.12 The employers' satisfaction towards new graduates is of the average level of no lower than 3.5 out of 5.0	-	-	/
7.13 The percentage of the specific courses that feature at least 1 special lecture of a guest speaker from the business/ government sector / non-profit organisation	50% of total number of courses open in academic year 2014	50% of total number of courses open in academic year 2015	50% of total number of courses open in academic year 2016
7.14 There is at least one course that feature international lecturer or international guest lecturer.	/	/	/
7.15 The percentage of international students per total number of students.	20%	20%	20%

Note

1. KPI 7.1– 7.12 are from the Thai Qualifications Framework for Higher Education in Thailand
2. KPI 7.13 - 7.15 are in accordance with the policy framework of Naresuan University.

7.2 Evaluation Criteria for the Approval and Promotion of the Curriculum

The evaluation results of KPI 7.1-7.13 must remain at the level of "good", with the complete operation of KPI 7.1-7.5 and at least 80% of KPI 7.6-7.13 in the year of the evaluation in order for the curriculum to be approved and promoted. The evaluation results must remain at the level of "good" based on these criteria for the continual development of the graduates.

Section 8 Evaluation and Improvement of the Curriculum

1. Evaluation of the teaching strategies' effectiveness

1.1 Evaluation of the teaching strategies

1.1.1 Teacher meeting is held for discussions, exchange of teaching strategies between teachers and experts

1.1.2 Responsible teachers/Teachers ask for feedbacks suggestions from other teachers after planning teaching strategies for a particular subject

1.1.3 Students are asked about their learning from the teaching methods used in class in a form of questionnaire or group discussion during a semester by the teacher

1.1.4 Evaluation of learners' achievement is conducted from their performance, their participation in group activities and examination

1.2 Evaluation of teachers' skills in applying the teaching strategies

The evaluation can be conducted by

1.2.1 Evaluation from learners in all subjects in terms of teaching strategies, punctuality, goal clarification, objective of the course clarification, and teaching materials at the end of the semester

1.2.2 Testing of learners' learning achievement by observing their behaviours and participation.

2. Overall evaluation of the curriculum

The minimum standard for measuring and evaluating learners' achievement should be in accordance with Notification of Ministry of Education of the standard of Master degree regarding the criteria for measuring and evaluating students' achievement can be conducted.

2.1 By students and graduates

Curriculum evaluation committee including current students and graduates should be appointed for evaluating the curriculum systematically. Also, a survey of satisfactions of all students and all graduates should be prepared.

2.2 By external sectors/employers

The following up process of graduates is conducted for surveying satisfactions' of graduates' employers by using questionnaire and interview methods.

2.3 By experts and/or external evaluators

Curriculum evaluation committee analyses and evaluates the curriculum in general and employs the previous information of learners, graduates, and employers for evaluation.

3. Evaluating of the curriculum implementation

The Annual Quality Assessment is performed according to indicators of performance specified in Section 7 no. 7. It must be done by the Evaluation Committee appointed by the University.

4. Reviewing the evaluation and planning for improvement

By gathering data from Number 1 – 3 mentioned above, problems of curriculum management should be demonstrated in general as well as all problems occurred in each subject. These problems can be solved during the semester as minor improvement. An every 5 years, the whole curriculum should be reviewed, revised and improved to be updated and in compliance with learners' needs and employers' expectations