



**Course Syllabus (Academic Year 2021)**  
**School of Interdisciplinary Studies, Kanchanaburi Campus, Mahidol**  
**University**

1. **Course No. and Title** : KAED 345 Disaster and Environmental Risk Management  
**Credit (study hours)** : 3(3-0-6)
2. **Program Name** : Bachelor of Engineering Program in  
Environmental Engineering and Disaster Management
3. **Course Module** : Major Required Courses  
**Pre/co-requisite** : None
4. **Class Semester** : 1st Semester Academic Year 2021
5. **Class Schedule & Venue:** XXXXXXXXX
6. **Class Coordinator** Sirinon Suwanmolee, Ph.D. Contact No. : 081-428-2303  
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Lecturers

- |                              |   |
|------------------------------|---|
| Sirinon Suwanmolee, Ph.D.    | Email: sirinon.suw@mahidol.edu  |
| Wimonmas Boonyungyuen, Ph.D. | Email: bwimonmas@yahoo.com  |
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## 1. Course Description

สถานการณ์ความเสี่ยงภัยพิบัติทั่วโลก แนวคิดและนิยามที่ใช้สำหรับการจัดการความเสี่ยงภัยพิบัติและสิ่งแวดล้อม การบ่งชี้และประเมินความเสี่ยงภัยพิบัติ ได้แก่ ระดับความอันตราย ความอ่อนไหวต่อพื้นที่และสังคม และความสามารถในการรับมือกับภัยพิบัติ การลดความเสี่ยงภัยพิบัติ เครื่องมือสนับสนุนการตัดสินใจสำหรับการลดความเสี่ยงภัยพิบัติ การเตรียมพร้อมรับมือกับภัยพิบัติ หลักการและแนวคิดการจัดการเหตุการณ์ฉุกเฉิน การฟื้นฟูหลังเกิดภัยพิบัติ แนวคิดและทางเลือกในการบริหารความเสี่ยงทางการคลังจากภัยพิบัติ เช่น การประกันภัยพิบัติ

Situations on disaster risk around the world; basic concepts and terminologies used in disasters and environmental risk management; disaster risk identification and assessment; hazards, local and social vulnerability, and adaptive capacity; disaster risk reduction; decision support tools for disaster risk reduction; disaster preparedness; principles and concepts on emergency response; disaster recovery; concepts and alternatives for financial risk management, such as disaster insurance

## 2. Course Objectives / Course Learning Outcomes (CLOs)

No.	Objectives / CLOs	Expected Skills / Knowledge			Sub-PLOs
		Specific	Generic	Knowledge	
8.1	Be able to explain concepts, theories and principles of disaster and environmental risk management			/	1.1
8.2	Be able to systematically summarize important issues from collected data		/		1.2
8.3	Be able to select appropriate methods and/or technology to analyze data systematically	/			2.2, 3.3
8.4	Be able to summarize the main idea of contents in Thai and English through reading and listening		/	/	4.1
8.5	Be able to express ideas and use appropriate media for communication in international language		/	/	4.2
8.6	Be able to develop a conceptual model for disaster and environmental risk management	/		/	6.3

## 3. Course Outline

Week	Date	Contents	CLOs	Learning method	Instructor
1		Introduction to the course outline, objectives, and assessment The global trend of disaster risk reduction, definition, disaster management cycle, classification of disaster	8.1	- Lecture - Case-studies	SS
2		<b>Preparedness :</b> Characteristic of Disaster - classify the elements that appear in the event	8.1, 8.2, 8.3	- Lecture - Case-studies - Evaluate situation	SS
3		<b>Preparedness :</b> Crisis Communication - Principles of crisis communication for crisis control - Evaluated the strengths or vulnerabilities of emergency communication in the case study	8.1, 8.2, 8.3	- Lecture - Case-studies Evaluate situation	SS
4		<b>Preparedness :</b>	8.1,	- Lecture	SS

Week	Date	Contents	CLOs	Learning method	Instructor
		Disaster Risk Analysis - classify the elements of risk - Evaluate the impact of a disaster - Analyze and guideline reducing risks	8.2, 8.3	- In-class activity	
5		<b>Mitigation :</b> - risk identification - Laws - Plans - National Disaster Management - How international organizations calculated and displayed global disaster risk data	8.1,8.2, 8.3, 8.4, 8.5	- Lecture - In-class activity	SS
6		<b>Mitigation :</b> - Hydrological hazard and Meteorological hazard risk assessment - Roleplay event, flood warning, high winds, storm surge, landslide - Designing guidelines for reducing risks from water and weather hazards - Assessing damage and needs assessment	8.1,8.2, 8.3, 8.4, 8.5	- Lecture In-class activity with roleplay	SS
7		<b>Mitigation :</b> - Geological hazard risk assessment - Cognition: Recognise scenario and impact of landslides, building collapses and how to survive in an emergency - Communication: Monitoring earthquake data - Coordination: Coordinating with relevant agencies to deal with earthquake emergencies. - Control: Basic building safety assessment - Design of guidelines to reduce the risk of building collapse	8.1,8.2, 8.3, 8.4, 8.5	- Lecture - In-class activity with roleplay	SS
8	Midterm Examination				
9		<b>Response and recovery :</b> <b>NATECH</b> (Natural Hazards Technological Disasters) Risk Assessment - Recognise scenario, identify risk and design to control	8.1,8.2, 8.4, 8.5	- Lecture - In-class activity with roleplay	SS
10		<b>Response and recovery:</b> - Writing a Bow Tie Analysis Risk Chart	8.1,8.2, 8.3,	- Lecture - Practice on	SS

Week	Date	Contents	CLOs	Learning method	Instructor
		<ul style="list-style-type: none"> <li>-Analyze workflow</li> <li>-Identify scenario and risk potential that is likely to occur in the work or production process.</li> <li>-Applied preparation to deal with business or industry on reducing risk</li> <li>-Create damage control guidelines</li> </ul>	8.4, 8.5	Bow Tie Analysis with case study	
11		<p><b>Response and recovery:</b> International Disaster Management</p> <ul style="list-style-type: none"> <li>-Understand national and international disaster management structures such as Sendai Framework, ASEAN ERAT, National Disaster Prevention and Mitigation Act.</li> </ul>	8.1,8.2, 8.4, 8.5	<ul style="list-style-type: none"> <li>- Lecture</li> <li>- In-class activity with roleplay</li> </ul>	SS
12		<p><b>Response and recovery:</b></p> <ul style="list-style-type: none"> <li>- Prepare: Hazard Mapping, Risk mapping, urban planning</li> <li>- Rehabilitation of complex disaster events on the humanitarian dimension</li> </ul>	8.1,8.2, 8.4	<ul style="list-style-type: none"> <li>- Lecture</li> <li>- In-class activity with roleplay</li> </ul>	SS
13		<p><b>Response and recovery:</b> Indigenous Knowledge on Risk Management</p> <ul style="list-style-type: none"> <li>- The concept of Community based-disaster risk management (CBDRM)</li> <li>- A case study of the Ban Nam Khem community affected by the tsunami</li> <li>- A case study of Mae Phun community, Lablae district, Uttaradit province affected by landslides and floods.</li> </ul>	8.1,8.2, 8.4, 8.6	<ul style="list-style-type: none"> <li>- Lecture</li> <li>- Case studies</li> </ul>	SS
14		Disaster Preparedness and Recovery	8.1	<ul style="list-style-type: none"> <li>Lecture</li> <li>Case-studies</li> </ul>	WB
15		Financial risk management/ disaster insurance	8.1	Lecture	YJ
16		Group brainstorm	8.6	Group discussion on the case studies	SS
17	Final Examination				

#### 4. Course Assessment

No.	Methods/Activities	Regulations	CLOs	Week	Weight Distribution
1	Class participation and Class attention	- Students must submit the assignments in time - Students must attend classes on time > 80% of the course, by CC		All	5
		Students must participate in class /group activities		All	25
2	Assignment	I. The learner must practice the engineering skills from exercises and assignments II. The score will be evaluated according to the quality and details of work by instructors. (Correctness, Determination)	All	Weekly	20
3	Midterm Examination	I. The exam will be held on schedule. II. It is <b>close-book exam</b> which students can use a personal calculator. III. The scope of exam will be cover topics of the 1 <sup>st</sup> -7 <sup>th</sup> week in this course.	All	8	25
4	Final Examination	I. The exam will be held on schedule. II. It is <b>close-book exam</b> which student can use personal calculator. III. The scope of exam will cover all topics of this course.	All	17	25
				Total	100

## 5. Grading System

Criterion-referenced evaluation

The student performance in the overall course will be measured by Criterion-referenced assessment as followed table.

Grade	Score	Grade	Score	Grade	Score	Grade	Score
A	80%	B	70 – 74.99%	C	60 – 64.99%	D	50 – 54.99%
B+	75 – 79.99%	C+	65 – 69.99%	D+	55 – 59.99%	F	< 50 %

## 6. References

- Brenda, P. (2002). Qualitative methods and Disaster research. in *Methods of Disaster Research*, ed. r. A. Stallings (Philadelphia: Xlibris, 2002), 194–211. Administrative Failure in the Wake of Katrina. December: S188-S196.
- Mileti, D. S. (1999). *Disasters by design: A reassessment of natural hazards in the United States*. Washington, DC: Joseph Henry Press.
- Comfort, K. L. (2007). Crisis management in hindsight: Cognition, communication, coordination and control. *the Public Administration Review*, 2007. Special Issue.

## 7. PLOs (update 26/10/2018)

Program Learning Outcomes	
1	Apply environmental engineering principles and knowledge to systematic solutions according to Professional Standards
2	Apply practical skills in environmental engineering and disaster management to real situations based on academic principles and professional ethics
3	Apply geo-informatics systems and information technologies in planning to handle environmental and disaster problems in accordance with academic principles
4	Present, discuss and transfer knowledge clearly to persons related to professional works according to communication objectives
5	Work as an environmental engineer with other people to solve complicated problems according to economic, social, and environmental issues
6	Design and invent a creative innovation in environmental engineering and disaster management