Course Syllabus (Academic Year 2021)

School of Interdisciplinary Studies, Kanchanaburi Campus, Mahidol University

1. **Course No. and Title**: KAED 477 Informatics for Forecasting and Disaster Warning

   Credit (study hours): 1(0-3-1)

2. **Program Name**: Bachelor of Engineering in Environmental Engineering and Disaster Management

3. **Course Module**: Major Required Course (Environmental Engineering).

   Pre/co-requisite: KAED204 Computer Programming and KAED 375 Geo-informatics for Environmental and Disaster Management

4. **Class Semester**: ☑ 1st Semester ☐ 2nd Semester Academic Year 2021

5. **Class Schedule & Venue**: Monday 9:00 AM – Noon / Friday 1:00 – 4:00 PM, Com Lab Room 3rd floor

Appointment will detail in Google classroom

6. **Class Coordinator**: Asst. Prof. Dr. Arika Bridhikitti Contact No.: 084-660-2919... Email: arika.bri@mahidol.edu

7. **Course Description**

Information system, disasters and information system, data for forecasting and warning disasters, responsible organizations for disaster warning, Integrated information, database system, information system and communication during crisis situation, local wisdom for disaster warning, development of informatics for forecasting and warning disasters.

8. **Course Objectives / Course Learning Outcomes (CLOs)**

No.	Objectives / CLOs	Expected Skills / Knowledge			PLOs
		Specific	Generic	Knowledge	

8.1	Be able to explain principles applied for inventing or developing scientific/engineering models for forecasting or disaster warning	2 Be able to solve problems related to environmental engineering based on knowledge in basic science and environmental engineering and disaster management fundamentals	6 Be able to apply computer program simulation and informatics technology for solving problems relating to environmental engineering and disaster management		1.1, 1.3
8.2	Be able to analyze or interpret information/data using scientific or engineering tools for forecasting, disaster warning				3.2, 3.3, 4.4, 5.1, 6.1

Program learning outcomes

PLO1.1 Accurately explain basic concepts, theories and principles of environmental engineering

PLO1.3 Use knowledge and skills of environmental engineering for solving the problems according to Professional Standards

PLO3.2 Properly explain updated geo-informatics system technological tools for environmental engineering works and disaster management works

PLO3.3 Select an appropriate geo-informatics system technology for actual situations

PLO4.3 Write a report using proper languages with logical results and discussion

PLO5.1 Integrate economics, social and environmental issues to environmental engineering and disaster management works

PLO6.1 Acquire essential knowledge and skills by oneself for life-long learning

9. Class Instructor List

9.1 Name: Asst. Prof. Dr..Arika Brihdhikitti (AB), Contact No.:084-6602919 Email: arika.bri@mahidol.edu.....

9.2 Name: Asst. Prof. Dr. Thongchai Kanabkaew (TK), Faculty of Public Health, Thammasat University

10. Course Outline

Week	Date	Contents	CLOs	Teaching & Learning	Instructor's Names
1	30 Aug 2021	• Course structure, grading system, class requirement and goal • Intro to Informatics for Forecasting and Disaster	8.1	Lecture Picture Game	AB

Week	Date	Contents	CLOs	Teaching & Learning	Instructor's Names
		Warning			
2	3 Sep 2021	MATlab introductory	8.1	Activities - Lecture - Learning by Doing - In-class assignment: - Post test (Class 3)	AB
3	6 Sep 2021				
4	10 Sep 2021	DO sag curve: water quality modeling	8.1 8.2	Activities - Lecture - Learning by Doing - In-class assignment - Post test (Class 4)	AB
5	13 Sep 2021	Time-series analysis - Linear regression Spectrum analysis	8.1 8.2	Activities - Lecture - Learning by Doing - In-class assignment Post test (Class 5)	AB
6	17 Sep 2021	CLUE model: The conversion of land use and its effects	8.1 8.2	Activities - Lecture - Learning by Doing - In-class assignment - Post test (Class 7)	AB
7	20 Sep 2021				
8	24 Sep 2021	Universal Soil Loss Equation สมการสูญเสียดินสากล	8.1 8.2	Activities - Lecture - Learning by Doing - In-class assignment - Post test (Class 9)	AB
9	27 Sep 2021				
10	1 Oct 2021	Local Wisdom	8.1 8.2	Activities - Read-Share - Learning by Doing - In-class assignment (group) - Post test (Class 10)	AB
11	4 Oct 2021	SCREEN3: Air dispersion model	8.1 8.2	Activities - Lecture - Learning by Doing - In-class assignment - Post test (Class 12)	AB
12	8 Oct 2021				
13	16-17 Oct	AERMOD: Dispersion Model for	8.1	Activities	TK

Week	Date	Contents	CLOs	Teaching & Learning	Instructor's Names
14 15	2021 (All Day)	Industrial source application	8.2	- Lecture - Learning by Doing - In-class assignment	

11. Course Assessment

No.	Methods / Activities	Regulations	CLOs	Week	Weight Distribution (%)
11.1	Mid-term exam				
11.2	Final exam				
11.3	In-class assignments	1. MATlab introductory 2. Time-series analysis 3. CLUE model 4. Universal Soil Loss Equation 5. Local Wisdom: Post-test 6. DO sag curve 7. SCREEN3 8. AERMOD	8.1 8.2	3, 4, 5, 7, 9, 10, 12, 15	70
11.4	Post test				20
11.5	Class participation	Participation (10%)		1-15	10
				Total	**100**

12. Grading System

☑ Criterion-referenced evaluation

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 %

☐ Norm-referenced evaluation

*If use both criterion and norm-referenced evaluation, please tick two boxes.

13. References

13.1. Benavidez, R., Jackson, B., Maxwell, D., & Norton, K. (2018). A review of the (Revised) Universal Soil Loss Equation ((R) USLE): with a view to increasing its global applicability and improving soil loss estimates. *Hydrology and Earth System Sciences*, *22*(11), 6059-6086.

13.2. US EPA, September 1995, SCREEN3 Model User's Guide EPA-454/B-95-004

13.3. Shaw, R., Uy, N., & Baumwoll, J. (Eds.). (2008). *Indigenous knowledge for disaster risk reduction: Good practices and lessons learned from experiences in the Asia-Pacific Region*. United Nations, International Strategy for Disaster Reduction.

13.4. Giri, R. R., Takeuchi, J., & Ozaki, H. (2006). Biodegradation of domestic wastewater under the simulated conditions of Thailand. *Water and Environment Journal*, *20*(3), 169-176.

13.4. Verburg, P. (2010). The CLUE model. *Hands-on Exercises. Course Material. Institute for Environmental Studies, University of Amsterdam*, 53.