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

1. **Course No. and Title** : KAED 349
   Geo-Informatics for Environment and Disaster Management
   Credit (3 Hour) : 3(3-2-5)

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

3. **Course Module** : Required course
   Pre/co-requisite : None

4. **Course Semester** : 2/2021

5. **Class Schedule & Venue** : Lecture room/Computer Laboratory Room
   Class Coordinator :
   1. Assist. Prof. Yutthana Phankamolsil (Ph.D.)
      Phone: (66) 81 695 4621
      Email: yutthana.pha@mahidol.ac.th

6. Course Description

Principles of the geo-informatics system; the coordinate system; the global positioning system; spatial analysis; surface analysis; basic remote sensing; practices on using geo-informatics software to visualize spatial data and support decision in the field of environmental engineering and disaster management.

7. Course Objectives / Course Learning Outcomes (CLOs)

No	Objectives / CLOs	Expected Skills / Knowledge			PLOs
		Specific	Generic	Knowledge	
1	Understand to the principles of the geo-informatics system.	SS1	GS1, GS3, GS4	K1, K2	1(1,2,3) 2(1,2,3) 3(2,3,4) 4(2,3) 5(1,2,3) 6(2,3,4)
2	Ability to calculate the spatial analysis.	SS2			
5	Apply GIS as a tool for solving problems of environmental engineering and disaster management.	SS3			

8. Instructor

1. Assist. Prof. Yutthana Phankamolsil (Ph.D.), Email: yutthana.pha@mahidol.ac.th
2. Sirinon Suwanmolee (Ph.D.), E-Mail: sirinon.suw@mahidol.ac.th
3. Supat Prasopsin (MSc), Email: suphat.pra@mahidol.ac.th

8.1 Office Hours : 12:00 Noon – 15:00 PM, Wed
8.2 Office : L321 Laboratory Building
8.3 **Course Website**
E-Learning MUKA

9. Course Outline

Week	Date	Contents	Instructor
1	4 Jan 22	Introduction to teaching and learning process - Course Learning Outcomes (CLOS) - Course outline - Course assessment - Grading system - The tool integration facility for GIS	YP/SP
2	11 Jan 22	Map and map projection - Coordinate System - Map projection - Projection transformation	YP/SP
3	18 Jan 22	Spatial data I - Feature data - Attribute Data - Creating feature data - Digitizing	YP/SP
4	25 Jan 22	Data Acquisition - Global Positioning System (GPS) - Google Map and Open Layer	YP/SP
5	1 Feb 22	Spatial Analysis (Vector based approach) - Proximity - Interpolation	YP/SP
6	8 Feb 22	Case study in disaster management	SS/TA
7	15 Feb 22	Spatial Analysis (Vector based approach) - Overlay	YP/SP
8	22 Feb 22	Spatial Analysis (Raster based approach) - Raster operation - Raster processing - Raster reclassification	YP/SP
9		Midterm Examination	
10	8 Mar 22	Spatial Analysis (Raster based approach) - Surface analysis	YP/SP
11	15 Mar 22	Basic of Remote Sensing - RS data sources - RS tools for Remote Sensing	YP/SP
12	22 Mar 22	Practice - Case study I	YP/SP
13	29 Mar 22	Practice - Case study II	YP/SP
14	5 Apr 22	Practice - Case study III	YP/SP

Week	Date	Contents	Instructor
15	12 Apr 22	Mini-project practice	YP/SP
16	19 Apr 22	Mini-project practice	YP/SP
17		Final Examination	

10. Course Assessment

No.	Methods / Activities	Regulations	Weight Distribution (%) [LC:LB]
1	Quizzes	Exam will cover the content from the previous weeks.	10% [50:50]
2	Midterm examination	Exam will cover the content from the previous weeks.	15% [45:55]
3	Final examination	Exam will cover the content from the previous weeks.	15% [45:55]
4	Assignments (Mimi-Project)	Project-Based Learning	50%
5	Class participation	Student must attend class more than 80% of course.	10%
			100

11. Grading System

This course use the following 8 point grading system

Grade	A	B+	B	C+	C	D+	D	F
Percentage (%)	80-100	75-79	70-74	65-69	60-64	55-59	50-54	0-49
Description	Excellent	Very Good	Good	Fairly Good	Fair	Poor	Very Poor	Fail
GPA	4.0	3.5	3.0	2.5	2.0	1.5	1.0	0.0

12. Reference

Aronoff, S. 1989. Geographic Information Systems: A Management Perspective, 2nd. WDL Publications, Ottawa, Canada. 293 pp.

Bernhardsen, T. 2002. Geographic Information Systems: An Introduction 3rd ed. John Wiley & Sons, New York, NY. 428 pp.

Bonham-Carter, G.F. 1994. Geographic Information Systems for Geoscientists: Modelling with GIS. Pergamon,

Burrough, P.A. 1986. Principles of Geographical Information Systems for Land Resources Assessment. Oxford University Press, Oxford. 193 pp.

Burrough, P.A. and R.A. McDonnell. 1998. Principles of Geographical Information Systems. Oxford University Press, Oxford. 333 pp.

Clarke, K.C. 2001. Getting Started with Geographic Information Systems. 3rd. Prentice-Hall, Upper Saddle River, NJ. 352 pp.

Heywood, I et al. 1998. An Introduction to Geographical Information System. Longman, New York, NY.

Note:

Specific Skill (SS)	
SS1	Understand to the principles of the geo-informatics system.
SS2	Ability to calculate the spatial analysis.
SS3	Apply GIS as a tool for solving problems of environmental engineering and disaster management.
Generic Skill (GS)	
GS1	Systematic thinking, problem solving and analytical skills
GS2	Life-long learning and technology updating
GS3	Disaster risk awareness
GS4	Professional ethics and responsibilities
Knowledge (K)	
K1	principles of the geo-informatics system
K2	GIS application
ABET Criteria	
(a)	an ability to apply knowledge of mathematics, science, and engineering
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data
(c)	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
(d)	an ability to function on multidisciplinary teams
(e)	an ability to identify, formulate, and solve engineering problems
(f)	an understanding of professional and ethical responsibility
(g)	an ability to communicate effectively
(h)	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
(i)	a recognition of the need for, and an ability to engage in life-long learning
(j)	a knowledge of contemporary issues
(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice