Course Syllabus (Academic Year 2021)
Environmental Engineering and Disaster Management Program

1. **Course No. and Title** : KAED 326 Hydrology
   Credit (study hours) : 3 (3-0-6)
2. **Program Name** : Bachelor of Engineering in Environmental Engineering and Disaster Management
3. **Course Module** : Required course (Basic Engineering)
   Pre/co-requisite : -
4. **Class Semester** : ☑ 1st Semester ☐ 2nd Semester Academic Year 2021
5. **Class Schedule & Venue**: Fridays 09:00 – 12:00

Class Coordinator : Yutthana Phankamolsil
Email: yutthana.pha@mahidol.edu

6. Course Description

An Introduction; hydrological cycle, precipitation; wind; evaporation; transpiration; infiltration/percolation; surface runoff; groundwater; sediment; reservoir; frequency analysis in hydrology.

7. Course Objectives / Course Learning Outcomes (CLOs)

No	Objectives / CLOs	Expected Skills / Knowledge			PLOs
		Specific	Generic	Knowledge	
1	Ability to define the hydrologic cycle, its components and the interaction between its components.	SS1	GS1	K1, K2	1/1.1 2/2.2 3/3.4 4/4.2 5/5.3 6/6.4
2	Ability to calculate precipitation/rainfall, evaporation, infiltration and surface flow/stream flow values for a basin.	SS2			
3	Ability to calculate groundwater flow value for a basin.				
4	Ability to calculate and plot fundamental design graphics for streamflow such as key curves, rating curve and hydrographs.		GS3		
5	Ability to use unit hydrograph theory for flood analysis.	SS3			

8. Class Instructor List

8.1 Yutthana Phankamolsil (YP), Email: yutthana.pha@mahidol.edu
8.2 Luksanaree Maneechot (LM), Email: luksanaree.man@mahidol.ac.th

9. Course Outline

Week	Date	Contents	CLOs	Teaching & Learning Method	Instructor
1	11 Aug 21	Hydrological Processes	1	Online [Live meeting on WebEX]	YP
2	18 Aug 21	Basic Weather	2		LM
3	25 Aug 21	Precipitation I - Formation of Precipitation	2		LM
4	1 Sep 21	Precipitation II - Estimating rainfall	2		YP
5	8 Sep 21	Evaporation and Evapotranspiration	2		YP
6	15 Sep 21	Infiltration	2		YP
7	22 Sep 21	Groundwater characteristics	3		KK
8	29 Sep 21	Groundwater flow calculation	3		
9		Mid-term examination			
10	makeup	Stream instrument	4	Online [Live meeting on WebEX]	YP
11	20 Oct 21	Hydrograph	4		YP
12	27 Oct 21	Unit Hydrograph I	4		YP
13	3 Nov 21	Unit Hydrograph II	4		YP
14	10 Nov 21	Flood Routing	5		YP
15	17 Nov 21	Flood Routing	5		YP
16	24 Nov 21	Introducing the hydrological modeling	1		YP
17	Final examination				

10. Course Assessment

No.	Methods / Activities	Regulations	CLOs	Week	Weight Distribution (%)
10.1	Mid-term exam	☑ Content (Week 1-8) ☑ Live examination ☑ Faculty-approved calculator	1-3	9	20
10.2	Final exam	☑ Content (Week 9-15) ☑ Live examination ☑ Faculty-approved calculator	4-5	17	20
10.3	Assignments (Homework, activities, or tests)	Students must solve the problem in homework and complete the task in class activities	1-5	All	50
10.4	Class participation	Student must attend a class more than 80% of the whole course.	1-5	All	10
				Total	**100**

11. 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 %

12. References

๑) Chow, V. T., D.R. Maidment, and L.W. Mays. 1988. Applied Hydrology. New York: Mc-Graw-Hill.

๒) Linsley, R.K., Jr., M.A. Kohler, and J.L.H. Paulhus. 1988. Hydrology for Engineers. SI Metric Lon-don: Edition. McGraw-Hill.

Note:

Specific Skill (SS)	
SS1	Understand hydrological processes
SS2	Estimate component of hydrological processes
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	Hydrological processes
K2	Hydrological Modelling
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