Course Syllabus (Academic Year 2020)
Environmental Engineering and Disaster Management Program

1. **Course No. and Title** : KAED 372 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 2020
5. **Class Schedule & Venue**: Fridays 09:00 – 12:00, Room 2218, Learning Building
   Class Coordinator : Dr. Yutthana Phankamolsil
   Contact No. : 0816954621 Email: yutthana.pha@mahidol.edu

6. Course Description

Introduction, hydrological cycle, climate variation, precipitation, wind, evaporation, transpiration, infiltration, runoff, rainfall-runoff, overland flow, sediment, reservoir, frequency analysis in hydrology.

7. Course Objectives / Course Learning Outcomes (CLOs)

No.	Objectives / CLOs	Expected Skills / Knowledge			PLOs
		Specific	Generic	Knowledge	
7.1	Be able to explain the hydrological components processes.	SS1	GS1, GS2	K1	1/1.1
7.2	Be able to estimate the hydrological components processes.	SS2	GS1, GS2 GS3, GS4	K1, K2	1/1.2

8. Class Instructor List

8.1 Name : Dr. Yutthana Phankamolsil (YP)
Contact No. : 0816954621 Email: yutthana.pha@mahidol.edu

9. Course Outline

Week	Date	Contents	CLOs	Teaching & Learning Method	Instructor
1	12 Aug 20	Hydrological Processes	1	Offline [Clips VDO, assignment] Online [Live meeting on WebEX, MS-team,	YP
2	13 Aug 20	Basic Weather	1		YP
3	19 Aug 20	Evaporation and Evapotranspiration	1		KK
4	20 Aug 20	Precipitation I - Formation of Precipitation	1		YP
5	26 Aug 20	Precipitation II - Estimating rainfall	1		YP
6	27 Aug 20	Infiltration	1		YP

7	2 Sep 20	Stream instrument	1	presentstion]	KK
8	3 Sep 20	Mid-term Examination			
9	9 Sep 20	Hydrograph - Hydrograph Shape - Mass Curve	1	Offline [Clips VDO, assignment] Online [Live meeting on WebEX, MS-team, presentstion]	YP
10	10 Sep 20	Hydrograph - Flow Duration Curve	1		YP
11	16 Sep 20	Hydrograph Analysis 1 - Unit Hydrograph I	1		YP
12	17 Sep 20	Hydrograph Analysis 2 - Unit Hydrograph II	1		YP
13	23 Sep 20	Flood Routing	2		YP
14	24 Sep 20	Ground Water I	2		YP
15	30 Sep 20	Ground Water II	2		YP
16	1 Oct 20	Hydrological Modelling Practice	1,2		YP
17	Final Examination				
18					

Note : YP (Yutthana Phankamolsil), KK (Kitiya Keatnarakorn)

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	1-2	8	20
10.2	Final exam	☑ Content (Week 10-16) ☑ Live examination ☑ Faculty-approved calculator	1-2	17,18	20
10.3	Assignments (Homework, activities, or tests)	Students must solve the problem in homework and complete the task in class activities	1-2	All	50
10.4	Class participation	Student must attend a class more than 80% of the whole course.	1-2	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

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