Course Syllabus (Academic Year 2021)

School of Interdisciplinary Studies, Kanchanaburi Campus, Mahidol University

1. **Course No. and Title** : KAED 227 Engineering Drawing
   Credit (study hours) : 3(2-3-5)
2. **Program Name** : Bachelor of Engineering Program in Environmental Engineering and Disaster management
3. **Course Module** : Major Required Courses
   Pre/co-requisite : -
4. **Class Semester** : ☑ 1st Semester ☐ 2nd Semester Academic Year 2021
5. **Class Schedule & Venue** : Thursday (13:00 – 17:00)
   Online course (via MOODLE MUKA e-learning)
6. **Class Coordinator** : Monchai Pumkaew
   Contact No. : 061 4644 663**,** Email : monchai.pum@mahidol.edu
7. **Course Description**

   Use of drawing instruments, engineering lettering, applied geometry, theory of orthographic projection and orthographic drawing, sectional views drawing, auxiliary views drawing, pictorial drawing, freehand sketching, dimensioning, abbreviations and symbols, interpreting engineering drawing, computer-aided design
8. **Course Objectives / Course Learning Outcomes (CLOs)**

No.	Objectives / CLOs	Expected Skills / Knowledge			PLOs
		Specific	Generic	Knowledge	
8.1	Learn and understand engineering drawing that includes use of drawing instruments, engineering lettering, applied geometry, theory of orthographic projection and orthographic drawing, sectional views drawing, auxiliary views drawing, pictorial drawing, freehand sketching, dimensioning, abbreviations and symbols, interpreting engineering drawing, computer-aided design		GS1, GS2, GS3	K1, K2, K3	1
8.2	Learn visualization of images and analyze their dimensions, and ability to create orthographic projections,		GS1, GS2, GS3	K1, K2, K3, K4	1

	pictorial drawings, auxiliary views drawing and sectional views				
8.3	Ability to produce simple assembly drawings by using AutoCAD	SS10, SS11	GS1, GS2, GS3, GS8	K1, K2, K3, K4, K5, K6	1, 2
8.4	Ability to apply the fundamental of engineering drawing in the environmental engineering and disaster management work	SS10, SS11	GS1, GS2, GS3, GS8	K1, K2, K3, K4, K5, K6	1, 2

9. Class Instructor List

Name : Monchai Pumkaew (MP) Contact No. : 0614644663 , Email : monchai.pum@mahidol.edu

10. Course Outline

Week	Date	Contents	CLOs	Teaching & Learning method	Instructor's Names
1	19 Aug 21	Introduction, Drawing Instruments, Metric and SI units, Title Block, Line, Lettering and Dimensioning, Scaling, Freehand sketching	8.1	• Presentation • Assignment	MP
2	26 Aug 21	Computer-aided design Basic command: Lines and shapes	8.1, 8.3	• Presentation • Assignment	MP
3	2 Sep 21	Computer-aided design Basic command: Modify tools	8.1, 8.3	• Presentation • Assignment	MP
4	9 Sep 21	Dimensioning, Abbreviations and symbols, Interpreting engineering drawing	8.1	• Presentation • Assignment	MP
5	16 Sep 21	Applied geometry	8.1	• Presentation • Assignment	MP
6	23 Sep 21	Theory of orthographic projection and orthographic drawing	8.1, 8.2	• Presentation • Assignment	MP
7	7 Oct 21	Computer-aided design Orthographic drawing	8.1, 8.2, 8.3	• Presentation • Assignment • Quiz 1	MP
8	Mid-term Examination (Online, to be announced)			•	
9	14 Oct 21	Pictorial drawing (Isometric drawing)	8.1, 8.2	• Presentation • Assignment	MP
10	21 Oct 21	Pictorial drawing (Oblique drawing)	8.1, 8.2	• Presentation	MP

				• Assignment	
11	28 Oct 21	Auxiliary views drawing	8.1, 8.2	• Presentation • Assignment	MP
12	4 Nov 21	3D model drawing	8.1, 8.2, 8.3	• Presentation • Assignment	MP
13	11 Nov 21	Sectional views drawing (Full section, Half section)	8.1, 8.2	• Presentation • Assignment	MP
14	18 Nov 21	Sectional views drawing (Broken section and Offset section)	8.1, 8.2	• Presentation • Assignment	MP
15	25 Nov 21	Sectional views drawing (Revolve section, Removed section)	8.1, 8.2	• Presentation • Assignment • Quiz 2	MP
16	2 Dec 21	Final Project: Shop Drawing	8.3, 8.4	• Presentation • Assignment	MP
17	Final Examination (Online, to be announced)				

11. Course Assessment

No.	Methods / Activities	Regulations	CLOs	Week	Weight Distribution (%)
11.1	Mid-term exam	**Theory test 15%** ▪ Content (Week 1-8) ▪ Closed book ▪ Faculty-approved calculator ▪ 2 Hours ▪ Lecture room **Practical test 15%** ▪ Content (Week 1-8) ▪ Open book ▪ Faculty-approved calculator ▪ Drawing instrument ▪ 3 Hours ▪ Drawing room	8.1, 8.2, 8.3, 8.4	9	20
11.2	Final exam	**Theory test 15%** ▪ Content (Week 1-8, 10-16) ▪ Closed book ▪ Faculty-approved calculator ▪ 2 Hours ▪ Lecture room **Practical test 15%**	8.1, 8.2, 8.3, 8.4	17,18	20

		▪ Content (Week 1-8, 10-16) ▪ Open book ▪ Faculty-approved calculator ▪ 3 Hours ▪ Computer room			
11.3	Assignments	15 assignments	8.1, 8.2, 8.3, 8.4	1-8,10-16	20
11.4	Quiz	3 Quizzes	8.1, 8.2, 8.3, 8.4	5,12, 16	20
11.5	Class participation	Sign name and student must attend a class more than 80% of the whole course	8.1, 8.2, 8.3, 8.4	1-8, 10-16	20
				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 %

13. References

13.1 Bertoline, G.R., & Wiebe, E.N., (2010). *Fundamentals of graphic communication* (6th ed.): McGraw-Hill.

13.2 Boundy, A.W. (2006). *Engineering Drawing*: McGraw-Hill.

13.3 Torsakul, S. (2008). *Fundamental of Engineering Drawing*: Se-education Public Co. Ltd.

13.4 Watanapa, A. (2010). *Fundamental of Engineering Drawing*: McGraw-Hill.

Note:

Specific Skill (SS)	
SS1	To understand principle functions, advantages and disadvantages of each IT tool
SS2	To apply and select suitable IT tool for each scenario/situation
Generic Skill (GS)	
GS1	Systematic Thinking, Problem Solving and Analytical Skills
GS2	Basic Computer Skills
GS3	Environmental and Disaster Risk Awareness
GS4	An ability to function on multidisciplinary teams
GS5	An ability to use the techniques, skills and modern engineering tools necessary for engineering practice
Knowledge (K)	
K1	Use of drawing instruments
K2	Fundamental of Engineering drawing
K3	Interpreting engineering drawing
K4	Visualization of images and their dimensions
K5	Producing simple assembly drawings
K6	Computer-aided design
PLO1	Apply environmental engineering principles and knowledge to systematic solutions according to Professional Standards
PLO2	Apply practical skills in environmental engineering and disaster management to real situations based on academic principles and professional ethics
PLO3	Apply geo-informatics system and information technologies in planning to handle environmental and disaster problems in accordance with academic principles
PLO4	Effectively present and discuss engineering knowledge to related professional people for objective fulfillment by using proper language and media
PLO5	Work as an environmental engineer with other people to solve complicated problems according to economic, social, and environmental issues
PLO6	Develop a creative technology in environmental engineering and disaster management