Course Syllabus (Academic Year 2021)

School of Interdisciplinary Studies, Kanchanaburi Campus, Mahidol University

1) **Course No. and Title:** KAED 222 Engineering Mechanics

   Credit (study hours): 3(3-0-6)

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

3) **Course Module:** Major Required Courses

   Pre/co-requisite: SCMA 165 (Ordinary Differential Equations)

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

5) **Class Schedule & Venue:** 9.00-12.00 on Monday, Offline, Google classroom, Webex and Moodle

6) **Class Coordinator:** Dr. Luksanaree Maneechot

   Mobile: 084-1598294   Email: luksanaree.man@mahidol.edu

7) **Course Description**

   Force system; resultant; equilibrium; kinematics and kinetics of particles and rigid Bodies; Newton's second law of motion.

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

No	Objectives / CLOs	Expected Skills / Knowledge			PLOs
		Specific (S)	Generic (G)	Knowledge (K)	
1	To understand force system and identify type of force	S1	G1	K1	1
2	To calculate resultant force, equilibrium force, friction force, and distributed forces	S1	G1	K1, K2	1
3	To identify type of motion and force	S1	G1	K1, K2	1
4	To calculate forces related to velocity and acceleration	S1	G1	K1, K2, K3	1

Specific Competences

   S1 Ability to apply knowledge of mathematics, physics, and engineering

Generic Competence

   G1 Systematic thinking, problem solving, and analytical skills

Knowledge Competence

K1 Calculus and vector mechanics

K2 Force systems, motions and equilibrium

K3 Kinematics and kinetics of particles and rigid bodies

9) Class Instructor List

9.1 Dr. Luksanaree Maneechot   Instructor and project advisor

10) Course Outline

Week	Date	Contents	CLOs	Teaching & Learning method	Instructors
1	10/1/2022	Introduction: Conversion	1	Course Syllabus and Lecture	LM
2	17/1/2022	Force systems: Two Dimensions	1, 2	Lecture and Activity/Assignment	LM
3	24/1/2022	Force systems: Three Dimensions	1, 2	Lecture and Activity/Assignment	LM
4	31/1/2022	Forces and Moments	1, 2, 3	Lecture and Activity/Assignment	LM
5	7/2/2022	Forces and Moments	1, 2, 3	Lecture and Activity/Assignment	LM
6	14/2/2022	Equilibrium of Rigid Bodies	1, 2	Lecture and Activity/Assignment	LM
7	21/2/2022	Equilibrium in Three Dimensions	1, 2	Lecture and Activity/Assignment	LM
8	Mid-term exam (28/2/2022-4/3/2022)				
9	7/3/2022	Friction Force	1, 2	Lecture and Activity/Assignment	LM
10	14/3/2022	Kinetics of Particles (Axes x-y)	1, 2	Lecture and Activity/Assignment	LM
11	21/3/2022	Kinetics of Particles: (Axes n-t)	1, 2	Lecture and Activity/Assignment	LM
12	28/3/2022	Kinetics of Particles	1, 2	Lecture and Activity/Assignment	LM
13	4/4/2022	Kinematics of Rigid Bodies	1, 2	Lecture and Activity/Assignment	LM
14	11/4/2022	Plane Motion of Rigid Bodies: Relative Velocity	1, 2, 4	Lecture and Activity/Assignment	LM
15	18/4/2022	Plane Motion of Rigid Bodies: Relative Acceleration	1, 2, 4	Lecture and Activity/Assignment	LM
16	2/5/2022	Plane Motion of Rigid Bodies: Motion Relative to Rotating Axes	1, 2, 4	Lecture and Activity/Assignment	LM
17	Final exam (2/5/2022-15/5/2022)				

11) Course Assessment

No.	Methods / Activities	Regulations	CLOs	Week	Weight Distribution (%)
1	Class participation	Submitting assignments in time and 80% of ontime-attendences		All	20
2	Mid-term exam		1, 2, 3	1-7	40
3	Final Exam		1, 2, 4	9-16	40

12) Grading System

Grade	Score
A	≥80
B	75-79.99
B+	70-74.99
C+	65-65.99
C	60-64.99
D+	55-59.99
D	50-54.99
F	<50

13) References

Beer, F.P., Johnston, E.R., Mazurek, D.F., (2019). Vector Mechanics for Engineers: Statics (12th ed.): McGraw-Hill.

Hibbeler, R.C., (2015). Mechanics for Engineers: Statics (14th ed.): Pearson Education South Asia Ple Ltd.

Hibbeler, R.C., (2015). Mechanics for Engineers: Dynamics (14th ed.): Pearson Education South Asia Ple Ltd.