



Course Syllabus (Academic Year 2022)

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 Course
Pre/co-requisite : SCPY 151 (General Physics I)
4. **Class Semester** : 1st Semester 2nd Semester Academic Year 2022
5. **Class Schedule & Venue** : Monday 9:00-12:00, Onsite course (MUKA e-learning)
6. **Class Coordinator** : Dr. Watcharapol Wonglertarak
watcharapol.won@mahidol.ac.th, Tel 085 849 3199

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			
		Specific (S)	Generic (G)	Knowledge (K)	PLOs
8.1	To understand force system and identify type of force	S1	G1	K1	1
8.2	To calculate resultant force, equilibrium force, friction force, and distributed forces	S1	G1	K1, K2	1
8.3	To identify type of motion and force	S1	G1	K1, K2	1
8.4	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

Dr. Watcharapol Wonglertarak

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10. Course Outline

Week	Date	Contents	CLOs	Teaching & Learning method	Instructor
1	9/1/2023	Introduction: Conversion	8.1	Course Syllabus and Lecture	WW
2	16/1/2023	Force systems: Two Dimensions	8.1, 8.2	Presentation, Activity, and Assignment	WW
3	23/1/2023	Force systems: Three Dimensions	8.1, 8.2	Presentation, Activity, and Assignment	WW
4	30/1/2023	Forces and Moments	8.1,	Presentation, Activity, and Assignment	WW
5	6/2/2023		8.2, 8.3		
6	13/2/2023				
7	20/2/2023	Equilibrium of Rigid Bodies	8.1, 8.2	Presentation, Activity, and Assignment	WW
8	27/2/2023	Equilibrium in Three Dimensions	8.1, 8.2	Presentation, Activity, and Assignment	WW
9	7-10/3/2023	Mid-term Examination			
10	13/3/2023	Friction Force	8.1, 8.2	Presentation, Activity, and Assignment	WW
11	20/3/2023	Kinetics of Particles (Axes x-y)	8.1, 8.2	Presentation, Activity, and Assignment	WW
12	27/3/2023	Kinetics of Particles (Axes n-t)	8.1, 8.2	Presentation, Activity, and Assignment	WW
13	3/4/2023	Plane Motion of Rigid Bodies: Motion Relative to Rotating Axes	8.1, 8.2, 8.4	Presentation, Activity, and Assignment	WW
14	10/4/2023	Plane Motion of Rigid Bodies: Relative Velocity	8.1, 8.2, 8.4	Presentation, Activity, and Assignment	WW
15	24/4/2023	Plane Motion of Rigid Bodies: Relative Acceleration	8.1, 8.2, 8.4	Presentation, Activity, and Assignment	WW
16	1-12/5/2023	Final Examination			

11. Course Assessment

No.	Methods/Activities	Regulations	CLOs	Week	Weight Distribution (%)
1	Class participation and Class attention	Learner must attend the class more and 80% of course.	-	All	5
2	Quiz	Learner must be testing the knowledge of previous week	8.1, 8.2, 8.3, 8.4	All	10
3	Assignment	- Learner must practice the engineering skills via exercises and assignments form each topic. - The score will be evaluated according to the quality and details of work by instructors of those topics.	8.1, 8.2, 8.3, 8.4	All	15
4	Midterm Examination	The scope of exam will be cover topics of the 1 st -8 th week in this course.	8.1, 8.2, 8.3	9	35
5	Final Examination	The scope of exam will be cover topics of the 10 th -15 th week in this course.	8.1, 8.2, 8.4	16	35
Total					100

12. Grading system

Grade	Score	Grade	Score
A	≥ 80%	B+	75-79.99 %
B	70-74.99%	C+	65-69.99%
C	60-64.99%	D+	55-59.99%
D	50-54.99%	F	<50

However, the rubric scoring scale will be applied for evaluation the student performance along their tasks, such as assignment responsibility, presentation skill, and use of language, and organization capability.

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.
- สิริศักดิ์ ปโยธรสิริ (2547). กลศาสตร์วิศวกรรม ภาคสถิตยศาสตร์ (พิมพ์ครั้งที่ 2)