Tamkang University Academic Year 113, 2nd Semester Course Syllabus

Course Title	APPLIED MECHANICS	Instructor	WANG, SHENG-WEI
Course Class	TEWXB1A DEPARTMENT OF WATER RESOURCES AND ENVIRONMENTAL ENGINEERING, 1A	Details	◆ General Course ◆ Required ◆ One Semester ◆ 3 Credits
Relevance to SDGs	SDG4 Quality education		

Departmental Aim of Education

Ⅰ. Educating students with the fundamental knowledge of mathematics, science and engineering to enable them to succeed in the practice or academic research related to water resources and environmental engineering.

1. Training students with engineering basics to equip them with the capabilities of construction supervision and operation management.
2. Cultivating students with ability of applying engineering theory and pursuing innovation to equip them with the capabilities of researching, planning, engineering design, integration and assessment.
3. Training students with capacity to apply information technology in the engineering business.

Ⅱ. Cultivating students to become professional engineers with care in environment and professional ethics.

1. Cultivating students with characters of respecting the nature and humane care.
2. Cultivating students with engineering ethics and law-abiding character.
3. Preparing students with the capabilities of exploring, analyzing, interpreting, and dealing with problems.

Ⅲ. Preparing students with the capabilities of engaging in domestic and international engineering business.

1. Cultivating students with the capabilities of project management, presentation and communication skills, and teamwork.
2. Preparing students with the capabilities of applying professional foreign language and expanding their global perspective.
3. Cultivating students with cognitive and habits of continuous learning.

Subject Departmental core competences

A. Basic mathematical and engineering knowledge needed for water resources and environmental engineering applications.(ratio:50.00)

B. Capabilities of engineering planning, design, and information applications.(ratio:20.00)

C. Capabilities of logical thinking, analysis, integration, problem-solving skills, innovative design and engineering implementation.(ratio:20.00)

D. Continuous learning of the up-to-date knowledge of professional engineering, professional foreign language skills and global perspective.(ratio:5.00)

E. Awareness of the importance of teamwork and working attitude, and with cognition of professional ethics.(ratio:5.00)

Subject Schoolwide essential virtues
1. A global perspective. (ratio:10.00)
2. Information literacy. (ratio:10.00)
3. A vision for the future. (ratio:10.00)
4. Moral integrity. (ratio:10.00)
5. Independent thinking. (ratio:25.00)
6. A cheerful attitude and healthy lifestyle. (ratio:10.00)
7. A spirit of teamwork and dedication. (ratio:15.00)
8. A sense of aesthetic appreciation. (ratio:10.00)

Course Introduction	The objective of this course is to introduce the basic theory and engineering application of engineering mechanics. Through drawing free-body diagrams and solving equations, students will have the abilities to analyze and design engineering problems, to establish calculation skills, and to apply to practical engineering. This course includes force vectors, particle equilibrium, rigid body equilibrium, structural analysis, center of gravity and centroid, shear and moment, to help students build the essential academic abilities in the field of engineering.

The correspondences between the course's instructional objectives and the cognitive, affective, and psychomotor objectives.

Differentiate the various objective methods among the cognitive, affective and psychomotor domains of the course's instructional objectives.

I. Cognitive : Emphasis upon the study of various kinds of knowledge in the cognition of the course's veracity, conception, procedures, outcomes, etc.

II.Affective : Emphasis upon the study of various kinds of knowledge in the course's appeal, morals, attitude, conviction, values, etc.

III.Psychomotor: Emphasis upon the study of the course's physical activity and technical manipulation.

No.	Teaching Objectives	objective methods

1	This course aims to develop the basic skills of analysis, design, alculation and application required. by future hydraulic engineers	Cognitive

The correspondences of teaching objectives : core competences, essential virtues, teaching methods, and assessment

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABCDE	12345678	Lecture, Discussion	Testing, Study Assignments, Discussion(including classroom and online)

Course Schedule

Week	Date	Course Contents	Note
1	114/02/17 ~ 114/02/23	緒論(General principal)	
2	114/02/24 ~ 114/03/02	力向量(Force vectors)	
3	114/03/03 ~ 114/03/09	質點平衡(Equilibrium of particle)	
4	114/03/10 ~ 114/03/16	力系統合成(Force system resultants)-純量法	
5	114/03/17 ~ 114/03/23	力系統合成(Force system resultants)-純量法	
6	114/03/24 ~ 114/03/30	剛體平衡(Equilibrium of a rigid body)-自由體圖	
7	114/03/31 ~ 114/04/06	剛體平衡(Equilibrium of a rigid body)-平衡方程式	
8	114/04/07 ~ 114/04/13	結構分析(Structural analysis)-接點法	
9	114/04/14 ~ 114/04/20	Midterm Exam/Midterm Assessment Week (teachers can adjust the week as needed)	
10	114/04/21 ~ 114/04/27	結構分析(Structural analysis)	
11	114/04/28 ~ 114/05/04	內力(Internal forces)-剪力與彎矩方程式	
12	114/05/05 ~ 114/05/11	內力(Internal forces)-剪力與彎矩圖	
13	114/05/12 ~ 114/05/18	摩擦(Friction)-楔	
14	114/05/19 ~ 114/05/25	摩擦(Friction)-螺桿與軸承	
15	114/05/26 ~ 114/06/01	重心與形心(Center of gravity and centroid)	
16	114/06/02 ~ 114/06/08	重心與形心(Center of gravity and centroid)	
17	114/06/09 ~ 114/06/15	Final Exam/Final Assessment Week (teachers can adjust the week as needed)	

18	114/06/16～ 114/06/22	Flexible Teaching Week: Generally, no in-person classes; teachers may arrange teaching activities or final assessments, among other options.	

Key capabilities	self-directed learning Problem solving
Interdisciplinary	STEAM course (S:Science, T:Technology, E:Engineering, M:Math, A field:Integration of Art and Humanist)
Distinctive teaching	Special/Problem-Based(PBL) Courses
Course Content	Logical Thinking
Requirement	
Textbooks and Teaching Materials	Self-made teaching materials:Textbooks
References	
Grading Policy	◆ Attendance： 10.0 % ◆ Mark of Usual：35.0 % ◆ Midterm Exam： 25.0 % ◆ Final Exam： 30.0 % ◆ Other〈 〉： %
Note	This syllabus may be uploaded at the website of Course Syllabus Management System at http://info.ais.tku.edu.tw/csp or through the link of Course Syllabus Upload posted on the home page of TKU Office of Academic Affairs at http://www.acad.tku.edu.tw/CS/main.php . **※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.**