國立東華大學

教學計劃表　Syllabus

課程名稱(中文) Course Name in Chinese	材料力學			學年/學期 Academic Year/Semester	114/2
課程名稱(英文) Course Name in English	Mechanics of Materials				
科目代碼 Course Code	MS__21710	系級 Department & Year	學二	開課單位 Course-Offering Department	材料科學與工程學系
修別 Type	學程 Program	學分數/時間 Credit(s)/Hour(s)	3.0/3.0		
授課教師 Instructor	/陳怡嘉				
先修課程 Prerequisite					

課程描述　Course Description

學習材料在軸向應力、扭力的作用下的力學行為，求得剪應力以及彎矩等等材料必須承受的參數，以應用在梁的設計上。

課程目標　Course Objectives

使修習者能夠獲得材料力學方面的基本知識。
本課程(一)(二)之目的在提供初學者建立材料基本的力學概念，課程(一)將自靜力學簡介開始，著重在力之合成及分解，力系平衡，及斷面性質等觀念建立，進一步在課程(二)引入材料力學相關的基本定義、虎克定律、扭轉、純彎曲、應力應變轉換、樑之受力計算…等。
This course will enable the student to acquire a basic knowledge of the mechanics of materials. The purpose of this course (1) and (2) is to provide the beginner with the basic concepts of material mechanics, starting with an introduction to static mechanics, focusing on the synthesis and decomposition of forces, equilibrium of force systems, and properties of sections. In course (2), we introduce the basic definition of material mechanics, Hooke's law, torsion, pure bending, stress strain transformation, and calculation of stress on beams are further introduced.

	系專業能力 Basic Learning Outcomes	課程目標與系專業能力相關性 Correlation between Course Objectives and Dept.'s Education Objectives
A	具備材料科學所需的物理、化學及數學的知識。Acquire required basic physical, chemical, and mathematic knowledge for materials science and engineering.	○
B	具備材料科學的專業知識，並能應用於解決工程上之問題。Acquire required professional knowledge for materials science and engineering, applicable in solving engineering problems.	●
C	具備邏輯思考、實驗執行、報告撰寫與數據解釋之能力。Equipped with capabilities of logic thinking, execution of experiment, and data interpretation.	
D	具備專業道德及責任感，與良好的溝通及團隊合作的能力。Acquire professional morality and responsibility, and capability of quality communication and team cooperation	○
E	具備適當的英文能力，應用於學習與交流。Acquire English capability used for learning and interaction.	○

圖示說明Illustration ：● 高度相關 Highly correlated ○中度相關 Moderately correlated

授 課 進 度 表 Teaching Schedule & Content

週次Week	內容 Subject/Topics	備註Remarks

1	Normal stress and Strain 正向應力與應變 2/26	
2	Shear stress and strain 剪應力與應變（螺栓連接設計） 3/05	
3	Changes in lengths of axially loaded members 軸力桿件長度變化 3/12	
4	Statically indeterminate structures 靜不定結構 3/19	
5	Stresses on inclined sections 作用在傾斜截面上的應力 3/26	
6	Torsional deformation 扭力變形 4/02	
7	Transmission of power by circular shafts 圓桿扭矩與功率 4/09	
8	Statically indeterminate torsional members 靜不定扭力組件 4/16	
9	期中考試週 Midterm Exam 4/23	期中考
10	Shear forces and bending moments 彎矩與剪力 4/30	
11	Relationships among loads, shear forces, and bending moment 分布載重、剪力、彎矩之關係 5/07	
12	Shear-force and bending-moment diagrams 彎矩與剪力 5/14	
13	Curvature of beams 梁受彎產生的曲率 5/21	
14	Normal stresses in beams 梁受彎產生的正向應力 5/28	
15	Design of beams for bending stresses 梁抗彎設計 6/04	
16	Principal stresses and maximum shear stresses 平面主應力與平面最大剪應力 6/11	
17	期末考試週 Final Exam 6/18	期末考
18	Mohr's Circle for plane stress 平面應力的莫爾圓 6/25	

教 學 策 略 Teaching Strategies

☑ 課堂講授 Lecture ☐ 分組討論Group Discussion ☐ 參觀實習 Field Trip

☐ 其他Miscellaneous:

教 學 創 新 自 評 Teaching Self-Evaluation

創新教學(Innovative Teaching)

☑ 問題導向學習(PBL) ☐ 團體合作學習(TBL) ☐ 解決導向學習(SBL)

☐ 翻轉教室 Flipped Classroom ☐ 磨課師 Moocs

社會責任(Social Responsibility)

☐ 在地實踐Community Practice ☐ 產學合作 Industy-Academia Cooperation

跨域合作(Transdisciplinary Projects)

☐ 跨界教學Transdisciplinary Teaching ☐ 跨院系教學Inter-collegiate Teaching

☐ 業師合授 Courses Co-taught with Industry Practitioners

其它 other:

學期成績計算及多元評量方式 Grading & Assessments									
配分項目 Items	配分比例 Percentage	多元評量方式 Assessments							
		測驗 會考	實作 觀察	口頭 發表	專題 研究	創作 展演	卷宗 評量	證照 檢定	其他
平時成績(含出缺席) General Performance (Attendance Record)	20%	✓							
期中考成績 Midterm Exam	30%	✓							
期末考成績 Final Exam	40%	✓							
作業成績 Homework and/or Assignments	10%	✓							
其他 Miscellaneous (_____)	10%								

評量方式補充說明
Grading & Assessments Supplemental instructions

教科書與參考書目（書名、作者、書局、代理商、說明）
Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.)

James M. Gere, Barry J. Goodno, Mechanics of Materials, Cengage Learning, 9th edition,2019
滄海書局 04 2708 8787, 0932-597322
THBOOK@TSANGHAI.COM.TW

課程教材網址(含線上教學資訊,教師個人網址請列位於本校內之網址)
Teaching Aids & Teacher's Website(Including online teaching information.
Personal website can be listed here.)

其他補充說明 (Supplemental instructions)