

教學大綱(Syllabus)

Updated: 2011/08/26

課程編碼 (course no.)	U019			學分 (credits)	3	
課程名稱 (course name)	(中) 材料力學					
課程名稱 (course name)	(Eng.) Mechanics of Materials					
開課系所班級 (dept. & year)	材料科學與工程學系學士班三年級 (Dept. of Materials Science and Engineering, Junior)			授課教師 (teacher)	薛顯宗 教授 (Prof. Sham-Tsong Shiue)	
課程類別 (course type)	選 修 (Elective Course)	授課語言 (language)	中文 (Chinese)	開課學期 (semester)	上學期 (Fall)	
課程簡述 (course description)	(中) 讓學生瞭解材料受到拉力、壓力、扭力以及彎曲時其內部應力和應變的分佈情形，以做為進一步瞭解材料機械性質的基礎。					
課程簡述 (course description)	(Eng.) The goal of this course is to teach the learner studying the distribution of stress and strain in materials which is subjected to the tension, compression, torsion, and bending. It will be helpful for the learner to study the basic concepts of mechanical property of materials.					
課程目標 (course objectives)	(中) <ol style="list-style-type: none"> 1. 能用自己的詞彙定義何謂材料力學:能夠描述力學的基本範疇及對材料的重要性。 2. 學習在固體中材料受力後，受力分佈圖的分析方式，並了解分佈圖中各部份所代表的物理意義。 3. 能清楚表達材料力學原理的應用場合，並能清楚辨識力圖的表示法。 4. 特殊案例的學習與應用，加強實例分析的經驗 5. 知道於何處可找到材料力學的相關資訊、研究結果及標準，並可評估所獲資訊的適用性 6. 能利用材料力學的原理，評估一產品或系統的壽命與耐用性，並提出適當材料的選擇法則 7. 能以書面或口頭方式將所獲結果與同儕、助教及教師溝通 					

(Eng.)

1. To explain what the mechanics of materials is: Learners themselves can describe the basic concepts of mechanics and illustrate the important of mechanics in materials.
2. Learners must study to understand the distribution of stress and strain in materials when a force is applied to a material. Meanwhile, learners must know the physical meanings of each part in a force diagram.
3. Learners can know how to use the theory of mechanics in materials in real case and must have an ability to understand the force diagram.
4. For the specific case of mechanics in materials, the learners must try to analyze this case and increase the analytical experiences.
5. To know how to collect the information of mechanics in materials, and study a method to determine available information that you get.
6. Using the theory of mechanics in materials, the learners must study to estimate the lifetime and the durability of a product or a material system and suggest a selection rule of available materials based on the concept of mechanics.
7. Though the homework paper or ask questions on this course, it will help learners, teaching assistants and teacher to discuss with each other.

先修課程(prerequisites)						
課程編碼 (course no.)	課程名稱 (course name)	與課程銜接的重要概念、原理與技能 (relation to the current course)				
教學模式 (teaching methodology)	模式 (methodology)	講授 (teaching)	討論/報告 (discussion & report)	實驗/參訪 (exp./fab visit)	遠距/網路教學 (remote/web teaching)	合計 (sum)
	學分分配 (credit distrib.)	2.5	0.5			3
	授課時數分配 (hour distrib.)	2.5	0.5			3
授課進度與內容 (週次、單元名稱與內容、習作/考試進度、備註) (course content and homework/tests schedule)						
週次 (week)	單元名稱與內容 (subject and content)		習作/考試進度 (homework and tests)		備註 (remark)	
01-03	Tension, Compression, and Shear					
04-05	Axially Loaded Members					
06-07	Torsion					
08	Shear force and bending moments					
09	Midterm exam.		Midterm exam.			
10	Shear force and bending moments (continued)					
11-12	Stress in beams (Basic Topics)					
13-14	Analysis of stress and strain					
15-16	Deflections of Beams					
17	Final exam.		Final exam.			



學習評量方式

(evaluation)

1. 學期成績計算項目及權重標準如下：
 - A. Ordinary score: 30%
 - B. Mid. term exam: 35%
 - C. Final exam: 35%
2. 平時分數(ordinary score):
包含出席率、課堂指派作業與課堂小考表現之綜合成績的平均值
3. 考試部分(Midterm exam, Final exam):
期中、期末考均配合學校考試時程。內容包含所有講授內容與參考書中部分教材。小考共二次，目的在培養學生平時複習的學習習慣。小考時間均已排定在課程進度表中。

教科書 (書名、作者、書局、代理商、說明)

(textbook)

1. “Mechanics of Materials”, 6th ed., J.M. Gere, 新月圖書公司代理

參考書目 (書名、作者、書局、代理商、說明)

(other references)

課程教材 (教師個人網址請列在本校內之網址。)

(teaching aids & teacher's website)

1. <http://web.nchu.edu.tw/~stshiue/>

與學系教育目標之關聯性(材料系) (相關請勾選)
(relation to educational mission of materials engineering department)

- 1. 提供材料性質、製程與應用及跨領域知識與訓練
To provide interdisciplinary know-how and training on materials properties, processing, and applications
- 2. 培育具獨立思考、創新與實作能力之材料科技人才
To train materials technology students for independent thinking, innovation, and practical skills
- 3. 培養團隊合作精神與溝通協調整合能力
To cultivate the spirit of teamwork and the capacity of integrated cooperation
- 4. 建立多元價值與國際觀
To inculcate multifarious values and cosmopolitan worldview
- 5. 強化綠色材料科技教育
To implement educational programs in eco-materials technology

與學系教育核心能力之關聯性(材料系) (相關請勾選)
(relation to educational core abilities for materials engineering department)

- (A) 運用數學、科學及材料工程知識能力
(ability to apply knowledge of mathematics, science, and materials engineering)
- (B) 設計與執行材料實驗及分析數據之能力
(ability to design and conduct experiments, as well as analyze data)
- (C) 執行材料工程實務所需之技術與能力
(ability to use techniques and skills for materials engineering practices)
- (D) 製程整合及及元件實作之能力
(ability to integrate process and make devices)
- (E) 溝通協調之能力與團隊合作之精神
(ability to communicate effectively and cultivate the spirit of teamwork)
- (F) 獨立思考及解決問題之能力
(ability to think independently and solve problems)
- (G) 培養國際觀及認識綠色材料對全球環境的影響
(cultivation of cosmopolitan worldview and understanding effects of eco-materials on global environment)
- (H) 終身學習之習慣與能力
(ability to cultivate life-long learning habit)
- (I) 瞭解材料工程人員的社會責任與專業倫理
(understanding materials engineers' social responsibility and professional ethics)