

E421800 Mechanics of materials

Course Overview: Provides basic knowledge of mechanics of materials. The content includes Stress, Strain, Mechanical Properties of Materials, Axial Load, Torsion, Bending, Transverse Shear, Combined Loading, Stress Transformation, Strain Transformation, and Criteria of Material Failure

Department: Resources Engineering

Lecture: Monday 13:10-15:00, Wednesday 15:10–16:00, RE4354

Instructor: Kuo-chin Hsu 徐國錦, RE43403, 06-2757575 ext 62837,

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Office hour: Monday 15:00-17:00.

Teaching Assistant: Hsu, Zu-Ming 許祖銘, Civil building 4511, 0939761393, n66111447@gs.ncku.edu.tw

TA Office hour: TBD, n66111447@gs.ncku.edu.tw

Class material and homework submission: moodle system

Textbook : R. C. Hibbeler, Mechanics of Materials, 10th edition (Taiwan adapted version), Pearson, 2017, ISBN 978-986-280-374-5

References:

Timothy P., Mechanics of materials: An integrated learning system, Wiley, 2007, ISBN 978-0-470-04438-4

Huei-Huang Lee, Mechanics of Materials Labs with SolidWorks Simulation 2014, Published February 10, 2014, 288 Pages, ISBN: 978-1-58503-895-4 (in Chinese), 李輝煌, 全華圖書

Jaeger, J. C., N, G. W. Cook, and R. W. Zimmerman, Fundamentals of rock mechanics, 4th Edit, Blackwell Publishing, 2007.

Julian, V., Structural biomaterials (Third edition), Princeton University Press, 228p, 2012.

Flugge, W., Viscoelasticity, Blaisdell Publishing Company, 1967.

Sample questions from previous exams: 序率地下水文研究室

<https://sites.google.com/view/kchsu-lab/%E6%8E%88%E8%AA%B2%E8%B3%87%E6%96%99>



Chinese terminology translation:

<http://terms.naer.edu.tw/search/?q=stress&field=ti&op=AND&group=1&num=10>

Web Site Resources: edx.org

Mechanical Behavior of Materials

<https://courses.edx.org/courses/MITx/3.032x/3T2014/courseware/fa156567e80a483ab833f2b1a581923c/8a344b60a6c04f8da5ebda9a0a7c402e/>

Mechanical Behavior of Materials, Part 1: Linear Elastic Behavior

<https://www.edx.org/course/mechanical-behavior-materials-part-1-mitx-3-032-1x>

Mechanical Behavior of Materials, Part 2: Stress Transformations, Beams, Columns, and Cellular Solids

<https://www.edx.org/course/mechanical-behavior-materials-part-2-mitx-3-032-2x>

Mechanical Behavior of Materials, Part 3: Time Dependent Behavior and Failure

<https://www.edx.org/course/mechanical-behavior-materials-part-3-mitx-3-032-3x>

COMSOL 力學教學網站

<http://web.tiit.edu.tw/mechanic/e-book/98B-002/dir.htm>

Date of Examine:

- . 1st examine Mon. 6th week (2023/3/20)
- . 2nd examine Mon. 13th week (2023/5/8)
- . 3rd examine Mon. 18th week (2023/6/12)

Assignments of Grades:

1st examine 25%

2nd examine 25%

3rd examine 25%

Class attendance, quiz, homework and programming, 15%

Final group Report, 10%

Project of Mechanics of Material (2023):

Topic: polystyrene 保麗龍

1. What can the polystyrene be used for?
2. Why polystyrene is an environmental issue?
3. What is the mechanical properties of polystyrene?
4. How to recycle the used polystyrene?



Problem statement 5%
 Motivation 10%
 Methodology 20%
 Prototype construction 30%
 Mechanical analyses 30%
 Conclusions 5%

General outline :

Week	Dates	Monday	Wednesday	Note
1	2/12-2/18	0, 1.1, 1.2	1.3-4	
2	2/19-2/25	1.5-7	2.1-2	
3	2/26-3/4	Holiday	3.1-2	
4	3/5-3/11	3.3-6	3.7, 4.1	
5	3/12-3/18	4.2-5	4.6-7	
6	3/19-3/25	First examine	4.8-9	
7	3/26-4/1	5.1-4	5.5-6	
8	4/2-4/8	Holiday	Holiday	
9	4/9-4/15	5.7*-8, 5.9-10,	6.1-2,	
10	4/16-4/22	6.3, 6.4-6.5	分組設計動機與構 想圖	
11	4/23-4/29	6.6-8	6.9-10	
12	4/30-5/6	7.1-2, 7.3-4,	7.5*	
13	5/7-5/13	Second examine	8.1-2	
14	5/14-5/20	9.1-3	9.4-5	
15	5/21-5/27	10.1-3	分組模型測試與評 分	
16	5/28-6/3	10.4-5	10.6	
17	6/4-6/10	10.7	資源工程與材料力 學	
18	6/11-6/17	Third examine		