

**Department of Chemical Engineering, College of Engineering,
National Taiwan University**

Course number: (2021F) AM 5011-01 (543 U5870) Credits: 3

Course name: 材料力學 **Mechanics of Materials**

Schedule/classroom: Tue. (10:20am-12:10) & Fri. (9:10am-10:00), 應用力學館 111.

Instructor: Professor 朱錦洲 Chin-Chou Chu, Tel.(02) 3366-5668 (IAM Hall 409)

Office hours: Wednesday 3-5pm, or appointment by email. Email: chucc@ntu.edu.tw

Teaching Assistant: 許博智 r90543075@ntu.edu.tw

Teaching object: 2nd-year students in the Department of Chemical Engineering and students with interests in other Departments

Pre-requisite: Physics (I) & (II)

©Mechanics of Materials-Overview:

Material mechanics explores the relationship between force and deformation of non-rigid structures. This course will first introduce the relationship between stress and strain concept. Then discuss the relationship between stress and strain under the action of axial loading and torsion of the rod, the stress distribution of the pressure vessel, bending moment analysis of flexural components and buckling analysis of axial components, etc.

©Contents: (45 hrs.)

1. Introduction and Review of Statics (6 hrs.)
2. Analysis of Stress: Concepts and Definitions (6 hrs.)
3. Analysis of Strain: Concepts and Definitions (4 hrs.)
4. Material Properties and Stress-Strain Relationships (5 hrs. + 1hr Lab tour)
5. Axial Loading Applications and Pressure Vessels (6 hrs.)
6. Torsional Loading of Shafts (6 hrs.)
7. Flexural Loading: Stresses in Beams (8 hrs.)
8. Flexural Loading: Beam Deflections (4 hrs.)
9. Buckling of columns (2 hrs.)

©Textbook: W. F. Riley, L. D. Sturges and D. H. Morris, *Mechanics of Materials*, 6th Ed., John Wiley & Sons 2007.

©Grading (total 100%)

Homework problems: 10%

Midterm exam.: 45%

Final exam.: 45%