

# Mechanical Design (I)

## 機械設計 (一) 機三乙

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### Course Instructor :

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### Course Information :

Days and Hours : 9:10-10:00 am, Tuesdays ; 8:10-10:00 am, Fridays

Classroom : Room #204, ME Building

Webpage : <http://iteach.ncku.edu.tw> (需登入，確認已將此課程加入，並設定常用Email帳號)

Textbook :

“*Fundamentals of Machine Component Design*” 4th ed.

by Robert C. Juvinall, John Wiley & Sons Inc., ( NCKU Bookstore : 06-274-4622 )

Credit : 3

Grades (100%):

Homework <sup>1</sup>	20%
Attendance and Participation	10%
Team Project	20%
Midterm Exam #1	15%
Midterm Exam #2	15%
Final Exam	20%

### Homework and Project:

Five homework sets will be assigned prior to midterm and final exams. These homework sets are based on course materials and discussions from class. In addition, teams of three people are formed to complete a design project. Detail description of the project will be provided in class. All members in the team are required to work on their specific part and then putting components together. Upon the completion of the project, randomly selected team will be asked to present their concepts at the end of the semester.

### Course Mission :

Provide concepts, procedures, and decision analyses that are essential in designing mechanical components. Students are expected to analyze individual element as well as the interfaces between elements as they work together to form a system.

### Course Objectives :

- Introduce the concept of mechanical design and provide examples (Chap. 1)
- Review force analysis ( Chap. 2)
- Describe mechanical properties of various materials (Chap. 3)
- Perform stress-strain analysis and provide case studies (Chap. 4 and 5)
- Introduce failure theory and reliability (Chap. 6)
- Perform impact analysis (Chap. 7)
- Explain various fatigue-failure models (Chap. 8)
- Demonstrate various surface failure mechanisms(Chap. 9)
- Class review and case study presentations

### Honor Code :

我在考試時絕不會給予別人協助，也不會接受他人的幫忙，所有作業及考試的答案均為本人努力的結果，若有違背誓言，一切依校規處置。

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<sup>1</sup> Homework Policy : 每星期五公佈作業題目，隔週五上課時抽考作業內容，抽考成績即為當次作業成績。

**Class Schedule : (updated 7/2)**

\* Holidays

Wk.	Dates		Lecture	Homework Quiz	Team Homework
	Tue.	Fri.			
1	9/16	9/19	Syllabus, Design Examples; Chap.1 Introduction		交分組名單
2	9/23	9/26	Chap.2 Force Analysis		分組面談
3	9/30	<b>10/3</b>	Chap.3 Material Properties	<b><u>HW #1(10/3)</u></b>	
4	10/7	<b>10/10*</b>	Chap.3 Material Properties		交設計概念圖(10/9)
5	10/14	<b>10/17</b>	Chap.3 Material Properties	<b><u>HW #2(10/17)</u></b>	
6	10/21	<b>10/24</b>	Review Chapters 1-3 <b><u>Midterm Exam #1 (10/24)</u></b>		
7	10/28	10/31	Chap.4 Stress Analysis		
8	11/4	<b>11/7</b>	Chap.4 Stress Analysis		交材料選擇考量及結果
9	11/11*	<b>11/14</b>	Chap.5 Stress-Strain Relations	<b><u>HW #3 (11/14)</u></b>	
10	11/18	11/21	Chap.5 Stress-Strain Relations		
11	11/28	<b>11/28</b>	Chap.5 Stress-Strain Relations	<b><u>HW #4 (11/28)</u></b>	
12	12/2	<b>12/5</b>	Chap.6 Failure and Reliability		交應力分析結果
13	12/9	<b>12/12</b>	Review Chapters 3-5 <b><u>Midterm Exam #2 (12/12)</u></b>		
14	12/16	12/19	Chap.6 Failure and Reliability ; Chap.7 Impact Analysis		
15	12/23	<b>12/26</b>	Chap.7 Impact Analysis ; Chap.8 Fatigue Failure	<b><u>HW #5 (12/26)</u></b>	交可靠度分析
16	12/30	1/2	Chap.8 Fatigue Failure		
17	1/6	<b>1/9</b>	Chap.9 Surface Failure and Class Review		交期末報告(1/9)
18	1/13	<b>1/16</b>	<b><u>Final Exam (1/16)</u></b>		