

<b>課程名稱 (course name)</b>	生活中的工程 Engineering in everyday life				
<b>開課系所班級 (dept. &amp; year)</b>	通識教育中心	<b>學分 (credits)</b>	2	<b>規劃教師 (teacher)</b>	精密所 王東安
<b>課程類別 (course type)</b>	必修	<b>授課語言 (language)</b>	中文或英文	<b>開課學期 (semester)</b>	上或下
<b>課程簡述 (course description)</b>	<p>這門課協助學生從工程的角度觀察日常生活的有趣事物，藉著對生活中的主題及事件的模擬分析，學生能對科技世界的挑戰有更深入的了解。課程的設計能增加各種背景的學生的知識廣度，並培養其觀察各種有趣事物的工程直覺。此課程需繳交一個日常生活中事件之工程分析的期末報告。</p> <p>This course develops an engineering insight into our everyday lives. Through modeling of the subjects and events encountered in real lives, students can gain a deeper understanding to the challenges of the technology world. The design of the course is suitable for students with all majors to extend their knowledge base and prepare students an engineering intuition to the interesting world. The course includes a term project related to engineering in everyday life using a computer software.</p>				
<b>先修課程 (prerequisites)</b>	無				
<b>課程目標與核心能力關聯配比(%) (relevance of course objectives and core learning outcomes)</b>					
<b>課程目標</b>	<b>course objectives</b>			<b>核心能力 core learning outcomes</b>	<b>配比 合計 100%</b>
<p>學習從工程的角度觀察日常生活的有趣事物，熟悉工程分析工具的使用，培養工程師的直覺以解決日常生活中所面對的挑戰。</p> <p>修習本課程的學生將能增加其對日常生活中的事物與工程科技之關聯性的了解，除了欣賞科技之美外，並探索工程的美麗世界。</p>	<p>Observe the interesting events in every life from an engineering perspective. Familiar with the use of engineering analysis tools. Prepare an engineering intuition to the challenges encountered in life.</p> <p>Students can gain a deeper understanding to the world and relate the objects/events to engineering. Appreciate the beauty of technology and explore the world of engineering.</p>			人文素養	10%
				科學素養	45%
				溝通能力	15%
				創新能力	30%
				國際視野	0%
				社會關懷	0%
<b>課程目標之教學方法與評量方法 (teaching and assessment methods for course objectives)</b>					
<b>教學方法 (teaching methods)</b>			<b>學習評量方式 (evaluation)</b>		

Lecture, 課堂講授  
 computer workshop, 電腦實習  
 classroom discussion, 課堂討論  
 group project. 分組報告

Computer assignment 30% 電腦作業  
 Class discussions 20% 課堂討論  
 Final report 50% 期末報告

**授課內容 (單元名稱與內容、習作 / 考試進度、備註)**  
**(course content and homework / tests schedule)**

Week	Lecture Topic	Homework
1	Course overview 課程簡介	
2	Aquarium and flow analysis 水族箱的水流	
3	Aquarium seepage analysis 水族箱漏水了	
4	Bridge and static analysis 橋梁會垮嗎	
5	Dam and static analysis 水壩撐不撐得住	Hw1
6	Temperature of iron table 好燙的桌子	
7	Hot water in a pipe 排水管的水哪去了	
8	Temperature of solar panel 發燒的太陽能板	Hw2
9	Lift of an airplane wing 飛機飛不飛	
10	Outlet velocity of a range hood 抽油煙機給力嗎	
11	Cell phone drop 墜落的手機	Hw3
12	Buckling analysis of a stool 椅腳會轉彎	
13	Tuning fork 音樂家的音叉棒	
14	Final report topic presentation 期末報告準備	
15	A blower fan 吹風機大風吹	
16	Fatigue of a basketball rim 籃筐會垮嗎	
17	Presentation I 期末報告	
18	Presentation II 期末報告	Final report

**教科書與參考書目 (書名、作者、書局、代理商、說明)**  
**(textbook & other references)**

Textbook  
 CADArtifex, "Exploring finite element analysis with SOLIDWORKS simulation 2017", CADArtifex, 2017.  
 References  
 1. Shih, "Introduction to finite element analysis using SOLIDWORKS simulation 2018", CRC press, 2018.  
 2. Huebner, Thornton, Byrom, "The finite element method for engineers", John Wiley & Sons, 1995  
 3. Hughes, "The finite element method", Dover, 2000.

**課程教材 (教師個人網址請列在本校內之網址)**  
**(teaching aids & teacher's website)**

[web.nchu.edu.tw/~daw/Teaching/LIFEengineering/lifeengineering.htm](http://web.nchu.edu.tw/~daw/Teaching/LIFEengineering/lifeengineering.htm)

**課程輔導時間**  
**(office hours)**

另行公告