

<b>課程名稱</b> (course name)	(中) 綠色能源材料導論  (Eng.) Introduction of Materials for Renewable Energy				
<b>開課系所班級</b> (dept. & year)	通識教育中心	<b>學分</b> (credits)	3	<b>規劃教師</b> (teacher)	賴宏仁
<b>課程類別</b> (course type)	必修	<b>授課語言</b> (language)	中文、英文	<b>開課學期</b> (semester)	上、下
<b>課程簡述</b> (course description)	(中) 課程重點為介紹先進再生能源材料技術原理與與應用趨勢、例如先進奈米材料應用於高效能太陽電池、燃料電池等領域，以及探討氫能、生質能所使用關鍵材料技術，以及探討奈米材料優異的性能在各能源元件與產品的應用。並舉例各項能源材料技術與再生能源產業未來潛在商機。  (Eng.) Teaching contents will introduce the principle and technology trend of the advanced materials for renewable energy. For example: nanomaterials for solar energy, micro fuel cells. And it also introduce hydrogen energy and hydroge storage alloys, biomass energy, and wind energy, etc. This course also give many application examples of advanced materials for renewable energy.				
<b>先修課程</b> (prerequisites)	無				
<b>課程目標與核心能力關聯配比(%)</b> (relevance of course objectives and core learning outcomes)					
<b>課程目標</b>	<b>course objectives</b>			<b>核心能力</b> core learning outcomes	<b>配比</b> 總計 100%
本課程講授重點為介紹先進再生能源材料技術，同時介紹各種材料製程技術與潛在應用商機。	The objective of this course is going to introduce the advanced materials of renewable energy, and to introduce manufacturing technologies and potential applications of different nanomaterials.			文化素養	10%
				溝通能力	20%
				問題解決能力	50%
				國際視野	10%
				社會關懷	10%
<b>課程目標之教學方法與評量方法</b> (teaching and assessment methods for course objectives)					
<b>教學方法 (teaching methods)</b>			<b>學習評量方式 (evaluation)</b>		
講授 討論 專題探討			1. 課堂作業 20% 2. 期中測驗 35% 3. 期末測驗 35% 4. 平常表現 10%		

**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)**

週次	授 課 大 綱
1	Overall Introduction
2	Technology Trend of Renewable Energy
3	Introduction of Nanomaterials
4	Solar Energy and Solar Cell
5	Nanomaterials for Solar Cell
6	Introduction of Fuel Cell
7	Nanomaterials for Micro Fuel Cell
8	Introduction of Thermoelectric Materials
9	Midterm Examination
10	Nano-structured Thermoelectric Materials
11	Introduction of Hydrogen Energy
12	Hydrogen Storage Alloys
13	Introduction of Wind Energy
14	Introduction of Biomass Energy
15	R&D Roadmap of DOE (USA) and NEDO (Japan)
16	Group Discussion
17	Group Discussion
18	Final Examination

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

1. Renewable Energy, Godfrey Boyle, Oxford University Press, 2004
2. 大部分授課內容將取自於授課老師自行編寫的講義。
3. Solar Cells, Tom Markvart, Elsevier Science, 2005
4. Nanomaterials, Stanislaw Mitura, Pergamon Press, 2000.
5. 圖解奈米科技, 工業技術研究院譯著, 2002。
6. 台灣奈米科技-從 2004 到嚮往的大未來, 工業技術研究院奈米科技研發中心, 2004。

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

**課程輔導時間**  
**(office hours)**