**研究所課程綱要表Graduate degree - Course Syllabus**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 課程名稱Course Name：電業自由化概論 | | | | | 開課系所Department | 電機所 | |
| Course Title: An Introduction to Electric Utility Deregulation | | | | | 課程代碼Course code | 4155509\_01 | |
| 授課教師Professor：吳元康Yuan-Kang Wu | | | | | | | |
| 學分數Credits | 3 | | 必/選修Req/Elec | 選修  Elec | 開課年級  Grade | 碩博合開 | |
| 先修科目或先備能力Prerequisite：Power System analysis | | | | | | | |
| 課程概述：Course Overview:  This course will give the fundamentals on electric market design, market power, ancillary service, capacity market, congestion management, security constraint unit commitment, available transfer capacity calculation, locational marginal price computation, wheeling charge, load demand and electricity price forecasts, hedging strategies, and risk management. | | | | | | | |
| 學習目標：Learning Objective: The complete understanding on electric market operation. | | | | | | | |
| 教科書  Textbooks1 | | Darryl R. Biggar and Mohammad Reza Hesamzadeh, The Economics of Electricity Markets  ISBN: 978-1-118-77575-2 | | | | | |
| 課程綱要 Syllabus | | | | | 對應之學生核心能力  Student Competencies | | 備註  Comments |
| 單元主題  Topic | | 內容綱要  Content Summary | | |
| Electric market design | | 1. Classification of electricity market models 2. Market Power 3. Operation rules for market trading 4. Ancillary services and capacity markets 5. Market power and indexes | | | 1.1, 1.3, 2.1, 4.1, 4.3, 4.4 | | This course will provide 18hour teaching videos (at least) for students |
| Congestion management | | 1. Electricity price mechanism 2. Available transfer capacity (ATC) calculation 3. Locational marginal price (LMP) computation 4. Wheeling charge 5. Security constraint Unit Commitment 6. Price calculations 7. Transmission services | | | 1.1, 1.3, 2.1, 4.1, 4.3, 4.4 | |
| Forecasting technologies | | 1. Price forecasting in markets 2. Load forecasting | | | 1.1, 1.3, 2.1, 4.1, 4.3, 4.4 | |
| Risk management | | 1. Hedging strategies 2. Contract management 3. Risk management. | | | 1.1, 1.3, 2.1, 4.1, 4.3, 4.4 | |
| 教學要點概述2：Grading Standards：  教材編選Textbook：🗹自編教材Own teaching material　　🗹教科書作者提供Authored Textbooks  教學方法Teaching Method：  🗹投影片講述PPT　　🗹板書講述Blackboard　　🗹實例示範Demonstration by examples  □操作練習Activities  評量方法Grading Method：□上課點名Final Presentation（%）　　□小考Quiz（%）  🗹作業Homework（40 %）　　□程式實作Program implementation（%）  □實習報告Internship report（%）　　□專案project（%）　　 🗹期中考Mid-term exam（30%）  □期末考Final exam（%）　　🗹期末報告Final report（30 %）　　□其它Other（%）  教學資源Teaching Resources：□課程網站Course Website  🗹教材電子檔供下載Teaching Material Downloads　　🗹其他Other EMI teaching videos  教學相關配合事項Other matters related：Student can also learn from EMI teaching videos | | | | | | | |
| **核心能力Core Capabilities**  🗹1.1 ○1.2 🗹1.3 🗹2.1 ○2.2 ○3.1 ○3.2 🗹4.1 ○4.2 🗹4.3 🗹4.4  1.1 學習電機／通訊工程相關領域之理論基礎(Learning the theoretical basis of EE/COMM related fields)  　　為何有關(Why is the course capable of cultivating this ability?)：The students can learn the basic electricity market planning and operation.  　　達成指標(Indicators to be reached)：The final score is above 70.  　　評量方法(Assessment methods)：Home works, exams and final Projects  1.2 瞭解電機／通訊工程相關領域之實務技術(Studying the substantive technologies of EE/COMM related fields)  　　為何有關(Why is the course capable of cultivating this ability?)：  　　達成指標(Indicators to be reached)：  　　評量方法(Assessment methods)：  1.3 訓練專業論文寫作與簡報的能力(Practice writing thesis and professional papers)  　　為何有關(Why is the course capable of cultivating this ability?)：The students need to prepare ppt files and present their reports in this course.  　　達成指標(Indicators to be reached)：The final score is above 70.  　　評量方法(Assessment methods)：Home works and presentations in English  2.1 培養發掘與分析電機／通訊工程特定領域專題研究之能力(Cultivating the ability to explore and analyze case studies of specific areas in EE/COMM)  　　為何有關(Why is the course capable of cultivating this ability?)：The students can learn the basic electricity market planning and operation.  　　達成指標(Indicators to be reached)：The final score is above 70.  　　評量方法(Assessment methods)：Home works, exams and final Projects  2.2 培養規劃與執行電機／通訊工程特定領域專題研究之能力(Cultivating the capacity of planning and implementation of Case studies of specific areas in EE/COMM)  　　為何有關(Why is the course capable of cultivating this ability?)：  　　　　達成指標(Indicators to be reached)：  　　評量方法(Assessment methods)：  3.1 學習溝通與表達的能力 (Practice communication and self-expression)  　　為何有關(Why is the course capable of cultivating this ability?)：  　　達成指標(Indicators to be reached)：  　　評量方法(Assessment methods)：  3.2 運用個人專長，與團隊成員合作達成計畫目標 (Collaboration with others)  　　為何有關(Why is the course capable of cultivating this ability?)：  　　達成指標(Indicators to be reached)：  　　評量方法(Assessment methods)：  4.1 瞭解國內外電機／通訊工程特定領域產業現況與需求 (Understand local and international EE/COMM industry and demands)  　　為何有關(Why is the course capable of cultivating this ability?)：The students will learn the different types of companies in electricity markets to know potential job opportunity.  　　達成指標(Indicators to be reached)：The final score is above 70.  　　評量方法(Assessment methods)：Home works, exams and final Projects  4.2 理解工程倫理及社會責任(Understanding engineering ethics and social responsibility)  　　為何有關(Why is the course capable of cultivating this ability?)：  　　達成指標(Indicators to be reached)：  　　評量方法(Assessment methods)：  4.3 培養良好的國際觀 (Develop international outlook)  　　為何有關(Why is the course capable of cultivating this ability?)：The students will learn the functions of independent system operators and transmission system operators in Europe and USA  　　達成指標(Indicators to be reached)：The final score is above 70.  　　評量方法(Assessment methods)：Home works, exams and final Projects  4.4 培養特定領域專業科技英文能力 (Develop the professional field English ability)  　　為何有關(Why is the course capable of cultivating this ability?)：  　　In this course, students must read many international journals and conference papers  　　達成指標(Indicators to be reached)：The final score is above 70.  　　評量方法(Assessment methods)：Home works, exams and final Projects | | | | | | | |

註：1. 教科書請註明書名、作者、出版社、出版年等資訊。

2. 教學要點概述請填寫教材編選、教學方法、評量方法、教學資源、教學相關配合事項等。

Include teaching materials, teaching method, assessment method, teaching resources, related matters

3. 研究所所有開設之課程，皆須填寫此表格或提供原有格式之課程綱要表。