



教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	高等電機控制		學年/學期 Academic Year/Semester	112/2
課程名稱(英文) Course Name in English	Advanced Electric Motor Drives and Control			
科目代碼 Course Code	EE_D0250	系級 Department & Year	博士	開課單位 Course-Offering Department
修別 Type	選修 Elective	學分數/時間 Credit(s)/Hour(s)	3.0/3.0	
授課教師 Instructor	/謝欣然			
先修課程 Prerequisite				
課程描述 Course Description				
The objective of this course is about analysis and control of power electronic converters and electric motor drives. Circuits design with power switches and pulse-width modulation techniques is studied, and the proportional-integral (PI) controller and advanced control approaches will be explored in detail. From this course, students will know about analysis and design of power circuits and controllers for dc and ac motor drives.				
課程目標 Course Objectives				
Electric machines have been the workhorses of industry for many years. Combined with the advanced power electronics, microprocessor technologies and control theories, the electric motor drives have become sophisticated, and make many high-performance industrial applications possible. Therefore, for the graduated students major in electric power and control, the knowledge of the modern technologies of the electric motor drives is necessary.				
系專業能力 Basic Learning Outcomes				課程目標與系專業能力相關性 Correlation between Course Objectives and Dept.'s Education Objectives
A	培育具備電機電子資訊工程等專業技術研發之能力。To cultivate the research and developing ability of electrical, electronics and information engineering。			●
B	培育系統分析、模擬驗證、實作實現之能力。To cultivate the advanced ability of analysis, verification and implementation of systems。			○
C	訓練軟體工具使用與硬體實務驗證相互輔助之能力。To train the auxiliary ability between the utilization of software tool and the verification of the hardware practice。			○
D	訓練電機電子資訊專業知識與工程實務相互結合運用之能力。To train the integrate ability between professional EECS knowledge and engineering practice。			●
E	落實高科技研究之分工整合與團體合作之領導能力。To fulfill the leading ability in high-tech research with integration and teamwork cooperation。			○
F	落實發掘問題、邏輯分析、克服瓶頸與持續學習之能力。To fulfill the ability of question finding, logical analyzing, bottleneck overcoming and continuous learning。			●
G	了解學術倫理與智慧財產觀念，掌握國內外產業更迭需求與具備多元專長之能力。To obtain the ability of multi-specialization and to meet the industry demand as well as to have the ability of academic ethics and concept of intellectual property。			○
H	參與國際研討會了解國際市場變化與未來研究走向，具備純熟科技英文閱讀溝通寫作之能力。To participate the conferences to understand the change of global market and the future trend as well as to have the skillful ability of reading, conversation and technical writing in English。			○
圖示說明 Illustration : ● 高度相關 Highly correlated ○ 中度相關 Moderately correlated				

授課進度表 Teaching Schedule & Content

週次Week	內容 Subject/Topics	備註Remarks
1	Introduction to semester grading method Introduction to electric machines control	02/22
2	Study on power electronics: DC-DC converters I	02/29
3	Study on power electronics: DC-DC converters II	03/07
4	Study on power electronics: DC-AC converters I	03/14
5	Study on power electronics: DC-AC converters II	03/21
6	Pulse-width modulation technology	03/28
7	Suspended due to holiday	04/04
8	Oral presentation #1	04/11
9	DC machines control I	04/18
10	DC machines control II	04/25
11	DC machines control III	05/02
12	Oral presentation #2	05/09
13	AC machines control I	05/16
14	AC machines control II	05/23
15	AC machines control III	05/30
16	Oral presentation #3	06/06
17	Special issues on motor drives control I	06/13
18	Special issues on motor drives control II	06/20

教學策略 Teaching Strategies

- 課堂講授 Lecture
 分組討論 Group Discussion
 參觀實習 Field Trip
 其他 Miscellaneous:

教學創新自評 Teaching Self-Evaluation

創新教學(Innovative Teaching)

- 問題導向學習(PBL)
 團體合作學習(TBL)
 解決導向學習(SBL)
 翻轉教室 Flipped Classroom
 磨課師 Moocs

社會責任(Social Responsibility)

- 在地實踐 Community Practice
 產學合作 Industry-Academia Cooperation

跨域合作(Transdisciplinary Projects)

- 跨界教學 Transdisciplinary Teaching
 跨院系教學 Inter-collegiate Teaching

- 業師合授 Courses Co-taught with Industry Practitioners

其它 other:

學期成績計算及多元評量方式 Grading & Assessments

配分項目 Items	配分比例 Percentage	多元評量方式 Assessments							
		測驗 會考	實作 觀察	口頭 發表	專題 研究	創作 展演	卷宗 評量	證照 檢定	其他
平時成績(含出缺席) General Performance (Attendance Record)									
期中考成績 Midterm Exam									
期末考成績 Final Exam									
作業成績 Homework and/or Assignments									
其他 Miscellaneous (_____)									

評量方式補充說明

Grading & Assessments Supplemental instructions

Presentation: 30%, 30%, 40%

教科書與參考書目 (書名、作者、書局、代理商、說明)

Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.)

Power Electronics, by Hart

Modern Power Electronics and AC Drives, by B.K. Bose

Electric Motor Drives: Modeling, Analysis, and Control, by R. Krishnan

課程教材網址(含線上教學資訊, 教師個人網址請列位於本校內之網址)

Teaching Aids & Teacher's Website(Including online teaching information.

Personal website can be listed here.)

其他補充說明 (Supplemental instructions)