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國立高雄科技大學
NATIONAL KAOHSIUNG
UNIVERSITY OF SCIENCE
AND TECHNOLOGY
授課大綱 Syllabus

部別：日間部博士

112學年度第2學期

列印日期：2024/03/01

中文課程名稱：電能控制與管理 英文課程名稱：Electrical Energy Control and Management 授課教師：Elsisi
 開課班級：博電一甲 學分：3.0 授課時數：3.0
 合班班級：碩電一甲, 碩電二甲 實習時數：0.0

1. 中文教學目標(Chinese Teaching objectives)

The course focuses on the principles of power control and management. Several recent and prospective topics are introduced in these contents and it can be used for future research. In this course, students learn mathematical formulation of the predictive control and the design procedure of the controller. The course is delivered with examples such as the design of model predictive controller based on the genetic algorithm on the power systems.

2. 英文教學目標(English Teaching objectives)

The course focuses on the principles of power control and management. Several recent and prospective topics are introduced in these contents and it can be used for future research. In this course, students learn mathematical formulation of the predictive control and the design procedure of the controller. The course is delivered with examples such as the design of model predictive controller based on the genetic algorithm on the power systems.

3. 中文教學綱要(Chinese CourseDescription)

1. Introduction 2. Systems modeling 3. Automatic control principles 4. Non constrained systems 5. Constrained systems 6. Predictive control principles 7. Design of predictive control 8. Conclusions

4. 英文教學綱要(English CourseDescription)

1. Introduction 2. Systems modeling 3. Automatic control principles 4. Non constrained systems 5. Constrained systems 6. Predictive control principles 7. Design of predictive control 8. Conclusions

5. 中文核心能力

	核心能力名稱	核心能力百分比
1	具備基本的電機工程專業知識	20%
2	具備工程實務歸納、分析、整合之能力	20%
3	具備有效溝通表達自我, 團隊合作之能力	15%
4	培養畢業生繼續深造的能力, 落實終身學習理念	15%
5	具備專業倫理及社會責任認知, 並遵守智慧財產權及職業道德	15%
6	對相關產業之國際發展趨勢有深入了解, 並具備接受全球化競爭挑戰的能力	15%

6. 英文核心能力

	核心能力名稱	核心能力百分比
1	Professional knowledge in basic electrical engineering	20%

2	Competence in induction, analysis and integration of engineering practices	20%
3	Competence in effective communication and team cooperation	15%
4	Competence of graduates in further study and lifelong learning	15%
5	Professional ethics and social responsibility awareness and compliance with intellectual property rights and ethics	15%
6	Profound knowledge in international development trend of related industries and ability of taking challenges in global competition	15%

7. 教科書

- 中文書名： 英文書名：Model predictive control system design and implementation using MATLAB
 中文作者： 英文作者：Wang, L.
 1 中文出版社： 英文出版社：Springer Science & Business Media
 出版日期： 年 月 備註：

8. 參考書

- 中文書名： 英文書名：Model Predictive Control of Microgrids
 中文作者： 英文作者：Carlos Bordons · Félix Garcia-Torres · Miguel A. Ridao
 1 中文出版社： 英文出版社：Springer
 出版日期： 年 月 備註：

9. 教學進度表

週次或項目 Week or Items	中文授課內容 Chinese Course Content	英文授課內容 English Course Content	分配節次 Assigned Classes	備註 Note
1	簡介	Introduction		
2	自動控制原理	Automatic control principles		
3	Matlab 和控制系統的基礎知識	Basics of Matlab and control systems		
4	Matlab 和控制系統的基礎知識(續)	Continue Basics of Matlab and control systems		
5	系統建模	Systems modeling		
6	系統建模(續)	Continue Systems modeling		
7	非受限系統	Non constrained systems		

8	非受限系統(續)	Continue Non constrained systems
9	期中報告	Midterm report
10	受限系統	Constrained systems
11	受限系統(續)	Continue Constrained systems
12	預測控制原理	Predictive control principles
13	預測控制原理(續)	Continue Predictive control principles
14	預測控制之設計	Design of predictive control
15	預測控制之設計(續)	Continue Design of predictive control
16	人工智慧應用	Application of artificial intelligence
17	人工智慧應用(續)	Continue application of artificial intelligence
18	期末報告	Final Report

10. 中文成績評定(Chinese Evaluation method)

Midterm report _30_% Final report _30_% Report (homework) _30_% Other (Attendance)_10_____ %

11. 英文成績評定(English Evaluation method)

Midterm report _30_% Final report _30_% Report (homework) _30_% Other (Attendance)_10_____ %

12. 中文課堂要求(Chinese Classroom requirements)

無要求

13. 英文課堂要求(English Classroom requirements)

No requirement

14. 本課程與SDGs相關項目(This course is relevant to these of SDGs as following)

「遵守智慧財產權」；「不得非法影印」！