



教學計劃表 Syllabus

| 課程名稱(中文) Course Name in Chinese | 電力電子學AA | | 學年/學期 Academic Year/Semester | 113/1 | |
|---|--|-----------------------------|---------------------------------|------------------------------------|--------|
| 課程名稱(英文) Course Name in English | Power Electronics | | | | |
| 科目代碼 Course Code | EE_3280AA | 系級 Department & Year | 學三 | 開課單位 Course-Offering Department | 電機工程學系 |
| 修別 Type | 學程 Program | 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 | | | | | |
| This course is learning about analysis and design of power electronic circuits, mainly focused on DC-DC converters, AC-DC rectifiers, and DC-AC inverters. Waveforms and specific values due to duty-ratio switching on power converters are described. | | | | | |
| 課程目標 Course Objectives | | | | | |
| This course provides the theory and design of power electronics. Topics covered include an overview of power semiconductor, generic converter topologies and applications and switch-mode power supplies. | | | | | |
| 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 | 1. Introduction to evaluation rules for semester grade 2. Introduction to power switches of converters. | | | 9/09 | |
| 2 | DC-to-DC converters I | | | 9/16 | |
| 3 | DC-to-DC converters II | | | 9/23 | |
| 4 | DC-to-DC converters III DC power supplies I | | | 9/30 | |
| 5 | DC power supplies II | | | 10/07 | |
| 6 | DC power supplies III Power computation | | | 10/14 | |
| 7 | Half-wave rectifiers I | | | 10/21 | |
| 8 | Half-wave rectifiers II | | | 10/28 | |
| 9 | 1st Exam (期中考試週 Midterm Exam) | | | 11/04 | |
| 10 | Full-wave rectifiers | | | 11/11 | |
| 11 | AC voltage controllers I | | | 11/18 | |
| 12 | AC voltage controllers II | | | 11/25 | |
| 13 | 2nd Exam (tentative) | | | 12/02 | |
| 14 | Inverters | | | 12/09 | |
| 15 | Resonant converters | | | 12/16 | |

| | | |
|----|---|-------|
| 16 | Drive circuits, snubber circuits, and heat sinks | 12/23 |
| 17 | 3rd Exan | 12/30 |
| 18 | Supplemental (Drive circuits, snubber circuits, and heat sinks) | 1/06 |

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 General Performance | 10% | | | | | | | | |
| 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

Semester grade: 45% 25%, 30%(Homework)

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, McGraw-Hill, by D.W. Hart
(東華/新月書局代理)

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)