# 國立東華大學

## 教學計劃表　Syllabus

| 課程名稱(中文)<br>Course Name in Chinese | 嵌入式系統 | | | 學年/學期<br>Academic Year/Semester | | 113/1 |
|---|---|---|---|---|---|---|
| 課程名稱(英文)<br>Course Name in English | Embedded Systems | | | | | |
| 科目代碼<br>Course Code | EE__M0170 | 系級<br>Department & Year | 碩士 | 開課單位<br>Course-Offering Department | | 電機工程學系 |
| 修別<br>Type | 選修 Elective | 學分數/時間<br>Credit(s)/Hour(s) | | 3.0/3.0 | | |
| 授課教師<br>Instructor | /謝長倭 | | | | | |
| 先修課程<br>Prerequisite | | | | | | |

### 課程描述　Course Description

This course introduces the basic architecture and components of embedded systems, the design and development process of embedded system products, and relevant techniques in embedded programming to establish a fundamental understanding of embedded systems.

### 課程目標　Course Objectives

本課程介紹嵌入式系統之基本架構與組成、嵌入式系統設計與開發流程、及嵌入式程式設計相關技術，以建立對嵌入式系統之基本瞭解。本課程主要內容包含：嵌入式系統之架構與軟硬體組成元件、嵌入式系統之設計與開發流程與核心技術、嵌入式系統軟硬體整合、嵌入式系統程式設計等主題。

This course introduces the basic architecture and components of embedded systems, the design and development process of embedded system products, and relevant techniques in embedded programming to establish a fundamental understanding of embedded systems.

| | 系專業能力<br>Basic Learning Outcomes | 課程目標與系專業能力相關性<br>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 | 落實論文研究之群體討論與團隊合作之互助能力。To fulfill the research ability in thesis by group discussion 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 | 了解國內外市場變化，具備科技英文閱讀溝通與科技論文寫作之能力。To understand the change of global market and to have the 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 of Embedded Systems | |
| 2 | Microcontroller Architecture (I) | |
| 3 | Microcontroller Architecture (II) | |
| 4 | Development Platforms | |
| 5 | Programming for Embedded Systems | |
| 6 | Digital Input and Output(I) | |
| 7 | Digital Input and Output(II) | |
| 8 | Interrupts and Power Management | |
| 9 | 期中考試週 Midterm Exam | |
| 10 | The Advanced Microcontroller Bus Architecture (AMBA) | |
| 11 | Conversion Between Analog and Digital Values | |
| 12 | Timing Operation(I) | |
| 13 | Timing Operation(II) | |
| 14 | .Communication Interfaces(UART) | |
| 15 | .Communication Interfaces(IIC, SPI) | |
| 16 | .Communication Interfaces(USB) | |
| 17 | 期末考試週 Final Exam | |
| 18 | 彈性補充學習<br>Flexible Learning | |

## 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 Industy-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<br>Items | 配分比例<br>Percentage | 多元評量方式 Assessments | | | | | | | |
| | | 測驗<br>會考 | 實作<br>觀察 | 口頭<br>發表 | 專題<br>研究 | 創作<br>展演 | 卷宗<br>評量 | 證照<br>檢定 | 其他 |
| 平時成績(含出缺席)<br>General Performance<br>(Attendance Record) | 10% | | ✓ | | | | | | |
| 期中考成績 Midterm Exam | 30% | | | ✓ | | | | | |
| 期末考成績 Final Exam | 30% | | | ✓ | ✓ | | | | |
| 作業成績 Homework and/or<br>Assignments | 30% | | ✓ | | | | | | |
| 其他 Miscellaneous<br>(_____) | | | | | | | | | |

評量方式補充說明
Grading & Assessments Supplemental instructions

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.)

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)

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| 學期成績計算及多元評量方式 Grading & Assessments | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 配分項目<br>Items | 配分比例<br>Percentage | 多元評量方式 Assessments | | | | | | | |
| | | 測驗<br>會考 | 實作<br>觀察 | 口頭<br>發表 | 專題<br>研究 | 創作<br>展演 | 卷宗<br>評量 | 證照<br>檢定 | 其他 |