

國立東華大學
教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	生醫訊號處理			學年/學期 Academic Year/Semester	114/1
課程名稱(英文) Course Name in English	Bio-Medical Signal processing				
科目代碼 Course Code	EE_M0230	系級 Department & Year	碩士	開課單位 Course-Offering Department	電機工程學系
修別 Type	選修 Elective	學分數/時間 Credit(s)/Hour(s)		3.0/3.0	
授課教師 Instructor	/謝長倬				
先修課程 Prerequisite					
課程描述 Course Description					
本課程涵蓋訊號處理的基礎知識以及設計和分析訊號處理所需的工具。課程主題包括常見生理訊號的描述、訊號分析、數位系統特徵以及影響生物醫學系統表現的傅立葉關係。 This course covers the fundamentals of signal processing as well as the tools required for designing and analyzing them. Course topics include a description of common physiological signals, signal analysis, digital system features, and Fourier relations that influence biomedical system performance.					
課程目標 Course Objectives					
奠定學生生醫訊號處理基礎，並熟悉生醫訊號量測與分析技術，以實際生理訊號為分析標的，培養具備生醫資訊整合與應用能力的人才。 Provide students with an introduction to biomedical signal processing and instruct them on methods for analyzing and quantifying such signals. Develop expertise in effectively integrating and applying biomedical information by utilizing real physiological signals as the analytical target.					
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 to biomedical signals	
2	Typical Measurement System	
3	Analog Signal Processing	
4	Time-domain Analysis	
5	Pan-Tompkins Algorithm	
6	Correlation and Convolution	
7	Frequency-domain Analysis	
8	Time-Frequency Analysis	
9	期中考試週 Midterm Exam	
10	Principles and Design of Filters	
11	BCI Applications in Medicine and Robotics	
12	Project Topic Selection	Clearly define the group research topic and objectives
13	Literature Analysis & Problem Definition	- Use Notebook LM to assist with literature summarization, method extraction, and knowledge integration
14	Introduction to Vibe Coding and BDD Methodology	
15	Biomedical Signal Preprocessing and Feature Extraction Practice	
16	Machine learning in Bio-signals	
17	Project Integration and Presentation Preparation	
18	Project Presentation	Group presentations with peer and instructor evaluations

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)	10%		✓						
期中考成績 Midterm Exam	30%	✓							
期末考成績 Final Exam									
作業成績 Homework and/or Assignments	30%						✓		
其他 Miscellaneous (期末報告)	30%			✓	✓				
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)									