# 國立東華大學

## 課　　綱　Course Outline

### 電機工程學系博士班國際組

| 中文課程名稱<br>Course Name in Chinese | 生醫訊號處理 | | | | |
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| 英文課程名稱<br>Course Name in English | Bio-Medical Signal processing | | | | |
| 科目代碼<br>Course Code | EE__D0330 | 班　別<br>Degree | | 博士班<br>Ph.D. | |
| 修別<br>Type | 選修<br>Elective | 學分數<br>Credit(s) | 3.0 | 時　數<br>Hour(s) | 3.0 |
| 先修課程<br>Prerequisite | | | | | |

### 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.

### 系教育目標 Dept.'s Education Objectives

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|---|---|
| 1 | 研究人才培育─訓練嚴謹思考能力，培育國家研究人才。<br>To cultivate talents with research knowledge |
| 2 | 團隊分工領導─落實分工合作觀念，具備領導協調能力。<br>To train students with teamwork leading and coordinate ability |
| 3 | 創新思維啟發─建立積極挑戰態度，展現獨力研究能力。<br>To inspire students with creative thinking |
| 4 | 國際視野養成─營造國際宏觀視野，培育卓越領導人才。<br>To educate students with global perspective and vision |

| 系專業能力<br><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。<br>To cultivate the research and developing ability of electrical, electronics and information engineering。 | |

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| B | 培育系統分析、模擬驗證、實作實現之能力。<br>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。<br>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。<br>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。<br>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。<br>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。<br>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。<br>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

## 課程大綱
## Course Outline

1. Introduction to biomedical signals
2. Typical Measurement System
3. Analog Signal Processing
4. Time-domain Analysis
5. Standardization and Detrending
6. Threshold Detection
7. Pan-Tompkins Algorithm
8. Correlation and Convolution
9. Principles and Design of Filters
10. Frequency-domain Analysis
11. Time-Frequency Analysis
12. Principles and Applications of Common Signal Analysis Functions
13. Coherence
14. Statistical Analysis
15. Machine learning in Bio-signals
16. Final Report

## 資源需求評估（師資專長之聘任、儀器設備的配合···等）
Resources Required (e.g. qualifications and expertise, instrument and equipment, etc.)



## 課程要求和教學方式之建議
## Course Requirements and Suggested Teaching Methods

1. Lectures

| 2. Programming Implementation |
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| 其他<br>Miscellaneous |
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