**元智大學　電機工程研究所(甲組)****博士班必修科目表**

**Department of Electrical Engineering(Program A), Yuan Ze University**

**List of Required Courses for the Doctoral Program**

**（112學年度入學新生適用）**

**(Applicable to Students Admitted in Academic Year of 2023)**

112.04.19 一一一學年度第六次教務會議通過

Passed by the 6th Academic Affairs Meeting, Academic Year 2022, on April 19, 2023

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 學年Year  學期Semester  科目Course | 第一學年  1st Academic Year | | 第二學年  2nd Academic Year | |
| 上Fall | 下Spring | 上Fall | 下Spring |
| 必修科目  Required Course  （4） | 書報討論  (Seminar)  EEA607  (1) | 書報討論  (Seminar)  EEA607  (1) | 書報討論  (Seminar)  EEA607  (1) | 書報討論  (Seminar)  EEA607  (1) |
| 學期學分  小計  Total Credits | 1 | 1 | 1 | 1 |
| 備  註  Remarks | 1.在學期間書報討論為必修科目，最多修四學期即可，若於畢業前不足之學分數由本組或他系書報討論(學分數需高於或至少相同)科目替補。  The students are required to take Seminar courses for four semesters to fulfill the requirements for graduation. If students fail to fulfill the requirements for graduation, the students may take Seminar courses offered by other departments. The credits of Seminar course offered by other departments must be equal to or higher than the credits offered by the Home Department.  2.選修科目：  Elective Course：18 credits  (１)在修業年限內，至少需修畢18學分，其中至少9學分必須為本院所開授之課程。  Students are required to take at least 18 credits (at least 9 credits offered by the Home Department) to fulfill the graduation requirement.  (２)本組碩士生直升博士班者，在修業年限內，含碩一之選修學分至少需修畢30學分(原在碩士班已修學分可採認學分數依本校學則規定辦理)。  For students admitted into the Ph.D. program without a master degree, a minimum of 30 credits (including transferred credits) must be completed within the permissible period of study.  3.其他資格考與論文考試相關規定，請參照「電機工程學系(甲組)博士班修業及資格與論文考試辦法」。  For other regulations related to qualifying exam and dissertation, please refer to” YZU Graduate School of Electrical Engineering(Program A) Regulations Governing Doctoral Studies, Qualifying and Thesis Related Exam”  4.本組學生修習電通學院各組之專業課程，皆予承認；但必修課程初次修課須在本組修讀始予承認。  Students may take the courses offered by the College of Electrical and Communication Engineering to fulfill the graduation requirement, however if the same courses offered in the Home Department, the students must take the course offered by the Home Department for the first time.  5.入學研究生須依本校學術研究倫理教育課程實施要點規定，於入學第一學期結束前完成學術研究倫理教育課程，最遲須於申請學位口試前補修完成，未完成本課程，不得申請學位口試。  Graduate students are required to complete Academic Research Ethics Education Course before the end of their first academic semester according to the regulations of Yuan Ze University Academic Research Ethics Education Course Implementation Highlights. The latest deadline for the course completion should be before the application towards the degree’s oral exam.  6.博士班學生選修碩士在職專班之課程，不列入畢業學分，須填寫「元智大學課程跨學制申請表」。  PhD students taking In-service graduate courses are not allowed to be counted as graduation credits.  Students who would like to apply for Cross-System Courses need to fill in the "Application for Cross-System Courses" form. | | | |

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**元智大學　電機工程研究所(甲組)博士班選修科目表**

**Department of Electrical Engineering(Program A), Yuan Ze University**

**List of Elective Courses for the Doctoral Program**

**（112學年度入學新生適用）**

**(Applicable to Students Admitted in Academic Year of 2023)**

112.04.19 一一一學年度第六次教務會議通過

Passed by the 6th Academic Affairs Meeting, Academic Year 2022, on April 19, 2023

113.05.01 一一二學年度第八次教務會議修訂通過

Amended by the 8th Academic Affairs Meeting, Academic Year 2023, on May 01, 2024

| 類別/組別  Group | 課號  Course Code | 中文課名  Course Title | 英文課名  Course Title | 學分數  Credits |
| --- | --- | --- | --- | --- |
| 數  位  科  技  組 | EEA626 | 科技英文(一) | Research Communication(I) | 1 |
| EEA627 | 科技英文(二) | Research Communication(II) | 1 |
| EEA685 | 系統工程 | Systems Engineering | 3 |
| EEA507 | 影像處理 | Image Processing | 3 |
| EEA581 | 個人通訊服務網路 | Personal Communications Services Networks | 3 |
| EEA610 | 樣型識別 | Pattern Recognition | 3 |
| EEA623 | 生醫信號處理 | Biomedical Signal Processing | 3 |
| EEA624 | 無線網際網路語音服務 | Wireless VoIP | 3 |
| EEA625 | 計算機視覺 | Computer Vision | 3 |
| EEA628 | 多媒體處理 | Multimedia Processing | 3 |
| EEA632 | 醫學影像處理 | Medical Image Processing | 3 |
| EEA649 | 計算機模擬 | Computer Simulation | 3 |
| EEA647 | 家庭網路傳輸標準 | Transmission Standards of Digital Home Network | 3 |
| EEA653 | 無線射頻辨識系統原理與應用 | Wireless Radio Recognition: Theory and Applications | 3 |
| EEA652 | 電腦視覺於家庭保全之應用 | Computer Vision and Its Application to Home Care Services | 3 |
| EEA654 | 網路模擬與實作 | Network Simulation and Implementation | 3 |
| EEA655 | 高等計算機數學 | Advanced Computer Mathematics | 3 |
| EEA656 | 影像處理演算法開發及應用 | Algorithms of Image Processing: Development and Applications | 3 |
| EEA658 | 次世代網路專題與應用實作 | Special topics on next generation network and network implementation | 3 |
| EEA659 | 應用導向之即時多媒體人機互動理論與實作 | Application-oriented Real-time Multimedia Human-computer Interaction: Theory and Development | 3 |
| EEA672 | 雲端計算原理與實作 | Cloud Computing Principle and Practice | 3 |
| EEA675 | 行動巨量資料分析與機器學習 | Mobile Big Data Analysis and Machine Learning | 3 |
| EEA679 | 壓縮式感測與統計學習 | Compressed Sensing and Statistical Learning | 3 |
| EEA680 | 深度學習 | Deep Learning | 3 |
| EEA681 | 通訊系統 | Communication System | 3 |
| EEA683 | 嗓音聲學訊號應用專題 | Application Projects for Fundamentals and Pearls of Acoustic Signal Processing | 2 |
| EEA684 | 微波工程與系統 | Microwave Engineering and system | 3 |
| EEA686 | 視覺導引 | Visual Guidance | 3 |
| EEA687 | 科學論文寫作 | Scientific Paper Writing | 2 |
| EEA688 | 臨床神經影像系統與數據分析 | Clinical Neuroimage: System and Data Analysis | 3 |
| EEA695 | 深度學習與視覺應用 | Deep Learning and its Vision Applications | 3 |
| EEA696 | 多媒體深度學習 | Deep Learning for Multimedia | 3 |
| EEA697 | 機器學習及其深層結構 | Machine Learning and its Deep Structure | 3 |
| EEA698 | 情感運算 | Affective Computing | 3 |
| EEA703 | 口語語言處理理論與應用 | Spoken Language Processing: Theory and Application | 3 |
| 備  註  Remarks | 1.選課截止前須先徵詢指導教授同意並簽字。  2.確保執行，由組上發放選課清單表格給研究生填寫。  Students must complete a Course List Form with obtaining their advisor’s signature. | | | |

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**元智大學　電機工程研究所(甲組)博士班選修科目表**

**Department of Electrical Engineering(Program A), Yuan Ze University**

**List of Elective Courses for the Doctoral Program**

**（112學年度入學新生適用）**

**(Applicable to Students Admitted in Academic Year of 2023)**

112.04.19 一一一學年度第六次教務會議通過

Passed by the 6th Academic Affairs Meeting, Academic Year 2022, on April 19, 2023

| 類別/組別  Group | 課號  Course Code | 中文課名  Course Title | 英文課名  Course Title | 學分數  Credits |
| --- | --- | --- | --- | --- |
| 電  子  組 | EEA626 | 科技英文(一) | Research Communication(I) | 1 |
| EEA627 | 科技英文(二) | Research Communication(II) | 1 |
| EEA685 | 系統工程 | Systems Engineering | 3 |
| EEA531 | VLSI信號處理 | VLSI Signal Processing | 3 |
| EEA564 | 通訊電子學 | Communication Electronics | 3 |
| EEA580 | 類比積體電路設計 | Analog IC Design | 3 |
| EEA588 | 數位VLSI設計 | Digital VLSI Design | 3 |
| EEA608 | 高等VLSI系統設計 | The Advanced VLSI System Design | 3 |
| EEA635 | 積體電路元件 | VLSI Devices | 3 |
| EEA640 | 半導體奈米元件 | Nanoscale Semiconductor Devices | 3 |
| EEA644 | 奈米CMOS元件 | Nanoscale CMOS Devices | 3 |
| EEA648 | 混合信號IC設計 | Mixed Signal IC Design | 3 |
| EEA650 | SOC 設計 | SOC Design | 3 |
| EEA651 | 寬頻介面電路設計 | Wide Bandwidth Interface Circuit Design | 3 |
| EEA657 | 高階數位訊號處理 | Advanced Digital Signal Processing | 3 |
| EEA660 | 高速低功率積體電路設計 | High-Speed Low-power IC Design | 3 |
| EEA664 | 進階積體電路專題實作I | Advanced Design and Implementation of Integrated Circuits I | 0 |
| EEA665 | 進階積體電路專題實作II | Advanced Design and Implementation of Integrated Circuits II | 0 |
| EEA666 | 進階積體電路專題實作III | Advanced Design and Implementation of Integrated Circuits III | 0 |
| EEA667 | 進階積體電路專題實作IV | Advanced Design and Implementation of Integrated Circuits IV | 0 |
| EEA674 | 多核心晶片設計實作 | Multicore Chip Design Laboratory | 3 |
| EEA676 | 特殊應用積體電路設計 | ASIC Design | 3 |
| EEA689 | 5G和物聯網世代之無線充電技術 | Wireless Power Transfer Technology in 5G and IoT Era | 3 |
| 備  註  Remarks | 1.選課截止前須先徵詢指導教授同意並簽字。  2.確保執行，由組上發放選課清單表格給研究生填寫。  Students must complete a Course List Form with obtaining their advisor’s signature. | | | |

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**元智大學　電機工程研究所(甲組)博士班選修科目表**

**Department of Electrical Engineering(Program A), Yuan Ze University**

**List of Elective Courses for the Doctoral Program**

**（112學年度入學新生適用）**

**(Applicable to Students Admitted in Academic Year of 2023)**

112.04.19 一一一學年度第六次教務會議通過

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Amended by the 8th Academic Affairs Meeting, Academic Year 2023, on May 01, 2024

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 類別/組別  Group | 課號  Course Code | 中文課名  Course Title | 英文課名  Course Title | 學分數  Credits |
| 控  制  組 | EEA626 | 科技英文(一) | Research Communication(I) | 1 |
| EEA627 | 科技英文(二) | Research Communication(II) | 1 |
| EEA685 | 系統工程 | Systems Engineering | 3 |
| EEA505 | 線性系統理論 | Linear System Theory | 3 |
| EEA509 | 隨機程序 | Random Processes for Engineers | 3 |
| EEA529 | 隨機控制 | Stochastic Control | 3 |
| EEA532 | 模糊控制 | Fuzzy Control | 3 |
| EEA536 | 非線性系統控制 | Nonlinear Control Systems | 3 |
| EEA537 | 可變結構控制 | Variable Structure Control | 3 |
| EEA538 | 強健控制 | Robust Control | 3 |
| EEA544 | 可適性訊號處理 | Adaptive Signal Processing | 3 |
| EEA547 | 機器人學 | Robotics | 3 |
| EEA563 | 飛行控制實務設計 | Practical Design of Fly Control | 3 |
| EEA569 | H ∞與LQG控制 | H∞ and LQG Control Theory | 3 |
| EEA578 | 智慧型控制 | Intelligent Control | 3 |
| EEA600 | 類神經網路 | Neural Network | 3 |
| EEA602 | 適應控制 | Adaptive Control | 3 |
| EEA634 | 飛行導引與系統動態 | Flight Guidance and Systems Dynamics | 3 |
| EEA636 | 信號偵測 | Signal Detection | 3 |
| EEA638 | 隨機訊號處理 | Random Signal Processing | 3 |
| EEA641 | 汽車電子 | Vehicular Electronic System | 3 |
| EEA661 | 進階電力系統 | Advanced Power Systems | 3 |
| EEA662 | 輸配電系統 | Electric Power Transmission and Distribution Systems | 3 |
| EEA663 | 配電系統模擬 | Modeling and Simulation of Power Distribution Systems | 3 |
| EEA668 | 電源轉換器設計 | Power Conversion Design | 3 |
| EEA669 | 多目標控制 | Multiobjective Control | 3 |
| EEA670 | 電力電子進階分析 | Advance Analysis of Power Electronics | 3 |
| EEA671 | 電力線通訊原理與實作 | Power Line Communications in Practice | 3 |
| EEA673 | 數值方法在系統工程之應用 | Numerical Methods in Systems Engineering | 3 |
| EEA677 | 資料科學 | Data Science | 3 |
| EEA678 | 進階資料科學 | Advanced Data Science | 3 |
| EEA682 | 機率規劃 | Probabilistic Programming | 3 |
| EEA690 | 無人載具控制 | Control of Unmanned Vehicles | 3 |
| EEA694 | 機器人學習 | Robot Learning | 3 |
| EEA699 | 強化學習 | Reinforcement Learning | 3 |
| EEA700 | 電力系統 | Power Systems | 3 |
| EEA701 | 智慧電網實驗 | Smart Grid Experiments | 2 |
| EEA704 | 電力系統與綠能實務 | Power Systems and Green Energy | 3 |
| 備  註  Remarks | 1.選課截止前須先徵詢指導教授同意並簽字。  2.確保執行，由組上發放選課清單表格給研究生填寫。  Students must complete a Course List Form with obtaining their advisor’s signature. | | | |

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