產學創新研究學院 智能系統研究所碩士班
甲組課程規劃: 主修人工智慧、資料科學、運算與應用

113 學年度

修業年限	以 1 至 4 年為限
應修學分數	24 學分，含本所核心課程至少 6 學分，及本所專業選修課程至少 12 學分;修業期間，論文研討(書報討論) 或企業研發實習課程(限參與本學院的相關企業)應加總通過 2 學期。論文研討(書報討論)、企業研發實習課程與論文研討不計入專業課程 24 學分中。
建議應修(應選)課程列表	**核心課程：** 以下專業核心課程，若為「本所開設課程」或「本所專任教師開設課程」，應優先修習方可認列為核心課程學分。若為第二次重修則不在此限。 1. 機器學習(3 學分) 2. 深度學習/深度學習與實務(最多採計 3 學分) 3. 人工智慧(3 學分) 4. 電腦視覺/應用電腦視覺(最多採計 3 學分) 5. 強化學習原理(3 學分) 6. 最佳化理論與應用(3 學分) **專業選修：** 1. 檢測與估計/檢測與估計理論(最多採計 3 學分) 2. 隨機過程(3 學分) 3. 消息理論(3 學分) 4. 影像處理(3 學分) 5. 嵌入式作業系統 /嵌入式系統設計(最多採計 3 學分) 6. 智慧霧運算系統和設計(3 學分) 7. 感測與智慧系統(3 學分) 8. 機器人學(3 學分) 9. 自主駕駛車技術(3 學分) 10. 車輛視覺系統(3 學分) 11. 自走式機器人(3 學分) 12. 機器人視覺(3 學分) 13. 雲端運算與巨量資料分析(3 學分) 14. 計算機結構(3 學分) 15. 自然語言處理(3 學分) 16. 資料探勘(3 學分) 17. 圖形識別(3 學分) 18. 深度學習系統與實現(3 學分) 19. 數位積體電路(3 學分) 20. 高等數位訊號處理(3 學分) 21. 計算機輔助設計特論(3 學分) 22. 資料科學(3 學分) 23. 積體電路設計實驗(3 學分) 24. 深度學習實驗(3 學分) 25. 數位語音訊號處理(3 學分) 26. 智慧感知與機器學習(3 學分) 27. 雲原生軟體開發與最佳實踐(3 學分)

	28. 資料視覺化與視覺分析(3 學分) 29. 影像編修技術與特效合成(3 學分) 30. 本所業師開設之專業課程 31. 本所開設之國際大師系列課程
備註	一、學術研究倫理教育課程採網路教學方式實施，為必修教育課程，但不計入專業課程學分。 （一） 學生於修業期間(建議入學後第一學期內)，至「臺灣學術倫理教育資源中心」平台修習本課程，並應通過課程總測驗成績達及格標準。 （二） 總測驗成績未達及格標準之學生，不得申請學位考試。 二、核心課程應先滿足 6 學分規定，超過之核心課程學分可列計專業選修學分。 三、未盡事宜以本所通過之修業規章辦理。

Industry Academia Innovation School
Master's Degree of the Institute of Artificial Intelligence Innovation
Group Ⅰ Curriculum : AI, Data Science, Data Processing and Application

Academic Year 2024

Minimum and Maximum Term of Study	1 ~ 4year
Minimum Credits	24 credits: Including 6 main course and 12 professional course credits. Thesis discussion (seminar) or Corporate Internship: 2 semesters are required, 0 credit for each semester.
Curriculum and Regulations	Core Courses: The following core courses, if offered by the institute or taught by full-time faculty members of the institute, must be taken as a priority in order to be counted as core course credits. This requirement does not apply to second retakes. 1. Machine Learning (3 credits) 2. Deep Learning/ Deep Learning and Practice (at most 3 credits) 3. Artificial Intelligence (3 credits) 4. Computer Vision/Applied Computer Vision (at most 3 credits) 5. Reinforcement Learning (3 credits) 6. Optimization Theory and Application (3 credits) Elective Courses: 1. Detection and Estimation/ Detection and Estimation Theory (at most 3 credits) 2. Stochastic Processes (3 credits) 3. Information Theory (3 credits) 4. Image Processing (3 credits) 5. Embedded Operating Systems / Embedded System Design (at most 3 credits) 6. Intelligent Fog Computing Systems and Designs (3 credits) 7. Sensing and Intelligent Systems (3 credits) 8. Robotics (3 credits) 9. Self-Driving Cars (3 credits) 10. Vehicular Vision System (3 credits) 11. Mobile Robots (3 credits) 12. Robotic Vision (3 credits) 13. Cloud Computing and Big Data Analytics (3 credits) 14. Computer Architecture (3 credits) 15. Natural Language Processing (3 credits) 16. Data Mining (3 credits) 17. Pattern Recognition (3 credits) 18. DL Systems and Inference Realization (3 credits) 19. Digital Integrated Circuits (3 credits) 20. Advanced Digital Signal Processing (3 credits) 21. Special Topics in Computer Aided Design (3 credits) 22. Data Science (3 credits) 23. Integrated Circuit Design Laboratory (3 credits) 24. Deep Learning Labs (3 credits) 25. Digital Speech Processing (3 credits) 26. Intelligent Sensing and Machine Learning (3 credits) 27. Cloud Native Development: towards Best Practice (3 credits) 28. Data Visualization and Visual Analytics (3 credits) 29. Image Manipulation Techniques and Visual Effects (3 credits)

	30. Courses offered by industrial professionals in our institute 31. International Grandmaster Course Series in our institute
Note	I. Students should take the “Research Ethics Course” on the “Taiwan Academic Ethics Education Resource Center” platform before the end of the first semester after enrollment and pass the required approval standard for the final test. Students who fail to pass the final test cannot apply for degree exam. II. Core course credits can be counted as electives only if the 6 main course credits are satisfied. III. Please refer to the “Academic Regulations for Master's Program in the Institute of Artificial Intelligence Innovation” for the details.

產學創新研究學院 智能系統研究所碩士班
乙組課程規劃: 主修資安與資訊工程

113 學年度

修業年限	以 1 至 4 年為限
應修學分數	24 學分，含本所核心課程至少 6 學分，及本所專業選修課程至少 12 學分;修業期間，論文研討(書報討論) 或企業研發實習課程(限參與本學院的相關企業)應加總通過 2 學期。論文研討(書報討論)、企業研發實習課程與論文研討不計入專業課程 24 學分中。
建議應修(應選)課程列表	**核心課程：** 以下專業核心課程，若為「本所開設課程」或「本所專任教師開設課程」，應優先修習方可認列為核心課程學分。若為第二次重修則不在此限。 1. 網路安全(3 學分) 2. 軟體測試(3 學分) 3. 網路程式設計(3 學分) 4. 機器學習(3 學分) 5. 演算法(3 學分) 6. 作業系統(3 學分) **專業選修：** 1. 密碼理論(3 學分) 2. 圖形理論(3 學分) 3. 程式安全(3 學分) 4. 無線網路(3 學分) 5. 正規語言與計算理論(3 學分) 6. 平行程式設計(3 學分) 7. 人機互動研究方法與研討(3 學分) 8. 計算機網路(3 學分) 9. 無線多媒體網路(3 學分) 10. 嵌入式系統設計(3 學分) 11. 軟體定義網路及網路功能虛擬化(3 學分) 12. 物聯網裝置與平台(3 學分) 13. 資料探勘(3 學分) 14. 排隊理論(3 學分) 15. 新創雲服務與開發工具(3 學分) 16. 編譯器設計(3 學分) 17. 作業系統總整與實作(3 學分) 18. 人工智慧(3 學分) 19. 電腦視覺 /應用電腦視覺(最多採計 3 學分) 20. 互動設計與虛擬實境(3 學分) 21. 腦機介面系統(3 學分) 22. XR 跨域專題(3 學分) 23. 計算機圖學(3 學分) 24. 影像處理(3 學分) 25. 視訊串流與追蹤(3 學分) 26. 車輛視覺系統(3 學分)

	27. 雲端運算與巨量資料分析(3 學分) 28. 雲原生軟體開發與最佳實踐(3 學分) 29. 資安實務與規範(3 學分) 30. 本所業師開設之專業課程 31. 本所開設之國際大師系列課程
備註	一、學術研究倫理教育課程採網路教學方式實施，為必修教育課程，但不計入專業課程學分。 （一） 學生於修業期間(建議入學後第一學期內)，至「臺灣學術倫理教育資源中心」平台修習本課程，並應通過課程總測驗成績達及格標準。 （二） 總測驗成績未達及格標準之學生，不得申請學位考試。 二、核心課程應先滿足 6 學分規定，超過之核心課程學分可列計專業選修學分。 三、未盡事宜以本所通過之修業規章辦理。

Industry Academia Innovation School
Master's Degree of the Institute of Artificial Intelligence Innovation
Group Ⅱ Curriculum : Information Security and Information Engineering

Academic Year 2024

Minimum and Maximum Term of Study	1 ~ 4year
Minimum Credits	24 credits: Including 6 main course and 12 professional course credits. Thesis discussion (seminar) or Corporate Internship: 2 semesters are required, 0 credit for each semester.
Curriculum and Regulations	Core Courses: The following core courses, if offered by the institute or taught by full-time faculty members of the institute, must be taken as a priority in order to be counted as core course credits. This requirement does not apply to second retakes. 1. Network Security (3 credits) 2. Software Testing (3 credits) 3. Network Programming (3 credits) 4. Machine Learning (3 credits) 5. Algorithm (3 credits) 6. Operating System (3 credits) Elective Courses: 1. Theory of cryptology (3 credits) 2. Graph Theory (3 credits) 3. Secure Programming (3 credits) 4. Wireless Networks (3 credits) 5. Formal Languages and Theory of Computation (3 credits) 6. Parallel Programming (3 credits) 7. Research Methods and Topics in Human-Computer Interaction (3 credits) 8. Computer Networks (3 credits) 9. Wireless Multimedia Networks (3 credits) 10. Embedded System Design (3 credits) 11. Software Defined Networks and Network Function Virtualization (3 credits) 12. IoT Devices and Platforms (3 credits) 13. Data Mining (3 credits) 14. Queuing Theory (3 credits) 15. Innovative Cloud Services and Development Tools (3 credits) 16. Intro. to Compiler Design (3 credits) 17. Operating Systems Capstone (3 credits) 18. Artificial Intelligence (3 credits) 19. Computer Vision /Applied Computer Vision (at most 3 credits) 20. Interaction design and virtual reality (3 credits) 21. Brain-Computer Interface (3 credits) 22. XR Camp (3 credits) 23. Computer Graphics (3 credits) 24. Image Processing (3 credits) 25. Video streaming and tracking (3 credits) 26. Vehicular Vision System (3 credits) 27. Cloud Computing and Big Data Analytics (3 credits) 28. Cloud Native Development: towards Best Practice (3 credits) 29. Information Security Practice and Regulation (3 credits)

	30. Courses offered by industrial professionals in our institute 31. International Grandmaster Course Series in our institute
Note	I. Students should take the “Research Ethics Course” on the “Taiwan Academic Ethics Education Resource Center” platform before the end of the first semester after enrollment and pass the required approval standard for the final test. Students who fail to pass the final test cannot apply for degree exam. II. Core course credits can be counted as electives only if the 6 main course credits are satisfied. III. Please refer to the “Academic Regulations for Master's Program in the Institute of Artificial Intelligence Innovation” for the details.

產學創新研究學院 智能系統研究所碩士班
丙組課程規劃: 主修寬頻通訊與物聯網

113 學年度

修業年限	以 1 至 4 年為限
應修學分數	24 學分，含本所核心課程至少 6 學分，及本所專業選修課程至少 12 學分;修業期間，論文研討(書報討論) 或企業研發實習課程(限參與本學院的相關企業)應加總通過 2 學期。論文研討(書報討論)、企業研發實習課程與論文研討不計入專業課程 24 學分中。
建議應修(應選)課程列表	**核心課程：** 以下專業核心課程，若為「本所開設課程」或「本所專任教師開設課程」，應優先修習方可認列為核心課程學分。若為第二次重修則不在此限。 1. 無線通訊(3 學分) 2. 數位通訊(3 學分) 3. 隨機過程/隨機程序(3 學分) 4. 排隊理論(3 學分) 5. 計算機網路(3 學分) 6. 數位訊號處理(3 學分) 7. 演算法(3 學分) 8. 檢測與估計/檢測與估計理論(最多採計 3 學分) 9. 機器學習 (3 學分) 10. 深度學習 (3 學分) 11. 最佳化理論與應用(3 學分) 12. 物理數學(3 學分) 13. 高等電磁學(一) (3 學分) 14. 天線理論(3 學分) 15. 電波傳播與散射(3 學分) 16. 微波工程(一) (3 學分) 17. 電腦輔助電路設計與分析(3 學分) 18. 數值半導體元件模式(3 學分) **專業選修:** 1. 消息理論(3 學分) 2. 編碼理論(3 學分) 3. 衛星太空通訊(3 學分) 4. 影像處理(3 學分) 5. 嵌入式作業系統/嵌入式系統設計(最多採計 3 學分) 6. 智慧霧運算系統和設計(3 學分) 7. 感測與智慧系統(3 學分) 8. 雲端運算與巨量資料分析(3 學分) 9. 計算機結構(3 學分) 10. 自然語言處理(3 學分) 11. 資料探勘(3 學分) 12. 圖形識別(3 學分) 13. 網路安全(3 學分) 14. 數位積體電路 (3 學分)

	15. 高等數位訊號處理(3 學分) 16. 量子訊息與計算(3 學分) 17. 適應性訊號處理(3 學分) 18. 高等電磁學(二) (3 學分) 19. 微波工程(二) (3 學分) 20. 半導體記憶體(3 學分) 21. 量子力學(3 學分) 22. 半導體元件物理/半導體物理及元件(最多採計 3 學分) 23. 微波主動元件(3 學分) 24. 射頻積體電路設計(3 學分) 25. 軟體定義網路及網路功能虛擬化(3 學分) 26. 物聯網裝置與平台(3 學分) 27. 賽局理論及應用(3 學分) 28. 資料科學(3 學分) 29. 深度學習實驗(3 學分) 30. 雲原生軟體開發與最佳實踐(3 學分) 31. 本所業師開設之專業課程 32. 本所開設之國際大師系列課程
備註	一、學術研究倫理教育課程採網路教學方式實施，為必修教育課程，但不計入專業課程學分。 （一） 學生於修業期間(建議入學後第一學期內)，至「臺灣學術倫理教育資源中心」平台修習本課程，並應通過課程總測驗成績達及格標準。 （二） 總測驗成績未達及格標準之學生，不得申請學位考試。 二、核心課程應先滿足 6 學分規定，超過之核心課程學分可列計專業選修學分。 三、未盡事宜以本所通過之修業規章辦理。

Industry Academia Innovation School
Master's Degree of the Institute of Artificial Intelligence Innovation
Group Ⅲ Curriculum : Broadband Communication and IoT

Academic Year 2024

Minimum and Maximum Term of Study	1 ~ 4year
Minimum Credits	24 credits: Including 6 main course and 12 professional course credits. Thesis discussion (seminar) or Corporate Internship: 2 semesters are required, 0 credit for each semester.
Curriculum and Regulations	Core Courses: The following core courses, if offered by the institute or taught by full-time faculty members of the institute, must be taken as a priority in order to be counted as core course credits. This requirement does not apply to second retakes. 1. Wireless Communications (3 credits) 2. Digital Communication (3 credits) 3. Stochastic Processes (3 credits) 4. Queuing Theory (3 credits) 5. Computer Networks (3 credits) 6. Digital Signal Processing (3 credits) 7. Algorithm (3 credits) 8. Detection and Estimation/ Detection and Estimation Theory (at most 3 credits) 9. Machine Learning (3 credits) 10. Deep Learning (3 credits) 11. Optimization Theory and Application (3 credits) 12. Mathematical Methods for Physicists (3 credits) 13. Advanced Electromagnetics (I) (3 credits) 14. Antenna Theory (3 credits) 15. Wave Propagation and Scattering (3 credits) 16. Microwave Engineering(I) (3 credits) 17. Computer - Aided Circuit Design and Analysis (3 credits) 18. Numerical Semiconductor Device Modeling (3 credits) Elective Courses: 1. Information Theory (3 credits) 2. Coding Theory (3 credits) 3. Satellite and space communication (3 credits) 4. Image Processing (3 credits) 5. Embedded Operating Systems/ Embedded System Design (at most 3 credits) 6. Intelligent Fog Computing Systems and Designs (3 credits) 7. Sensing and Intelligent Systems (3 credits) 8. Cloud Computing and Big Data Analytics (3 credits) 9. Computer Architecture (3 credits) 10. Natural Language Processing (3 credits) 11. Data Mining (3 credits) 12. Pattern Recognition (3 credits) 13. Network Security (3 credits) 14. Digital Integrated Circuits (3 credits) 15. Advanced Digital Signal Processing (3 credits) 16. Quantum Information and Computation (3 credits) 17. Adaptive Signal Processing (3 credits)

	18. Advanced Electromagnetics (II) (3 credits) 19. Microwave Engineering(II) (3 credits) 20. Semiconductor Memory (3 credits) 21. Quantum Mechanics (3 credits) 22. Semiconductor Device Physics/ Semiconductor Physics and Devices (at most 3 credits) 23. Active Microwave Circuit (3 credits) 24. Radio Frequency Integrated Circuits (3 credits) 25. Software Defined Networks and Network Function Virtualization (3 credits) 26. IoT Devices and Platforms (3 credits) 27. Game Theory and Its Applications (3 credits) 28. Data Science (3 credits) 29. Deep Learning Labs (3 credits) 30. Cloud Native Development: towards Best Practice (3 credits) 31. Courses offered by industrial professionals in our institute 32. International Grandmaster Course Series in our institute
Note	I. Students should take the "Research Ethics Course" on the "Taiwan Academic Ethics Education Resource Center" platform before the end of the first semester after enrollment and pass the required approval standard for the final test. Students who fail to pass the final test cannot apply for degree exam. II. Core course credits can be counted as electives only if the 6 main course credits are satisfied. III. Please refer to the "Academic Regulations for Master's Program in the Institute of Artificial Intelligence Innovation" for the details.

智能系統研究所博士班

113 學年度

修業年限	修業期限 2 年至 7 年為限，若轉為在職生得增加修業年限 2 年。
應修學分數	18 學分。
逕博應修學分數	逕博生至少應修畢 24 學分。
應修(應選)課程及符合畢業資格之修課相關規定	一、含本所核心課程至少 6 學分，及本所專業選修課程至少 6 學分; 修業期間，論文研討(書報討論)或企業研發實習課程(限參與本學院的相關企業)應加總通過 2 學期，並完成博士論文。論文研討(書報討論)、企業研發實習課程與學位論文研究不計入專業課程 18 學分中。 二、修習並通過本校語言/寫作中心開設之研究生英文課程兩門或(本校)博士班英語能力考核。英文修習可使用第三方公正機構之英文檢定成績來抵免，抵免標準由本所另訂定之。 三、學術研究倫理教育課程為必修教育課程，採網路教學方式，課程總測驗成績應達及格標準，但不計入應修學分數。
備註	一、核心課程應先滿足 6 學分規定，超過之核心課程學分可列計專業選修學分。 二、未盡事宜以本所通過之修業規章辦理。

Institute of Artificial Intelligence Innovation
Ph.D. Program Curriculum

Academic Year 2024

Minimum Term of Study	Two to Seven Years.
Minimum Credits	18 Credits
Minimum Credits for Direct admitted Ph.D. students	Direct admitted Ph.D. students : 24 Credits.
Curriculum and Regulations	I. Students must select Core courses 6 credits and Elective courses 6 credits offer by our institute. Seminar or Corporation Internship courses are required for total two semesters. Seminar, Corporation Internship and Academic Dissertation Research courses are not included in 18 credits. II. Students must select and pass two Graduate English courses opened by NYCU Language Teaching and Research Center, or pass NYCU Measures for PhD Students' English Competence. English courses can be waived by English Proficiency Test which is hold by third party inspection organization. The Accreditation Measures will be regulated by our Institute. III. Students should take the “Research Ethics Course” on the “Taiwan Academic Ethics Education Resource Center” platform before the end of the first semester after enrollment and pass the required approval standard for the final test. Students who fail to pass the final test cannot apply for degree exam. The courses are not included in Minimum Credits.
Notes	I. Core course credits can be counted as electives only if the 6 main course credits are satisfied. II. Please refer to the “Academic Regulations for Ph.D.'s Program in the Institute of Artificial Intelligence Innovation” for the details.