# 國立勤益科技大學 113 學年度 機械工程系碩士班學分計畫表
## Curriculum for 2024 Master Program of Department of Mechanical Engineering

| 科目 | Subjects | 上學期 First Semester | | 下學期 Second Semester | |
|---|---|---|---|---|---|
| | | 學分 Credits | 學時 Hour | 學分 Credits | 學時 Hour |
| **必修科目(10 學分) Required Courses (10credits hours)** | | | | | |
| **第一學年 First Year** | | | | | |
| 書報討論（一） | Seminar（I） | 1 | 2 | | |
| 書報討論（二） | Seminar（II） | | | 1 | 2 |
| | | | | | |
| **第二學年 Second Year** | | | | | |
| 書報討論（三） | Seminar（III） | 1 | 2 | | |
| 書報討論（四） | Seminar（IV） | | | 1 | 2 |
| 論文 | Thesis | 3 | 3 | 3 | 3 |
| | | | | | |
| **專業選修科目 Professional Required Courses** | | | | | |
| **第一學年 First Year** | | | | | |
| 時間序列分析 | Time Series Analysis | 3 | 3 | 3 | 3 |
| 多變數線性系統 | Linear Multivariable Systems | 3 | 3 | 3 | 3 |
| 近代物理學 | Modern Physics | 3 | 3 | 3 | 3 |
| 精密機械設計 | Design of Precision Machinery | 3 | 3 | 3 | 3 |
| 進階熱處理 | Advanced Heat Treatments | 3 | 3 | 3 | 3 |
| 滾珠軸承設計 | Design of Ball Bearing | 3 | 3 | 3 | 3 |
| 燃料電池原理與應用 | Theory and Applications of Fuel Cells | 3 | 3 | 3 | 3 |
| 高等相變態 | Advanced Phase Transformation | 3 | 3 | 3 | 3 |
| 奈米材料特論 | Special Topics on Nanotechnology | 3 | 3 | 3 | 3 |
| 應用塑性力學 | Applied Plastic Mechanics | 3 | 3 | 3 | 3 |
| 複合材料力學 | Mechanics of Composite Materials | 3 | 3 | 3 | 3 |
| 可靠度工程理論與應用 | Theory and Applications of Reliability Engineering | 3 | 3 | 3 | 3 |
| 微機電系統 | Microelectromechanical Systems（MEMS） | 3 | 3 | 3 | 3 |
| 工程數值分析 | Numerical Analysis for Engineering | 3 | 3 | 3 | 3 |
| 有限元素法 | Finite Element Method | 3 | 3 | 3 | 3 |
| 計算力學 | Computational Mechanics | 3 | 3 | 3 | 3 |
| 切削特論 | Special Topics on Metal Cutting | 3 | 3 | 3 | 3 |
| 最佳化方法與應用 | Optimization with Applications | 3 | 3 | 3 | 3 |
| 光學 | Optics | 3 | 3 | 3 | 3 |
| 類神經網路 | Neural Networks | 3 | 3 | 3 | 3 |
| 太陽能源工程 | Solar Energy Engineering | 3 | 3 | 3 | 3 |
| 機器人學 | Robotics | 3 | 3 | 3 | 3 |
| 精密鎖定螺帽原理與檢測 | Precision Fastening Nut Lock | 3 | 3 | 3 | 3 |
| 科技日文 | Technical Japanese | 3 | 3 | 3 | 3 |
| 壓電元件原理與應用 | Principles and Applications of piezoelectric devices | 3 | 3 | 3 | 3 |
| 機器視覺 | Machine Vision | 3 | 3 | 3 | 3 |
| 創意機構設計 | Creative Design of Mechanisms | 3 | 3 | 3 | 3 |
| 感測器原理與應用 | Principles and Applications of Sensors | 3 | 3 | 3 | 3 |
| 機率與隨機程序 | Probability and Stochastic Processes | 3 | 3 | 3 | 3 |
| 最佳控制 | Optimal Controls | 3 | 3 | 3 | 3 |
| 智慧製造感測聯網與數據處理分析技術 | The internet of sensors and data processing analysis technology applied in smart manufacturing | 3 | 3 | 3 | 3 |
| 非線性控制 | Nonlinear Control | 3 | 3 | 3 | 3 |
| 高分子加工 | Polymer Processing | 3 | 3 | 3 | 3 |
| 高等工程熱力學 | Advanced engineering thermodynamics | 3 | 3 | 3 | 3 |
| 創新發明與專利佈局 | Innovative invention and patent layout | 3 | 3 | 3 | 3 |
| 複合材料特論 | Process and Inspection of Composite Materials | 3 | 3 | 3 | 3 |
| 機器學習原理與應用 | Theory and application of machine learning | 3 | 3 | 3 | 3 |
| **第二學年 Second Year** | | | | | |
| 科技英文 | English for Science and Technology | 3 | 3 | 3 | 3 |
| 精密加工 | Precision Machining | 3 | 3 | 3 | 3 |
| 防蝕工程 | Corrosion Engineering | 3 | 3 | 3 | 3 |
| 油膜軸承設計 | Design of Fluid Film Bearing | 3 | 3 | 3 | 3 |
| 材料微結構特性分析 | Micro-structure Character Analysis for Materials | 3 | 3 | 3 | 3 |
| 陶瓷材料特論 | Special Topics on Ceramic Materials | 3 | 3 | 3 | 3 |

| 儀器分析 | Instrumentation | 3 | 3 | 3 | 3 |
|---|---|---|---|---|---|
| 有限元素與塑性加工 | Finite Element Method and Metal Forming | 3 | 3 | 3 | 3 |
| 高等材料力學 | Advanced Mechanics of Materials | 3 | 3 | 3 | 3 |
| 電子元件與應用電路 | Electronic Elements and Applied Circuits | 3 | 3 | 3 | 3 |
| 微系統製造技術 | Fabrication Technologies of Micro-systems | 3 | 3 | 3 | 3 |
| 金屬成形特論 | Special Topics on Metal Forming | 3 | 3 | 3 | 3 |
| 生醫力學 | Biomedical Mechanics | 3 | 3 | 3 | 3 |
| 彈性力學 | Elastic Mechanics | 3 | 3 | 3 | 3 |
| 磨潤工程 | Tribology Engineering | 3 | 3 | 3 | 3 |
| 數位控制 | Digital Control | 3 | 3 | 3 | 3 |
| 動態系統分析與模擬 | Analysis and Simulation of Dynamic Systems | 3 | 3 | 3 | 3 |
| 先進材料分析與應用 | Advanced Materials Analysis with Applications | 3 | 3 | 3 | 3 |
| 多軸加工原理與應用 | Principles and applications of Multi-axis Machining Tool | 3 | 3 | 3 | 3 |
| 實驗設計 | Design of Experiment | 3 | 3 | 3 | 3 |
| 精密機械量測 | Precision Mechanical Measurement | 3 | 3 | 3 | 3 |
| 太陽能電池 | Solar Cells | 3 | 3 | 3 | 3 |
| 科技論文寫作 | Technical Thesis Writing | 3 | 3 | 3 | 3 |
| 工程振動學 | Mechanical Vibrations | 3 | 3 | 3 | 3 |
| 系統性產品創新設計 | Innovative Design of Systemic Products | 3 | 3 | 3 | 3 |
| 電腦輔助工程分析 | Computer Aided Engineering Analysis | 3 | 3 | 3 | 3 |
| 緊固邊界特論 | Topics on Fastener Boundaries | 3 | 3 | 3 | 3 |
| 應用機械動力學 | Applied Mechanical Dynamics | 3 | 3 | 3 | 3 |
| 主動式磁浮軸承之設計與應用 | Design and Application of Active Maglev Bearing | 3 | 3 | 3 | 3 |
| 氣壓控制特論 | Special Topics on Pneumatic Controls | 3 | 3 | 3 | 3 |
| 自動化光學檢測 | Automated Optical Inspection | 3 | 3 | 3 | 3 |
| 深度學習 | Deep Learning | 3 | 3 | 3 | 3 |
| 工業德文 | Engineering German | 3 | 3 | 3 | 3 |
| 自動化生產系統 | Automatic production systems | 3 | 3 | 3 | 3 |

備註 Note:

1. 畢業至少應修 34 學分：必修 10 學分(含論文 6 學分、專題討論 4 學分)，選修 24 學分（專業選修至少 24 學分）。
   Before graduation, each student should complete at least 34 credits including 10 required credits (6 credits for Thesis and 4 credits for Seminar) and 24 elective credits (at least 24 credits should be completed from professional elective courses).

2. 學生應於申請學位考試前至「教育部臺灣學術倫理教育資源中心」網路平臺完成學術研究倫理教育課程，至少 6 小時課程。
   Students need to complete the academic research ethics education course for at least 6 hours before the final defence applicaiton.

3. 研究生至少需於本系所教師開課科目中修畢 24 學分(不含論文及書報討論)。因研究需要，經指導教授及系主任同意，得選修他所開授之科目計入此 24 學分中，但最多以 6 學分為限，語文類課程(科技日文、科技英文、科技論文寫作、工業德文)最多採計 3 學分。
   Graduate students have to complete at least 24 credits offered by the teachers in the department (not including Degree Thesis and Seminar courses). For research needs, ones can take courses offered by other departments after the approvals of supervisor and director of department, which are counted in 24 graduate credits where at most 6 credits is adopted, in addition,language courses (like Technical Japanese, Technical English, Technical Thesis Writing and Engineering German) at most 3 credits are adopted.

4. 研究生必須通過碩士班論文口試方准予畢業。畢業時，依法授予工學碩士學位。
   Graduate students have to pass the oral defense for graduation. Once graduation, ones are awarded Master Degrees of Science in Engineering.

5. 以同等學力或非相關科系畢業而考取者，依需要加修大學部相關學系開授之科目，其學分不得列入畢業學分之計算。
   One granting an admission with the same educational level or non-major related graduation should add to the roll of related courses offered in the undergraduate department as needed, in which earned credits are not included in the graduate credit calculation.

6. 研究生必須於在學期間完成下列規定(至少一項以上)：通過全民英檢中級、參與國際研討會以英文口頭報告一次、書報討論課程以英文口頭報告一次。
   Graduate students have to complete the following requirements (at least one of them) duration of study: passing the intermediate General English Proficiency Test (GEPT) and doing an oral English presentation at international conferences or Seminars.