國立彰化師範大學
物理學系碩士班畢業條件表暨課程架構表
(115學年度入學學生適用)

National Changhua University of Education

Graduation Requirements and Course Structure for Master's Program of Physics

(Applicable for students in 115 academic year)

列印日期(Print Date:2025/10/01)

一.系必修課程

Ⅰ.Department Required Courses

課程名稱 Course Name	學分/學時 Credit(s)/ Hour(s)	年級 Grade	學期 Semester
專題討論(一) Seminar I	1/2	1	1
專題討論(二) Seminar II	1/2	1	2
論文指導(一) Thesis Supervision I	3/0	2	1
論文 Thesis	0/0	2	2
論文指導(二) Thesis Supervision II	3/0	2	2

二.系選修課程

Ⅱ.Department Elective Courses

課程名稱 Course Name	學分/學時 Credit(s)/ Hour(s)
中小學科學課程研究 Research Methods in Science Education	3/3
反射式液晶顯示器 Reflective Liquid Crystal Displays	3/3
天文物理導論 Introduction to Astrophysics	3/3
太陽電池學特論 Special Topics in Solar Cells	3/3
半導體奈米結構光學 Optical Properties of Semiconductor Nanostructures	3/3
半導體物理 Semiconductor Physics	3/3
半導體製程 Semiconductor Manufacturing Technology	3/3
光電半導體特論 Special Topics in Optoelectronic Semiconductors	3/3
光譜學 Spectroscopy	3/3
光纖通訊 Fiber Communications	3/3
多體物理(一) Many-body Physics I	3/3
有機半導體物理 Organic Semiconductor Physics	3/3

材料模擬科學導論(一) Material Simulation Science I	3/3
固態物理(一) Solid State Physics I	3/3
固態物理導論(一) Introduction to Solid State Physics I	3/3
奈米材料(一) Nano-Materials I	3/3
奈米結構製程(一) Fabrication Processes for Nanostructure I	3/3
奈米電子專題研究 Special Topics on Nano-electronics	3/3
奈米電子學(一) Nano-Electronics I	3/3
物理光學 Physical Optics	3/3
物理專題(一) Individual Studies in Physics I	3/3
物理教材教法研究 Seminar in Methods and Materials for Teaching the Physics	3/3
物理教育專論 Special Topics in Physics Education	3/3
物理教育專題(一) Project in Physics Education I	3/3
物理教育論文寫作(一) Physics Education Academic Writing I	3/3
表面物理與技術 Surface Physics and Techniques	3/3
非線性光學 Nonlinear Optics	3/3
科學史與物理教育 History of Science and Physics Education	3/3
科學概念改變研究 Research in Science Conceptual Development	3/3
科學概念發展與分析 Development and Analysis of Science Concepts	3/3
高等物理教育研究法 Advanced Research Methods in Physics Education	3/3
高等量子力學 Advanced Quantum Mechanics	3/3
基本粒子物理 Elementary Particle Physics	3/3
探究教學理論與實務 Inquiry Teaching Theory and Practice	3/3
教育統計(一) Educational Statistics I	3/3
渦流動力學 Vortex Dynamics	3/3
發光材料與應用 Luminescent Materials and Applications	3/3
量子力學(一) Quantum Mechanics I	3/3
量子場論 Quantum Field Theory	3/3

電動力學(一) Electrodynamics I	3/3
電磁波系統與元件技術(上) Techniques of Systems and Components for Electromagnetic Waves (I)	3/3
電磁波系統與元件技術(上) Techniques of Systems and Components for Electromagnetic Waves (I)	3/3
電漿物理(一) Plasma Physics I	3/3
磁性物理 Physics of Magnetism	3/3
熱電物理特論(一) Special Topics in Thermoelectric I	3/3
質的研究法 Qualitative Research	3/3
凝態物理特論 Special Topics in Condensed-matter Physics	3/3
應用量子力學(一) Applied Quantum Mechanics I	3/3
半導體光學 Semiconductor Optics	3/3
半導體物理特論 Special Topics in Semiconductor Physics	3/3
半導體雷射 Semiconductor Lasers	3/3
光電子學 Optoelectronics	3/3
光電半導體元件 Optoelectronic Devices	3/3
多體物理(二) Many-body Physics II	3/3
自旋電子學 Spintronics	3/3
低維度半導體物理 Physics of Semiconductors in Low Dimensions	3/3
低維度磁結構物理 Physics of Magnetic Structures in Low Dimension	3/3
材料模擬科學導論(二) Material Simulation Science II	3/3
固態光學 Solid State Optics	3/3
固態物理(二) Solid State Physics II	3/3
固態物理導論(二) Introduction to Solid State Physics II	3/3
奈米材料(二) Nano-Materials II	3/3
奈米結構製程(二) Processes for Nanostructure Fabrication II	3/3
奈米電子學(二) Nano-Electronics II	3/3
物理專題(二) Individual Studies in Physics II	3/3
物理教育研究法 Research Methods in Physics Education	3/3

物理教育專題(二) Project in Physics Education II	3/3
物理教育論文寫作(二) Physics Education Academic Writing II	3/3
相對論 Relativity	3/3
計算物理 Computational Physics	3/3
原子核物理 Nuclear Physics	3/3
原子與分子物理 Atomic and Molecular Physics	3/3
高效能計算 High Performance Computing	3/3
教育統計(二) Educational Statistics II	3/3
液晶光學 Liquid-Crystal Optics	3/3
統計力學(一) Statistical Mechanics I	3/3
幾何光學 Geometrical Optics	3/3
發光二極體特論 Special Topics in Light-Emitting Diodes	3/3
超導體物理 Superconductivity	3/3
量子力學(二) Quantum Mechanics II	3/3
量子場論專題 Special Topics in Quantum Field Theory	3/3
雷射原理與應用 Principles and Applications of Lasers	3/3
電動力學(二) Electrodynamics II	3/3
電腦在物理教育上的應用 Applications of Computer in Physics Education	3/3
電磁波系統與元件技術(下) Techniques of Systems and Components for Electromagnetic Waves (II)	3/3
電磁波系統與元件技術(下) Techniques of Systems and Components for Electromagnetic Waves (II)	3/3
電漿物理(二) Plasma Physics II	3/3
熱電物理特論(二) Special Topics in Thermoelectric II	3/3
質的資料分析 Qualitative data Analysis	3/3
應用量子力學(二) Applied Quantum Mechanics II	3/3
顯示光學 Display optics	3/3
X光繞射專題 Special Topics on X-ray Diffraction	3/3
半導體物理與元件 Semiconductor Physics and Device	3/3

半導體表面與界面 Semiconductor Surfaces and Interfaces	3/3
半導體雷射特論 Special Topics in Semiconductor Lasers	3/3
古典力學 Classical Mechanics	3/3
自旋電子學專題 Special Topics on Spintronics	3/3
低溫物理 Low Temperature Physics	3/3
冷原子物理特論 Special Topics in Ultracold Atomic Physics	3/3
材料物理特論(二) Special Topics in the Physics of Materials II	3/3
物理專題(三) Individual Studies in Physics III	3/3
物理教育專題(三) Individual Studies in Physics Education III	3/3
物理教學活動設計(一) Activity Design in Physics Education I	3/3
物理數學特論 Special Topics in the Mathematical Methods for Physics	3/3
物理課程與教學研究 Research in Physics Curriculum and Instruction	3/3
科技論文寫作 Introduction to Scientific Writing	3/3
科學學習心理學 Psychology of Science Learning	3/3
高分子物理 Polymer Physics	3/3
高等固態物理特論 Special Topics in Advanced Solid State Physics	3/3
高等物理數學(一) Advanced Mathematical Methods in Physics I	3/3
高等教育統計(一) Advanced Educational Statistics I	3/3
專題討論(三) Seminar III	1/2
液晶光學特論 Special Topics in Liquid-Crystal Optics	3/3
量子光學 Quantum Optic	3/3
群論與物理 Group Theory and Physics	3/3
雷射物理 Laser Physics	3/3
電腦模擬 Computer Simulation	3/3
磁性氧化物專題(一) Special Topics in Magnetic Oxides I	3/3
遠距教學研究 Research in Distance Instruction	3/3
獨立研究(一) Individual Studies I	3/0

半導體表面與界面特論 Special Topics in Semiconductor Surface and Interfaces	3/3
生物物理 Biological Physics	3/3
光電半導體元件特論 Special Topics in Optoelectronic Semiconductor Devices	3/3
有機發光二極體 Organic Light-Emitting Diodes	3/3
材料物理特論(一) Special Topics in the Physics of Materials I	3/3
物理專題(四) Individual Studies in Physics IV	3/3
物理教育專題(四) Individual Studies in Physics Education IV	3/3
物理教學改革與研究 Innovation and Research in Physics Teaching	3/3
物理教學活動設計(二) Activity Design in Physics Education II	3/3
非線性力學特論 Special Topics in Nonlinear Dynamics	3/3
科技論文導讀 Introduction to Scientific Reading	3/3
科學教育專題 Introduction to Theory and Practice in Science Education	3/3
科學教育專題特論 Special Topics on Themes and Issues in Science Education	3/3
粉末X光繞射結構鑑定 Structural Determination from Powder X-ray Diffraction	3/3
高等物理教育專論 Advanced Special Topics in Physics Education	3/3
高等物理數學(二) Advanced Mathematical Methods in Physics II	3/3
高等粉末X光繞射專題 Special Topics in Advanced Powder X-ray Diffraction	3/3
高等教育統計(二) Advanced Educational Statistics II	3/3
專題討論(四) Seminar IV	1/2
統計力學(二) Statistical Mechanics II	3/3
軟物質物理 Soft Matter Physics	3/3
傅氏光學 Fourier Optics	3/3
幾何與拓樸在物理中的應用 Applications of Geometry and Topology in Physics	3/3
測驗與評量研究 Research of Educational Testing and Measurement	3/3
量子光學特論 Special Topics in Quantum Optics	3/3
量子資訊特論 Special Topics in Quantum Information Theory	3/3
磁性物理特論 Special Topics in the Physics of Magnetism	3/3

磁性氧化物專題(二) Special Topics in Magnetic Oxides II	3/3
認知心理學專論 Cognitive Psychology	3/3
獨立研究(二) Individual Studies II	3/0
積體光學 Integrated Optics	3/3

三.先修科目
Ⅲ.Prerequisite Courses

先修課程 Prerequisite Course	後修課程 Subsequent Course

四.畢業條件
Ⅳ.Graduation Requirements

1. 最低畢業學分數為26學分，包含必修2學分、選修24學分，不含「論文指導(一)(二)」6學分及教育學分；凡註冊後應至少修習一門科目(含論文)，否則應辦理休學。已修畢最低畢業學分數而論文尚在撰寫中者，次學年起每學期必須選修「論文」。
2. 本系學生可修習教育學程科目，但需視學校之規定修習。
3. 修業年限：以一至四年為限(不含休學期間)。
4. 凡選修本系研究所及光電科技研究所所開設課程(不限學期)，一律可採認為畢業學分數；選修理學院國際碩士學位學程所開設之課程(不限學期)，經課程委員會同意後，可採認為畢業學分數。
5. 研究生應於申請學位考試前修習通過於「臺灣學術倫理教育資源中心」(https://ethics.nctu.edu.tw/)網路教學平台之「學術研究倫理教育」課程等相關規定。
6. 本校學生修習遠距教學課程，其修習學分(含抵免學分)總數以不超過畢業總學分之二分之一為限。
7. 本畢業條件之未盡事宜與例外情形，悉依本系課程委員會之決議辦理。

1. The minimum graduation credit is 26 credits, including 2 required credits and 24 credits of elective credits, excluding 6 credits of " Thesis Supervision (I)(II)" and education credits; and those who should take at least one subject (including thesis) after registration, otherwise they should be suspended. Those who have completed the minimum number of graduation credits and are still working on their thesis are required to take the " Thesis Supervision " in each semester from the next academic year.
2. Students can take courses in the Teacher Education Program but must comply with the school's regulations.
3. The duration for the completion of the master degree is no less than one academic years and no more than four academic years (excluding periods of voluntary suspension).
4. All courses offered by the master programs of this department and the Graduate Institute of Photonics, (regardless of the semester), can be regarded as graduation credits. Courses offered by the International Master's Degree Program of the College of Science can also be regarded as graduation credits upon approval by the curriculum committee.
5. Graduate students should study the relevant regulations of the "Academic Research Ethics Education" course of the "Taiwan Academic Ethics Education Resource Center" (https://ethics.nctu.edu.tw/) online teaching platform before applying for the degree examination.
6. The total credits from online courses (including waived credits) cannot exceed half of the graduation credits.
7. Matters not covered in these graduation requirements and exceptional circumstances shall be handled in accordance with the decisions of the department's curriculum committee.