**元智大學　化學工程與材料科學學系博士班 必修科目表**

**（111學年度入學新生適用）**

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

**Department of Chemical Engineering and Materials Science, Yuan Ze University**

**(Applicable to Students Admitted in Academic Year of 2022）**

111.04.20 一一○學年度第六次教務會議通過

Passed by the 6th Academic Affairs Meeting, Academic Year 2021, on April 20, 2022

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 學年(Year)學期(Semester)科目(Course) | 第一學年1st Year | 第二學年2nd Year | 第三學年3rdYear | 第四學年4thYear |
| 上學期Fall Semester  | 下學期Spring Semester | 上學期Fall Semester  | 下學期Spring Semester | 上學期Fall Semester  | 下學期Spring Semester | 上學期Fall Semester  | 下學期Spring Semester |
| 必修科目(12)Required Course(12) |  |  |  |  |  |  |  | 論文(Dissertation)CH901(12) |
| 學期學分小計Semester Total Credits | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 備註Remarks | 1. 學期學分小計指必修課程部份。The “semester total credits” indicates the sum of total credit hours of the required courses.2. 最低畢業學分計 33 學分。除論文(12學分)外，至少應修21學分，其中本系課程不得少於15學分。A total of 33 credits are required for PhD degree. These include 12 credits from the dissertation and 21credits from courses, of which at least 15 credits should be taken from the courses offered in the department. 3.其他未盡事宜，請參閱本系「博士班修讀辦法」。Students should refer to the "Regulations for PhD's Students" in the department for additional information. 4.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。For those graduate students who shall complete Academic Research Ethics Education Course before the end of their first academic semester, they must follow the regulations of Yuan Ze University Academic Research Ethics Education Course Implementation Highlights. The latest deadline for them shall be their course completions and then their applications towards the degree’s oral exam. |

[AA-CP-04-CF04](http://www.yzu.edu.tw/admin/so/files/%E5%85%A7%E6%8E%A7%E6%96%87%E4%BB%B6/AA/AA-CP-04/AA-CP-04-CF04.pdf) (1.2 版)／101.11.15修訂

**元智大學　化學工程與材料科學學系博士班 選修科目表**

**（111學年度入學新生適用）**

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

**Department of Chemical Engineering and Materials Science, Yuan Ze University**

**(Applicable to Students Admitted in Academic Year of 2022)**

|  |  |  |
| --- | --- | --- |
| 學年、學期Year/ Semester科目Course選修領域Options | 第一學年1st Year | 第二學年2nd Year |
| 上學期Fall Semester | 下學期Spring Semester | 上學期Fall Semester | 下學期Spring Semester |
| 核心科目Core course | 科技英文Technical WritingCH502 (3) |  |  |  |
|  | 科技論文寫作Methods of Research and Thesis Writing CH570 (3) | 統計實驗設計與應用Statistical Experimental Design and Application EG501 (3) | 可靠度工程Reliability EngineeringIE566 (3) | 智慧財產權Copyright ProtectionCH801 (3) |
| 高等品質管制Advanced Quality Control IE531 (3) |
| 高分子材料領域Polymer Materials | 高分子化學Polymer ChemistryCH509 (3) | 高等儀器分析(二)Advanced Instrumental Analysis (Ⅱ)CH526 (3) | 專題討論Seminars in Science and EngineeringCH517 (3) | 生物高分子特論Special Topics on BiomacromoleculesCH519 (3) |
| 實驗設計Design for ExperimentalCH511 (3) | 高分子物理Polymer PhysicsCH527 (3) | 平面顯示器材料化學Chemistry of Materials for Flat Visual DisplayCH521 (3) | 表面分析特論Special Topics on Surface AnalysisCH536 (3) |
| 高等儀器分析Advanced Instrumental AnalysisCH525 (3) |  | 有機半導體材料特論Special Topics on Organic Semiconductor Materials CH589 (3) | 材料特性分析Analysis of Materials [properties](http://tw.dictionary.yahoo.com/search?ei=UTF-8&p=property)CH620 (3) |
| 高分子熱力學Polymer ThermodynamicsCH528 (3) |  | ***質子交換膜燃料電池特論******Special Topics on Proton-exchange-membrane Fuel Cells CH566 (3)*** |  |
| 藥物制放特論Special Topics on Controlled Drug ReleaseCH535 (3) |  |  |  |
| 生化工程領域Biochemical Engineering | 實驗設計Design for ExperimentalCH511 (3) | 高等化工熱力學Advanced Chemical Engineering ThermodynamicsCH514 (3) | 專題討論Seminars in Science and EngineeringCH517 (3) | 生物高分子特論Special Topics on BiomacromoleculesCH519 (3) |
| 高等儀器分析Advanced Instrumental AnalysisCH525 (3) | 高等儀器分析(二)Advanced Instrumental Analysis (Ⅱ)CH526 (3) | 薄膜分離技術Membrane SeparationsTechnologyCH520 (3) | 製藥技術工程Pharmaceutical EngineeringCH579 (3) |
| 藥物制放特論Special Topics on Controlled Drug ReleaseCH535 (3) | 分離技術特論Special Topics on Separations Technology CH534(3) | 環境生物技術Environmental BiotechnologyCH586 (3) | 細胞訊息路徑Cellular Signal TransductionCH610 (3) |
| 生物物理化學Biophysical ChemistryCH548 (3) | 生物模擬材料Biomimetic MaterialsCH569 (3) | 再生醫學Regenerative MedicineCH609 (3) |  |
| 高等生化工程Advanced Biochemical EngineeringCH584 (3) | 生物醫學工程Biomedical EngineeringCH599(3) | 計算生物學Computational Biology CB537 (3) |  |
| 分子生物學Molecular Biology CB521(3) | 基因體學與蛋白體學Genomics and ProteomicsCB530 (3) |  |  |
| 材料科學領域Materials Science | 實驗設計Design for ExperimentalCH511 (3) | 高等儀器分析(二)Advanced Instrumental Analysis (Ⅱ)CH526 (3) | 專題討論Seminars in Science and EngineeringCH517 (3) | 光電材料與應用Optoelectronic Materials and its ApplicationsER505 (3) |
| 高等儀器分析Advanced Instrumental AnalysisCH525 (3) | 質子交換膜燃料電池特論Special Topics on Proton-exchange-membrane Fuel Cells CH566 (3) | 電化學特論Special Topics on Electrochemical EngineeringCH539(3) | 表面分析特論Special Topics on Surface AnalysisCH536 (3) |
| 精密陶瓷概論Introduction to Fine CeramicsCH530 (3) | 無機奈米材料Inorganic NanomaterialsCH568 (3) | 太陽能技術Solar Energy TechnologyCH588 (3) | 光電材料特論Special Topics on Optoelectronic MaterialsCH537 (3) |
| 藥物制放特論Special Topics on Controlled Drug ReleaseCH535 (3) | 化學蒸鍍技術Chemical Vapor DepositionC H577 (3) | 有機半導體材料特論Special Topics on Organic Semiconductor Materials CH589 (3) | 觸媒原理與應用Catalyst Principles and Applications CH578 (3) |
| 材料物理化學Physical Chemistry of MaterialsCH600 (3) | 物理冶金Physical MetallurgyCH617 (3) | 奈米材料製備與觸媒應用Nanomaterial Preparations and Catalytic ApplicationsCH607 (3) | 材料特性分析Analysis of Materials [properties](http://tw.dictionary.yahoo.com/search?ei=UTF-8&p=property)CH620 (3) |
|  | 相變態Phase TransformationsCH604 (3) | 晶體結構與缺陷Crystal Structure and Defects CH618 (3) | 結晶學與繞射概論Elements of Crystallography and Principles of X-Ray Diffraction CH619 (3) | 鋰電池材料與製程技術Materials and Processing of Lithium BatteryCH701 (3) |
| 光電材料與元件Optoelectronic Materials and Devices CH622 (3) |  | 計算材料學Calculation in Materials Science CH621 (3) |  |
|  | 磁性材料概論Introduction to Magnetic MaterialsCH625 |  |  |  |
| 程序工程領域Process Engineering | 高等輸送現象Advanced Transport PhenomenaCH501 (3) | 應用數值分析Applied Numerical AnalysisCH507 (3) | 專題討論Seminars in Science and EngineeringCH517 (3) | 懸浮微粒制技術Particulate Control TechniqueCH564 (3) |
| 高等化工動力學Advanced Chemical Engineering KineticsCH503 (3) | 高等化工熱力學Advanced Chemical Engineering ThermodynamicsCH514 (3) | 薄膜分離技術Membrane Separations TechnologyCH520 (3) | 氣膠學Aerosol ScienceCH574 (3) |
| 實驗設計Design for ExperimentalCH511 (3) | 高等儀器分析(二)Advanced Instrumental Analysis (Ⅱ)CH526 (3) | 分離技術特論Special Topics on Separations Technology CH534(3) |  |
| 高等儀器分析Advanced Instrumental AnalysisCH525 (3) | 反應器設計Reactor DesignCH561 (3) |  |  |
|  | 薄膜程序設計與應用Design and Applications of Membrane ProcessesCH585 (3) |  |  |
| 永續發展領域Sustainable Development | 高等輸送現象Advanced Transport PhenomenaCH501 (3) | 應用數值分析Applied Numerical AnalysisCH507 (3) | 專題討論Seminars in Science and EngineeringCH517 (3) | 光電材料與應用Optoelectronic Materials and its ApplicationsER505 (3) |
| 實驗設計Design for ExperimentalCH511 (3) | 綠色工程創意設計Innovative Design for Green EnergyER509 (3) | 分離技術特論Special Topics on Separations Technology CH534(3) | 懸浮微粒制技術Particulate Control TechniqueCH564 (3) |
| 環境系統工程Environmental Systems EngineeringCH518 (3) | 高等儀器分析(二)Advanced Instrumental Analysis (Ⅱ)CH526 (3) | 電化學特論Special Topics on Electrochemical EngineeringCH539 (3) | 氣膠學Aerosol ScienceCH574 (3) |
| 高等儀器分析Advanced Instrumental AnalysisCH525 (3) | 環工程序化學Environmental Process ChemistryCH573 (3) | 太陽能技術Solar Energy TechnologyCH588 (3) | 觸媒原理與應用Catalyst Principles and Applications CH578 (3) |
| 環境生物技術Environmental BiotechnologyCH586 (3) | 燃料電池Fuel CellsCH575 (3) | 有機半導體材料特論Special Topics on Organic Semiconductor Materials CH589 (3) | 鋰電池材料與製程技術Materials and Processing of Lithium BatteryCH701 (3) |
| 材料物理化學Physical Chemistry of MaterialsCH600 (3) | 光電材料與元件Optoelectronic Materials and Devices CH622 (3) | ***質子交換膜燃料電池特論******Special Topics on Proton-exchange-membrane Fuel Cells CH566 (3)*** |  |
| 備註Remarks | 博士生在學期間至少須完成一個選修領域，該領域學程內至少須選修2門課，且此2門課均要求及格(70分以上)。All graduate students are required to take one of the five options and pass (above 70) at least two courses in the selected option before graduation. |

[AA-CP-04-CF04](http://www.yzu.edu.tw/admin/so/files/%E5%85%A7%E6%8E%A7%E6%96%87%E4%BB%B6/AA/AA-CP-04/AA-CP-04-CF04.pdf) (1.2 版)／101.11.15修訂