國立彰化師範大學
化學系學士班畢業條件表暨課程架構表
(114學年度入學學生適用)

National Changhua University of Education

Graduation Requirements and Course Structure for Bachelor's Program of Chemistry

(Applicable for students in 114 academic year)

列印日期(Print Date:2025/04/11)

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
普通化學(一) General Chemistry I	3/3	1	1
普通化學實驗(一) General Chemistry Laboratory I	1/3	1	1
普通物理(一) General Physics I	3/3	1	1
微積分(一) Calculus I	2/2	1	1
普通化學(二) General Chemistry II	3/3	1	2
普通化學實驗(二) General Chemistry Laboratory II	1/3	1	2
普通物理(二) General Physics II	3/3	1	2
微積分(二) Calculus II	2/2	1	2
分析化學(一) Analytical Chemistry I	3/3	2	1
分析化學實驗(一) Analytical Chemistry Laboratory I	1/3	2	1
有機化學(一) Organic Chemistry I	4/4	2	1
有機化學實驗(一) Organic Chemistry Laboratory I	1/3	2	1
分析化學(二) Analytical Chemistry II	3/3	2	2
分析化學實驗(二) Analytical Chemistry Laboratory II	1/3	2	2
有機化學(二) Organic Chemistry II	4/4	2	2
有機化學實驗(二) Organic Chemistry Laboratory II	1/3	2	2
物理化學(一) Physical Chemistry I	3/3	2	2
物理化學(二) Physical Chemistry II	3/3	3	1
物理化學實驗(一) Physical Chemistry Laboratory I	1/3	3	1
無機化學(一) Inorganic Chemistry I	3/3	3	1

物理化學(三) Physical Chemistry III	3/3	3	2
物理化學實驗(二) Physical Chemistry Laboratory II	1/3	3	2
無機化學(二) Inorganic Chemistry II	3/3	3	2
專題討論（一）(至少2學分) **Seminar 1(2 credits is least required)**			
專題討論化教組(一) Seminar in Chemical Education I	2/2	4	1
專題討論有機無機組(一) Seminar in Organic and Inorganic Chemistry I	2/2	4	1
專題討論物化分析組(一) Seminar in Physical and Analytical Chemistry I	2/2	4	1
專題討論（二）(至少2學分) **Seminar 2(2 credits is least required)**			
專題討論化教組(二) Seminar in Chemical Education II	2/2	4	2
專題討論有機無機組(二) Seminar in Organic and Inorganic Chemistry II	2/2	4	2
專題討論物化分析組(二) Seminar in Physical and Analytical Chemistry II	2/2	4	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)
地球科學(一) Earth Science I	2/2
產業化學(一) Industrial Chemistry I	3/3
普通生物學(一) Biology I	2/2
普通生物學實驗(一) Biology Laboratory I	1/3
普通物理實驗(一) General Physics Lab. I	1/3
地球科學(二) Earth Science II	2/2
產業化學(二) Industrial Chemistry II	3/3
普通生物學(二) Biology II	2/2
普通生物學實驗(二) Biology Laboratory II	1/3
普通物理實驗(二) General Physics Lab. II	1/3
人工智慧在化學的應用 Artificial Intelligence for Chemistry	2/2
化學研究入門(一) Introduction to Chemistry (I)	2/2
化學數學 Mathematics in Chemistry	2/2

生活科技概論 Introduction to Technology Education	3/3
環境化學(一) Environmental Chemistry I	2/2
化學研究入門(二) Introduction to Chemistry (II)	2/2
自然科學領域探究與實作專題 Special topic in scientific inquiry and practice	2/2
群論 Group Theory	2/2
環境化學(二) Environmental Chemistry II	2/2
有機合成 Organic Synthesis	3/3
材料分析 Material Analysis	3/3
高分子定性與分析 Characterization and Analysis of Polymer	3/3
探究與實作課程設計 Design course in scientific inquiry and practice	2/2
無機化學實驗(一) Inorganic Chemistry Laboratory I	1/3
儀器分析(一) Instrumental Analysis I	3/3
儀器分析實驗A組 Instrumental Analysis Experiment (group A)	1/3
儀器分析實驗B組 Instrumental Analysis Experiment (group B)	1/3
營養化學(一) Nutritional Chemistry I	2/2
光電高分子 Optoelectronic polymer	3/3
有機反應機構 Organic Reaction Mechanisms	3/3
奈米科學導論 Introduction to Nanoscience	3/3
無機化學實驗(二) Inorganic Chemistry Laboratory II	1/3
聚合物化學 Polymer Chemistry	3/3
儀器分析(二) Instrumental Analysis II	3/3
營養化學(二) Nutritional Chemistry II	2/2
分析特論(一) Special Topics in Analytic Chemistry I	2/2
生化特論(一) Special Topics in Biochemistry I	2/2
生物化學(一) Biochemistry I	3/3
生物化學實驗(一) Biochemistry Laboratory I	1/3
有機金屬化學(一) Organometallic Chemistry I	2/2

有機結構論 Organic Structures	3/3
物化特論 Special Topics in Physical Chemistry	3/3
高分子化學 Polymer Chemistry	3/3
基礎核磁共振 Introduction to Nuclear Magnetic Resonance	3/3
量子化學(一) Quantum Chemistry I	2/2
螢光光譜學 Principle of fluorescence spectroscopy	3/3
觸媒化學 Catalytic Chemistry	3/3
分析特論(二) Special Topics in Analytic Chemistry Ⅱ	2/2
生化特論(二) Special Topics in Biochemistry II	2/2
生物化學(二) Biochemistry II	3/3
生物化學實驗(二) Biochemistry Laboratory II	1/3
生物有機化學 Bioorganic Chemistry	3/3
生物無機化學 Bioinorganic Chemistry	3/3
光化學 Photochemistry	3/3
有機光譜分析 Organic Spectroscopy	3/3
有機金屬化學(二) Organometallic Chemistry II	2/2
材料化學 Material Chemistry	3/3
界面化學 Interfacial Chemistry	3/3
量子化學(二) Quantum Chemistry II	2/2
電化學 Electrochemistry	3/3
藥物化學 Medicine Chemistry	3/3
教育專業課程 **Professional Course**	
中學化學示範教學 Demonstration in Chemistry for Secondary School	2/2
化學概念與學習 Chemistry Concept and Learning	2/2
化學科教材教法 Instructional Materials & Teaching Methods in Chemistry	2/2
化學科教學實習 Chemistry Teaching Practicum	2/4
化學科教學應用與實作 Teaching Application and Practice for Chemistry	2/2

專題研究組（一） **Research Project Group 1**	
專題研究化教組(一) Research in Chemical Education I	2/2
專題研究有機物化組(一) Research in Organic and Physical Chemistry I	2/2
專題研究無機分析組(一) Research in Inorganic and Analytical Chemistry I	2/2
專題研究組（二） **Research Project Group 2**	
專題研究化教組(二) Research in Chemical Education II	2/2
專題研究有機物化組(二) Research in Organic and Physical Chemistry II	2/2
專題研究無機分析組(二) Research in Inorganic and Analytical Chemistry II	2/2
專題研究組（三） **Research Project Group 3**	
專題研究化教組(三) Research in Chemical Education III	2/2
專題研究有機物化組(三) Research in Organic and Physical Chemistry III	2/2
專題研究無機分析組(三) Research in Inorganic and Analytical Chemistry III	2/2
專題研究組（四） **Research Project Group 4**	
專題研究化教組(四) Research in Chemical Education IV	2/2
專題研究有機物化組(四) Research in Organic and Physical Chemistry IV	2/2
專題研究無機分析組(四) Research in Inorganic and Analytical Chemistry IV	2/2

三.先修科目
Ⅲ.Prerequisite Courses

先修課程 Prerequisite Course	後修課程 Subsequent Course
數學科教材教法 Content and Method in Mathematics Teaching	數學科教學實習(一) Teaching Practicurn in Mathemtics(I)
數學科教學應用與實作(數學科教材教法專題) Application and Practice of Mathematics Teaching(Topics in Content and Method in Mathematics Teaching)	數學科教學實習(一) Teaching Practicurn in Mathemtics(I)
數學科教材教法 Content and Method in Mathematics Teaching	數學科教學實習(二) Teaching Practicurn in Mathemtics(II)
數學科教學應用與實作(數學科教材教法專題) Application and Practice of Mathematics Teaching(Topics in Content and Method in Mathematics Teaching)	數學科教學實習(二) Teaching Practicurn in Mathemtics(II)

四.畢業條件
Ⅳ.Graduation Requirements

一、本系最低畢業學分為128學分，包含校必修28學分、系必修57學分、選修43學分，不含軍訓及體育。
二、凡選修本系（所）開設科目一律採認為本系畢業學分，惟已列為師資培育課程之「教育專業課程」

者不得再列入本系畢業學分。
三、欲修習外系開設之科目，需提出修課計畫並經本系課程委員會核可後，方可修習。外系課程（非通識課程及教育專業課程科目），至多採計16學分為本系畢業學分。
四、學生畢業前須通過資訊檢定測驗門檻：依照國立彰化師範大學資訊能力檢定畢業門檻實施辦法之相關規定辦理。
五、系必修「專題討論（一）（二）」，上下學期需修習不同組別。
六、系選修之專題研究組（一）、專題研究組（二）、專題研究組（三）、專題研究組（四），各組至多採計2學分，總計至多採計6學分為畢業學分。修習儀器分析實驗A組、儀器分析實驗B組，至多採計1學分。
七、輔系需修畢29學分，請參閱本系輔系及雙主修修課規定。
八、雙主修需修畢50學分，請參閱本系輔系及雙主修修課規定。
九、畢業總學分數之遠距教學課程學分數，不得超過畢業總學分數之二分之一。

• The minimum graduation credits for this department are 128 credits, including 28 credits of university-required courses, 57 credits of department-required courses, and 43 credits of elective courses, excluding military training and physical education.
• All courses taken within this department are recognized as graduation credits. However, courses categorized as "Education Professional Courses" within the teacher training program cannot be counted towards graduation credits.
• To take courses offered by other departments, students must submit a study plan and obtain approval from the department's curriculum committee before enrolling. Courses from other departments (excluding general education and professional education courses) may be counted for up to 16 credits toward the department's graduation requirements. • Students must pass the information competency test threshold before graduation, following the relevant regulations of the National Changhua University of Education on the implementation of the graduation threshold for information competency testing.
• "Seminar (Part I) (Part II)" are required courses for the department. Students must take different groups of these courses in consecutive semesters.
• Each of the department's elective research groups (Group 1, Group 2, Group 3, Group 4) may contribute up to 2 credits towards graduation, with a total maximum of 6 credits. Taking Instrumental Analysis Experiment Group A or Group B can contribute up to 1 credit each.
• A minor requires completion of 29 credits. Please refer to the regulations for taking minor or double major courses in this department.
• Double major requires completion of 50 credits. Please refer to the regulations for taking minor or double major courses in this department.
• The number of credits from distance learning courses for graduation must not exceed half of the total graduation credits.