

國立暨南國際大學 應用化學 學系 學士班 必選修科目一覽表

Undergraduate Program Course Catalog of Department of Applied Chemistry, National Chi Nan University

本表(113)學年度入學新生適用 Effective for students admitted in Fall,2024

最低畢業學分：128 學分，全校共同課程 16 學分，通識領域課程 15 學分，系必修 57 學分，選修 40 學分(其中學系專業課程選修至少 20 學分。) Undergraduate requirements: a minimum of 128 required credits, including 16 credits in the school-wide curriculum, 15 credits of General Education courses, 57 credits of Departmental required courses and 40 credits of elective courses (20 of the elective credits must be the credits offered by this department.)

壹、全校共同課程 1.School-Wide Curriculum

一、共同課程(必修 **16** 學分) A. School-Wide Required Courses (**16** credits)

課程代號 Course Code	課程名稱(中文及英文) Course Name (Chinese and English)	學分數 Credits	備註Notes (更正文)
	應化系跨域專業學術英文(一)：文本解析與書寫 Department of Applied Chemistry Cross-disciplinary ESAP: Textual Interpretation and Composition	2	自110學年度起，英文能力分班改為依照本校自辦英檢(OOPT)作依據，分為三級上課：前10%的同學將分配至「跨域專業學術英文(一)：文本解析與書寫(進階)/跨域專業學術英文(二)：思辨與表達(進階)/跨域專業學術英文(三)：跨文化溝通與表達(進階)」上課；中間80%的同學將分配至原班英文上課；後10%的同學將分配至「跨域專業學術英文(一)：文本解析與書寫(基礎)/跨域專業學術英文(二)：思辨與表達(基礎)/跨域專業學術英文(三)：跨文化溝通與表達(基礎)」上課。 Since the first semester of 110 Academic Year (September 2021), the competence-based class grouping policy of Freshmen English (Course Title: Cross-disciplinary ESAP: Textual Interpretation and Composition) will be based on registered student's OOPT scores; Students will be accordingly divided into three different levels: advanced (top 10%), general (middle 80%) and basic (bottom 10%).
	應化系跨域專業學術英文(二)：思辨與表達 Department of Applied Chemistry Cross-disciplinary ESAP: Critical Thinking and Expression	2	
	應化系跨域專業學術英文(三)：跨文化溝通與表達 Department of Applied Chemistry Cross-disciplinary ESAP: Cross-Cultural Communicative Skills	2	
	中文思辨與表達一：閱讀書寫 Critical Thinking And Expression In Chinese (I) : Reading And Writing	2	僑外生修習「僑外生華語文」可抵通識人文領域課程，不得以「僑外生華語文」抵免中文思辨與表達課程。(Overseas students who take Chinese for Overseas Students can be credited in field of Humanities, but cannot be certified as Critical Thinking And Expression In Chinese.)
	中文思辨與表達二：多元應用 Critical Thinking And Expression In Chinese (II) : Multiple Applications	2	

	社會服務學習 Service Learning	1	依所屬學系分班上課，無特殊原因不得跨班選課。(Students are divided into groups by their own department, without any proper reasons they cannot change the decision.)
	資訊科技 Information Technology	1	每學年於上學期開課，不分學系上課。(Freshmen take courses in the first semester of each academic year, regardless of department.)
	大一體育(上)Physical Education (1)	1	上學期依所屬學系分班上課，無特殊原因不得跨班選課，惟未達40人之學系、院學士班班級，則採合併班開課；下學期則依運動項目分班，自由選課。(In the first semester of freshman, students are arranged to take Physical Education (1) by their original department. Without any proper reasons, change will be prohibited. If a class of the department or the interdisciplinary program that is less than 40 students, the combined class will be adopted. In the second semester of freshman, students are able to take Physical Education (2) by their interesting.)
	大一體育(下)Physical Education (2)	1	
	特色運動 (Featured Sports)	2	大二開始，每學期限修一項，畢業前須完成至少2項特色運動 (Students are limited to take 1 featured sports course each semester since sophomore. At least 2 featured sports courses are required before graduation.)
	通識講座 General Education Seminar	0	畢業前至少應出席6場。(Students are required to attend at least 6 lectures before graduation.)

二、共同選修課程 (各系依共同選修加列課程) B. School-Wide Elective Courses

	第二外語 (Second Foreign Languages)		含日文、韓文、法文、德文及西班牙文等。(Including Japanese, Korean, French, German and Spanish, etc.)
	東南亞語言(Southeast Asia Languages)		含泰語、越南語、緬甸語、印尼語及馬來語，可抵特色通識領域。(Including Thai, Vietnamese, Burmese, Indonesian and Malay. These courses can be credited course credits in Topical General Education)
	進階語文(Advanced English)		
	其他選修(Other Elective Course)		

貳、通識領域課程(至少15學分) 2.General Education Courses

領域 Field (須修習資訊科技與自主學習課程) (Information Technology and Self-directed Learning courses are required)	學分數 Credits	備註 Notes
文學與藝術(Literature and Art)		

人文領域 Humanities	歷史哲學與文化(History, Philosophy and Culture)	3	至少修習3學分。(Students should attend a total of at least 3 credits.)
	AI文創協作(AI Collaboration in Cultural Creativity)		
社會領域 Society	法政與教育(Law, Politics and Education)	3	至少修習3學分。(Students should attend a total of at least 3 credits.)
	社經與管理(Society, Economy and Management)		
	資料科學分析(Data Science Analysis)		
自然領域 Nature	工程與科技(Engineering and Technology)	3	至少修習3學分。(Students should attend a total of at least 3 credits.)
	生命與科學(Life and Science)		
	程式設計(Programming)		
特色通識領域 Topical General Education	國際連結(International Connection)	3	至少修習3學分。(Students should attend a total of at least 3 credits.)
	淨零永續(Net-Zero Sustainability)		
	社會創新(Social Innovation)		
<p>通識各主領域課程(人文、社會、自然及特色通識)得單一領域跨域認抵，至多4學分 (需經通識教育中心認定之) General education courses from various fields (humanities, social, natural, and topical general education) can be cross-credited within a single field, up to a maximum of 4 credits (subject to approval by the General Education Center).</p> <p>領域課程15學分中，學生須至少修習二門資訊科技課程，且須包括自主學習類型課程1學分。 Students are required to take at least two Information Technology courses and get 1 credit of Self-directed Learning courses out of the 15 credits of General Education Courses.</p>			

參、學系專業課程 3.Departmental Courses

課程代號 Course Code	課程名稱(中文及英文) Course Name (Chinese and English)	學分數 Credits	修別 Course type (required/elective)	開課年級 Course availability (freshman/ sophomore/junior/senior)	備註 Notes
240001	普通化學(上) General Chemistry (1)	3	必	一上 Freshman 1st Semester	
240013	普通化學(下) General Chemistry (2)	3	必 required	一下 Freshman 2nd Semester	
240005	微積分(上) Calculus (1)	3	必 required	一上 Freshman 1st Semester	
240016	微積分(下) Calculus (2)	3	必 required	一下 Freshman 2nd Semester	

240087	生物化學導論 Introduction To Biochemistry	3	必 required	一下 Freshman 2nd Semester	
240088	普通物理 General Physics	3	必 required	一上 Freshman 1st Semester	
240082	普通化學實驗 Experiments in General Chemistry	1	必 required	一上 Freshman 1st Semester	
240083	分析化學實驗 Experiments in Analytical Chemistry	1	必 required	一下 Freshman 2nd Semester	
240009	英語聽講(上) Listening Comprehensive and Spoken English (1)	1	選 elective	— Freshman	
240021	英語聽講(下) Listening Comprehensive and Spoken English (2)	1	選 elective	— Freshman	
240079	普通物理實驗 Experiments in General Physics	1	選 elective	— Freshman	
240004	專題研究一(上) Undergraduate Research (1)	1	選 elective	— Freshman	
240015	專題研究一(下) Undergraduate Research (2)	1	選 elective	— Freshman	需先修習普通化學(上) Prerequisite courses: General Chemistry (1)
240089	化學通論 Comprehensive Chemistry	3	選 elective	— Freshman	為全英語授課 English as a Medium of Instruction
240081	普通生物學 Biology	3	選 elective	— Freshman	
240086	普通生物學(二) Biology(2)	3	選 elective	— Freshman	
240022	科技英文 Scientific English	3	選 elective	— Freshman	
240090	基因遺傳研究以「族群」為基礎的倫理 議題 Ethical concerns: the use of racial classification in genealogical base studies	2	選 elective	— Freshman	
240092	科技創發與正義實踐 Scientific and Technological Innovation and Justice Practice	2	選 elective	— Freshman	
240102	生醫科學的種族主義 Ethical concerns: the use of racial classification in genealogical base studies	2	選 elective	— Freshman	
210036	計算機概論 Introduction to Computer Science	3	選 elective	— Freshman	資訊工程學系開課 Department of Computer Science & Information Engineering

210099	程式設計 Computer Programming	3	選 elective	— Freshman	資訊工程學系開課 Department of Computer Science & Information Engineering
240028	化學數學 Chemical Mathematics	3	必 required	二上 Sophomore 1st Semester	需先通過微積分 (上)、微積分(下) Prerequisite courses : Calculus (1), Calculus (2)
240035	物理化學(一) Physical Chemistry (1)	3	必 required	二下 Sophomore 2nd Semester	
240026	分析化學(上) Analytical Chemistry (1)	3	必 required	二上 Sophomore 1st Semester	
240033	分析化學(下) Analytical Chemistry (2)	3	必 required	二下 Sophomore 2nd Semester	
240024	有機化學(上) Organic Chemistry	4	必 required	二上 Sophomore 1st Semester	
240034	有機化學(下) Organic Chemistry (2)	4	必 required	二下 Sophomore 2nd Semester	
240084	分析化學暨有機化學實驗 Experiments in Analytical and Organic Chemistry	2	必 required	二上 Sophomore 1st Semester	
240085	有機化學實驗 Experiments in Organic Chemistry	2	必 required	二下 Sophomore 2nd Semester	
240029	專題研究二(上) Undergraduate Research II (1)	1	選 elective	二 Sophomore	需先修習普通化學 (上)、普通化學(下) Prerequisite courses: General Chemistry (1), General Chemistry (2)
240032	專題研究二(下) Undergraduate Research II (2)	1	選 elective	二 Sophomore	需先修習普通化學 (上)、普通化學(下) Prerequisite courses: General Chemistry (1), General Chemistry (2)
240043	生物化學(上) Biochemistry (1)	3	選 elective	二 Sophomore	
240103	人工智慧與質譜數據分析 Artificial Intelligence and Mass Spectrometry Data Analysis	3	選 elective	二 Sophomore	
240049	生物化學(下) Biochemistry (2)	3	選 elective	二 Sophomore	
280020	奈米科技導論 Introduction to Nano-technology	3	選 elective	二 Sophomore	應用材料及光電工程系開 課 Applied Materials and Optoelectronic

240038	物理化學(二) Physical Chemistry (2)	3	必 require d	三上 Junior 1st Semester	需曾修習化學數學 Prerequisite courses:Chemical Mathematics
240040	無機化學(上) Inorganic Chemistry (1)	3	必 require d	三上 Junior 1st Semester	
240045	無機化學(下) Inorganic Chemistry (2)	3	必 require d	三下 Junior 2nd Semester	
240039	物理化學實驗 Experiments in Physical Chemistry	2	必 require d	三上 Junior 1st Semester	
240062	生物化學實驗 Experiments in Biochemistry	2	選 elective	三 Junior	
240044	專題研究三(上) Undergraduate Research III (1)	1	選 elective	三 Junior	需先修習普通化學 (上)、普通化學(下) Prerequisite courses:General Chemistry (1), General Chemistry (2)
240047	專題研究三(下) Undergraduate Research III (2)	1	選 elective	三 Junior	需先修習普通化學 (上)、普通化學(下) Prerequisite courses:General Chemistry (1), General Chemistry (2)
240041	儀器分析 Instrumental Analysis	3	選 elective	三 Junior	需先通過普通化學 (上)、普通化學 (下)、分析化學 (上)、分析化學 (下)、普通化學實 驗、分析化學實 驗、分析化學實 驗、分析化學實 驗、有機化學實 驗、有機化學實 驗 Pre-requisite including General Chemistry (1), General Chemistry (2), Analytical Chemistry (1), Analytical Chemistry (2), Experiments in General Chemistry, Experiments in Analytical Chemistry, Experiments in Analytical and Organic Chemistry, Experiments in Organic
240080	有機光譜分析 Introduction to Spectroscopic Analysis of Organic Compounds	3	選 elective	三 Junior	
240048	材料科學導論(上) Introduction to Material Science (1)	3	選 elective	三 Junior	
240060	材料科學導論(下) Introduction to Material Science (2)	3	選 elective	三 Junior	

240042	儀器分析實驗 Experiments in Instrumental Analysis	2	選 elective	三 Junior	需先通過普通化學(上)、普通化學(下)、分析化學(上)、分析化學(下)、普通化學實驗、分析化學實驗、分析化學實驗暨有機化學實驗、有機化學實驗 Pre-requisite including General Chemistry (1), General Chemistry (2), Analytical Chemistry (1), Analytical Chemistry (2), Experiments in General Chemistry, Experiments in Analytical Chemistry, Experiments in Analytical and Organic Chemistry, Experiments in Organic Chemistry must be passed
240066	基礎材料化學實驗 Experiments in Fundamental Material chemistry	2	選 elective	三 Junior	
240077	材料化學實驗 Experiments in Material Science	2	選 elective	三 Junior	
240091	無機合成 Inorganic Synthesis	3	選 elective	三 Junior	
240093	生物醫學導論 Introduction to Biomedicine	3	選 elective	三 Junior	
240073	固態化學 Solid State Chemistry	3	選 elective	三 Junior	
240101	現代醫學概論 Introduction to Modern Medicine Science	3	選 elective	三 Junior	
240104	分離技術 Separation Science	2	選 elective	三 Junior	
240105	有機合成及反應機構(一) Organic Synthesis (1)	3	選 elective	三 Junior	需先通過有機化學(上)、有機化學(下) Pre-requisite including Organic Chemistry(1), Organic Chemistry (2)
240106	有機合成及反應機構(二) Organic Synthesis (2)	3	選 elective	三 Junior	需先通過有機化學(上)、有機化學(下) Pre-requisite including Organic Chemistry(1), Organic Chemistry (2)
240100	生理學 Physiology	3	選 elective	三 Junior	

240099	腫瘤生物學 Oncology	3	選 elective	三 Junior	
240095	微生物與免疫學 Microbiology & Immunology	3	選 elective	三 Junior	
240107	生化分析 Bioanalytical Science	3	選 elective	三 Junior	
240096	物理化學(三) Physical Chemistry (3)	3	選 elective	三 Junior	
240098	雜環化學 Heterocyclic Chemistry	3	選 elective	三 Junior	需先通過有機化學(上)、有機化學(下) Pre-requisite including Organic Chemistry(1), Organic Chemistry (2)
240055	生物化學特論 Special Topics on Biochemistry	3	選 elective	三 Junior	
240097	電化學特論 Special topics in Electrochemistry	3	選 elective	三 Junior	
240108	電化學 Electroanalytical Chemistry	3	選 elective	三 Junior	
240059	生物醫學實驗 Experiments in Biomedicine	2	選 elective	三 Junior	
240094	材料分析暨實驗 Experiments in Material Science	2	選 elective	三 Junior	
280033	奈米製作技術 Nano Fabrication Techniques	3	選 elective	三 Junior	應用材料及光電工程系 開課 Applied Materials and Optoelectronic Engineering
280063	材料分析 Materials Analysis	3	選 elective	三 Junior	應用材料及光電工程系 開課 Applied Materials and Optoelectronic Engineering
280042	平面顯示器概論 Introduction to Flat Panel Display	3	選 elective	三 Junior	應用材料及光電工程系 開課 Applied Materials and Optoelectronic Engineering
280043	光纖元件原理與應用 Optical Fiber Devices - Principles and Applications	3	選 elective	三 Junior	應用材料及光電工程系 開課 Applied Materials and Optoelectronic Engineering
280034	材料微結構分析 Microstructural Analysis of Materials	3	選 elective	三 Junior	應用材料及光電工程系 開課 Applied Materials and Optoelectronic Engineering

280102	光電工程實驗 Optoelectronic Engineering Lab.	2	選 elective	三 Junior	應用材料及光電工程系 開課 Applied Materials and Optoelectronic Engineering
280101	材料實驗 Materials Lab.	2	選 elective	三 Junior	應用材料及光電工程系 開課 Applied Materials and Optoelectronic Engineering
280049	奈米光電材料與元件 Nano Optoelectronic Materials and Devices	3	選 elective	三 Junior	應用材料及光電工程系 開課 Applied Materials and Optoelectronic Engineering
240109	細胞生物學 Cellular Biology	3	選 elective	三 Junior	
240110	生醫技術 Biomedical Skill	3	選 elective	三 Junior	
240111	分子生物學 Molecular Biology	3	選 elective	三 Junior	
240115	超分子化學導論 Introduction to Supramolecular Chemistry	3	選 elective	三 Junior	
240114	藥物化學導論 Introduction to Medicinal Chemistry	3	選 elective	三 Junior	
240112	計算化學 Computational chemistry	3	選 elective	三 Junior	需同時修習計算化學實 驗 requisite courses Computational Chemistry Lab at same time
240113	計算化學實驗 Computational Chemistry Lab	1	選 elective	三 Junior	需同時修習計算化學 requisite courses Computational Chemistry
280040	奈米製作實驗 Nano Manufacturing Lab.	1	選 elective	三 Junior	應用材料及光電工程系 開課 Applied Materials and Optoelectronic
240056	書報討論(上) Seminar (1)	1	必 require d	四上 Senior 1st Semester	
240057	書報討論(下) Seminar (2)	1	必 require d	四下 Senior 2nd Semester	
240052	專題研究四(上) Undergraduate Research IV (1)	1	選 elective	四 Senior	需先修習普通化學 (上)、普通化學(下) Prerequisite courses:General Chemistry (1), General Chemistry (2)

240058	專題研究四(下) Undergraduate Research IV (2)	1	選 elective	四 Senior	需先修習普通化學(上)、普通化學(下) Prerequisite courses: General Chemistry (1), General Chemistry (2)
280145	虛擬儀控程式設計 Programming of Virtual Instruments	3	選 elective	四 Senior	應用材料及光電工程系開課 Applied Materials and Optoelectronic Engineering

- 備註：
1. 大四學生聽演講的次數，由書報討論(上)(下)之任課老師規定之。
 2. 選修40學分中，其中應化系專業選修課程至少20學分，其餘20學分為自由選修。
 3. 如需至校外暑修課程，需先完整修習系上相同課程。
 4. 3年級以上可選修系上碩士班課程作為專業選修。

填表人：

系(所)主管：

院長：

填表日期：