

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(114)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 |
|---------------------|---|----------------|---|
| | 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 | |

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| 983004 | 資訊科技 (一) Information Technology (1) | 1 | 分上、下學期修課，不分學系上課。 資訊工程學系、電機工程學系、科技學院學士班及資訊管理學系學生得免修課程，符合免修條件者，仍須以其他課程補足免修之學分數。 (First-year students are required to take "Information Technology (1)" in the first semester and "Information Technology (2)" in the second semester. Students from the Department of Computer Science and Information Engineering, Department of Electrical Engineering, Bachelor of Science and Technology, and Department of Information Management may waive the course. Students who choose to waive the course must complete the equivalent credits with other courses.) |
| 983005 | 資訊科技 (二) Information Technology (2) | 1 | |
| | 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) |

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| | 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 |
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| 人文領域 Humanities | 文學與藝術(Literature and Art) | 3 | 至少修習3學分。(Students should attend a total of at least 3 credits.) |
| | 歷史哲學與文化(History, Philosophy and Culture) | | |
| | 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) | | |
| 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). 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. | | | |

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 |
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| 240001 | 普通化學(上) General Chemistry (1) | 3 | 必 required | 一上 Freshman 1st Semester | |

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| 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 | |

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| 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 | 需先修習普通化學(上)、普通化學(下) Prerequisite courses : General Chemistry (1), General Chemistry (2) |
| 240034 | 有機化學(下) Organic Chemistry (2) | 4 | 必 required | 二下 Sophomore 2nd Semester | 需先修習普通化學(上)、普通化學(下) Prerequisite courses : General Chemistry (1), General Chemistry (2) |
| 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 | |

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| 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 Engineering |
| 240038 | 物理化學(二) Physical Chemistry (2) | 3 | 必 required | 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 required | 三上 Junior 1st Semester | |
| 240045 | 無機化學(下) Inorganic Chemistry (2) | 3 | 必 required | 三下 Junior 2nd Semester | |
| 240039 | 物理化學實驗 Experiments in Physical Chemistry | 2 | 必 required | 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) |

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| 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 |
| 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 | |

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| 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 | |

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| 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 | |

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| 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 Engineering |
| 240056 | 書報討論(上) Seminar (1) | 1 | 必 required | 四上 Senior 1st Semester | |
| 240057 | 書報討論(下) Seminar (2) | 1 | 必 required | 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：