

## 課程大綱 syllabus

課程 (course) : 有機化學 (Organic Chemistry)

教師 (teacher) : 龔佩雲教授

| 項目 | 此科目對應之系所課程規畫所欲培養之核心能力<br>Core capability to be cultivated by this course  | 權重 (百分比)<br>Percentage |
|----|---|------------------------|
| 1  | 運用數學、科學及材料科學與工程知識的能力<br>The ability to employ the knowledge of mathematics, science, and materials science & engineering.   | 40                     |
| 2  | 設計及執行實驗，以及分析解釋數據的能力<br>The ability to design and execute experiments, analyze and interpret data.   | 10                     |
| 3  | 執行實驗所需技術、技巧及使用實驗工具解決問題之能力<br>The ability to employ the techniques and tools that are needed in executing experiments and in solving problems.   | 10                     |
| 4  | 設計工程系統或製程之能力<br>The ability to design engineering systems or processes.   | n/a                    |
| 5  | 有效溝通及團隊合作的能力<br>The ability to communicate and cooperate in team works.   | 10                     |
| 6  | 發掘、分析及處理問題的能力<br>The ability to discover, analyze, and solve problems.  | 10                     |
| 7  | 認識當代材料問題，瞭解材料對於環境、社會及全球的影響，並培養持續學習的習慣與能力<br>The ability to know contemporary materials issues, to realize the influences of materials on the environment, the society, and the globe, and to keep the habit of learning continuously. | 10                     |
| 8  | 瞭解專業倫理及社會責任<br>The ability to realize professional ethics and social responsibility.  | 10                     |

### 課程簡述(必填) Brief Course Description (required) :

(50-200 words if possible, up to 1000 letters / 最多500個中文字) ,

本欄位資料會上傳教育部課程網

In this 1 semester of Organic Chemistry course will covers essential topics relevant in material science. Fundamental topics in organic chemistry and material science such as structure and bonding, acid and bases, nucleophilic, electrophilic, substitution, elimination, and selected reactions will also be taught here. Finally, the course will end with various spectroscopic techniques to analyze chemical compounds via UV-Vis, FTIR, NMR and Mass spectroscopy.

### 關鍵字(必填) course keywords(required) :

課程內容「中文暨英文關鍵字」至少5個，每個關鍵字至多20個中文，以半形逗點分隔  
(必填) Please fill in at least 5 course keywords (up to 40 letters for each keyword) and

## use commas to separate them.(required)

Chemical bonding, molecular structure, acid-base, curve arrow notation, reaction mechanism, analysis and spectroscopy.

### 一、課程說明(Course Description)

This 1 semester organic chemistry course will cover essential topics for materials science students.

### 二、指定用書(Text Books)

Bruice, Organic Chemistry Global Edition. Pearson Education Limited

### 三、參考書籍(References)

### 四、教學方式(Teaching Method)

Lecture will be conducted using a combination of powerpoint and on the chalk board.

### 五、教學進度(Syllabus)

Ch. 1: Structure and bonding

Ch. 2: Acid and bases

Ch. 3: Introduction to organic compounds (nomenclature, alkanes, functional groups)

Ch. 4: Stereoisomers

Ch. 9: Substitution and Elimination reactions

Ch. 10: Reactions of alcohols, amines containing compounds

Ch. 13: Mass-spectrometry, Infrared Spectroscopy, UV/Vis Spectroscopy

Ch. 14: NMR spectroscopy

Ch. 15: Reactions of carboxylic acids and derivatives.

### 六、成績考核(Evaluation)

Quizzes (15%)

Project (15%)

Midterm (30%)

Final (40%)

### 七、可連結之網頁位址(Website)

Generation Artificial Intelligence (A.I.) Ethics Statement. The use of AI is conditionally open in this course. Based on the principles of transparency and responsibility, this course encourages students to use AI to collaborate or learn from each other to improve the quality of the course output. According to the "Guidelines for AI Collaboration, Co-learning and Quality Cultivation in University Educational Fields" announced by our University, this course is conditionally open. The following explains how to use generative AI in course output.

1. Students must briefly explain how to use generative AI for topic ideation, sentence modification, or structural reference in the "title page footnote" or "after citing literature" in class assignments or reports. If it is checked and used but not marked in the homework or report, the teacher, school or related units have the right to re-grade the homework or report or not to score.
2. If there are references to self-generated AI in the teaching materials or learning materials of this course, the teacher will also mark them on the slides or orally.
3. Students who take this course are deemed to have agreed to the above ethics statement when choosing courses.