



課 綱 Course Outline  
資訊工程學系國際組

|                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                           |                  |                    |                                                                                          |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|------------------|--------------------|------------------------------------------------------------------------------------------|-----|
| 中文課程名稱<br>Course Name in Chinese                                                                                                                                                                                                                                                                                                                                                                          | 生成式AI導論                                                                                   |                  |                    |                                                                                          |     |
| 英文課程名稱<br>Course Name in English                                                                                                                                                                                                                                                                                                                                                                          | Introduction to generative AI                                                             |                  |                    |                                                                                          |     |
| 科目代碼<br>Course Code                                                                                                                                                                                                                                                                                                                                                                                       | CSIEB0530                                                                                 | 班 別<br>Degree    | 學士班<br>Bachelor' s |                                                                                          |     |
| 修別<br>Type                                                                                                                                                                                                                                                                                                                                                                                                | 學程<br>Program                                                                             | 學分數<br>Credit(s) | 3.0                | 時 數<br>Hour(s)                                                                           | 3.0 |
| 先修課程<br>Prerequisite                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                           |                  |                    |                                                                                          |     |
| 課程目標<br>Course Objectives                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                           |                  |                    |                                                                                          |     |
| In this course, we'll dive into key models in generative AI like ChatGPT, Transformer, GAN, Diffusion Model, and more. Students will learn the basics of their theory, get a handle on essential math concepts, practice with hands-on exercises, and tackle coding assignments to put the knowledge into action. Plus, we'll help students understand the capabilities and limitations of generative AI. |                                                                                           |                  |                    |                                                                                          |     |
| 系教育目標<br>Dept.' s Education Objectives                                                                                                                                                                                                                                                                                                                                                                    |                                                                                           |                  |                    |                                                                                          |     |
| 1                                                                                                                                                                                                                                                                                                                                                                                                         | 具備學科知識，養成專業技能<br>Acquire academic knowledge, develop professional skills                  |                  |                    |                                                                                          |     |
| 2                                                                                                                                                                                                                                                                                                                                                                                                         | 學習創新思考，分析解決問題<br>Inspire innovative thinking, increase analytical problem solving ability |                  |                    |                                                                                          |     |
| 3                                                                                                                                                                                                                                                                                                                                                                                                         | 培養團隊精神，學習溝通合作<br>Promote teamwork spirit, encourage coordination and cooperation          |                  |                    |                                                                                          |     |
| 4                                                                                                                                                                                                                                                                                                                                                                                                         | 提昇專業倫理，承擔社會責任<br>Sublimate professional ethics, engage social responsibility              |                  |                    |                                                                                          |     |
| 5                                                                                                                                                                                                                                                                                                                                                                                                         | 涵育人文素養，開拓國際視野<br>Cultivate humanities, broaden global perspectives                        |                  |                    |                                                                                          |     |
| 系專業能力<br>Basic Learning Outcomes                                                                                                                                                                                                                                                                                                                                                                          |                                                                                           |                  |                    | 課程目標與系專業能力相關性<br>Correlation between Course Objectives and Dept.' s Education Objectives |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                         | 資訊專業終身學習能力<br>Ability of lifetime learning in information profession                      |                  |                    |                                                                                          | ○   |

|   |                                                                                                     |   |
|---|-----------------------------------------------------------------------------------------------------|---|
| B | 實驗驗證資訊科學能力<br>Ability of validate experimental result validation in information science field       | ● |
| C | 資訊工具整合運用能力<br>Ability of integrated applications of information technology                          | ● |
| D | 資訊系統應用設計開發能力<br>Ability of information application system design and development                    | ● |
| E | 團隊合作溝通協調能力<br>Ability of teamwork, communication, and coordination                                  | ○ |
| F | 資通訊科技問題解決能力<br>Ability of problem solving regarding information and communication technology        | ● |
| G | 瞭解資訊科技多元影響能力<br>Ability to understand information technology' s multiple influences                 | ● |
| H | 肩負資訊人社會責任能力<br>Ability of bearing the social responsibilities being among information professionals | ○ |

圖示說明Illustration : ● 高度相關 Highly correlated ○ 中度相關 Moderately correlated

課程大綱  
Course Outline

1. Introduction
2. History Of Generative Models
3. Creating with generative AI: text and code
4. Creating with generative AI: media resources
5. Variational Autoencoders
6. Generative Adversarial Networks
7. Autoregressive Models
8. Multimodal Models
9. Large language models: ChatGPT
10. Prompt engineering: Optimizing the generative AI experience
11. The Impact on Major Industries

資源需求評估 (師資專長之聘任、儀器設備的配合 . . . 等)  
Resources Required (e.g. qualifications and expertise, instrument and equipment, etc.)

We have qualified full-time teachers and the necessary equipment already in place.

課程要求和教學方式之建議  
Course Requirements and Suggested Teaching Methods

Class lectures, assignments, lab sessions and term project

其他  
Miscellaneous