

Department of Computer Science and Engineering

(資訊工程學系碩士班)

Course Information

- **Degree:** 1132
- **Course Code:** CS646
- **Credits:** 3
- **Course Title:** Generative AI and Applications
- **Instructor:** QAZI MAZHAR UL HAQ (卡其)

Course Outline

1. **Introduction to Generative Models** (生成模型簡介)
2. **Normalizing Flow Models** (標準化流動模型)
3. **Variational Autoencoders (VAEs)** (變分自動編碼器 (VAE))
4. **Autoregressive Models and Information-Theoretic Foundations** (自迴歸模型與資訊理論基礎)
5. **Transformers I in Generative Models** (生成模型中的變形金剛 I)
6. **Transformers II in Generative Models** (生成模型中的變形金剛 II)
7. **Neural Text Decoding Techniques** (神經文本解碼技術)
8. **Prompt Programming** (即時程式設計)
9. **Mid-Exam and Project Proposal Deadline** (期中考和專案提案截止日期)
10. **Neural Cellular Automata** (神經細胞自動機)
11. **Detection of Generated Content** (檢測生成的內容)
12. **Applications of Generative Models** (生成模型的應用)
13. **Explainability I** (可解釋性一)
14. **Explainability II** (可解釋性 II)
15. **Future Directions and Current Research Topics in Generative AI** (產生人工智慧的未來方向和當前研究主題)
16. **Final Project Presentations and Course Wrap-Up** (最終專案簡報和課程總結)
17. **Project Presentation** (項目介紹)
18. **Project Presentation** (項目介紹)

Grading

- **Homework grade:** 20%
- **In-class Performance:** 10%
- **Mid-term:** 30%
- **Final Examination:** 0%
- **Project:** 40%

Textbook / Reference (Library)

NO	Reading Type	Language	Material Type	Title
1	Textbook	English	e-Book	Applications of generative AI
2	Reference Book	English	e-Book	Advanced applications of generative AI and natural language processing models
3	Reference Book	English	Book	I. Goodfellow, Y. Bengio, and A. Courville, Deep Learning, MIT Press, 2016
4	Textbook	English	e-Book	Transforming education with generative AI