

114 學年度 第 2 學期 生成式 AI 創新應用 課程大綱

課程中文名稱 Title of Course in Chinese : 生成式 AI 創新應用
課程英文名稱 Title of Course in English : Generative AI Innovative Applications
應修系級 Major : 資訊管理研究所 2 , 智慧醫療管理英語碩士學位學程 1 , 智慧醫療管理英語碩士學位學程 2 ,
授課教師 Instructor : 戴敏育
選修類別 Required/Elective : 選
全半學年 Whole or Half of the Academic Year : 半學年
學 分 Credit(s) : 3 學分
時 數 Hour(s) : 3 小時
教師網址 Instructor's Website : http://web.ntpu.edu.tw/~myday/
教師專長 Instructor's Specialty : 人工智慧 (Artificial Intelligence)、生成式 AI (Generative AI)、永續綠色金融科技 (ESG and Green Financial Technology)、大數據分析 (Big Data Analytics)、電子商務 (Electronic Commerce)
課綱附檔 Attachments :
先修科目 : None
Prerequisites : None
教學目標 : <ol style="list-style-type: none">1. 瞭解生成式 AI 創新應用基本概念與研究議題。2. 具備生成式 AI 創新應用實務操作能力。3. 進行生成式 AI 創新應用相關之資訊管理研究。
Course Objectives : <ol style="list-style-type: none">1. Understand the fundamental concepts and research issues of Generative AI Innovative Applications.2. Equip with Hands-on practices of Generative AI Innovative Applications.3. Conduct information systems research in the context of Generative AI Innovative Applications.
本課程包含永續發展(SDGs)目標(→ 點此瞭解永續相關目標 ←) :

SDG4 | 優質教育 (Quality Education)

SDG8 | 尊嚴就業與經濟發展 (Decent Work and Economic Growth)

SDG9 | 產業創新與基礎設施 (Industry, Innovation and Infrastructure)

內容綱要：

[這是一門 EMI 全英語課程]

本課程介紹生成式 AI 創新應用基本概念、研究議題、與實務操作。課程內容包括生成式 AI 創新應用概論、轉換器於自然語言處理與計算機視覺、大型語言模型、生成式 AI 模型、生成式 AI 於多模態資訊生成、生成式 AI 在數據增強與內容創作的應用、生成式 AI 資訊管理、生成式 AI 金融創新、生成式 AI 數位永續轉型、生成式 AI 產出洞察與建議、NVIDIA 使用大型語言模型 (LLMs) 構建檢索增強生成 (RAG) 代理、NVIDIA 生成式 AI 與擴散模型、代理程式與大型多模態代理程式、與生成式 AI 創新應用個案研究。

Course Outline：

This course introduces the fundamental concepts, research issues, and hands-on practices of Generative AI Innovative Applications. Topics include Introduction to Generative AI, Transformers for Natural Language Processing and Computer Vision, Large Language Models (LLMs), Generative AI Models, Generative AI for Multimodal Information Generation, Generative AI in Data Augmentation and Content Creation, Generative AI for Information Management, Generative AI for Financial Innovation, Generative AI for Digital Sustainability Transformation, Generative AI for Generating Insights and Recommendations, NVIDIA Generative AI with Diffusion Models, AI Agents and Large Multimodal Agents (LMAs), and Case Study on Generative AI Innovative Applications.

學生核心能力關連(Student's Core Competence)：

(八大核心能力為百分比；合計 100%；Total 100%)

資訊管理研究所 114 年 系核心能力：資訊科技新知探索與系統開發應用 80 %

網路行銷企劃能力 10 %

論文寫作與獨立研究能力新知 10 %

[二]

智慧醫療管理英語碩士學位學程 114 年 系核心能力：透過跨領域的學習來培養學生創新思考並解決問題的素養 Students will be cultivated to think innovatively and build the competence of solving problems through cross-disciplinary learning. 10 %

訓練學生智慧醫療管理的專業素養 To train students the professional competence in smart healthcare management 60 %

來自不同文化的學生在學習及討論的過程中，了解彼此的差異、尋求共識，建立溝通協調的能力 To build up the abilities of students from various culture to understand the differences among each other, to seek the consensus and establish the ability for communication and coordination 5 %

藉由與不同國籍同學之間的合作培養團隊合作精神 To cultivate the spirit of team work through the cooperation among students of various nations 5 %

培養學生關注醫療、商業倫理素養 To cultivate the competence for focusing on healthcare and commercial ethics 5 %

培養學生關注人工智慧議題的專業倫理素養 To cultivate students' professional ethics in artificial intelligence issues 5 %

養成學生對於不同領域之議題之思辨力 To develop students' competence in critical thinking of various fields 5 %

培養跨領域專業人才以因應未來國際趨勢 To cultivate the professional talents of cross-disciplinary in response to the international trends in the future 5 %

校四大基本素養
Four Fundamental Qualities

專業 Professionalism		人際 Interpersonal Relationship		倫理 Ethics		國際觀 International Vision	
創意思考與問題解決 (Creative thinking and Problem-solving) 40 %	綜合統整 (Comprehensive Integration) 30 %	溝通協調 (Communication and Coordination) 5 %	團隊合作 (Teamwork) 5 %	誠信正直 (Honesty and Integrity) 5 %	尊重自省 (Self-Esteem and Self-reflection) 5 %	多元關懷 (Caring for Diversity) 5 %	跨界宏觀 (Interdisciplinary Vision) 5 %

商學院院核心素養目標 (College Competency Goals) :

- Communication
- Fundamental Skill
- Teamwork
- Leadership
- Professionalism
- Research
- Business Ethics and Sustainability
- Global Awareness

教學進度 (Teaching Contents) :

週別 (Weekly Schedule)	日期 (Date)	教學預定進度 (Tentative teaching schedule) (若有調整，依教師實際授課為準; Adjustments are made according to instructor's actual teaching schedule)	教學方法與教學 活動 (Teaching methods and activities)
Week 1	20260224	Introduction to Generative AI Innovative Applications	講授 Lecture 討論 Discussion
Week 2	20260303	Transformers for Natural Language Processing and Computer Vision; Large Language Models (LLMs)	講授 Lecture 討論 Discussion 實習 Practicum
Week 3	20260310	NVIDIA Building RAG Agents with LLMs Part I	講授 Lecture 討論 Discussion 實習 Practicum
Week 4	20260317	Case Study on Generative AI Innovative Applications I	講授 Lecture 討論 Discussion 實習 Practicum
Week 5	20260324	NVIDIA Building RAG Agents with LLMs Part II	討論 Discussion
Week 6	20260331	NVIDIA Building RAG Agents with LLMs Part III	講授 Lecture 討論 Discussion 實習 Practicum
Week 7	20260407	Make-up holiday for NTPU Sports Day (No Classes)	講授 Lecture 討論 Discussion 實習 Practicum
Week 8	20260414	Midterm Project Report	討論 Discussion

Week 9	20260421	Generative AI for Multimodal Information Generation	講授 Lecture 討論 Discussion 實習 Practicum
Week 10	20260428	NVIDIA Generative AI with Diffusion Models Part I	講授 Lecture 討論 Discussion 實習 Practicum
Week 11	20260505	NVIDIA Generative AI with Diffusion Models Part II	討論 Discussion
Week 12	20260512	Case Study on Generative AI Innovative Applications II	講授 Lecture 討論 Discussion 實習 Practicum
Week 13	20260519	NVIDIA Generative AI with Diffusion Models Part III	講授 Lecture 討論 Discussion 實習 Practicum
Week 14	20260526	Agentic AI and Large Multimodal Agents (LMAs)	講授 Lecture 討論 Discussion 實習 Practicum
Week 15	20260602	Final Project Report I	討論 Discussion
Week 16	20260609	Final Project Report II	討論 Discussion
彈性補充教學		課程於 16 週內上完，彈性補充教學規劃如下： 問題討論 翻轉教學 展演實作 校外參訪 校內外各類演講/講座 線上作業 數位自學 課業輔導 遠距教學(同步) 遠距教學(非同步) 學生自主學習 其他	

評量方式(Evaluation Methods) :

課堂之前測(Pre-test) 0 %
期中考-筆試(Mid-Term Exam) 0 %
個案分析報告(Case Report) 10 %
個人報告(Individual Presentation) 60 %
作業(Assignment) 10 %
其他評量方式(Other Evaluation Methods)

課堂之隨堂測驗(Quiz) 0 %
期末考-筆試(Final Exam) 0 %
課堂參與(Class Participation) 10 %
團體報告(Group Presentation) 10 %

指定用書(Required Texts) :

Numa Dhamani and Maggie Engler (2024), Introduction to Generative AI, Manning
Denis Rothman (2024), Transformers for Natural Language Processing and Computer Vision - Third Edition: Explore Generative AI and Large Language Models with Hugging Face, ChatGPT, GPT-4V, and DALL-E 3, 3rd ed. Edition, Packt Publishing
Thomas R. Caldwell (2025), The Agentic AI Bible: The Complete and Up-to-Date Guide to Design, Build, and Scale Goal-Driven, LLM-Powered Agents that Think, Execute and Evolve, Independently published

參考書目(Reference Books) :

Ben Auffarth (2023), Generative AI with LangChain: Build large language model (LLM) apps with Python, ChatGPT and other LLMs, Packt Publishing
Chris Fregly, Antje Barth, and Shelbee Eigenbrode (2023), Generative AI on AWS: Building Context-Aware Multimodal Reasoning Applications, O'Reilly Media
NVIDIA DLI (2024), Building RAG Agents with LLMs,
https://learn.nvidia.com/courses/course-detail?course_id=course-v1:DLI+S-FX-15+V1
NVIDIA DLI (2024), Generative AI with Diffusion Models,
https://learn.nvidia.com/courses/course-detail?course_id=course-v1:DLI+S-FX-14+V1

其他參考資料(Other References) :

David Foster (2023), Generative Deep Learning: Teaching Machines to Paint, Write, Compose, and Play, 2nd Edition, O'Reilly & Associates Inc
Chip Huyen (2023), Designing Machine Learning Systems: An Iterative Process for Production-Ready Applications, O'Reilly Media

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