INTERNATIONAL QUALIFICATIONS

AND ASSESSMENT CENTRE (IQAC)

«Approved»

2025 y. «____» _____

Programme	**Level 7 Diploma in Artificial Intelligence**		
Unit Number/ Unit Title	UNIT 3 GENERATIVE AI AND FOUNDATION MODELS		
Cohort Code:	L07GAIM-U3		
Unit Level	7		
Total GLH	Total qualification time 200/ Total Guided learning hours 90/ Self-guided learning hours 110		
Credits	20 CATS/ 10 ECTS		
Lecturer			
Start Date		**End Date**	

Unit Aims	This unit explores the theoretical underpinnings and practical applications of Generative AI, with a particular focus on foundation models such as large language models (LLMs) and diffusion models. Learners will gain an understanding of the architectures that power generative systems (e.g., GANs, Transformers), how they are trained and fine-tuned, and their impact across industries. The unit also addresses risks, limitations, and ethical concerns around synthetic content and autonomous generation.
Differentiation Strategies *(e.g. planned activities or support for individual learners according to their needs)*	The total number of students to be in the lesson is approximately 20. This is a multicultural group of students predominantly between the ages of 24 – 45, with numerous ethnic, gender, and creed background. These are UK academic level 5 students; hence it is assumed that they have practical, theoretical, or technological knowledge and understanding of a subject or field of work to find ways forward in broadly defined, complex contexts. These students must be able to generate information, evaluate, synthesise the use information from a variety of sources. Various approaches to addressing the various identified students needs will be adopted throughout the lesson. Such will include:- 1. Progressive tasks

	2. Digital resources 3. Verbal support 4. Variable outcomes 5. Collaborative learning 6. Ongoing assessment 7. Flexible-pace learning
Equality & Diversity	Variety of teaching techniques will be employed to ensure that the needs of each individual learner are met.
Safeguarding & Prevent	Safeguarding policies and the Prevent duty are strictly observed to ensure the safety, well-being, and inclusivity of all students and staff.
Health & Safety	SIRM H&S policies will be maintained.
Learning Resources	**Teaching and Learning Materials**
	• Bommasani, R., et al. (2021). On the Opportunities and Risks of Foundation Models. Stanford. • Goodfellow, I., Bengio, Y., & Courville, A. (2016). Deep Learning. MIT Press. • Ouyang, L. et al. (2022). Training language models to follow instructions with human feedback. OpenAI. • Floridi, L. (2023). AI Ethics and Governance. Oxford University Press. • Crawford, K. (2021). Atlas of AI. Yale University Press.

Learning Outcome	Assessment Criteria
LO1. 1. Understand the architecture and principles behind generative models and foundation models	Written Report: 1.1 Compare GANs, VAEs, and transformer-based generative models. 1.2 Evaluate the evolution from task-specific models to foundation models.
LO2. 2. Implement and evaluate generative AI models.	Practical Lab Work: 2.1 Fine-tune a pre-trained LLM (e.g., GPT) or diffusion model. 2.2 Evaluate model outputs using quality metrics such as FID, BLEU.
LO3. 3. Analyse the implications of generative AI on content authenticity and creativity.	Case Study Review: 3.1 Examine use cases in creative industries, education, or journalism. 3.2 Discuss the impact of synthetic content on human labour and innovation.
LO4. 4. Evaluate ethical, legal, and societal challenges posed by generative AI.	Research Essay: 4.1 Analyse legal issues (e.g., copyright, misinformation). 4.2 Discuss alignment, hallucination, and bias in generative systems.
LO5. 5. Design responsible deployment strategies for generative AI tools.	Presentation: 5.1 Propose a governance strategy for responsible generative AI deployment in an organisation. 5.2 Justify the safeguards proposed in relation to stakeholder trust.

No	Learning Outcome / Topic	Learning and Teaching Activities	Which assessment criteria does the session relate to?	Day/month/year/ signature
1.	**Introduction to Generative AI**	**Introduction to Generative AI** Definitions, evolution, and key applications (text, images, audio)	LO1: Architecture & Principles	
2.	**Generative Adversarial Networks (GANs)**	**Generative Adversarial Networks (GANs)** Generator vs. discriminator, training challenges (mode collapse)	LO1: Architecture & Principles	
3.	**Variational Autoencoders (VAEs)**	**Variational Autoencoders (VAEs)** Latent space, reparameterization trick	LO1: Architecture & Principles	
4.	**Transformer-Based Generative Models**	**Transformer-Based Generative Models** Self-attention, GPT architecture, decoder-only designs	LO1: Architecture & Principles	
5.	**Diffusion Models**	**Diffusion Models** Forward/reverse processes, DDPM, Stable Diffusion	LO1: Architecture & Principles	
6.	**Foundation Models**	**Foundation Models** Emergence of LLMs (BERT, GPT, PaLM), multi-modal capabilities	LO1: Architecture & Principles	
7.	**Fine-Tuning Pre-trained LLMs**	**Fine-Tuning Pre-trained LLMs** LoRA, adapter layers, prompt engineering	LO2: Implementation & Evaluation	
8.	Half-Term Exam	- Review of LO1 topics - Practice questions and mock assessment - **Half-term assessment** based on LO1 (theory)	LO1 LO2	
9.	**Fine-Tuning Diffusion Models**	**Fine-Tuning Diffusion Models** Dreambooth, textual inversion for custom generation	LO2: Implementation & Evaluation	
10.	**Quality Metrics for Text Generation**	**Quality Metrics for Text Generation** BLEU, ROUGE, perplexity, human evaluation	LO2: Implementation & Evaluation	
11.	**Quality Metrics for Image Generation**	**Quality Metrics for Image Generation** FID (Fréchet Inception Distance), Inception Score, CLIP score	LO2: Implementation & Evaluation	

12.	**Bias & Fairness in Generative AI**	**Bias & Fairness in Generative AI** Detecting and mitigating bias in model outputs	LO2: Implementation & Evaluation	
13.	**Generative AI in Creative Industries**	**Generative AI in Creative Industries** AI art (DALL·E, Midjourney), music (Jukebox), writing (ChatGPT)	LO3: Content Authenticity & Creativity	
14.	Final Exam Preparation & Review	- Comprehensive review of all learning outcomes - Practice questions and revision of key topics		
15.	Final Exam	- **Final-term assessment** covering all learning outcomes (theory and practical elements)		
16.	Feedback & Reflection	- Review of final exam - Individual feedback on performance - Reflective discussion on key learning points		
17.	**Synthetic Media & Deepfakes**	**Synthetic Media & Deepfakes** Detection tools (Microsoft Video Authenticator), ethical concerns	LO3: Content Authenticity & Creativity	
18.	**Impact on Education**	**Impact on Education** AI-generated essays, personalized tutoring (Khanmigo)	LO3: Content Authenticity & Creativity	
19.	**Journalism & Misinformation**	**Journalism & Misinformation** AI-written news, combating synthetic disinformation	LO3: Content Authenticity & Creativity	
20.	**Human-AI Collaboration**	**Human-AI Collaboration** Co-creation, augmentation vs. replacement	LO3: Content Authenticity & Creativity	
21.	**Copyright & Ownership**	**Copyright & Ownership** Stability AI lawsuits, fair use, AI as a "co-author"	LO4: Ethical & Legal Challenges	

22.	**Misinformation & Hallucinations**	**Misinformation & Hallucinations** Fact-checking AI outputs, retrieval-augmented generation (RAG)	LO4: Ethical & Legal Challenges	
23.	Half-Term Exam	**Capstone Project** Design a responsible generative AI deployment plan		
24.	**Bias & Stereotypes**	**Bias & Stereotypes** Case studies (e.g., gendered/racial biases in generated images)	LO4: Ethical & Legal Challenges	
25.	**Alignment & Control**	**Alignment & Control** RLHF (Reinforcement Learning from Human Feedback), constitutional AI	LO4: Ethical & Legal Challenges	
26.	**Governance Frameworks**	**Governance Frameworks** EU AI Act, NIST AI RMF, OpenAI's usage policies	LO5: Responsible Deployment	
27.	**Content Provenance Standards**	**Content Provenance Standards** C2PA (Coalition for Content Provenance and Authenticity)	LO5: Responsible Deployment	
28.	**Stakeholder Trust Strategies**	**Stakeholder Trust Strategies** Transparency reports, human-in-the-loop systems **Organizational Deployment** Use-case risk assessment, employee training	LO5: Responsible Deployment	
29.	Final Exam Preparation & Review	LO1, LO2, LO3, LO4	LO1, LO2, LO3, LO4	
30.	Final Exam		LO1, LO2, LO3, LO4	