INTERNATIONAL QUALIFICATIONS

AND ASSESSMENT CENTRE (IQAC)

«Approved»

2025 y. «16» aylik

Programme	**Level 6 Diploma in Artificial Intelligence**		
Unit Number/ Unit Title	UNIT 5 AI PROJECT DESIGN AND DEPLOYMENT		
Cohort Code:	L06APDD-U5		
Unit Level	6		
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 equips learners with skills to design, develop, and deploy an AI project end-to-end. Emphasis is placed on problem formulation, stakeholder engagement, agile development, deployment strategies, and post-deployment monitoring.
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** • Provost, F. & Fawcett, T. (2013). Data Science for Business. • Gokhale, P. (2021). Practical MLOps. • Sculley, D. et al. (2015). Hidden Technical Debt in ML Systems.

Learning Outcome	Assessment Criteria
LO1. 1. Formulate AI project requirements.	1.1 Conduct problem scoping and stakeholder analysis. 1.2 Define KPIs and success metrics.
LO2. 2. Plan and manage AI development lifecycle.	2.1 Use Agile or CRISP-DM methodologies. 2.2 Create and manage project milestones.
LO3. 3. Execute AI model development.	3.1 Implement end-to-end machine learning pipelines. 3.2 Perform iterative testing and refinement.
LO4. 4. Deploy and maintain AI systems.	4.1 Select appropriate deployment tools and platforms. 4.2 Monitor model performance and drift post- deployment.
LO5. 5. Reflect on project outcomes.	5.1 Conduct post-mortem analysis. 5.2 Recommend future improvements and scaling plans.

No	Learning Outcome / Topic	Learning and Teaching Activities	Which assessment criteria does the session relate to?	Day/month/year/ signature
1.	**Problem Scoping & Feasibility Analysis**	**Problem Scoping & Feasibility Analysis** Business vs. technical requirements, ROI estimation	LO1: AI Project Formulation	
2.	**Stakeholder Identification & Management**	**Stakeholder Identification & Management** User personas, expectation alignment techniques	LO1: AI Project Formulation	
3.	**Defining AI Success Metrics**	**Defining AI Success Metrics** KPIs (Accuracy, F1, Latency), business alignment	LO1: AI Project Formulation	
4.	**Data Readiness Assessment**	**Data Readiness Assessment** Availability, quality, and legal compliance checks	LO1: AI Project Formulation	
5.	**Ethical & Legal Risk Assessment**	**Ethical & Legal Risk Assessment** Bias audits, GDPR/CCPA impact analysis	LO1: AI Project Formulation	
6.	**Methodologies for AI Projects**	**Methodologies for AI Projects** Agile vs. CRISP-DM vs. MLOps workflows	LO2: Project Planning & Management	
7.	**Milestone Planning**	**Milestone Planning** Gantt charts, critical path analysis for AI projects	LO2: Project Planning & Management	
8.	Half-Term Exam	- Review of LO1 topics - Practice questions and mock assessment - **Half-term assessment** based on LO1 (theory)	LO1 LO2	
9.	**Resource Allocation**	**Resource Allocation** Team roles (Data Scientists, ML Engineers), budget planning	LO2: Project Planning & Management	
10.	**Risk Management Strategies**	**Risk Management Strategies** Mitigation plans for data/model/ deployment risks	LO2: Project Planning & Management	
11.	**Tools for Collaboration**	**Tools for Collaboration** JIRA, Trello, Git for AI project tracking	LO2: Project Planning & Management	

12.	**End-to-End ML Pipeline Design**	**End-to-End ML Pipeline Design** Data ingestion → preprocessing → training → evaluation	LO3: AI Model Development	
13.	**Feature Engineering Strategies**	**Feature Engineering Strategies** Domain-specific transformations, automated tools (Featuretools)	LO3: AI Model Development	
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.	**Model Selection & Experiment Tracking**	**Model Selection & Experiment Tracking** MLflow, Weights & Biases for reproducibility	LO3: AI Model Development	
18.	**Iterative Testing Frameworks**	**Iterative Testing Frameworks** A/B testing, shadow mode deployment	LO3: AI Model Development	
19.	**Technical Debt in ML**	**Technical Debt in ML** Scalability, maintainability tradeoffs	LO3: AI Model Development	
20.	**Deployment Architecture Patterns**	**Deployment Architecture Patterns** Batch vs. real-time, on-prem vs. cloud (AWS SageMaker, GCP Vertex AI) **Containerization for AI** Docker, Kubernetes for model serving	LO4: Deployment & Maintenance	
21.	**Monitoring & Alerting Systems**	**Monitoring & Alerting Systems** Data drift (Evidently), concept drift (Fiddler)	LO4: Deployment & Maintenance	
22.	**CI/CD for AI Models**	**CI/CD for AI Models** GitHub Actions, Jenkins pipelines for auto-retraining	LO4: Deployment & Maintenance	

23.	Half-Term Exam	**Project** End-to-end AI solution with deployment & monitoring		
24.	**Versioning & Rollback Strategies**	**Versioning & Rollback Strategies** Model registries, canary deployments	LO4: Deployment & Maintenance	
25.	**Post-Mortem Analysis Framework**	**Post-Mortem Analysis Framework** Root cause analysis (5 Whys), lessons learned	LO5: Reflection & Scaling	
26.	**Performance Benchmarking**	**Performance Benchmarking** Comparative analysis against baselines	LO5: Reflection & Scaling	
27.	**Scaling Recommendations**	**Scaling Recommendations** Horizontal/vertical scaling, cost optimization	LO5: Reflection & Scaling	
28.	**Documentation & Knowledge Transfer**	**Documentation & Knowledge Transfer** Model cards, API documentation, handover protocols	LO5: Reflection & Scaling	
29.	Final Exam Preparation & Review	LO1, LO2, LO3, LO4	LO1, LO2, LO3, LO4, LO5	
30.	Final Exam		LO1, LO2, LO3, LO4, LO5	