INTERNATIONAL QUALIFICATIONS

AND ASSESSMENT CENTRE (IQAC)

«Approved»

2025 y «____» _____

Programme	**LEVEL 5 EXTENDED DIPLOMA IN DATA SCIENCE**		
Unit Number/ Unit Title	UNIT 7 DATA VISUALIZATION AND COMMUNICATION		
Cohort Code:	L05DVC-U7		
Unit Level	Level 5		
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 module aims to develop students' skills in effectively visualizing and communicating data insights to diverse audiences. Students will learn to create compelling visualizations that not only highlight key findings but also engage and inform their audience. The module will emphasize the importance of tailoring communication strategies to different stakeholders, ensuring that complex data is presented clearly and meaningfully. By the end, students will be adept at using various tools and techniques to transform data insights into impactful narratives.
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**
	• Few, S. (2009). Show Me the Numbers: Designing Tables and Graphs to Enlighten. Analytics Press. • Cairo, A. (2016). The Truthful Art: Data, Charts, and Maps for Communication. New Riders. • Healey, C. G. (2010). Choosing Effective Graphs. Springer.

Learning Outcome	Assessment Criteria
LO1. 1. Understand principles of data visualization.	1.1 Describe principles and best practices of data visualization. 1.2 Identify appropriate visualization techniques for different types of data.
LO2. 2. Develop skills in creating visualizations.	2.1 Design and create effective visualizations using data visualization tools. 2.2 Interpret visualizations to extract meaningful insights.
LO3. 3. Communicate data insights effectively.	3.1 Present findings and insights from data analyses using clear and engaging communication techniques. 3.2 Adapt communication style for technical and non technical audiences.

No	Learning Outcome / Topic	Learning and Teaching Activities	Which assessment criteria does the session relate to?	Day/month/year/ signature
1.	**Introduction to Data Visualization**	**Introduction to Data Visualization** Importance, goals, and role in decision-making	LO1: Principles of Data Visualization	
2.	**Visual Perception & Cognitive Psychology**	**Visual Perception & Cognitive Psychology** Gestalt principles, pre-attentive attributes	LO1: Principles of Data Visualization	
3.	**Data Types & Chart Selection**	**Data Types & Chart Selection** Categorical vs. numerical, time-series, geospatial	LO1: Principles of Data Visualization	
4.	**Color Theory in Visualization**	**Color Theory in Visualization** Color palettes, accessibility (color blindness), emotional impact	LO1: Principles of Data Visualization	
5.	**Common Visualization Pitfalls**	**Common Visualization Pitfalls** Misleading axes, overplotting, chart junk	LO1: Principles of Data Visualization	
6.	**Matplotlib & Seaborn (Python)**	**Matplotlib & Seaborn (Python)** Customizing plots, themes, and annotations	LO2: Tools & Techniques for Visualization	
7.	**Interactive Visualizations with Plotly** H	**Interactive Visualizations with Plotly** Hover effects, dropdowns, animations	LO2: Tools & Techniques for Visualization	
8.	Half-Term Exam	- Review of LO1 topics - Practice questions and mock assessment - **Half-term assessment** based on LO1 (theory)	LO1 LO2	
9.	**Dashboard Design**	**Dashboard Design** Layout principles, storytelling with dashboards (Tableau/Power BI)	LO2: Tools & Techniques for Visualization	

10.	**Geospatial Visualization**	**Geospatial Visualization** Folium (Python), GeoPandas, choropleth maps	LO2: Tools & Techniques for Visualization	
11.	**Advanced Charts**	**Advanced Charts** Sankey diagrams, treemaps, radar charts	LO2: Tools & Techniques for Visualization	
12.	**Exploratory Data Analysis (EDA) Visuals**	**Exploratory Data Analysis (EDA) Visuals** Histograms, scatter plots, box plots	LO3: Exploratory vs. Explanatory Visualization	
13.	**Explanatory Visualizations**	**Explanatory Visualizations** Tailoring visuals for presentations/reports	LO3: Exploratory vs. Explanatory Visualization	
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.	**Storytelling with Data**	**Storytelling with Data** Narrative structure, emphasis techniques	LO3: Exploratory vs. Explanatory Visualization	
18.	**Case Study: Effective vs. Ineffective Visuals**	**Case Study: Effective vs. Ineffective Visuals** Critique real-world examples (e.g., news graphics)	LO3: Exploratory vs. Explanatory Visualization	
19.	**Designing Infographics**	**Designing Infographics** Tools: Canva, Adobe Illustrator	LO3: Exploratory vs. Explanatory Visualization	
20.	**Communicating to Technical Audiences**	**Communicating to Technical Audiences** Detailed metrics, model performance visuals	LO4: Communication & Audience Adaptation	

21.	**Communicating to Non-Technical Stakeholders**	**Communicating to Non-Technical Stakeholders** Simplifying jargon, actionable insights	LO4: Communication & Audience Adaptation	
22.	**Data-Driven Presentations**	**Data-Driven Presentations** Slide design, pacing, Q&A handling	LO4: Communication & Audience Adaptation	
23.	Half-Term Exam	**Project** End-to-end visualization project with a presentation		
24.	**Written Reports with Visuals**	**Written Reports with Visuals** Integrating charts into narratives (Google Docs, LaTeX)	LO4: Communication & Audience Adaptation	
25.	**Ethics in Data Communication**	**Ethics in Data Communication** Avoiding cherry-picking, disclosing uncertainty	LO4: Communication & Audience Adaptation	
26.	**Visualization for Machine Learning**	**Visualization for Machine Learning** Confusion matrices, ROC curves, feature importance	LO5: Capstone & Advanced Topics	
27.	**Real-Time Data Visualization**	**Real-Time Data Visualization** Streaming data with Dash/Streamlit	LO5: Capstone & Advanced Topics	
28.	**Accessibility in Visualization**	**Accessibility in Visualization** Alt text, screen reader compatibility **Emerging Trends** AR/VR visualizations, generative AI tools	LO5: Capstone & Advanced Topics	
29.	Final Exam Preparation & Review	LO1, LO2, LO3, LO4	LO1, LO2, LO3, LO4	
30.	Final Exam		LO1, LO2, LO3, LO4	