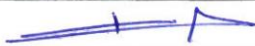


MODULE DESCRIPTION FORM

Module Information			
Module Title	Data management		Module Delivery
Module Type	Basic		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☒ Seminar
Module Code	AIE315		
ECTS Credits	4		
SWL (hr/sem)	100 H/Sem.		
Module Level	2	Semester of Delivery	3
Administering Department	Artificial Intelligence Eng.	College	College of Engineering
Module Leader	Mohammed Abdel Hadi	e-mail	mohammed_daykh@yahoo.com
Module Leader's Acad. Title	Asst.porf.	Module Leader's Qualification	PHD
Module Tutor	Mohammed Abdel Hadi	e-mail	mohammed_daykh@yahoo.com
Peer Reviewer Name		e-mail	Hasnaa.Mohammad@alayen.edu.iq
Scientific Committee Approval Date	27/9/2025	Version Number	1.0

Relation with other Modules			
Prerequisite module	AIE221 Data structure2	Semester	4
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	<u>The indicative contents of this module include the following key topics:</u> • <u>Introduction to Data and Data Management Concepts</u> • <u>Importance of Data in Organizations and Research</u> • <u>Data Lifecycle and Data Management Planning</u> • <u>Data Creation and Collection Methods</u> • <u>Data Processing, Cleaning, and Validation</u> • <u>Data Documentation and Metadata Standards</u> • <u>Data Organization, Classification, and Storage Systems</u> • <u>Data Preservation and Backup Strategies</u> • <u>Data Sharing, Accessibility, and Open Data Policies</u>



	• Data Reuse, Citation, and Attribution • Ethical, Legal, and Privacy Issues in Data Handling • Data Security, Protection, and Integrity • Data Management Tools, Software, and Best Practices • Case Studies and Applications in Academic and Professional Environments		
Module Learning Outcomes	Knowledge	A1	A1.1 understand the key principles and lifecycle of data management, data processing , documenting, sharing , preserving & its security A1.2 Explain the key principles and lifecycle of data management & its security A1.3 apply data management & its security.
		A4	A4.1 collect and manage data A4.2 design a data base security system.
	Skills	B1	B.1.1 Function efficiently as an individual B.1.2 Function as a member of multidisciplinary and multicultural teams.
		B3	B.3.1 Acquire and apply new knowledge. B.3.2 Practice the strategies of searching for information in life – long self-learning
	Ethics	C1	C.1.1 Define professional and ethical responsibilities C.1.2 Demonstrate diversity in their commitment to ethical responsibilities.
Indicative Contents	1. Introduction to Data Management (2 hs) • Definition and types of research data (observational, experimental, simulation, derived, metadata). • The concept and stages of the data lifecycle. • Importance of data management and data sharing in research. • Emerging concepts: Open Data, Big Data, and Open Science. 2. Planning Data Management(4 hs) • Developing a Data Management Plan (DMP). • Assigning roles and responsibilities in data projects. • Time and budget considerations for data management. • Institutional and funder policies and requirements. • Data Management Checklist and good practice principles. 3. Creating Data (4hs) • Data collection methods in field and laboratory environments. • Ensuring data quality and consistency. • Recording metadata during data collection. • Data digitization, organization, and use of international data standards. 4. Processing Data(4hs) • Data cleaning, validation, and transformation. • File naming conventions, folder organization, and version control.		

	• Use of open formats (e.g., CSV, TXT) and reproducible workflows. • Application of software tools such as R for data processing. • Introduction to biodiversity data standards (e.g., Darwin Core, TDWG). 5. Documenting Data(4hs) • Creating project-level and data-level documentation. • Use and structure of metadata for data discovery and interoperability. • Recording variables, codes, methods, and data provenance. • Standards for descriptive, administrative, and structural metadata. 6. Preserving Data(4hs) • Strategies for secure data storage and backup. • Institutional policies on data preservation. • Types of storage: local, external, and remote/cloud systems. • Data migration and long-term preservation practices. 7. Sharing Data(4hs) • Methods of data sharing (repositories, open notebooks, institutional repositories, GBIF). • Data archiving policies and ethical considerations. • Publishing data papers and promoting open access. • Benefits of sharing: collaboration, transparency, and visibility. 8. Reusing Data(4hs) • Legal and ethical aspects of data reuse. • Intellectual property rights, licensing, and data citation. • Responsible reuse and proper acknowledgement. • Benefits of data openness and long-term research value.101:57
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Learning and Teaching Strategies

Strategies	Learning and Teaching Strategies • Presentation • Interactive learning • Discussions • Brainstorming • Group Problem Solving • Self-learning • Case Studies • Practical Workshops • Collaborative Projects
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Student Workload (SWL) for 15 weeks

Structured SWL (h/sem)	78	Structured SWL (h/w)	5.2
Unstructured SWL (h/sem)	22	Unstructured SWL (h/w)	1.4
Total SWL (h/sem)	100		



Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	A1 , A4
	Assignments	3	10% (10)	4, 8 and 12	A1 , A4
	Projects / Lab.				
	Report	1	10% (10)	13	A1, B1 , A4, B2 ,C1
Summative assessment	Midterm Exam	1hr	10% (10)	7	A1 , A4
	Final Exam	3hr	50% (50)	15	A1 , A4
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)		
المنهاج الاسبوعي النظري		
	Material Covered	Los
Week 1	Introduction to data and data management concepts.	A1,B1,B2,C1
Week 2	The importance and goals of data management in academic and organizational contexts.	A1,B1,B2,C1
Week 3	Overview of the data lifecycle and its stages.	A1,B1,B2,C1
Week 4	Planning for data management and creating a data management plan.	A1,B1,B2,C1
Week 5	Data creation and collection methods.	A1,B1,B2,C1
Week 6	Data processing, cleaning, and validation	A1,B1,B2,C1
Week 7	Data organization and structuring.	A1,B1,B2,C1
Week 8	Midterm review and assessment	A1,B1,B2,C1
Week 9	Data documentation and metadata creation.	A4,B1,B2,C1
Week 10	Data storage and preservation strategies	A4,B1,B2,C1
Week 11	Data sharing, accessibility, and open data principles.	A4,B1,B2,C1
Week 12	Data reuse and citation practices.	A4,B1,B2,C1



Week 13	• Data ethics and privacy concerns.	A4,B1,B2,C1
Week 14	• Data security and integrity management.	A4,B1,B2,C1
Week 15	• Modern tools and best practices in data management.	A4,B1,B2,C1
Week 16	• Final review and overall course assessment.	A1, A4

Delivery Plan (Weekly Lab. Syllabus) المناهج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Required Texts British Ecological Society (2019). Data Management: Guides to Better Science. British Ecological Society, London, UK. Available at: https://www.britishecologicalsociety.org/publications/guides-to-better-science	Yes
Recommended Texts	Recommended Texts • UK Data Archive (2011). Managing and Sharing Data: Best Practice for Researchers. University of Essex. Available at: https://www.data-	Yes



	archive.ac.uk/media/2894/managingsharing.pdf • GBIF (2018). <i>Quick Guide to Publishing Data through GBIF.org.</i> Global Biodiversity Information Facility. Available at: https://www.gbif.org/publishing-data • Digital Curation Centre (DCC). <i>How to Develop a Data Management and Sharing Plan.</i> Available at: https://www.dcc.ac.uk/resources/how-guides/develop-data-plan	
Websites	https://www.dcc.ac.uk/resources/how-guides/develop-data-plan	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

