MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Data Science		Module Delivery	
Module Type	C		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☒ Seminar	
Module Code	AIDC125			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level		1	Semester of Delivery	2
Administering Department		AI	College	Type College Code
Module Leader	Name		e-mail	E-mail
Module Leader's Acad. Title		Associate Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Ahmed J. Aljaaf		e-mail	a.j.aljaaf@uoanbar.edu.iq
Peer Reviewer Name		Name	e-mail	E-mail
Scientific Committee Approval Date		21/10/2023	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	AIDC111	Semester	1
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	This course has been designed to help learners to understand the core concepts and applications of Data Science and Familiarize them with essential data manipulation and visualization techniques. Various data sources and collection methods will be explored in this course to enable learners develop skills in data cleaning and preprocessing. It is anticipated that learners, at the end of this course, will be able to effectively communicate data insights and build data narratives by creating reports and visualizations for data communication.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of this comprehensive Data Science course, learners will have achieved a diverse set of learning outcomes. They will have a solid understanding of the core principles of data science, enabling them to proficiently collect, clean, and explore data for analysis. Learners will develop strong data visualization skills, including advanced techniques, and will be able to apply statistical and probability concepts to perform robust data analysis. Furthermore, by the end of this course, learners will have the knowledge and skills needed to communicate their findings effectively and present data insights in a compelling manner. The capstone project will serve as a practical application of their skills, allowing them to tackle real-world data science challenges and showcase their problem-solving abilities.
Indicative Contents المحتويات الإرشادية	● Definition and scope of Data Science. ● Data preprocessing: encoding, scaling, and normalization. ● Data cleaning techniques: handling missing data, data formatting. ● Descriptive statistics: mean, median, variance, skewness. ● Exploratory data analysis techniques: box plots, scatter plots, histograms. ● Correlation Analysis, Analysis of variance, and Non-parametric statistical tests. ● Time series data exploration. ● Data extraction and manipulation using SQL. ● Data wrangling techniques: filtering, merging, pivoting ● Ethical considerations in data collection and analysis. ● Building data narratives and reports. ● Applying data science skills to a real-world project.

Learning and Teaching Strategies	
	استراتيجيات التعلم والتعليم
Strategies	Hands-on Practical Exercises Case Studies and Real-World Examples Collaborative Learning Continuous Assessment and Feedback

Student Workload (SWL)			
		الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا	
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	5% (5)	Continuous	All
	Report	1	5% (5)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	20% (20)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Data Science
Week 2	Data and information
Week 3	Data analytics Lifecycle
Week 4	Data Collection and Cleaning
Week 5	Exploratory Data Analysis (EDA)
Week 6	Data Visualization
Week 7	Statistical Analysis
Week 8	Time Series Analysis
Week 9	Data Wrangling
Week 10	Feature Engineering
Week 11	Data Ethics and Privacy
Week 12	Data Storytelling and Communication
Week 13	Capstone Project
Week 14	SQL and Databases for Data Science
Week 15	Project Presentations and Wrap-up

Delivery Plan (Weekly Lab. Syllabus)

<div dir="rtl">المنهاج الاسبوعي للمختبر</div>

	Material Covered
Week 1	Data Collection and Cleaning
Week 2	Exploratory Data Analysis (EDA)
Week 3	Data Visualization
Week 4	Statistical Analysis
Week 5	Time Series Analysis
Week 6	Data Wrangling
Week 7	Feature Engineering
Week 8	Data Ethics and Privacy
Week 9	Data Storytelling and Communication
Week 10	Capstone Project

Learning and Teaching Resources

<div dir="rtl">مصادر التعلم والتدريس</div>

	Text	Available in the Library?
Required Texts	Introducing Data Science, Davy Cielen, Anro DB Meysman, Mohamed Ali	No
Recommended Texts	Data Science Job: How to Become a Data Scientist, Przemek Chojecki	No
Websites		

Grading Scheme

<div dir="rtl">مخطط الدرجات</div>

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.