Ministry of Higher Education and Scientific Research - Iraq
Al-Nahrain University
College of Science
Computer Science Department

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	**Scientific Research Methodology**	**Module Delivery**	
Module Type	**University requirement**	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	URRESMET		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	3	**Semester of Delivery**	1
Administering Department	Computer Science	**College**	كلية العلوم
Module Leader	Dr. Suhad A. Yousif	**e-mail**	
Module Leader's Acad. Title	Full Professor	**Module Leader's Qualification**	دكتوراه في علم الحاسوب
Module Tutor		**e-mail**	Suhad.a.yousif@nahrainuniv.edu.iq
Peer Reviewer Name	Dr. Hasnsa Emad Abdulsalam	**e-mail**	
Scientific Committee Approval Date		**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	• Enable students to understand research methodology as an **algorithmic process** starting from problem definition to result interpretation. • Develop the ability to represent research problems using **computational models**. • Train students to analyze and design research steps in a **structured and executable manner**. • Utilize digital tools (Overleaf, EndNote, Excel) as part of a **computational environment for scientific research**. • Enhance analytical thinking through evaluating studies using **measurable methodological criteria**. •
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the course Represent the research process as a sequence of **algorithmic steps**. • Analyze research problems using **abstract models**. • Apply qualitative and quantitative research methods using **structured methodologies**. • Use computational tools for **data and reference management**. • Evaluate research quality using **methodological metrics**. • Design a complete research project based on a **systematic methodology**.

Indicative Contents
المحتويات الإرشادية
	• Transforming the research problem into a **logical model**
	• Identifying variables and parameters
	• Literature review as **data collection**
	• Extracting knowledge as datasets
	• Analyzing scientific sources
	• Research design as **algorithm design**
	• Structuring research steps
	• Selecting appropriate methodology (Qualitative vs Quantitative)
	• Data collection methods
	• Treating data as system inputs
	• Data collection tools (Survey / Experiment)
	• Tools as computational environment:
	  ○ Overleaf (LaTeX Engine)
	  ○ EndNote (Reference Database)
	  ○ Excel (Data Processing)
	• Data analysis as a **transformation process**
	• Visualization
	• Writing research proposals
	• Representing solutions as models
	• Structuring research papers
	• Research project execution
	• Implementing research workflow
	• Testing and evaluating results

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
الاستراتيجيات	• **Lectures:** Deliver core theoretical concepts and their applications. • **Interactive Discussions:** Engage students in research writing and tool usage. • **Problem-Solving Sessions:** Apply theory to real research problems. • **Assignments and Quizzes:** Continuous assessment and reinforcement. • **Group Projects:** Collaborative research work. • **Examinations:** Evaluate understanding and application. •

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

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	1	10% (10)	10	All
	Assignments	1	10% (10)	10	All
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	10	All
Summative assessment	**Midterm Exam**	2 hr	10% (10)		All
	Final Exam	3 hr	50% (50)		All
Total assessment			100% (100 Marks)		

Teaching Plan **Weekly Theoretical Syllabus**	
Week 1	Introduction to Research – Conceptual foundations, significance of scientific research, and stages of the research process
Week 2	Problem Identification – Formulation of research problems, defining objectives, hypotheses, and variables
Week 3	Literature Review – Systematic searching, critical evaluation, and synthesis of related studies
Week 4	Research Design – Classification of research designs and selection of appropriate methodological approaches
Week 5	Data Collection Methods – Comparative analysis of surveys, interviews, and experimental techniques
Week 6	Introduction to Overleaf – Academic writing using LaTeX and collaborative research documentation
Week 7	LaTeX Fundamentals – Structured document preparation, formatting, and mathematical representation
Week 8	Advanced LaTeX – Integration of tables, figures, citations, and bibliographic management
Week 9	Data Analysis Tools – Statistical data handling using Excel and effective presentation design using PowerPoint
Week 10	Reference Management – Systematic organization and citation of references using EndNote
Week 11	Qualitative Research Methods – Content analysis, thematic interpretation, and case study approaches
Week 12	Research Proposal Development – Structuring, writing, and presenting a comprehensive research proposal

Week 13	Research Project Implementation – Application of research methodology and data processing
Week 14	Research Project Evaluation – Interpretation of results, validation, and critical analysis
Week 15	Final Presentation – Professional presentation and discussion of research findings

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Research Design: Qualitative, Quantitative, and Mixed Methods Approaches	
Recommended Texts	by Wayne C. Booth, Gregory G. Colomb, Joseph M. Williams	
Websites	EndNote, Overleaf, Google Scholar	

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.