MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية
Scientific Research Methodology -Level 1

Module Information معلومات المادة الدراسية					
Module Title	**Scientific Research Methodology**			**Module Delivery**	
Module Type	**B**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Code	**ITM 301**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level		4	**Semester of Delivery**		7
Administering Department		ITM	**College**		TCMM
Module Leader	Ahmed Fathi Abdul-Majeed		**e-mail**		Ahmed_fathi@ntu.edu.iq
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Ahmed Fathi Abdul-Majeed		**e-mail**		Ahmed_fathi@ntu.edu.iq
Peer Reviewer Name		Dr Harith Akram	**e-mail**		hhamoodat@ntu.edu.iq
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 Objectives أهداف المادة الدراسية	1. **Understand Research Fundamentals:** Gain a solid grasp of the principles, processes, and ethical considerations involved in scientific research. 2. **Develop Research Skills:** Learn to design, conduct, and evaluate research studies using various methodologies and data analysis techniques. 3. **Apply Research Techniques:** Apply quantitative and qualitative research methods to solve practical problems and contribute to the academic field. 4. **Critically Evaluate Research:** Develop the ability to critically review and interpret research findings and methodologies in the context of scientific literature. 5. **Communicate Research Findings:** Enhance skills in writing research proposals, reports, and papers, and presenting research findings effectively.

Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	Upon successful completion of this module, students will be able to: 1. **Describe and explain key concepts and methodologies in scientific research.** 2. **Design a research project including formulating research questions, hypotheses, and selecting appropriate methodologies.** 3. **Conduct research using qualitative and quantitative techniques and analyze data effectively.** 4. **Critically assess research articles and reports for validity, reliability, and ethical considerations.** 5. **Present and communicate research findings in a clear, coherent, and academically appropriate manner.**
Indicative Contents **المحتويات الإرشادية**	**Week 1: Introduction to Scientific Research** • **The concept of scientific research.** • **Types of scientific research.** • **Characteristics of scientific research.** • **Steps of scientific research.** **Week 2: Research Hypothesis** • **The Concept of Research Hypothesis.** • **Types of Hypothesis.** • **Sources of Hypotheses.** **Week3: Search Problem .** • **Research Problem Sources.** • **Research Problem Formulation.** **Week 4: Scientific Research Methods** • **The Concept of Research Methodology.** • **Types of Scientific Research Methods.** **Week 5: Data Collection Methods** • **Data Collection Sources.** • **Data Collection Methods.** **Week 6: Scientific steps in preparing a scientific research.** • **Reading sources and how to utilize them.** • **Scientific writing style and rules.** **Week 7: Scientific Research Introduction.** • **Basics of building an introduction to a scientific research paper.** • **Contents of the scientific research introduction.** **Week 8: Midterm exam.** **Week 9: How to Install Sources.** • **Sources at the search level.** • **Sources at the page level.** • **Sources using the Harvard style.** **Week 10: Formal preparation of scientific researches, theses and dissertations.** • **Organizing the title page** • **Organizing the table of contents** • **Organizing the list of tables** • **Organizing the list of figures**

	• **Organizing the list of appendices** **Week 11: How to write sources and organize a list of sources in Arabic and English.** **Week 12: Writing and Structuring Research Papers** • **Lecture Topics:** Structure and formatting of research papers, writing literature reviews, methods, results, and discussions. • **Activities:** Writing workshop focusing on different sections of a research paper. **Assignments: Write and submit a draft research paper, focusing on a specific section.** **Week 13: Rules for avoiding plagiarism in scientific research.** **Week 14: Structuring a Scientific Paper.** **Week 15: Rules for testing an effective headline** **Week 16: week before the final Exam** **Total hrs = 100 = SSWL - (Exam hrs) = 63 - 3 = 59 hr (Time table hrs x 15 weeks)**

Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	• **Lectures and Theoretical Instruction:** Provide foundational knowledge through lectures that cover essential research methodologies, concepts, and theoretical frameworks. • **Interactive Seminars:** Facilitate interactive seminars and workshops to discuss research design, data collection, and analysis methods, encouraging active student engagement and practical application. • **Case Studies and Examples:** Use case studies and real-world examples to illustrate research methodology concepts, allowing students to see the practical application of theoretical knowledge. • **Hands-On Activities:** Incorporate hands-on activities such as data analysis using software tools (e.g., SPSS, NVivo), research design exercises, and group projects to enhance practical skills. • **Guest Lectures and Expert Panels:** Invite guest lecturers and experts to share insights and experiences in scientific research, providing students with exposure to current practices and industry standards. • **Peer Review and Feedback:** Facilitate peer review sessions where students critique each other's work, providing constructive feedback and learning to assess research quality critically. • **Research Proposal Development:** Guide students through the process of developing and refining research proposals, including drafting, revising, and presenting proposals for peer and instructor feedback.

Student Workload (SWL) **الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا**			
Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	62	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	4
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	38	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	2

Total SWL (h/sem) **الحمل الدراسي الكلي للطالب خلال الفصل**	**100**

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 #3,
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #5
	Projects / Lab.	1	10% (10)	Continuous	All
	Report				LO #5, #8 and #10
Summative assessment	Midterm Exam	1hr	20% (10)	7	LO #1 - #5
	Final Exam	3hr	60% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Scientific Research • The concept of scientific research. • Types of scientific research. • Characteristics of scientific research. • Steps of scientific research.
Week 2	Research hypothesis • The concept of research hypothesis • Types of Hypothesis • Sources of hypotheses • Research hypothesis conditions
Week 3	Search Problem • Research Problem Sources. • Research Problem Formulation.
Week 4	Scientific Research Methods • The concept of research methodology. • Types of Scientific Research Methods.
Week 5	Data Collection Methods • Data Collection Sources. • Data Collection Methods.
Week 6	Scientific steps in preparing a scientific research. • Reading sources and how to utilize them. • Scientific writing style and rules.
Week 7	Scientific Research Introduction. • Basics of building an introduction to a scientific research paper. • Contents of the scientific research introduction.
Week 8	Midterm exam.

Week 9	**How to Install Sources.** • **Sources at the search level.** • **Sources at the page level.** • **Sources using the Harvard style.**
Week 10	**Formal preparation of scientific researches, theses and dissertations.** • **Organizing the title page** • **Organizing the table of contents** • **Organizing the list of tables** • **Organizing the list of figures** • **Organizing the list of appendices**
Week 11	• **How to write sources and organize a list of sources in Arabic and English**
Week 12	**Writing and Structuring Research Papers** • **Lecture Topics: Structure and formatting of research papers, writing literature reviews, methods, results, and discussions.** • **Activities: Writing workshop focusing on different sections of a research paper.** • **Assignments: Write and submit a draft research paper, focusing on a specific section.**
Week 13	• **Rules for avoiding plagiarism in scientific research.**
Week 14	• **Structuring a Scientific Paper.**
Week 15	• **Rules for testing an effective headline.**
Week 16	**Week before the final Exam.**

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	
Week 16	Final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**1.** Cuschieri, S., Grech, V., & Savona-Ventura, C. (2019), "WASP (Write a Scientific Paper): Structuring a scientific paper", Early human development, 128, 114-117. 2. Ober, H., Simon, S. I., & Elson, D. (2013). "Five Simple Rules to Avoid Plagiarism". Annals of Biomedical Engineering, 41(1), 1-2. DOI: 10.1007/s10439-012-0662-9 . 3. Abdulkarim, A.M. and Kadawi, T.M. (2006), "Fundamentals of Scientific Research", second edition, University of Mosul, Mosul. 4. Gaste,B. and Day, R. A. (2022). How to write and publish a scientific paper.9th Edit., U.S.A.	Yes
Recommended Texts	**1.** Kamat, P. V. (2021), "Five Key Attributes of an Effective Title", ACS Energy Letters, 6(5), PP.1857-1858. **2.** Henning, E., Gravett, S. and van ensburg,H(2002)," Finding your way in academic writing", 2nd Edit, Printed and bound by Creda Communications, Cape Town.	
Websites	1. **Google Scholar** ○ **Description:** A freely accessible search engine that indexes scholarly articles across various disciplines.	

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.