	Ministry of Higher Education and Scientific Research – Iraq Al-Mustaqbal University College College of Sciences	

MODULE DESCRIPTOR
وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	FUZZY LOGIC	**Module Delivery**	
Module Type	CORE		**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**
Module Code	UOMU0304044		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	2	**Semester of Delivery**	4
Administering Department	Artificial Intelligence	**College**	College of Sciences
Module Leader	Ali Saleem Haleem	**e-mail**	ali.saleem.haleem@uomus.edu.iq
Module Leader's Acad. Title	Assist Lec.	**Module Leader's Qualification**	M.Sc.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval		**Version Number**	

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	None

Co-requisites module	None	**Semester**	None

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	This course aims to introduce the student to fuzzy logic, the difference between fuzzy logic and crisp logic, the common operations on fuzzy set and how to build a fuzzy logic system
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understand the fundamental concepts of fuzzy set theory and fuzzy logic. 2- Learn about fuzzy membership functions and their properties. 3-Perform operations on fuzzy sets, such as union, intersection, and complement. 4-Apply fuzzy rules and fuzzy inference systems (FIS) in reasoning and decision-making. 5-Understand the process of fuzzification, fuzzy inference, and defuzzification. 6-Implement fuzzy logic systems using programming languages or tools. 7- Explore applications of fuzzy logic in various domains, such as control systems, pattern recognition, and decision support systems. 8-Analyze the advantages and limitations of fuzzy logic compared to traditional binary logic.
Indicative Contents المحتويات الإرشادية	• Fuzzy sets • the operations of fuzzy sets • fuzzy relations and compositions, • fuzzy graph and relation, fuzzy number, • fuzzy functions, probability and uncertainty, • fuzzy logic, fuzzy inference, • fuzzy control and fuzzy expert systems • real applications

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	Lectures (Theoretical and Practical) Examples, Homework and Programs Exams and using modern data show devices to display lectures subjects. References as books, internet subjects.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**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, 10	LO #1, 2, 3 and 6
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 7 and 8
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 4, 5 and 6
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-8
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction What is fuzzy logic Why fuzzy logic Fuzzy logic applications
Week 2	Fuzzy Operation on sets Characteristic of crisp sets example
Week 3	Definition of fuzzy set Expanding Concepts of fuzzy sets examples Standard operation on fuzzy sets Examples
Week 4	The operation on fuzzy set Standard operation on fuzzy sets Fuzzy complement Fuzzy union The operation on fuzzy set Fuzzy intersection
Week 5	FUZZY NUMBER Concept of Fuzzy Number Operation of Fuzzy Number Triangular Fuzzy Number Other Types of Fuzzy Number
Week 6	FUZZY NUMBER Other Types of Fuzzy Number
Week 7	Fuzzy function functions Triangle Trapezoidal function Gauss function examples
Week 8	Fuzzy relations Crisp relation Properties of relation on a single

Week 9	Fuzzy relations Crisp relation Properties of relation on a single
Week 10	Fuzzy relation Extension of fuzzy set examples
Week 11	Classical logic examples fuzzy logic
Week 12	Fuzzy logic Linguistic variable examples
Week 13	Fuzzy truth modifier examples
Week 14	Representation of fuzzy rule example
Week 15	**Representation of fuzzy rule example**

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	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. First course on fuzzy theory and	Yes

	application ", Kwang H. Le, spring 2005. 2. Introduction to fuzzy logic, and fuzzy control system, Gauanrony Chen, Trung Tat Pham, © 2001 by CRC press LLC.	
Recommended Texts		
Websites		

APPENDIX:

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB 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.