MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computational mathematics**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☒**Lecture** ☐ **Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**COM-112**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		1	**Semester of Delivery**		1
Administering Department		COM	**College**	cos	
Module Leader	Khalid M.S. Al Zaidi		**e-mail**	dr.khaledmoh@uodiyala.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**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. The principal objective of this course is to develop the analytic skills need to learn mathematics. 2. Studying basic mathematical concepts to solve problems. 3. To understand analyze systems in a mathematical manner. 4. This course deals with the basic concept of discrete mathematical. 5. This is the basic subject for most computer science subjects.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Recognize the basic concepts in a discrete mathematical structure. 2. To understand the fundamental properties of sets. 3. Identify the basic sets operations. 4. To study the sets types and counting principle. 5. Recognize the relations and functions to describe the relationship between the elements from two sets. 6. To learn several basic proof techniques. 7. Discuss the proof techniques to prove important results in set theory. 8. To studies properties of integers and use the proof techniques to prove some basic facts in number theory. 9. To understand the fundamental properties of graph. 10. To study how representation of functions by using graph. 11. Discuss the types of graphs and special graph. 12. Explain the Polish notation.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Sets • The basic concepts • Set Operations • Finite sets, counting princple • Classes of sets • Partitions of set 2. Relations • Representation of relations • Properties of relations • Inverse relations • Composition of relations 3. Function • One-to-one, onto and invertible functions • Graph of a function • Composition of function 4. Graphs • Degree • Connectivity • Special graph

	• Matrices and graphs • Labeled graphs • Tree • Polish notation

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Discrete mathematics is foundational material for computer science: Many areas of computer science require the ability to work with concepts from discrete mathematics, specifically material from such areas as set theory, logic, graph theory, combinatorics, and probability theory. The main strategy that will be adopted in delivering the discrete mathematical structures module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. The module will include a combination of classes, and interactive tutorials.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	52	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	73	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

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.				
	Report	1	10% (10)	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 - The basic concepts
Week 2	Sets
Week 3	Set Operations
Week 4	Set Operations
Week 5	Finite sets, counting principle
Week 6	Cardinality
Week 7	Mid-term Exam
Week 8	Inverse relations
Week 9	Function
Week 10	Graph of a function
Week 11	Graphs
Week 12	Graphs
Week 13	Connectivity
Week 14	Special graph
Week 15	Polish notation
Week 16	**Preparatory 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	

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Discrete mathematical structures for computer science by Bernard Kolman & Robert C. Busby	Yes
Recommended Texts	- Theory and problems of Discrete mathematics, by Seymour Lipschutz & Marc Lars Lipson, Schaum's Outline Series, third edition 2007. - Mathematical foundation of computer science, Y.N. Singh, 2005. - Discrete Mathematics and Its Applications, Seventh Edition, Kenneth H. Rosen, AT&T Laboratories, 2012.	Yes
Websites	- http://www.math.uvic.ca/faculty/gmacgill/guide - http://en.wikibooks.org/wiki/Discrete_mathemati cs/Set_theory	

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.