

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Foundation of Mathematics (I)	Module Delivery	
Module Type	Core	<input type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	MATH1102		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	1		
Administering Department	MATH	College	Science
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/06/2023	Version Number	

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

<p>Module Aims أهداف المادة الدراسية</p>	<ol style="list-style-type: none">1. To understand the concepts of sets, logic and functions and enable the student to study the theorems that are related to them.2. To understand the need for proofs and develop the skills to enable the student to construct for themselves formal proofs.3. To develop the manipulative skills and mathematical intuition necessary for the study of mathematics at university.
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none">1. Understand and use logical notation and arguments.2. Construct simple mathematical proofs.3. To express correctly statements and proofs of simple mathematical theorems.4. To explain the properties of sets and their operations.5. Understand theorems related with algebra of sets and their proofs.6. Recognize the domain and the range of a function, draw the graph of a function7. Recognize the inverse of a function and the inverse image of a function.8. Understand the cardinal number and its applications.9. Recognize the countable sets.
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Chapter One – Mathematical Logic</u> Mathematical statements, Compound statements, Negation, Connective, Conjunction, Disjunction, Conditional and biconditional statements, Logical equivalence, Tautology, Contradiction, Algebra of statements, Idempotent laws, Associativity, De Morgan's laws, Arguments, Valid arguments, Invalid arguments.</p> <p><u>Chapter Two – Set Theory</u> Set, Subset, Belongs, Equal sets, Union, Intersection, Complement, Disjoint, Partition, Empty set, Universal set, Power set, Algebra of sets, Idempotent law, Commutative law, Distributive law, De Morgan's law, Cartesian product of sets.</p>

	<p><u>Chapter Three– Mappings</u></p> <p>Basic concepts and definition, Domain, Codomain, Range, Graph of mapping, 1-1 mappings, Onto mappings, Bijective mapping, Equality of mappings, types of mapping, Identity mapping, Constant mapping, Restriction of mapping, Extension of mapping, Absolute value function, Composition mapping and inverse mapping, Direct images and inverse images under mapping. [21 hrs]</p> <p><u>Chapter Four– Cardinality, Cardinal Numbers, Arithmetic on Cardinal Numbers</u></p> <p>Finite and infinite sets, Countable and uncountable sets.</p>
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>The main strategy that will be used in this module is to encourage the students to participation in the module activities. This strategy will be by giving the students quizzes, assignments, projects and midterm exams throughout the semester.</p>

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	97	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.4666667
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3, 9	LO #1, 2, 4 and 5
	Assignments	2	10% (10)	5,11	LO # 1,2, 3, 6 and 7
	Projects	1	10% (10)	Continuous	
	Report	1	10% (10)	14	LO # 4, 5 and 8
Summative assessment	Midterm Exam	2	10% (10)	6,12	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	Mathematical statements, Compound statements, Negation, Connective,
Week 2	Conjunction, Disjunction, Conditional and biconditional statements,
Week 3	Logical equivalence, Tautology, Contradiction
Week 4	Algebra of statements, Idempotent laws, Associativity, De Morgan's laws
Week 5	Arguments, Valid arguments, Invalid arguments
Week 6	Mid-term Exam+ Set, Subset, Belongs, Equal sets, Union, Intersection, Complement
Week 7	Disjoint, Partition, Empty set, Universal set, Power set, Algebra of sets
Week 8	Idempotent law, Commutative law, Distributive law, De Morgan's law
Week 9	Cartesian product of sets, Basic concepts and definition, Domain, Codomain, Range
Week 10	Graph of mapping, 1-1 mappings, Onto mappings, Bijective mapping, Equality of mappings
Week 11	types of mapping, Identity mapping, Constant mapping, Restriction of mapping, Extension of mapping, Absolute value function
Week 12	Mid-term Exam + Composition mapping and inverse mapping
Week 13	Direct images and inverse images under mapping, cardinal number of a set
Week 14	Finite and infinite sets
Week 15	Countable and uncountable sets
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	أسس الرياضيات, هادي جابر مصطفى وآخرون, الجزء الأول ١٩٨٣, جامعة البصرة-العراق.	Yes
Recommended Texts	Schaum's Outline of Set Theory and Related Topics	No
Websites	https://www.britannica.com/science/foundations-of-mathematics	

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.