Syrian Arab Republic		الجمهورية العربية السورية
Ministry of Higher Education	SVU	وزارة التعليم العالـــي
Syrian Virtual University	الجامعـة الإفتراضيــة السوريــة SYRIAN VIRTUAL UNIVERSITY	الجامعة الافتراضية السورية

Mathematical Algebra Course Definition Form

1- Basic Information:

Course Name	Mathematical Algebra
Course ID	GMA101
Contact Hours (Registered Sessions)	36
Contact Hours (Synchronized Sessions)	18
Mid Term Exam	There is not
Exam	1.5
Registered Sessions Work Load	36
Synchronized Session Work Load	18
Credit Hours	6

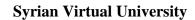
2- Pre-Requisites: There is not

3- Course General Objectives:

This course aims to teaches the student the basic skills of a number of math's topics that qualify to understand the specialized courses. Where the student recognizes the basic concept of sets, set operations and concept functions. As recognized by numbers, particularly real numbers and its basic operations, then recognizes the polynomial arithmetic and fractions and Partial fraction decomposition. And then recognizes the trigonometry and trigonometric equations. It also recognizes complex numbers and its basic operations. And then recognizes the algebraic structures of groups, rings and fields and down to vector spaces and matrix, determinants and then using them to solve linear equations.

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4- Intended Learning Outcomes (ILO):

Code	Intended Learning Outcomes
ILO1	Sets including number sets and its basic operations, concept of function between two sets
ILO2	Polynomial arithmetic, fractions and Partial fraction decomposition
ILO3	Trigonometry and solving trigonometric equations
ILO4	Complex numbers, its operations and solving complex equations
ILO5	Algebraic structures: groups, rings, fields, and morphisms
ILO6	Vector spaces and linear applications
ILO7	Matrix, determinants and using them to solve linear equations

5- Course Syllabus (18 hours of total synchronized sessions)

• RS: Recorded Sessions; SS: Synchronized Sessions;

ILO	Course Syllabus	RS	SS	Type	Additional Notes
ILO1	Sets and functionsSets and its operationsFunctions: types, composition, inverse	3	1.5	Exercises	
ILO1	Real numbers: equations and inequalities Real numbers and its operations Algebraic equations with one unknown Linear, quadratic inequalities	3	1.5	Exercises	
ILO2	 Polynomials Polynomials operations Polynomial arithmetic fractions and Partial fraction decomposition 	3	1.5	Exercises	
ILO3	Trigonometry Trigonometric ratios Unit circle Relations between angles	3	1.5	Exercises	

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	• Trigonometric equations, its				
	solution				
	Complex numbers				
ILO4	• Basic operations	3	1.5	■ Exercises	
	• Complex numbers representation				
	• Complex equations, its solution				
	Algebraic structures				
11.05	• Groups, morphism between groups	3	1.5	Exercises	
ILO5	• Rings, morphism between rings	3	1.5		
	• Fields, morphism between fields				
	Vector spaces				
	 Vector spaces and subspaces 		9 4.5		
шос	• Set of vectors: spanning,	9		□ .	
ILO6	independents, basis			E Exercises	
	 Vector space dimention 				
	• Linear applications and morphisms				
ILO7	Linear equations, its solution	3	1.5	E Exercises	
	Matrix and determinants				
н от	• Matrix operations	_	2	W Evansians	
ILO7	• Linear application matrix	6	3	E Exercises	
	• Determinants and its applications				

6- Assessment Criteria (Related to ILOs)

ISC	Interactive Synchronized Collaboration		Ex	Exams		Rpt	Reports
PF2F	Presentations and Face-to-Face Assessments		PW	Practice Wo	rk		

ILO			Assessment Type		
Code	ILO	Intended Results	ISC	Ex	
	Sets including number sets and	1. Using Venn diagrams			
ILO1	its basic operations, concept of	2. Finding type function	X	X	
	function between two sets	3. Finding composition and inverse			

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ILO2	Polynomial arithmetic, fractions and Partial fraction decomposition	 Addition, subtraction, multiplying and division of polynomials First and second Polynomial decomposition Partial fraction decomposition 	X	X
ILO3	Trigonometry and solving trigonometric equations	 Solving triangle Solving trigonometric equation 	X	X
ILO4	Complex numbers, its operations and solving complex equations	Writing complex numbers in the algebraic, trigonometric and exponential form Solving complex equations	X	X
ILO5	Algebraic structures: groups, rings, fields, and morphisms	 Proving that an Algebraic structures is a group, ring or field Proving that a set is subgroup, subring or subfield Proving that an application is morphism 	X	X
ILO6	Vector spaces and linear applications	 Proving that an Algebraic structures is a vector space Proving that a set is subspace Finding the sum of 2 vector spaces Proving that a set of vectors is spanning, independents, basis Proving that an application is linear Finding kernel and Image of a linear application Finding the dimension of a vector space Finding the rink of a set of vectors 	X	X

Syrian Arab Republic Ministry of Higher Education Syrian Virtual University 1. Basic operations on matrix: addition, subtraction and multiplying 2. Finding the great of a linear to the great

1 11.07	, determinants and using o solve linear equations	 2. Finding the matrix of a linear application 3. Finding the inverse of a matrix 4. Finding the determinant of a matrix 5. Solving linear equations 	X	X

7- Practice Tools:

Tool Name	Description

8- Main References

9- Additional References