

Syrian Arab Republic	 الجامعة الافتراضية السورية SYRIAN VIRTUAL UNIVERSITY	الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالي
Syrian Virtual University		الجامعة الافتراضية السورية

Course Description: Mathematics

1- Basic Information:

Course Name	Mathematics
Course ID	GMA401
Contact Hours (Registered Sessions)	24
Contact Hours (Synchronized Sessions)	24
Mid Term Exam	-
Exam	75 min
Registered Sessions Work Load	36
Synchronized Session Work Load	24
Credit Hours	5
Course Level	4

2- Pre-Requisites: None

Course	ID

3- Course General Objectives:

This course aims to introduce students to some basic concepts in mathematics such as numbers sets and mathematical equations and methods of solving them ,the numerical and geometric sequences and their properties, matrices and their related concepts, As well as the functions and the most important concepts related to them, in addition to studying the transformations of some of the functions and drawing of their graphs , So that the student will be able to use these tools in the field of management with various disciplines.

In our time , the usage of mathematics in economic studies has become an urgent necessity .

In addition to the above , the economy of transport, distribution, storage, production, marketing, flexibility and distribution of tasks is one of the subjects whose study is based on the mathematical methods that help when necessary to use computer to show results.

Syrian Arab Republic	 الجامعة الافتراضية السورية SYRIAN VIRTUAL UNIVERSITY	الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالي
Syrian Virtual University		الجامعة الافتراضية السورية

Intended Learning Outcomes (ILO):

Code	Intended Learning Outcomes
ILO1	The learner learns about the basic concepts in mathematics (roots, bases, logarithms) and deduces the properties of the processes of it.
ILO2	The learner solves equation .
ILO3	The learner uses the laws of numerical sequence, solving of two of linear equations and solving of first degree equation in problems solving .
ILO4	The learner uses the laws of geometric sequence, solving of two of linear equations and solving of first degree equation in problems solving .
ILO5	The learner finds the results of arithmetic operations on matrices.
ILO6	The learner calculates a determinant of Matrix 3x3.
ILO7	The learner finds the common solution of the system of three linear equations using an elementary transformations.
ILO8	The learner defines the continuity of function and deduce its rules.
ILO9	The learner defines the derivative function and deduce the rules of derivation.
IL10	The learner applies the concept of limits , continuity and derivation to study of changes of polynomial of degree 1 ,2,3 .
IL11	The learner defines the integration and deduce its rules .

4- Course Syllabus (24 hours of total Recorded Sessions, 24 hours of total synchronized sessions)

- **RS:** Recorded Sessions; **SS:** Synchronized Sessions;

ILO	Course Syllabus	RS	SS	Type	Additional Notes
ILO1	Basic principles of mathematics	2	2	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> Seminars <input type="checkbox"/> Projects <input type="checkbox"/> Practices <input checked="" type="checkbox"/> Discussion group <input type="checkbox"/> Others	
ILO2	Mathematical equations and methods of solving them	2	2	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> Seminars <input type="checkbox"/> Projects	

Syrian Arab Republic	 الجامعة الافتراضية السورية SYRIAN VIRTUAL UNIVERSITY	الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالي
Syrian Virtual University		الجامعة الافتراضية السورية

				<input type="checkbox"/> Practices <input checked="" type="checkbox"/> Discussion group <input type="checkbox"/> Others	
ILO3	Mathematical inequalities and methods of solving them	2	2	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> Seminars <input type="checkbox"/> Projects <input type="checkbox"/> Practices <input checked="" type="checkbox"/> Discussion group <input type="checkbox"/> Others	
ILO4	Numerical sequences	2	2	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> Seminars <input type="checkbox"/> Projects <input type="checkbox"/> Practices <input checked="" type="checkbox"/> Discussion group <input type="checkbox"/> Others	
ILO5	Matrices and Matrix Operations	2	2	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> Seminars <input type="checkbox"/> Projects <input type="checkbox"/> Practices <input checked="" type="checkbox"/> Discussion group <input type="checkbox"/> Others	
ILO6	Matrix Determinants	2	2	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> Seminars <input type="checkbox"/> Projects <input type="checkbox"/> Practices	

Syrian Arab Republic	 الجامعة الافتراضية السورية SYRIAN VIRTUAL UNIVERSITY	الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالي
Syrian Virtual University		الجامعة الافتراضية السورية

				<input checked="" type="checkbox"/> Discussion group <input type="checkbox"/> Others	
ILO7	Inverse of a Matrix and Solving System of Linear Equations.	4	4	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> Seminars <input type="checkbox"/> Projects <input type="checkbox"/> Practices <input checked="" type="checkbox"/> Discussion group <input type="checkbox"/> Others	
ILO8	Real functions with real variables	2	2	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> Seminars <input type="checkbox"/> Projects <input type="checkbox"/> Practices <input checked="" type="checkbox"/> Discussion group <input type="checkbox"/> Others	
IL9	Derivation and its rules	2	2	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> Seminars <input type="checkbox"/> Projects <input type="checkbox"/> Practices <input checked="" type="checkbox"/> Discussion group <input type="checkbox"/> Others	
IL10	Study of functions changes and drawing its graphs	2	2	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> Seminars <input type="checkbox"/> Projects <input type="checkbox"/> Practices <input checked="" type="checkbox"/> Discussion	

Syrian Arab Republic	 الجامعة الافتراضية السورية SYRIAN VIRTUAL UNIVERSITY	الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالي
Syrian Virtual University		الجامعة الافتراضية السورية

				group	
				<input type="checkbox"/> Others	
IL11	calculus	2	2	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> Seminars <input type="checkbox"/> Projects <input type="checkbox"/> Practices <input checked="" type="checkbox"/> Discussion group <input type="checkbox"/> Others	

5- Assessment Criteria (Related to ILOs)

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

ILO Code	ILO	Intended Results	Assessment Type				
			ISC	PW	Ex	PF 2F	Rpt(home work)
ILO1	The learner learns about the basic concepts in mathematics (roots, bases, logarithms) and deduces the properties of the processes of it.	1) The learner defines Number Sets (natural numbers, Integers, Rational Numbers and real numbers). 2) The learner gives examples of natural, Integers, Rational and real numbers. 3) The learner Connects between ranges of real numbers. 4) The learner defines neighborhood of point.					
			✓		✓		✓

Syrian Arab Republic	 الجامعة الافتراضية السورية SYRIAN VIRTUAL UNIVERSITY	الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالي
Syrian Virtual University		الجامعة الافتراضية السورية

		5) The learner defines the absolute value. 1) The learner defines the root . 2) The learner deduces the properties of roots. 3) The learner defines the exponential. 4) Learner deduces the properties of exponential. 5) The learner defines the logarithm. 6) The Learner deduces the properties of logarithms.					
ILO2	The learner solves equation .	1) The learner classifies the equations according to their degrees. 2) The learner solves a first-order equation with one unknown. 3) The learner solves a second-order equation with one unknown. 4) The learner solves the equation of the third degree with one unknown. 5) The learner defines an inequalities . 6) The learner solves inequality.	✓	✓	✓		

Syrian Arab Republic	 الجامعة الافتراضية السورية SYRIAN VIRTUAL UNIVERSITY	الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالي
Syrian Virtual University		الجامعة الافتراضية السورية

		7) The learner solves a radical equation. 8) The learner solves an equation that contains absolute value. 9) The learner solves an exponential equation. 10) The learner solves a logarithmic equation.					
ILO3	The learner uses the laws of numerical sequence, solving of two of linear equations and solving of first degree equation in problems solving .	1) The learner distinguishes the mathematical pattern of the numerical sequence. 2) The learner deduces the general n-th term law of the numerical sequence. 3) The learner applies the general n-th term law to calculate the term that its order is specified in a given numerical sequence. 4) The learner applies the general n-th term law to the calculate order of the determined term in a given numerical sequence 5) The learner deduces the law of sums first n terms of given numerical sequence . 6) The learner uses the laws of numerical sequence, solving of two of linear equations and solving of first degree equation in problems solving .	✓		✓		✓
ILO4	The learner uses the laws of geometric sequence, solving of two of linear equations	1) The learner distinguishes the mathematical pattern of the geometric sequence.	✓		✓		✓

Syrian Arab Republic	 الجامعة الافتراضية السورية SYRIAN VIRTUAL UNIVERSITY	الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالي
Syrian Virtual University		الجامعة الافتراضية السورية

	and solving of first degree equation in problems solving .	2) The learner deduces the general n-th term law of the geometric sequence. 3) The learner applies the general n-th term law to calculate the The term that its order is specified in a given geometric sequence. 4) The learner applies the general n-th term law to the calculate order of the determined term in a given geometric sequence 5) The learner deduces the law of sums first n terms of given geometric sequence . 6) The learner uses the laws of geometric sequence, solving of two of linear equations and solving of first degree equation in problems solving .					
ILO5	The learner finds the results of arithmetic operations on matrices.	1) The learner defines the matrix. 2) The learner distinguishes between matrix forms (square, rectangular, Identity , diagonal, triangular,...) 3) The learner finds the sum of two matrices. 4) The learner deduces the properties of sum of matrices. 1) The learner finds the multiply of matrix by real number	✓		✓		✓

Syrian Arab Republic	 الجامعة الافتراضية السورية SYRIAN VIRTUAL UNIVERSITY	الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالي
Syrian Virtual University		الجامعة الافتراضية السورية

		2) The learner finds the multiplying a matrix by another Matrix. 3) The learner deduces the properties of multiplying of matrices.					
ILO6	The learner calculates a determinant of Matrix 3x3.	1) The learner calculates a determinant of Matrix 2x2. 2) The learner calculates a determinant of matrix 3x3 calculation by expanding it on a line or a column, using Bézout' rule (expanding). 3) the learner calculates a determinant of Matrix 3x3 calculation using Sarrus' rule (Parallel diagonals) 4) The Learner deduces the properties of determinants.	✓		✓		✓
ILO7	The learner finds the common solution of the system of three linear equations using an elementary transformations.	1) The learner determines the condition of existence an Inverse of a given matrix . 2) The learner finds the inverse of a given 2x2 matrix. 3) The learner finds the inverse of a given 3x3 matrix. 4) The learner finds the common solution of the system of three linear equations using an Inverse of matrix . 5) The learner finds the common solution of the system of three linear equations using an	✓		✓		✓

Syrian Arab Republic	 الجامعة الافتراضية السورية SYRIAN VIRTUAL UNIVERSITY	الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالي
Syrian Virtual University		الجامعة الافتراضية السورية

		elementary transformations.					
ILO8	The learner defines the continuity of function and deduce its rules.	<ol style="list-style-type: none"> 1) The learner defines the numerical function. 2) The learner gives examples of polynomial , fractional, root, exponential and Logarithm functions. 3) The learner finds the definition set of numerical function. 4) The learner finds the limit of function at specific point. 5) The learner finds the limit of function at infinity. 6) The learner distinguish the cases of Indeterminate form and methods of removal . 7) The learner defines the continues function. 8) The learner distinguishes between continuous and non-continuous functions depending on their graphs. 9) The learner Prove the continuity of function depending on the definition. 10) The learner Prove the non-continuity of function depending on the definition. 	✓		✓		✓

Syrian Arab Republic	 الجامعة الافتراضية السورية SYRIAN VIRTUAL UNIVERSITY	الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالي
Syrian Virtual University		الجامعة الافتراضية السورية

IL9	The learner defines the derivative function and deduce the rules of derivation.	1) The learner defines the derivation. 2) The learner defines the geometric interpretation of the derivative. 3) The learner defines the derivative function. 4) The learner deduces the rules of derivation.	✓		✓		✓
IL10	The learner applies the concept of limits , continuity and derivation to study of changes of polynomial of degree 1 ,2,3 .	1) The learner applies the concept of limits , continuity and derivation to study of changes of polynomial of degree 1 ,2,3 . 2) The learner draws the graphs of the polynomials using the table of its changes.	✓		✓		✓
IL11	The learner defines the integration and deduce its rules .	1) The learner defines the integral function . 2) The learner defines the indefinite integral. 3) The learner defines definite integral. 4) The learner concludes the rules of integration (Change the variable and Integration by Parts). 5) The Learner uses integration in Calculating surface.	✓		✓		✓

6- Practice Tools:

Tool Name	Description
PowerPoint presentations , Mathematica	We use the PowerPoint presentations as tool to illustrate important shapes, tables and properties, which are key to explaining lectures.

Syrian Arab Republic	 الجامعة الافتراضية السورية SYRIAN VIRTUAL UNIVERSITY	الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالي
Syrian Virtual University		الجامعة الافتراضية السورية

program	More on that , We use the Mathematica program for drawing graphs .
---------	--

7- Main References

Syrian Arab Republic	 الجامعة الافتراضية السورية SYRIAN VIRTUAL UNIVERSITY	الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالي
Syrian Virtual University		الجامعة الافتراضية السورية

المراجع العربية

- أحمد عبيد - زياد طرزي - جمال عطفة - محمد السمان - محمود المالكي: المسائل الرياضية - منشورات رشيد القدسي - مكتبة المعرض الوطني بدمشق 1966.
- د. إبراهيم العلي - د. أمل كابوس: الرياضيات العالية، منشورات جامعة حلب مديرية الكتب والمطبوعات الجامعية 1981 - 1982.
- د. محمد سمير دركزيلي - د. سمير حجير - الرياضيات العالية، منشورات جامعة حلب مديرية الكتب والمطبوعات الجامعية 1988.
- أ. أحمد علوذي: الجبر والتحليل الرياضي، منشورات جامعة حلب، مديرية الكتب والمطبوعات الجامعية 1975.
- وليم هـ. دورفي: حساب التفاضل والتكامل والهندسة التحليلية - دار ماكجروهيل للنشر جمهورية مصر العربية - القاهرة -
- د. عبد الرزاق الفاضل: الرياضيات العالية، منشورات جامعة دمشق - مديرية الكتب والمطبوعات الجامعية - 1987.
- د. عبد الرزاق الفاضل: الرياضيات الإدارية والاقتصادية - منشورات جامعة دمشق - مديرية الكتب والمطبوعات الجامعية - 1991.
- د. عبد الرزاق الفاضل وآخرون - أساسيات التحليل الرياضي - منشورات جامعة دمشق - مركز التعليم المفتوح - مديرية الكتب والمطبوعات الجامعية - 2003
- د. عبد الرزاق الفاضل - الرياضيات 1--الجامعة الافتراضية السورية - 2007
- د. عبد الرزاق الفاضل - الرياضيات 2--الجامعة الافتراضية السورية - 2007
- د. ياسر نصر وآخرون - رياضيات حاسوبية /1/ منشورات جامعة دمشق 2017-2018

المراجع الإنكليزية:

- *Calculus, (8th Edition)*: James Stewart, Cengage learning, 2016
- *Mathematics with application*: Laurence D, Hoffmann, Michael Orkin, Mc Graw-McGraw-Hill (1979)
- *Mathematics for business applications*: Harold D. Shane, Published by Charles E; Merrill publishing company, Merrill, 1976.
- *Calculus "fifth Edition"*: Stanley I. Grossman, University of Montana and University College London. Saunders Collage Publishing; 5th or later Edition edition (1992).

Syrian Arab Republic	 الجامعة الافتراضية السورية SYRIAN VIRTUAL UNIVERSITY	الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالي
Syrian Virtual University		الجامعة الافتراضية السورية

Precalculus: An Investigation of Functions: David Lippman , Melonie Rasmussen,2015.

Precalculus: Mathematics for Calculus (7th Edition) : James Stewart ,Lothar Redlin Saleem Watson , Kindle Edition ,2016.

- Matrix Algebra for Business and Economics: Searle S. R. & Hausman W. H, Wiley, Inter-science, New York, 1970.

– Mathematics for Calculus (Edition 7) :James Stewart & Lothar Redlin& Saleem Watson Precalculus , Cengage Learning, Boston ,United States of Amrica -2015

8- Additional References

د. عبد الرزاق الفاضل - سميرة تغنكجي - الرياضيات المالية والعامه - منشورات جامعة دمشق - مديرية الكتب و المطبوعات الجامعية - 1994 .
 د. عبد الرزاق الفاضل وآخرون - الرياضيات المالية والعامه - منشورات جامعة دمشق - مديرية الكتب والمطبوعات الجامعية - 2004