

**ACULTY OF SCIENCES - DEPARTMENT OF MATHEMATICS
COURSE SYLLABUS**

MATH 110: General Mathematics (1)

<i>COURSE TITLE</i>	<i>ENGLISH CODE/NO</i>	<i>ARABIC CODE/NO.</i>	<i>CREDITS</i>			
			<i>Th.</i>	<i>Pr.</i>	<i>Tr.</i>	<i>Total</i>
General Mathematics (1)	MATH 110	١١٠٥	3			3
<i>Pre-requisites:</i>	None					
<i>Course Role in Curriculum</i> <i>(Required/Elective):</i>	Required Course					
<i>Catalogue Description:</i> This course is a first Calculus dealing mainly with differential calculus. After a discussion of few mathematical preliminaries, we introduce functions and models, limits and derivatives, differentiation rules, and finally applications of differentiation.						

Textbooks:

1. J. Stewart, Calculus, Early Transcendentals, Seventh Edition. International Metric Version, 2012.

Supplemental Materials:

Course Learning Outcomes:

By the completion of the course the student should be able to:

1. Handle functions occurring in calculus and in the mathematical modeling of real-world problems;
2. Grasp the central idea of limit and continuity, and its application in a variety of problems;
3. Understand the main theme of calculus and its applications involving rates of change and the approximation of functions;
4. Differentiate standard functions by applying the fundamental rules of differentiation;
5. Compute the optimal values of functions and handle the optimization problems;
6. Apply the concepts of monotonicity and concavity in sketching the plane curves;
7. Deal with indeterminate forms and L'Hôpital's rule;
8. Understand the connection between derivatives and antiderivatives.
9. Handle functions occurring in calculus and in the mathematical modeling of real-world problems;

Topics to be Covered:

1. Mathematical Preliminaries
 - a. Numbers, Inequalities, and Absolute Values
 - b. Coordinate Geometry and Lines
 - c. Graphs of Second-Degree Equations
 - d. Trigonometry
2. Functions and Models
 - a. Four Ways to represent a Function

- b. Mathematical Models
- c. New Functions from Old Functions
- d. Graphing Calculators and Computers
- e. Exponential Functions
- f. Inverse Functions and Logarithms
- 3. Limits and Derivatives
 - a. The Tangent and Velocity Problems
 - b. The Limit of a Function
 - c. Calculating Limits Using the Limit Laws
 - d. Continuity
 - e. Limits at Infinity; Horizontal Asymptotes
 - f. Derivatives and Rates of Change
 - g. The Derivative as a Function
- 4. Differentiation Rules
 - a. Derivatives of Polynomials and Exponential Functions
 - b. The Product and Quotient Rules
 - c. Derivatives of Trigonometric Functions
 - d. The Chain Rule
 - e. Implicit Differentiation
 - f. Derivatives of Logarithmic Functions
 - g. Rates of Change in the Sciences
 - h. Exponential Approximations and Differentials
 - i. Hyperbolic Functions
- 5. Applications of Differentiation
 - a. Maximum and Minimum Values
 - b. The Mean Value Theorem
 - c. How derivatives Affect the Shape of a Graph
 - d. Intermediate Forms and L'Hospital Rule
 - e. Summary of Curve Sketching
 - f. Graphing with Calculus and Calculators
 - g. Optimization Problems
 - h. Antiderivatives