



Date:	<b>REGISTRATION OF COURSES</b>	RESPONSIBLE OF REGISTRATION:
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AREA OF KNOWLEDGE	SUB-AREA	UNDERGRADUATE	POSTGRADUATE
<b>BASIC SCIENCES</b>			
ECONOMICS AND SOCIAL SCIENCES			
<b>HEALTH SCIENCES</b>			
<b>ENGINEERING, ARCHITECTURE AND TECHNOLOGY</b>		X	
<b>EDUCATION SCIENCES</b>			
HUMANITIES AND ARTS			
<b>AGRICULTURAL AND SEA SCIENCES</b>			
<b>MILITARY ARTS AND SCIENCES</b>			
SAFETY AND CIVIL PROTECTION			
<b>INTERDISCIPLINARY</b>			
<b>OTHERS</b>			

**ADSCRIPTION OR BRANCH (ES):**

FACULTY	ARCHITECTURE AND URBANISM
SCHOOL	ARCHITECTURE
INSTITUTE	
DEPARTMENT	METHODS SECTOR
OTHERS	

**COURSE:**

NAME	MATHEMATICS I (96)
CODE	1041
EXECUTIVE UNIT	
CLASSIFICATION	COMPULSORY / THEORETICAL - PRACTICAL
APPROVAL DATE	
UPDATE DATE	
APPROVAL AUTHORITY	
CREDIT UNITS	FOUR (4)
HOURS/WEEK	SIX (6)
REGIMEN	SEMI-ANNUAL
ACADEMIC PERIODS	
REQUIREMENTS	None
PROFESSOR	



## PURPOSES

Provide a fundamental basis in the formative process of the architecture student introducing it in the comprehension of the mathematical language, which, combined with the learning of problem solving, will result in the intuitive and formal development of the logical thinking processes in the student.

## LEARNING OBJECTIVES

That the student would be able to:

- Understand the location of points and shapes in the plane, assimilate key concepts such as segments, line, distance between points, slopes, and solving of simple problems that interrelate these concepts.
- Understand and develop the concept of relation and real function. Determine basic features and properties of real functions.
- Identify and employ concepts in different representation domains: natural language, ordered pairs, formulas, graphic representation.
- Analyse the general second-degree equation, identify the corresponding family of conics, find the canonical equation and its notable elements. Solve simple problems of intersections, tangency, etc; related to the conics.
- Apply the concept of limits to analyse the continuity of a function; perform simple calculations of various cases of indeterminate limits; understand the concept of derivative and, in particular, its geometric interpretation; solve problems of tangent line and straight normal line; calculate simple derivatives, applying: the definition of the derivative, the properties of the derivative and the derivation tables (formulas).



## CONTENTS

### 1. FUNCTIONS:

- Cartesian plane, ordered pair, cartesian product, independent and dependent variables.
- Relation, function, graphic representation, domain and range.
- Functions: Injective, surjective and bijective.
- Functions examples: absolute value functions, identity, constant, affine, algebraic, trigonometrical, exponentials, logarithmical, etc.
- Algebra of functions. Function composition. Inverse functions.

### 2. LINES AND CONICS:

- Distance between two points. Slope of a line. Equations of lines. Intersecting lines.
- Angle between two lines. Parallelism and perpendicularity. Distance from a line to a point.
- Family of lines
- General quadratic equation. Definition, construction, general equation, symmetric equation, remarkable elements and degenerate forms of: the circumference, ellipse, hyperbola and rectangular hyperbola.

### 3. LIMITS AND CONTINUITY:

- Intuitive notion of limit (graphic).
- Limit definition. Properties.
- Algebra of limits
- Intuitive notion of continuity. Definition, examples. Algebra of continuous functions.
- Continuous functions composition.

### 4. DERIVATIVE:

- Geometrical interpretation of the derivative.
- Tangent line and normal line exercises.
- Definition of the derivative. Derivative rules. Chain rule. Higher order derivatives.



### **INSTRUCTIONAL STRATEGIES**

- The course is organized 60% in theoretical classes, in which the professor state definitions and theorems related to the subject, and 40% intended for practice, where exercises are assigned to students to consolidate the acquired knowledge.
- Through examples, and by means of solving practical exercises: illustrate and analyse the exposed concepts.

### **INSTRUCTIONAL MEDIA**

- Conventional media

### **EVALUATION**

- Course evaluation consists of 3 partial exams.
- Final and make-up exams are prepared in the Sector by the professors of the area.

### **TEXTBOOKS (If possible, according to contents)**

- **GUIDE TEXT:**  
  
LARSON, HOSTETLER AND EDWARDS. CALCULUS.