



## Course Syllabus

<b>Course Code</b>	<b>Course Title</b>	<b>ECTS Credits</b>
MATH-195	Calculus I	6
<b>Prerequisites</b>	<b>Department</b>	<b>Semester</b>
MATH-180 or MPT	Computer Science	Fall, Spring
<b>Type of Course</b>	<b>Field</b>	<b>Language of Instruction</b>
Required	Mathematics	English/Greek
<b>Level of Course</b>	<b>Lecturer(s)</b>	<b>Year of Study</b>
1 <sup>st</sup> Cycle	George Portides	1 <sup>st</sup>
<b>Mode of Delivery</b>	<b>Work Placement</b>	<b>Corequisites</b>
Face to face	n/a	None

### Course Objectives:

The main objectives of the course are to:

- Introduce the concepts of limits and continuity.
- Define the derivative and apply differentiation techniques on algebraic and trigonometric functions.
- Define the Intermediate Value theorem, the Mean Value theorem and Rolle's theorem.
- Analyze functions for graphing purposes.
- Introduce the concept of antiderivative and apply basic techniques for the evaluation of indefinite and definite integrals.
- Define logarithmic and exponential functions and use differentiation and integration techniques on them.

### Learning Outcomes:

After completion of the course students are expected to be able to:

- Compute limits.
- Determine points of discontinuity and intervals of continuity for functions.
- Use standard differentiation techniques for finding derivatives and tangent lines.
- Use the derivative to analyze functions and sketch graph.
- Apply Rolle's theorem and the mean value theorem.
- Find definite and indefinite integrals using basic integration techniques.

- Differentiate and integrate exponential functions and functions involving logarithms, and employ the logarithmic differentiation technique when appropriate.

**Course Content:**

- Limits, asymptotes and continuity of functions.
- The derivative function, basic techniques of differentiation, derivatives of trigonometric functions, the chain rule, Implicit differentiation.
- Analysis of functions for sketching graphs.
- Applications of the Rolle's theorem and the Mean Value theorem and an overview of the area problem.
- The antiderivative, basic techniques for finding Indefinite and Define integrals.
- Derivatives and integrals of exponential functions and functions involving logarithms, logarithmic differentiation.

**Learning Activities and Teaching Methods:**

Lectures, Exercises and Tests

**Assessment Methods:**

One test and one Final Exam

**Required Textbooks / Readings:**

Title	Author(s)	Publisher	Year	ISBN
Calculus: Late Transcendentals, 10th edition	Anton H., Bivens I., Davis S.	Wiley	2012	978-1118092484
APEX Calculus I, 3 <sup>rd</sup> edition	Hartman G.	CreateSpace Independent Publishing Platform	2015	978-1514225158

**Recommended Textbooks / Readings:**

<b>Title</b>	<b>Author(s)</b>	<b>Publisher</b>	<b>Year</b>	<b>ISBN</b>
Calculus (International Metric Edition), 6th edition	Stewart J.	Brooks/Cole	2008	978- 0495383628