Course Syllabus

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH-195</td>
<td>Calculus I</td>
<td>6</td>
</tr>
</tbody>
</table>

**Prerequisites**

- MATH-180 or MPT

**Department**

- Computer Science

**Semester**

- Fall, Spring

**Type of Course**

- Required

**Field**

- Mathematics

**Language of Instruction**

- English/Greek

**Level of Course**

- 1st Cycle

**Lecturer(s)**

- George Portides

**Year of Study**

- 1st

**Mode of Delivery**

- Face to face

**Work Placement**

- n/a

**Corequisites**

- 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:

<table>
<thead>
<tr>
<th>Title</th>
<th>Author(s)</th>
<th>Publisher</th>
<th>Year</th>
<th>ISBN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculus: Late Transcendentals, 10th edition</td>
<td>Anton H., Bivens I., Davis S.</td>
<td>Wiley</td>
<td>2012</td>
<td>978-1118092484</td>
</tr>
</tbody>
</table>
Recommended Textbooks / Readings:

<table>
<thead>
<tr>
<th>Title</th>
<th>Author(s)</th>
<th>Publisher</th>
<th>Year</th>
<th>ISBN</th>
</tr>
</thead>
</table>