Course Code: MATH-180  
Course Title: Algebra and Trigonometry  
ECTS Credits: 6

Department: Computer Science  
Semester: Fall, Spring  
Prerequisites: None

Type of Course: Required/Elective  
Field: Mathematics  
Language of Instruction: English

Level of Course: 1st Cycle  
Year of Study: 1st  
Lecturer(s): Dr George Chailos

Mode of Delivery: Face-to-face  
Work Placement: N/A  
Co-requisites: None

Objectives of the Course:
The main objectives of the course are to:
• Introduce students to polynomials, rational expressions and nth roots.
• Provide students with the necessary knowledge for solving linear and quadratic equations.
• Introduce students to Complex numbers and provide them with the necessary techniques for solving quadratic equations in the Complex number domain.
• Develop the necessary skills in order for the students to be capable of solving polynomial and rational inequalities as well as inequalities involving absolute values.
• Cover the elementary theory of functions, their graphs and their properties.
• Discuss composition of functions and the elementary theory of inverse functions.
• Develop the theory of logarithmic and exponential functions, and discuss logarithmic and exponential equations.
• Discuss the basic concepts of Trigonometric functions, and make the students able to handle trigonometric expressions and graph sine, cosine and tangent functions.

Learning Outcomes:
After completion of the course students are expected to be able to:
1. Solve linear equations and quadratic equations in the complex domain.
2. Solve polynomial and rational inequalities as well as inequalities involving absolute values.
3. Apply the basic concepts of function theory
4. Sketch the graphs of elementary functions.
5. Compose functions, determine if a function is invertible and find inverses of 1-1 functions.
6. Utilize and handle logarithmic and exponential expressions and solve logarithmic and exponential equations.
7. Use basic trigonometric theory and graph elementary trigonometric functions.
Course Contents:

1. Polynomial and Rational expressions
2. Equations and inequalities
   - Linear and quadratic equations.
   - Introduction to Complex numbers.
   - Polynomial and rational inequalities.
   - Equations and inequalities involving absolute values
3. Functions and their graphs
   - Properties of functions.
   - Graph of functions.
   - Composite functions and one to one functions; invertibility of functions.
4. Exponential and Logarithmic functions
   - Basic properties of exponential and logarithmic functions and their graphs.
   - Logarithmic and exponential equations.
5. Trigonometric functions
   - Right angle trigonometry.
   - Trigonometric functions of general angles.
   - Graphs of elementary trigonometric functions.

Learning Activities and Teaching Methods:
Lectures, Exercises, Assignments and Tests.

Assessment Methods:
2 Mid-Term Exams; Final Exam; Class Participation.

Required Textbooks/Reading:

<table>
<thead>
<tr>
<th>Authors</th>
<th>Title</th>
<th>Publisher</th>
<th>Year</th>
<th>ISBN</th>
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<tbody>
<tr>
<td>M. Sullivan</td>
<td>Algebra and Trigonometry</td>
<td>Prentice Hall</td>
<td>2008</td>
<td>0-132-32903-4</td>
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</tbody>
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<tr>
<td>Dugopolsk, Barnett, Bluman</td>
<td>Algebra for College students with Trigonometry and Statistics</td>
<td>Mc Graw Hill</td>
<td>2006</td>
<td>0-072-93482-4</td>
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