

Course Title	Mathematical Foundations for Science and Engineering				
Course Code	MAT140				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	1 <sup>st</sup> Year / 1 <sup>st</sup> Semester				
Teacher's Name	TBA				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	This course blends the concepts and skills that must be mastered before enrollment in a college-level calculus course. Students will continue to build on their algebra and geometry foundations aiming the expansion of their understanding through other mathematical experiences.				
Learning Outcomes	<p>Upon successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> <li>• Solve problems by applying elementary algebra.</li> <li>• Produce graphs of polynomial equations of first and second degree and to explain features of the graphs such as: intercepts, vertex, slope, line of symmetry and translations.</li> <li>• Recognize functions and to perform operations on functions such as: addition, multiplication, division, composition.</li> <li>• Identify the domain and range of a function and solve problems involving the domain and range.</li> <li>• Identify and solve problems involving inverse functions, exponential and logarithmic functions and equations.</li> <li>• Solve problems involving systems of two equations in two unknowns, using the method of substitutions or the theorem of equivalent systems.</li> <li>• Interpret the six trigonometric functions in terms of both the right triangle definition and the circular definition and use the basic trigonometric identities to solve trigonometric equations.</li> <li>• Perform basic operations with complex numbers.</li> </ul>				
Prerequisites	None	Co-requisites	None		
Course Content	<p>Algebra and Real Numbers, Exponents, Radicals, Basic Operations and Factoring of Polynomials, Basic Operations of Rational Expressions</p> <p>Long Division of Polynomials, Partial Fraction Decomposition</p>				

	<p>Linear Equations and Applications, Quadratic Equations and Applications</p> <p>Linear Inequalities, Absolute Value, Linear Inequalities with Absolute Value, Complex Numbers and Polar Form</p> <p>Cartesian Coordinate System, Distance Formula, Equation of a Line (slope-intercept and point-slope forms), Parallel and Perpendicular Lines, Equation of a Parabola (polynomials of degree 2), Completing the Square, Equation of a Circle</p> <p>Functions, Domain and Range, Graphs and Transformations of Functions, Operations on Functions and Composition</p> <p>Inverse Functions, Exponential and Logarithmic Functions, Graphs and Properties of Exponential and Logarithmic Functions, Exponential and Logarithmic Equations</p> <p>Angles and Their Measure, Trigonometric Functions using the Unit Circle, Solving Right Triangles, Graphs and Properties of Trigonometric Functions, Basic Trigonometric Identities.</p> <p>Recent developments and contemporary issues pertaining to the subject matter of the course</p>						
Teaching Methodology	Face- to- face						
Bibliography	<p>Barnett, Ziegler, Byleen, PRECALCULUS McGraw-Hill (Latest edition)</p> <p>Sullivan, M., PRECALCULUS, Pearson-Prentice Hall (Latest edition)</p> <p>Sullivan &amp; Sullivan, PRECALCULUS concepts through functions, Prentice Hall (Latest edition)</p> <p>Huettenmueller, R., PRECALCULUS Demystified, McGraw-Hill (Latest edition)</p> <p>Stewart J., Redlin L., Watson S. PRECALCULUS: Mathematics for Calculus, Prentice Hall (Latest edition)</p>						
Assessment	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 5px;">Examinations</td> <td style="text-align: center; padding: 5px;">90%</td> </tr> <tr> <td style="padding: 5px;">Class Participation and Attendance</td> <td style="text-align: center; padding: 5px;">10%</td> </tr> <tr> <td></td> <td style="text-align: center; padding: 5px;">100%</td> </tr> </table>	Examinations	90%	Class Participation and Attendance	10%		100%
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Language	English						