

Course Title	Mathematics I			
Course Code	MAT 101			
Course Type	Compulsory			
Level	Undergraduate			
Year / Semester	Year 1 / Semester 1			
Teacher's Name	ARISTIDIS SAMITAS/GEORGE ANAYIOTOS/POLINA ELLINA			
ECTS	6	Lectures / week	3	Laboratories / week
Course Purpose and Objectives	This course provides students with an in-depth understanding of mathematical principles and concepts required for problem-solving and decision-making in business and economics. Topics include functions, graphs, differential, and integral calculus, and partial derivatives. Students should understand the mathematical methods that are necessary tools to solve several economic and financial problems.			
Learning Outcomes	<p>Upon successful completion of this course, students should be able to:</p> <ul style="list-style-type: none"> ▪ Understand the knowledge of functions in a wide range of business disciplines, including Economics and Finance. ▪ Differential and integral functions. ▪ Develop critical attitudes, which are necessary for life-long learning. ▪ Understand and explain financial figures using mathematical tools. ▪ Explain the mathematical solutions using financial and economic theory. 			
Prerequisites	NONE	Required	NONE	
Course Content	<ul style="list-style-type: none"> ▪ Introduction <p>Basic linear algebra, functions, inequalities, algebraic solution of simultaneous linear equations, graphical illustration.</p> <ul style="list-style-type: none"> ▪ Functions, Graphs and Limits <p>linear functions, quadratic functions, exponential functions, logarithmic functions, introduction to limits.</p> <ul style="list-style-type: none"> ▪ Differentiation <p>Differential definition and calculus, rules of derivatives, product and quotient rules, higher-order derivatives, chain rule, marginal analysis.</p> <ul style="list-style-type: none"> ▪ Application of the Derivative 			

	<p>Increasing and decreasing functions, concavity and point of inflection, curve sketching, relative and absolute extrema, optimisation of economic functions.</p> <ul style="list-style-type: none"> ▪ Exponential and Logarithmic Functions <p>Properties of functions, differentiation of exponential and logarithmic functions, applications of exponential models in Business and Economics.</p> <ul style="list-style-type: none"> ▪ Integration <p>The indefinite integral, integration by substitution, definite integral and theorem of calculus, applications to Business and Economics.</p> <ul style="list-style-type: none"> ▪ Calculus of several variables <p>Functions of several variables, partial derivatives.</p>								
Teaching Methodology	<p>This course will be delivered as a combination of interactive lectures, handouts, assignments, and in-class problem-solving exercises that students will learn to apply mathematical methods and tools to economic and business problems.</p>								
Bibliography	<ul style="list-style-type: none"> ▪ Calculus: for Business, Economics, and the Social and Life Sciences Laurence D. Hoffmann and Gerald L. Bradley McGraw-Hill Science 10th edition 2010 ▪ Calculus: for Business, Economics, Life Sciences and Social Sciences Barnett Raymond A., Ziegler Michael R., Byleen Karle E. Prentice-Hall 12th edition 2011 ▪ Applied Mathematics for Business, Economics and the Social Sciences Budnick Frank S. McGraw-Hill any edition ▪ Mathematics for Economics and Business Jacques, I. Pearson 9th edition 2018 								
Assessment	<table> <tr> <td>Participation</td> <td>10%</td> </tr> <tr> <td>Midterm Exam</td> <td>30%</td> </tr> <tr> <td>Project/Exercises</td> <td>20%</td> </tr> <tr> <td>Final Exam</td> <td>40%</td> </tr> </table>	Participation	10%	Midterm Exam	30%	Project/Exercises	20%	Final Exam	40%
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Language	English								