

Course unit title:	Business Mathematics		
Course unit code:	AMAT110		
Type of course unit:	Required		
Level of course unit:	Bachelor (1st Cycle)		
Year of study:	1		
Semester when the unit is delivered:	1 (Fall)		
Number of ECTS credits allocated :	6		
Name of lecturer(s):	Dr Petroula Mavrikiou		
Learning outcomes of the course unit:	<ol style="list-style-type: none"> <li>1) Recognise elementary functions.</li> <li>2) Solve and draw simple equations and manipulate basic functions (linear, quadratic, exponential, and logarithmic).</li> <li>3) Solve simultaneous linear equations 2x2 using various methods: substitution, elimination and comparison.</li> <li>4) Understand the concept of a matrix (determine the size and the elements).</li> <li>5) Recognize different types of matrices (the symmetric matrix and the Identity).</li> <li>6) Perform operations with matrices (addition, subtraction, multiplication, division by scalar).</li> <li>7) Calculate the cofactors, minors, the transpose and the inverse of a matrix.</li> <li>8) Calculate the determinant of a matrix.</li> <li>9) Use determinants and inverse matrix to solve 2x2 and 3x3 systems of linear equations.</li> <li>10) Recognize inequalities. Solve linear inequalities on the plane.</li> <li>11) Formulate simple and complicated Linear Programming problems</li> <li>12) Solve simple and complicated Linear Programming problems using the graphical method (determine and interpret the feasible region)</li> <li>13) Solve Linear Programming problems using the SIMPLEX method (minimization and maximization).</li> </ol>		
Mode of delivery:	Face-to-face		
Prerequisites:	None	Co-requisites:	None
Recommended optional program components:	None		
Course contents:	<ul style="list-style-type: none"> <li>• <b>Basic Algebra</b> Review of basic Algebra. Functions; Nature and notation, types of functions, (linear, quadratic, cubic, polynomial, rational, exponential, logarithmic). Graphical representation. Linear equations and analytical geometry of the straight line. Linear functions.</li> <li>• <b>Matrix Algebra</b> The concept of a matrix. Types and properties of matrices. Transpose, inverse, symmetric, and identity matrix. Matrix algebra. Addition, subtraction, division, multiplication. Square matrices. Determinants.</li> <li>• <b>Simultaneous Equations 2x2 and 3x3</b> Use of matrices and determinants to solve simultaneous equations (systems of linear equations with two or with three unknowns).</li> <li>• <b>Linear programming-Graphical Solution</b> Inequalities in the plane. Introduction to Linear Programming. Graphical solutions for maximization and minimization. Applications in business problems.</li> <li>• <b>Special Cases of Linear programming</b> Special cases for the feasible region: no feasible region, unboundness and multiple solutions.</li> <li>• <b>Formulation of Business Problems</b> Formulation of complicated business problems with more than three variables.</li> <li>• <b>Linear programming-Simplex Method</b> Further Linear programming. Linear programming in 3-dimensions. The usage of</li> </ul>		

	Simplex Method. Duality and Sensitivity Analysis.
Recommended and/or required reading:	Notes and exercises given by the instructor.
Textbooks:	Barnett R., Ziegler M., Byleen K., <b>College Mathematics for Business, Economics, Life Sciences and Social Sciences</b> . Pearson Prentice Hall 2008.
References:	Anton, H., and Kolman, A., <b>Mathematics with Applications for the Management, Life and Social Sciences</b> , Wiley, 2002.
Planned learning activities and teaching methods:	The course is delivered to the students by means of lectures, and tutorials. Lecture notes are available through the e-learning platform of the University, and the instructor's webpage. Students are strongly encouraged for class work, problem and exercise solving and discussion.
Assessment methods and criteria:	<ul style="list-style-type: none"> <li>• Test 1            20%</li> <li>• Test 2    20%</li> <li>• Final Exam    60%</li> </ul>
Language of instruction:	English
Work placement(s):	No