Course unit title:	Calculus and Analytic Geometry II		
Course unit code:	AMAT122		
Type of course unit:			
Level of course unit:	Bachelor		
Year of study:			
Semester when the unit is delivered:			
Number of ECTS credits allocated :	5		
Name of lecturer(s):			
Learning outcomes of the course unit:	1. Explain the notion of definite and indefinite integrals. 2. Solve simple definite and indefinite integrals of polynomials, functions involving rational powers of the variable, exponential, trigonometric, and rational functions. 3. Solve more complicated integrals by using the methods of integration by parts, u-substitution, partial fraction decomposition, and trigonometric substitution. 4. Explain the concept of functions of two variables, find partial derivatives, and evaluate double integrals. 5. Explain the concept of infinite series, state Taylor's and MacLaurin's Theorems, and expand simple functions in such series. 6. Explain the concept of Fourier series, and expand simple periodic functions in such series. 7. Explain the notion of complex numbers, evaluate simple expressions involving complex numbers, and express complex numbers in polar form. 8. Apply definite integration in order to compute areas between curves, and volumes of solids of revolution by using the methods of slices.		
Mode of delivery:	Face-to-face		
Prerequisites:	AMAT111	Co-requisites:	None
Recommended optional program components:	None		
Course contents:	• **Definite and Indefinite Integrals:** The notion of definite and indefinite integrals. • **Applications of the Definite Integral:** Areas between Two Curves, Volumes of solids by revolution using the method of Slices. • **Techniques of Integration:** U-substitution method, Integrals of Trigonometric and Inverse Trigonometric Functions, Integration of rational functions using partial fractions decomposition, Integration by Parts, • **Partial Derivatives and Double Integrals:** The notion of a function of two variables. An Introduction to Partial Derivatives and Double Integrals. • **Series:** Infinite Series, Power Series, Taylor, MacClaurin Series and Fourier Series.		

	• **Polar Coordinates:** Polar Coordinates and conversion of Cartesian to Polar Coordinates. Areas in polar coordinates. • **An introduction to complex numbers:** Geometric interpretation, Polar Form, Exponential Form, De Moivre's formula.
Recommended and/or required reading:	
Textbooks:	Anton H., Bivens I and Davis S, ***Calculus***, 7th edition, John Wiley & Sons, 2002.
References:	• C. Henry Edwards, David E. Penney, ***Calculus, Matrix Version***, Pearson Education; 6th edition, 2002. • James Stewart, ***Calculus, Concepts and Context***, Thomson Learning; 3rd Bk & CD edition, 2004.
Planned learning activities and teaching methods:	• The theory is taught and several examples are solved on the white board. Students are encouraged to participate. • Technology is used to deliver concepts and ideas. • Students are asked to work on their own during class hours on examples and practice problems. • Extra homework is given to students to work at home. • Students are encouraged to attend office hours for extra help.
Assessment methods and criteria:	• Tests: 40% • Final Exam: 60%
Language of instruction:	English
Work placement(s):	No