Course Title	Linear Algebra				
Course Code	MAT160				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	1st Year / 2nd Semester				
Teacher's Name	TBA				
ECTS	6	Lectures / week	3 hours / 14 weeks	Laboratories / week	N/A
Course Purpose and Objectives	A brief review of matrices and matrix operations is followed by a presentation of the axioms and properties of vector spaces, and the concepts of linear transformations, eigenvalues and eigenvectors.				
Learning Outcomes	Upon successful completion of the course, students will be able to: • List the basic principles of matrix algebra. • Solve systems of equations using matrices. • Create the intricate thread of relationships between systems of equations, matrices, determinants, transformations and eigenvalues. • Use vector arithmetic including dot and cross products of vectors. • Explain basic concepts such as those of linear independence of vectors, basis for a vector space and vector subspace, orthonormal basis of vectors. • Explain the underlying concepts behind eigenvector and eigenvalue. • Describe the effects of applying matrix transformations.				
Prerequisites	None	Co-requisites	None		
Course Content	Systems of Linear Equations and Matrices: Introduction to Systems of Linear Equations; Gaussian Elimination; Homogeneous Systems of Linear Equations; Matrices and Matrix Operations; Rules of Matrix Arithmetic; Elementary Matrices and a Method for Finding A-1; Further Results on Systems of Equations and Invertibility. Determinants: The Determinant Function; Evaluating Determinants by Row Reduction; Properties of the Determinant Function; Cofactor Expansion; Cramer's Rule.				

	Vectors in 2-Space and 3-Space: Introduction to Vectors (Geometric); Norm of a Vector; Vector Arithmetic; Dot Product; Projections; Cross Product; Lines and Planes in 3-space. Vector Spaces: Euclidean n-Space; General Vector Spaces; Subspaces; Linear Independence; Basis and dimension; Row and Column Space; Rank; Finding Bases; Inner Product Spaces; Length and Angle in Inner Product Spaces; Orthonormal Bases; Gram-Schmidt Process; Coordinates; Change of Basis. Linear Transformations; Properties of Linear Transformations; Kernel and Range; Linear Transformations from Rn to Rm, Geometry of Linear Transformations from R2 to R2; Matrices of Linear Transformations; Equivalence and Similarity. Eigenvalues, Eigenvectors; Diagonalization; Orthogonal Diagonalization; Symmetric Matrices. Recent developments and contemporary issues pertaining to the subject-matter of the course
Teaching Methodology	Face- to- face
Bibliography	Anton, H., ELEMENTARY LINEAR ALGEBRA, Wiley Kolman, B. & Hill D., Elementary Linear Algebra with Applications, Pearson Modern Classics for Advanced Mathematics Series Anton, H., Rorres, C., ELEMENTARY ALGEBRA (Applications Version), Wiley Stoll, R. & Wong., E., LINEAR ALGEBRA, Academic Press Hill Jr., R.G., ELEMENTARY LINEAR ALGEBRA, Academic Press Lay, D., Lay, R. & McDonald, J., Linear Algebra and its Applications, Pearson
Assessment	Examinations 90% Class Participation and Attendance 10% 100%
Language	English