



# ***MATHEMATICS FOR*** **INFORMATION** **SCIENCE - 2** **(GAMAT201)**

**IMPORTANT TOPICS**

# MODULE 1

**LINEAR SYSTEMS OF EQUATIONS**

**SOLUTION BY GAUSS ELIMINATION, ROW ECHELON FORM AND  
RANK OF A MATRIX**

**FUNDAMENTAL THEOREM FOR LINEAR SYSTEMS HOMOGENEOUS  
AND NON-HOMOGENEOUS**

**EIGEN VALUES AND EIGEN VECTORS OF MATRICES,  
DIAGONALIZATION OF MATRICES.**

# MODULE 2

**VECTOR SPACES**

**LINEAR COMBINATIONS OF VECTORS IN A VECTOR SPACE,  
SPANNING SETS**

**LINEAR DEPENDENCE AND INDEPENDENCE,  
BASIS FOR A VECTOR SPACE**

**THE DIMENSION OF VECTOR SPACE,  
COORDINATE REPRESENTATION IN  $\mathbb{R}^n$ , CHANGE OF BASIS IN  $\mathbb{R}^n$**



# MODULE 3

**VECTOR LENGTH AND UNIT VECTOR,  
DOT PRODUCT AND ANGLE BETWEEN TWO VECTORS**

**THE CAUCHY- SCHWARZ INEQUALITY,  
INNER PRODUCT**

**ORTHOGONAL PROJECTIONS IN INNER PRODUCT  
SPACES**

**ORTHOGONAL AND ORTHONORMAL SETS,  
ORTHOGONAL AND ORTHONORMAL BASIS,  
GRAM-SCHMIDT ORTHONORMALIZATION PROCESS**

**PROJECTION ONTO A SUBSPACE**

# MODULE 4

**LINEAR TRANSFORMATIONS, PROPERTIES OF LINEAR TRANSFORMATIONS**

**LINEAR TRANSFORMATION GIVEN BY A MATRIX**

**KERNEL OF A LINEAR TRANSFORMATION  
AND ITS BASIS**

**RANGE OF A LINEAR TRANSFORMATION  
AND ITS BASIS**

**RANK AND NULLITY OF A LINEAR TRANSFORMATION**

**RANK AND NULLITY THEOREM**

**MATRICES FOR LINEAR TRANSFORMATIONS**





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