



**SCHOOL OF APPLIED SCIENCE & HUMANITIES**  
**DEPARTMENT OF MATHEMATICS**

Subject: Linear Algebra

Subject Code : 25MT103

Sem. : I

Academic Year: 2025-2026

Section: 14

Regulation: R25

**T5 - Assignment 5**

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1. Define the following.
  - a. Vector space.
  - b. Subspace.
  - c. Span of Vectors.
  - d. Linear Independent Vectors.
  - e. Basis and Dimension of Vector space.
2. Determine if the following vectors are linearly dependent or independent.
  - a.  $\{(1,2,1), (2,4,3), (0,1,1)\}$ .
  - b.  $\{(3,0,0), (0,3,0), (0,0,3)\}$ .
  - c.  $\{(1,0,0,1), (0,1,0,1), (0,0,1,1), (0,0,0,1)\}$
  - d.  $\{(1,0,0,1), (0,1,0,1), (0,0,1,1), (0,0,0,0)\}$
3. Determine if the following sets are subspaces. If so, calculate the basis and dimension.
  - a.  $W = \{f: \mathbb{R} \rightarrow \mathbb{R} \mid f(0) = 1\}$
  - b.  $W = \{f: \mathbb{R} \rightarrow \mathbb{R} \mid f(0) = 0\}$
4. Determine if the set of all symmetric  $2 \times 2$  matrices forms a subspace of  $\mathbb{R}^{2 \times 2}$ .