- $4.1 Vector\ Spaces\ 1-12,\ 20-26\ 2,\ 4,\ 5,6,\ 8,\ 10,\ 11,\ 12,\ 20,\ 21,22,\ 24,\ 26$
- 4.2Null Space and column space 1–9, 15, 16, 23, 24, 25, 26, 31, 32 2, 4, 5, 6,
- 7, 8, 16, 23, 24, 26, 32
  - 4.3Linearly independent sets and bases 1,2,3,5,9,10,11,13,14,15,16,19,20,21,22,29,30
- 2,3,10,14,16,20,19,22,30
- $\begin{array}{l} 4.5 \text{Dimension of a vector space 1,2,3,5,6,7,8,11,12,13,14,15,16,17,19,20,21,22,25,26,27,28-32\ 2,5,6,8,12,14,17,20,22,26,28,29,31} \end{array}$ 
  - $4.6 \\ Rank 1 14, 17, 18, 19, 20, 27, 28, 29, 30 \ 2, 3, 4, 6, 8, 10, 11, 12, 14, 18, 19, 28, 30$
  - 4.7Change of Basis 1,2,3,4,5,6,7,8,9,10,11,12,13,14 2,3,4,6,8,9,10,12,14