



**Dharampeth M. P. Deo Memorial Science College, Nagpur**  
**Syllabus wise You Tube Links**

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**B. Sc. SEM VI (Mathematics)**

**M-12: Linear Algebra**

**Unit I**

Vector Spaces: Definition and examples of vector spaces, Sub-spaces, Span of a set, More about sub-spaces, Linear dependence, Linear independence, Dimensions and Basis.

[https://youtube.com/watch?v=1XIT3Y2oyAU&list=PLU6SqdYcYsfI7Ebw\\_j-Vy8YKHdbHKP9am](https://youtube.com/watch?v=1XIT3Y2oyAU&list=PLU6SqdYcYsfI7Ebw_j-Vy8YKHdbHKP9am)

**Unit II**

Linear Transformations: Definition and examples, Range and kernel of linear map, Rank-Nullity, Inverse of a linear transformation, Consequences of Rank-Nullity Theorem.

[https://youtube.com/watch?v=1XIT3Y2oyAU&list=PLU6SqdYcYsfI7Ebw\\_j-Vy8YKHdbHKP9am](https://youtube.com/watch?v=1XIT3Y2oyAU&list=PLU6SqdYcYsfI7Ebw_j-Vy8YKHdbHKP9am)

**Unit-III**

The space  $L(U, V)$ , Composition of linear maps, Operator equations, Applications to the theory of ordinary linear differential equations, Matrix associated to linear map, Linear map associated with matrix

[https://youtube.com/watch?v=1XIT3Y2oyAU&list=PLU6SqdYcYsfI7Ebw\\_j-Vy8YKHdbHKP9am](https://youtube.com/watch?v=1XIT3Y2oyAU&list=PLU6SqdYcYsfI7Ebw_j-Vy8YKHdbHKP9am)

**Unit IV**

Linear Operations in Matrices, Matrix multiplication, Rank and Nullity of a matrix, Inner product spaces, Normed linear space, Orthogonal and orthonormal vectors, Gram-Schmidt orthogonalization process, Orthogonal and Unitary matrices, Application to reduction of quadrics.

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