

Course Syllabi

1. MAES-00124 LINEAR ALGEBRA

2. 192 credits hours.

3. Bibliography

- Algebra lineal y sus aplicaciones, LAY D, 2007

4. Specific Course Information

- a. The Linear Algebra at present is a fundamental tool for a student of a scientific or technical career, as is an engineering. The general didactic strategy of this subject is to introduce the student to this part of mathematics in a progressive way. Students are gradually introduced into the abstract space of the Linear Algebra. This process is initially accompanied by simple examples easy to understand by students, and then raise problems. The subject addresses the following main themes: (1) Linear equations in Linear Algebra: systems of linear equations, vector equations and matrix equations. (2) Matrix algebra: operations with matrices and the inverse of a matrix. (3) Determinants: concepts, properties and applications. (4) Vector spaces: void spaces, subspaces and vector spaces. (5) Own values and own vectors: definition, characteristic equation, diagonalization. (6) Inner product and Orthogonality: internal product, standard, angle, orthogonal projections, orthogonal bases, Gram-Schmidt process.

5. Learning Objectives of the Course

- a. Incorporate in a systematic way the fundamental concepts and tools of Linear Algebra creating cognitive links between algebraic, geometric and abstract perspectives.
- Assimilate the most important concepts of linear algebra and correctly use the corresponding mathematical language and notation.
 - Achieving the capacity of argumentative rigor in Linear Algebra.
 - Acquiring the conceptual and instrumental bases to solve problems of linear algebra arising from problems in the scientific application and engineering.
 - Related geometric, algebraic and abstract approaches in the study of linear algebra.
- b. Learning Outcomes
- It understands and uses interior product concepts and orthogonality to solve application problems.
 - Understands and uses concepts, describes, determines and evaluates systems of linear equations
 - Understands and uses determinants for matrix analysis
 - Understands and uses concepts, describes, determines and evaluates vector spaces
 - Understand, use concepts, describe and use matrix algebra
 - Understands and uses concepts, describes, determines and evaluates own values and own vectors

6. Course Topics

- Line equations in linear algebra
- Algebra of matrices
- Determinants
- Vector spaces
- Own values and own vectors
- Interior product and orthogonality