Course Syllabus

Course Code	Course Title	ECTS Credits
MATH-280	Linear Algebra I	6
Prerequisites	**Department**	**Semester**
MATH-190	Computer Science	Fall/Spring
Type of Course	**Field**	**Language of Instruction**
Required	Mathematics	English/Greek
Level of Course	**Lecturer(s)**	**Year of Study**
1st Cycle	Dr. George Chailos	2nd
Mode of Delivery	**Work Placement**	**Corequisites**
Face to Face	NA	None

Course Objectives:

The main objectives of the course are to:
- Teach the basic theory of Linear systems of equations.
- Introduce the student to the basic theory of Matrices, their applications in the Linear Systems theory and the notions of eigenvalues and eigenvectors.
- Introduce the concepts of vectors in $\mathbf{R^n}$.
- Study the basic theory of Linear transformations and their applications.
- Offer the basic concepts and the elementary theory of finite dimensional vector spaces and their applications on matrix and linear systems theory.

Learning Outcomes:

After completion of the course students are expected to be able to:
1. Solve linear systems using the general theory of linear systems as well as the matrix theory.
2. Understand the basic concepts of n-vectors and their representation on $\mathbf{R^2}$, $\mathbf{R^3}$.
3. Comprehend the basic theory of Linear transformations and their applications on systems theory.
4. Handle abstract vector spaces and prove basic theorems related to the notions of linear independence, span, basis, and dimension of the vector space.
5. Comprehend the theory of matrices and be able to calculate the eigenvalues and eigenvectors of square matrices.

Course Content:

1. Linear systems and Matrices
   - General theory of Linear systems.
   - Theory and properties of Matrices, Invertibility of Matrices, Determinant of a Matrix.
2. Vectors and Linear Transformations
   - Vectors in the plane and $n-$vectors.
   - Introduction to the theory of linear Transformations.
3. Vector Spaces
   - Vector spaces and subspaces.
   - The basis and the dimension of a vector space.
   - The Rank of a Matrix and its applications.
4. Further theory of square Matrices
   - Eigenvalues and Eigenvectors of square matrices.
   - Diagonalization of Matrices.

Learning Activities and Teaching Methods:

Lectures, Exercises, Assignments and Tests.

Assessment Methods:

Midterm Examination, Final Examination, Homework Assignments

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Elementary Linear Algebra	B. Kolman and D. Hill	Pearson 9th Ed.	2017	9780134718538

Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Linear Algebra and its Applications	S. Lay and J. McDonald	Pearson 5th Ed.	2015	9780321982384