# Linear Algebra

| Unit Title | Linear Algebra | | |
|---|---|---|---|
| Level of Study | Level I – Bachelor's degree | | |
| Credit Value | 7 | ECTS Value | 3 |
| Home Department | Fundamental Mathematics | | |
| Home Faculty | Mathematics and Mechanics | | |
| Unit Co-ordinator | | | |
| Key Words | complex numbers, determinants, matrixes, basic algebraic structures, polynomials, linear spaces, systems of linear equation, quadratic forms, Euclidean space, affine space. | | |
| Brief Summary | The course presents notions which often appear in other undergraduate courses. The course offers a sufficiently general background for some high school algebra topics and the opportunity to develop some problem solving skills useful for further study activities. Some basic results on vector spaces, matrices, systems of linear equations, eigenvalues, eigenvectors and quadratic forms are considered. | | |
| Indicative Content | Students will study: <ul><li>operations with complex numbers;</li><li>different methods to calculate determinants of any finite order;</li><li>operations with matrices;</li><li>concept of the rank of the matrix (or rank of the system of vectors) and its application to solving problems;</li><li>different techniques to solving systems of linear equation with any finite number of equations and unknown parameters;</li><li>linear spaces and their subspaces: definition, bases and dimensions, properties of linearly dependent and independent systems of vectors, coordinates of vectors in different bases;</li><li>linear operators and their matrices;</li><li>Euclidian space: definition, different methods to define a scalar product of vectors; vector orthogonalization;</li></ul> | | |

| | |
|---|---|
| | • quadratic form: canonical and normal form;<br>• algebraic structures: groups, rings, fields |