



Exam : Mathematics

Syllabus for the Admission Examination to “Politehnica” University of Timisoara

Field :

Subject: Mathematics

Faculty of Automation and Computers

- **Bachelor’s Programmes : Computers and Information Technology**
 - Bachelor Level I, years of study: 4 – Romanian-medium programmes and English-medium programmes
- **Bachelor’s Programmes: Systems Engineering**
 - Bachelor Level I, years of study: 4 – Romanian-medium programmes

Faculty of Electronics and Telecommunications

- **Bachelor’s Programmes: Electronics and Telecommunications Engineering**
 - Bachelor Level I, years of study: 4 – Romanian-medium programmes and English-medium programmes

Syllabus

Elements of algebra

Arithmetical and geometrical progressions

Functions: integer part function , square root function , quadratic function , Exponential and Logarithmic functions, Irrational equations , Exponential and logarithmic equations

Systems of non-linear equations , Permutations , arrangements , combinations , Newton's binomial

Complex numbers in the algebraic form . Complex numbers in the geometric form

Matrices , determinants , systems of linear equations

Composition laws .Groups .Rings and fields . Polynomial rings with coefficients in a commutative field.

Elements of geometry and trigonometry

Plane vectors .Trigonometric functions .Relations between trigonometric functions .Trigonometric equations . Scalar product .

Trigonometric applications in plane geometry :cosine law, sine rule , solution of triangles . Equations of a straight line in plane geometry . Parallelism and perpendicularity of two straight lines . Calculus of distances and areas .Circles , ellipses , hyperbolas , parabolas and their graphic representations .

Elements of Mathematical Analysis

Limits of sequences . Limits of functions . Continuity .Differentiability . Applications of derivatives for the study of the variation of functions .Primitives .Definite integral .Applications of definite integral :area of a plane surface ,volume of rotation bodies , calculus the limit of a sum using definite integrals .

Bibliography:

- [1] Alternative handbooks approved by the Romanian Ministry of Education for IXth, Xth, Xith, XIIth grade;
- [2] *** Mathematical tests (with choose option response) for the high school graduated and the university admission examinations. Ed. Politehnica, Timisoara, 2004;
- [3] *** Mathematics Test (for Admission Examination)

*Note:*The selected exam subjects will contain problems as those contained in bibliography sources.