BM1100

Study program / course: Mechanical Engineering

Type and level of study: Bachelor academic studies

Course: Mathematics 1

Lecturers: Petrovic Miroslav

Status of course: Obligatory, joint for all modules, I semester

Number of ECTS: 7

Precondition: None

The objective of course

Introducing the students with basic concepts in analytical geometry (vector algebra, surfaces and lines in space), linear algebra (systems of differential equations, matrices, determinants) and mathematical analysis (functions, boundary values, derivatives). Qualifying the students for solving problems and tasks from the mentioned areas using scientific procedures and methods. Qualifying the students for attending other courses at the studies.

The outcome of course

Acquiring necessary theoretical knowledge and understanding the problems related to analytical geometry, linear algebra and mathematical analysis. Mastering the skills and methods of solving the tasks and problems from mentioned areas.

Syllabus

Theoretical study

Analytical geometry. Set of free vectors in space. Scalar, vector and mixed vectorial product. Surfaces and lines in space. Equation of plane. Equation of line in space. Equation of sphere. Algebraic surfaces of second order. Linear algebra. Matrices and determinants. Inverse matrix. Systems of linear algebraic equations. Gauss method of elimination. Mathematical analysis. Functions - basic principles. Basic elementary functions. Arrays. Function boundary value. Continuity of function. Differential calculus. Definition of derivatives and differentials and their geometrical and mechanical meaning. Basic rules of calculation of derivatives and differentials. Derivatives and differentials of higher order. L'Hopital's rules. Taylor's formula. Testing of function with differential calculus method.

Practical classes.

Program of practical classes is identical to program of theoretical study.

Recommended reading

1. Petrovic, M,: "Mathematics", Faculty of science, Kragujevac, 1994
2. Uscumlic, M., Trifunovic, M., Milicic, P.: "Elements of higher mathematics", Naucna knjiga, Belgrade, 1990
3. Petrovic-Torgasev, M., Lazic, M.: "Collection of solved problems from Mathematics 1", Faculty of Mechanical Engineering, Kragujevac, 2003

The number of hours of active teaching:				Other classes:
Theory: 2	Practical classes: 2	Other forms of teaching: 0	Research study: 0	1

Methods of teaching

Evaluation of knowledge

Pre-final exam obligations	**points**	**Final exam**	**points**
Activities during the classes:	**6**	oral exam	**46**
Practical classes:			
Colloquiums(s) :	**48**		
Seminar(s) :			