Tárgytematika

Félév: 2020/21/1 **Tárgynév:** Műszaki Matematika 1. **Tárgykód:** MSB293ANEP

Felelős szervezet neve:	Mérnöki és Smart Technológiák Intézet
Felelős szervezet kódja:	MIK-MS
Tárgyfelelős neve:	Dr. Perjésiné Dr Hámori Ildikó Viktória
Tárgy követelménye:	Vizsga
Tárgy heti óraszáma:	2/2/0/0
Tárgy féléves óraszáma:	10/10/0/0

Oktatás célja:

Upon completion of this course the student should be able to: **interpret,** and **put into practice**

1. operations with vectors,
2. elementary functions in one variable,
3. sequences of real numbers
4. differential calculus of functions

This lecture and practical based course aims to give students a solid mathematics basis through covering the following topics: sets of numbers (natural, integer, rational, real and complex numbers); vectors and operations with vectors, scalar and vector products and their applications; sets and operations with sets; matrix and determinant, solving linear equation systems definition of functions. Presentation of elementary functions; polynomials; rational functions; algebraic functions, trigonometric and logarithmic functions. Sequences of real numbers (definition of monotonicity, limit, convergence and divergence); limit and continuity of functions; types of discontinuity; definition of tangents; differential calculus of functions in one variable, differential coefficient, derivatives, relations between differentiability and continuity; rules of derivation, derivatives of elementary functions; osculating circles, tangent of the plane curve at a given point.

Students learn the basics of mathematics enabling them to interpret and understand engineering sciences and through solving elementary tasks they deepen their basic theoretical knowledge in the field of engineering. The practical sessions are designed to complement the requirements of different specialisations.

Tantárgy tartalma:

1. Basic concepts of mathematics: definition, theory, proof, symbols of mathematicsReal numbers, sets and operations with sets, complex numbers: operations with algebraic form
2. Complex numbers: operations with trigonometrical and exponential form
3. Vectors and operations with vectors, scalar and vector products
4. Matrix and determinant
5. Solving linear equation systems using Cramer's rule and Gauss-Jordan elimination
6. Definition of functions, presentation of elementary functions operations on function
7. Inverse function, classifying functions, Logarithmical and exponential function
8. Basic trigonometric constructions, trigonometric function and their inverses.
9. Sequences of real numbers
10. Limit and continuity of functions
11. Differential coefficient, derivative Relations between differentiability and continuity Rules of derivation, derivatives of elementary functions

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Számonkérési és értékelési rendszere:

Grading will follow the course structure with the following weight:

1. Class participation, class activity 10 %
2. Homework 10 %.
3. 3 MidtermTests 80 %
4. Offered exam grade: over 65 % during the study and correction period.
5. Written exam in the exam period. A minimum of 55% is required to pass the exam.

Grading scale

Numeric Grade:	5	4	3	2	1
Evaluation in points:	89%-100%	77%-88%	66%-76%	55%-65%	0-54%

Kötelező irodalom:

George B. Thomas, Jr.: Thomas' Calculus, Pearson Addision Wesley, 2005.

Anthony J. Pettofrezzo: Vectors and Their Applications, Dover Books on Mathematics, 2005.