General Information:

Name of Course:

MATHEMATICS FOR INFORMATION TECHNOLOGY 1

Course Code:	IVB291ANMI **Semester:** 1st
Number of Credits:	6
Allotment of Hours per Week:	2 lectures, 2 practices
Evaluation:	Exam (with grade)
Prerequisites:	**-**
Instructors:	**Dr Ildikó PERJÉSINÉ HÁMORI, associate professor**
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Introduction, Learning Outcomes

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

        a. operations with vectors,
        b. elementary functions in one variable,
        c. sequences of real numbers
        d. differential calculus of functions

General Course Description and Main Content:

Brief Syllabus: 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; 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.

Methodology:

The presentations give an introduction to important mathematical techniques of exercise solving and the basic theory of calculus. Equal emphasis is given to learning new mathematics and to learning how to construct and write down correct mathematical arguments.

Schedule:

Study period in 15 weeks: September 3 - December 14 (2018)

1. Orientation test, basic concepts of mathematics: definition, theory, proof, symbols of mathematics
2. Real numbers, sets and operations with sets, complex numbers: operations with algebraic form
3. Complex numbers: operations with trigonometrical and exponential form
4. Vectors and operations with vectors, scalar and vector products
5. Matrix and determinant
6. Solving linear equation systems using Cramer's rule and Gauss-Jordan elimination **1st Homework**
7. Definition of functions, presentation of elementary functions   operations on functions
    1st test
8. Inverse function, classifying functions, Logarithmical and exponential function
9. *Autumn break – no class*
10. Basic trigonometric constructions, trigonometric function and their inverses.
11. Sequences of real numbers **2nd Homework**
12. Limit and continuity of functions **2nd test**
13. Differential coefficient, derivative
14. Relations between differentiability and continuity Rules of derivation, derivatives of elementary functions
    3rd Homework
15. **3rd test**

Correction period: December 17-21 (2018)
Exam: January 3 (2019)

Attendance:
Attending is required all classes, and will impact the grade (max. 10%). Unexcused absences will adversely affect the grade, and in case of absence from more than 30% of the total number of lesson will be grounds for failing the class. To be in class at the beginning time and stay until the scheduled end of the lesson is required, tardiness of more than 20 minutes will be counted as an absence. In the case of an illness or family emergency, the student must present a valid excuse, such as a doctor's note.

Evaluation + Grading
Grading will follow the course structure with the following weight:
1. Class participation, class activity 10 %
2. Homework 10 %.
3. Test 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%

Students with special needs:
Students with special physical needs and requiring special assistance must first register with the Dean of the Students Office. All reasonable requests to provide an equal learning environment for all students is to be assured.

Required Reading and other Materials will be equivalent to:
GEORGE B. THOMAS, JR.: THOMAS' CALCULUS, PEARSON ADDISION WESLEY, 2005.
ANTHONY J. PETTOFREZZO: VECTORS AND THEIR APPLICATIONS, DOVER BOOKS ON MATHEMATICS, 2005.