Course description, Requirements

Óbuda University Bánki Donát Faculty of Mechanical and Safety Engineering	Institute of Natural Sciences and Basic Subjects (TAI)

Course title and code: Mathematics I, BTXMME1BNF **Credits: 5**
Full-time, semester 1.

Faculties in which the subject is taught: **Mechatronics engineer, BSc**

Supervised by:	**Dr. Hanka László**	Instructors:	Dr. Hanka László
Prerequisites conditions:	-		

Lessons per week:	Theory: 2	Practice (in Auditorium): 2	Laboratory: 0	Consultation:
Exam type (s,v,f):	exam			

Syllabus

Aim: The purpose of the lecture is to present efficient mathematical tools that can be successfully applied in engineering sciences. In the framework of the practice lessons, the students deepen their knowledge through practical tasks, thereby becoming able to solve complex engineering problems at the end of the semester.

Curriculum: Elementary algebra, Polynomials, Trigonometry, vector geometry, Complex algebra, Functions, Sequences, Limit, Differentiation and its applications.

Topics:	**Lec.**	**Lab.**
1. Elementary algebra, Solving equations.	**2**	**2**
2. Polynomials, Binomial theorem.	**2**	**2**
3. Trigonometry, functions, identities, equations.	**2**	**2**
4. Vector geometry, basic vector operations.	**2**	**2**
5. Analytic geometry.	**2**	**2**
6. Komplex algebra.	**2**	**2**
7. Functions, operations.	**2**	**2**
8. Sequences, limit of a sequence.	**2**	**2**
9. Limit of function	**2**	**2**
10. Definition of derivative, linear approximation.	**2**	**2**
11. Differentiation rules.	**2**	**2**
12. Function analysis.	**2**	**2**
13. L'Hospital's rule.	**2**	**2**
14. Applications of the derivative.	**2**	**2**

Semester requirements
1 midterm test.

Requirements:

There will be 10 **blitz quizzes**, each worth 2 points. You can miss at most 3 quizzes! If you miss more than three, you can't get a signature!!!

One **midterm test**: On the 10th week. Its subjects are the topics covered up to the 7th week, both the theory and the problems. On the test you can get 30 points. If you take the midterm, you get a signature.

In case you missed or failed the test you have to retake it in order to qualify for the exam. If you passed the test you may retake it if you want to try to improve your score. In this case the last result will be taken to the exam!

If you have a signature, you are free to take the **exam** in the exam period. The exam covers only the topics presented between weeks 8 and 14. On the exam you can get 50 points. The minimum score you have to get in order to pass is 15 points.

The **grade** is determined by the sum of the points you achieved on the tests (quizzes and midterm) and on the exam. The intervals are as follows:

0-39%: fail (1)
40-54%: pass (2)
55-69%: satisfactory (3)
70-84%: good(4)
85-100%: excellent (5)

Exam method: written

Literature:

Mandatory:
Thomas Calculus I-III.; Pearson Addison- Wesley, 2005
Stewart Calculus; Brooks, 2008
Sheldon Ross: A first course in probability, Pearson, 2010
Paul Dawkins: Differential Equations, Prentice-Hall, 2007

Offered: