Részletes tantárgyprogram és követelményrendszer

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 **Full-time, semester 1.**		**Credits: 5**
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
2 midterm tests.

Requirements:
There will be 10 blitz quizzes, each worth 2 points. One **midterm test**: On the 12th week. Its subjects are the topics covered up to the 9th week, both the theory and the problems. On the test you can get 30 points. The **prerequisite for the signature** is the achievement of at least 25 points on the test and the quizzes. 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 case you fail to achieve 25 points even after retaking the test, you can take a special **exam to get the signature** at the beginning of the exam period. 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 13. On the exam you can get 50 points, 10 for theory and 40 for problems. 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 test and on the exam. The intervals are as follows: 0-49% : fail (1) 50-62% : pass (2) 63-74% : satisfactory (3) 75-87% : good(4) 88-100% : 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: