UNIVERSITY OF PÉCS POLLACK MIHÁLY FACULTY OF ENGINEERING AND INFORMATION TECHNOLOGY
DEPARTMENT OF MATHEMATICS
2014/2015/ 1.

M A T H E M A T I C S B / 1

Copies of the approved course syllabus are available at:
www. pmmik.pte.hu

Catalogue information:
ECTS credits: 5

course number:

prerequisites: -
allotment of hours per week: 4 L, 0 P

Instructor:
Mihály Klincsik CSc, professor, Ildikó Perjésiné Hámori, PhD, associate professor
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General Course Description:[1]
Brief Syllabus: This lecture and practical based course aims to give architecture students a solid mathematics basis through covering the following topics: sets of numbers (natural, integer, rational and real 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, curvature of the plane curve at a given point, Taylor-polynomials, testing functions.

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.

Methods:
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.

Learning Objectives:
Upon completion of this course the student should be able to:

1. **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

[1] az akkreditációs anyag rövidleírása

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Required Reading and other Materials will be equivalent to:
Required Reading:

GEORGE B. THOMAS, JR.: THOMAS' CALCULUS, PEARSON ADDISION WESLEY, 2005.
ANTHONY J. PETTOFREZZO: VECTORS AND THEIR APPLICATIONS, DOVER BOOKS ON MATHEMATICS,
2005.

Programme:

1. Orientation test
2. Basic concepts of mathematics: definition, theory, proof, symbols of mathematics
3. Sets and operations with sets
4. Vectors and operations with vectors, scalar and vector products
5. Applications of vectors: equation of plane and line
6. 1st test
7. Definition of functions, presentation of elementary functions
8. Trigonometric and logarithmic functions
9. Sequences of real numbers
10. Limit and continuity of functions
11. Differential coefficient, derivative, relations between differentiability and continuity
12. Rules of derivation, derivatives of elementary functions
13. 2nd test
14. Osculating circles, curvature of the plane curve
15. Taylor-polynomials, testing functions

Completing of the course is dependent on the following:

1. Class participation, class activity. Any unexcused absences will negatively affect your grade; 3 unexcused absences will result in failing the class. If you need to miss a class for any reason, please notify your professor by email prior to the start of that class.
2. Achieving more than 40% in the two written tests during the semester.
3. Written exam in the exam period. A minimum of 40% is required to pass the exam.

Grading scale

Grade	5	4	3	2	1
Numeric Grade	100-86	85-71	70-56	55-41	40-0

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.