**Mathematics A2 (BMETE90AX02)**

Lecturer: *Dr. Marianna Bolla* (marib@math.bme.hu , +3614631111/5902), *Dr. Peter Moson* (moson@math.bme.hu , +3614632690, +36309329626).

*Prerequisites:* Mathematics A1.

*Detailed program* (see e.g. Bulletin – BME).
Mathematics A2a -Vector Functions
Solving systems of linear equations: elementary row operations, Gauss- Jordan- and Gaussian elimination. Homogeneous systems of linear equations. Arithmetic and rank of matrices. Determinant: geometric interpretation, expansion of determinants. Cramer's rule, Vandermonde determinant. Linear space, subspace, generating system, basis, orthogonal and orthonormal basis, Gram-Schmidt orthogonalization. Linear maps, linear transformations and their matrices. Kernel, image, dimension theorem. Linear transformations and systems of linear equations. Eigenvalues, eigenvectors, similarity, diagonalizability.
Infinite series: convergence, divergence, absolute convergence. Sequences and series of functions, convergence criteria, power series, Taylor series.
Fourier series: expansion, odd and even functions.
Functions in several variables: continuity, differential and integral calculus, partial derivatives, Young's theorem. Local and global maxima/minima. Vector-vector functions, their derivatives, Jacobi matrix. Integrals: area and volume integral.
6 hours/6 credits.

*Literature:*

THOMAS'CALCULUS by Thomas, G.B. et al. Addison-Wesley, 2005. (ISBN0321185587)

K.F.RILEY,M.P.HOBSON,S.J.BENCE. Mathematical methods for physics and engineering. Cambridge University Press 1998 (reprinted 2000). (ISBN 0 521 55529 9 paperback)

ANTON, H., Elementary Linear Algebra, Wiley, 1987.

*Lectures, practical lectures.*

On Mondays Dr. Bolla will teach the part "Linear algebra" of the course.

On Tuesdays, Wednesdays Dr. Moson will teach the parts "Function of several variables" and "Functional sequences, series".

*Attendance:*
Being absent for more than 30% of the classes will result in denial of the final grade.

*Grading system.*

*Midterm tests. 40%.* Ms. Bolla's part: March 13, 2017. *7%*., April 24, 2017. *7%.* Mr. Moson's parts: March 14, 2017. *13%*, May 2, 2017. *13%*. The sum of the results of the 4 tests must be at least 12% for the signature.

*Make up tests* (for students whose sum of the midterm tests is less than *12%*): 14-th week (May 8-9, 2017).

*Written exam. 60%.* Only for students having signature. Dates: May 16, May 23, May 30, June 13, 2017.

Marks: 0-39 fail (1), 40-54 pass (2), 55-69 satisfactory (3), 70-… good (4).

If the sum of midterm tests and written exam is more than 78% then the student can take part at an *oral exam* for the mark excellent (5).

Home pages of the professors: Google: Bolla Marianna, Moson Péter.

***Good Luck, Have a Nice Semester!***