

Lecturer: Dr. Aniko Csakany
csakany@math.bme.hu

office: H 510 (or K.I.7.)

Course requirements:

Presence sheet should be signed during each class. Maximum portion of absences: 30%.

There will be 2 Midterm Tests (50 minutes, 20 points each) , pocket calculator and formula sheet (handed out by the department) can be used. Passing limit (faculty signature): 30% (6 points) in each test.

Test 1: 6th week

numerical series, function series, power series, Fourier series, matrices, determinants, systems of linear equations

Test 2: 12th week

vector spaces, linear transformations, eigen-values, eigen-vectors, space curves, surfaces, multivariable functions, continuity, differentiation, local extrema, double integrals

Repetition Test: 13th week

One of the two tests can be repeated during the 13th week of the semester. Anyone can retake one test, the last result counts. (Students can increase and also decrease their former score on the repeated tests!)

By the **open book short quizzes** and take-home quizzes students – only who meet the above requirements of faculty signature - may increase their total score.

Students who fail to meet the required 30 % on midterm tests by the end of the semester can retake one test (this is called Faculty Signature Test) during the make-up week. (Extra fee will be charged.)

Students already having the faculty signature:

- may retake the tests, in this case their midterm result equals to the sum of their test scores;
- may not retake the tests, in this case their midterm result is their past result. If not requested else by the end of first week it will be assumed to be 12 points.

Weight of midterm work in final grade : 40 % (40 points)

Weight of written Final Exam in final grade : 60%. (60 points)

In the Final Exam the passing limit is 40% .

| | | | |
|---------------|-------------|---|--------------|
| Final grades: | - 39 points | 1 | failed |
| | 40 - 54 | 2 | passed |
| | 55 - 69 | 3 | satisfactory |
| | 70 - 84 | 4 | good |
| | 85 - 100 | 5 | excellent |

Textbooks:

Thomas: Calculus, 11th edition , Addison Wesley

H. Anton: Elementary Linear Algebra

E. Kreyszig: Advanced Engineering Mathematics

Topics:

Infinite series: convergence, divergence, absolute convergence. Sequences and series of functions, convergence criteria, power series, Taylor series. Fourier series: expansion, odd and even functions.

Systems of linear equations: elementary row operations, Gaussian elimination. Homogeneous systems of linear equations. Arithmetics, and rank of matrices. Determinant: geometric interpretation, expansion of determinants. Inverse matrix. Cramer's rule. Linear space, subspace, generating system, basis, orthogonal and orthonormal basis. Linear maps, linear transformations and their matrices. Linear transformations and systems of linear equations. Eigenvalues, eigenvectors, similarity, diagonalizability. 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 integrals.

Topics according to weeks (subjected to change):

1. Numerical Series, convergence, divergence, absolute and conditional convergence, convergence criteria.
2. Power series, Taylor Series.
3. Fourier Series, expansion, odd and even functions.
4. Systems of Linear Equations, elementary row operations, Gaussian Elimination, homogeneous systems.
5. Matrices, Determinants, Rank, Cramer's Rule, Inverse Matrix.
6. Linear space, subspace, generating system, basis, orthogonal and orthonormal basis. Linear maps, linear transformations and their matrices., change of basis (Midterm Test #1)
7. Linear transformations. Eigenvalues, eigenvectors, similarity. Diagonalization, Quadratic Forms.
8. Multivariable functions, limits, continuity, partial derivatives.
9. Differentiation of multivariable functions, Taylor polynomial, local extrema.
10. Double integrals.
11. Double integrals with substitution. Triple Integrals .
12. Multiple Integrals in Cylindrical Coordinates, Spherical Coordinates (Midterm Test #2)
13. Vector functions. Curves in 3D.
14. Integration along curves

Days off (no lectures):

14-15 March (Mon-Tue) (National Holiday)
15 April (Fri) (Vasarhelyi Day, only Faculty of Civil Engineering)
25 April (Easter Mon)

Extra week day:

19 March (Sat!!)

Feb 4, 2011

Dr. Aniko Csakany
Department of Stochastics