Mathematics A2a 2009/10/2
BMETE90AX02

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, 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 qiuzes and take-home quizes 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 can take a 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 30% (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% (40 points of the total 100 points).

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, conergence, divergence, absolute and conditional conergence, convergence criteria.
2. Power series, Taylor Series.
3. Fourier Series, expansion, odd and even functions.
4. Systems of Linear Equatins, 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. Doble 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

Nov 23, 2009

Dr. Aniko Csakany
Department of Stochastics