Program	Level	First cycle			
	Name of the program	Mathematics Education, Pure Mathematics, Applied Mathematics			

COURSE					
Course title	**Numerical Mathematics**				
Course code	Semester	Course status		ECTS	Contact hours (L+AE+LE)
AMAT 220	III	Mandatory course		5	2+0+2
Lecturer					
Course Goals	Goal of this module is to introduce a student to the theory of errors, algorithms and representation of basic algorithms for solving systems of linear equations, for solving nonlinear equations, for function approximation and interpolation.				
Learning Outcomes	Understanding basic numerical algorithms and their application.				

COURSE CONTENT

- Problems of numerical mathematics. Examples.
- Preliminaries from Analysis and Linear algebra.
- Sources of errors (model errors, rounding methods).
- Solving systems of linear equations by direct methods (Gaussian elimination method, LU factorization).
- Symmetric matrices. Cholesky factorization.
- Solving systems of linear equations by iterative methods.
- Solving nonlinear equations: Bisection method. Newton method. Secant method.
- Sparse matrices and applications.
- Introduction to approximation. Taylor's polynomial.
- Interpolation. Lagrange interpolation polynomial. Divided differences. Newton's interpolation polynomial Hermitte interpolation. Chebyshev polynomials.
- Least squares method.
- Numerical integration.

LITERATURE

[1]   W. Cheney, D. Kincaid, Numerical mathematics and computing, Thomson Brooks/Cole, 2004.
[2]   R. L. Burden, J. D. Faires, Numerical analysis, Pacific Grove, California: Brooks/Cole, 2001.

STUDENT WORKLOAD (hours in a semester)

Lectures	30	Exercises	30	Individual work	65	T o t a l	125

GRADING			REMARKS	
Criterion	Maximum points	Minimum points		
Midterm exams	80	45		
Final exam	20	10		
T o t a l	100	55		