Program	Level	First cycle
	Name of the program	Mathematics and Informatics Education, Theoretical Computer Science

COURSE				
Course title	**Numerical Methods**			
Course code	Semester	Course status	ECTS	Contact hours (L+AE+LE)
CS 220	III	Mandatory course	4	2+1+2
Lecturer				
Course Goals	The aim of the course is to introduce the students to basic algorithms for numerical solving characteristic problems that arise both in pure mathematics and in applications in science and technology.			
Learning Outcomes	Upon succesful completion of the course students will be able to: - Be familiar with algorithms for solving standard problems of a numerical nature. - To be able to independently program numerical algorithms.			

COURSE CONTENT

-Algorithms for calculating polynomials and rational functions.
-Algorithms for calculating basic elementary functions
-Algorithms of the interpolation type.
- Algorithms for working with matrices.
-Algorithms for matrix decompositions.
-Algorithms for numerical differentiation.
-Dual numbers and automatic differentiation.
-Algorithms for numerical integration.
-Algorithms for the numerical solution of differential equations.
-Applications in physics and technology.
-Monte-Carlo method and simulations.
-Introduction to linear programming.

LITERATURE

[1] W. Cheney & D. Kincaid, Numerical Mathematics and Computing, Brooks Cole (2012)
[2] L.N. Trefethen & D. Bau III, Numerical Linear Algebra, SIAM (1997)
[3] W. Ford, Numerical Linear Algebra with Applications using MATLAB, Elsevier (2014)

STUDENT WORKLOAD (hours in a semester)

Lectures	30	Tutorial	45	Individual work		T o t a l	100

GRADING			REMARKS
Criterion	Maximum points	Minimum points	
Midterm exams	50	25	
Final exam	50	25	
T o t a l	100	55	