Program	Level	Second cycle			
	Name of the program	Applied Mathematics			
COURSE					
Course title	**Advanced Numerical Methods**				
Course code	Semester	Course status	ECTS	Contact hours (L+AE+LE)	
AMAT 465	II	Mandatory course	7	2+2+1	
Lecturer					
Course Goals	The goal of this subject is to introduce a student to some modern numerical methods which are used in science and industry in the numerical solving of ordinary and partial differential equations.				
Learning Outcomes	After finishing this subject successfully student will be able to understand finite element method, wavelet element method as some meshfree methods. Student will be ready to apply the same methods in applications.				

COURSE CONTENT

- Problems of optimization.
- Operator equations and variational methods.
- Numerical solution of boundary value problems for ordinary and partial differential equations.
- Finite element method.
- Variational inequalities and their applications.
- Wavelets and their applications to the numerical solution of the partial differential equations
- Meshfree methods.
- Reproducing kernel particle method (RKPM method).

LITERATURE

[1] Abul Hasan Siddiqi, Applied Functional Analysis. Numerical methods, Wavelet methods and image processing, King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia, 2004.

[2] J. Stoer, R. Bulirsch: Introduction to Numerical Analysis (2nd ed.), Springer, 1996

[3] K. W. Morton, D.F. Mayers: Numerical solution of partial differential equations. An introduction (2nd ed), Cambridge University Press, 2005.

[4] J. W. Thomas: Numerical partial differential equation. Conservation laws and elliptic equations, Springer, 1999

[5] A. Quarteroni, A. Valli: Numerical Approximation of Partial Differential Equations, Springer, 1997

STUDENT WORKLOAD (hours in a semester)

Lectures	30	Exercises	45	Individual work	100	T o t a l	175

GRADING			**REMARKS**
Criterion	Maximum points	Minimum points	
Midterm exams	20	10	
Zadaće	15	10	
Projects	40	30	
Seminarski rad	5	0	
Final exam	20	5	
T o t a l	100	55	