ESOGÜ Mathematics and Computer Sciences Department
COURSE INFORMATION FORM

SEMESTER	Fall

COURSE CODE	821613006	COURSE NAME	Numerical Analysis I

SEMESTER	WEEKLY COURSE PERIOD			COURSE OF			
	Theory	Practice	Labratory	Credit	ECTS	TYPE	LANGUAGE
3	3	0	0	3	5	COMPULSORY () ELECTIVE (X)	Turkish

COURSE CATAGORY		
Mathematics	**Computer**	**Social Science**
X		

ASSESSMENT CRITERIA			
	Evaluation Type	**Quantity**	**%**
MID-TERM	1st Mid-Term	1	50
	2nd Mid-Term		
	Quiz		
	Homework		
	Project		
	Report		
	Others (………)		
FINAL EXAM		1	50

PREREQUIEITE(S)	None
COURSE DESCRIPTION	Taylor theorem and Taylor series, errors, numerical solutions of equations in one variable, error analysis for iterative methods, interpolation and polynomial approximation, numerical differentiation, numerical integration, numerical solutions of initial value problems, systems of ordinary differential equations, direct methods for solving linear systems, iterative methods for solving linear systems.
COURSE OBJECTIVES	The aim of the course is to introduce the concepts and techniques involved in the basic topics listed in this lecture and to develop skills in applying those concepts and techniques to solve the problem using numerical approaches.
ADDITIVE OF COURSE TO APPLY PROFESSIONAL EDUATION	Gain the ability of problem solution using numerical approaches.
COURSE OUTCOMES	Gain sufficient knowledge of numerical analysis subject, related with science and own branch; an ability to apply theoretical and practical knowledge on solving and modeling of problems.
TEXTBOOK	Burden, R. L. & Faires J. D. (1993). Numerical Analysis. Fifth Ed., PWS Publishing Company, Boston.
OTHER REFERENCES	Ward Cheney & David Kincaid, Numerical Mathematics and Computing, Second Ed., Cole Publishing Company, California, 1985.
TOOLS AND EQUIPMENTS REQUIRED	

COURSE SYLLABUS

WEEK	TOPICS
1	Taylor Theorem and Taylor Series
2	Errors
3	Numerical Solutions of Equations in One Variable
4	Error Analysis For Iterative Methods
5	Error Analysis For Iterative Methods
6	Interpolation and Polynomial Approximation
7	Numerical Differentiation
8	Midterm
9	Numerical Integration
10	Numerical Integration
11	Numerical Solutions of Initial Value Problems
12	Numerical Solutions of Initial Value Problems
13	Systems of Ordinary Differential Equations
14	Direct Methods For Solving Linear Systems
15	Iterative Methods For Solving Linear Systems
16,17	Final Exam

NO	PROGRAM OUTCOMES	3	2	1
1	The ability to apply knowledges of Mathematics and Computer Sciences,		X	
2	To have sufficient theoretical and practical knowledge of Mathematics at international level,	X		
3	The ability of describing, modelling and solving of mathematical problems at Mathematics and related subjects,	X		
4	The skill to solve and design a problem process in accordance with a defined target,	X		
5	Skills to analyze data, interpret and apply to other datum and using these data on computer,		X	
6	The skill to use the modern techniques and computational tools needed for mathematical applications,	X		
7	The skill to make team work within the discipline and interdisciplinary,		X	
8	The ability to improve oneself by following the developments on other modern, scientific and technological subjects as well as Mathematics and Computer Sciences,		X	
9	The skill to communicate orally and in written way, in a clear and concise manner by having individual work skills and ability to independently decide and analytical thinking,		X	
10	The skill to have professional and ethical responsibility,		X	
11	The skill to have consciousness for quality issues and scientific research,		X	
12	The skill to be sensitive to environmental issues related with problems and development of living area and consistent in the social relations,		X	
13	Ability to solve problems in the working life faced to find an appropriate algoritms via mathematical modeling and to write computer programs,	X		
14	The skill to developed design of software systems at different complex levels,		X	
15	The credence of necessity of life-long learning and ability to apply the formation long-life learning.		X	
1:None. **2**:Partially contribution. **3**: Completely contribution.				

Instructor(s): Prof. Dr. Bülent SAKA

Signature: **Date:** 29.08.2022