



**ESOGÜ Mathematics and Computer Science Department**  
**COURSE INFORMATION FORM**

<b>SEMESTER</b>	Fall
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<b>COURSE CODE</b>	821617022	<b>COURSE NAME</b>	Applications of Numerical Solutions of the Partial Differential Equations I
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SEMESTER	WEEKLY COURSE PERIOD			COURSE OF			
	Theory	Practice	Labratory	Credit	ECTS	TYPE	LANGUAGE
7	2	2	0	3	5	COMPULSORY (x) ELECTIVE ( )	Turkish

COURSE CATAGORY			
Mathematics	Computer	[if it contains considerable design, mark with (√) ]	
√			

ASSESSMENT CRITERIA			
	Evaluation Type	Quantity	%
<b>MID-TERM</b>	1st Mid-Term		
	2nd Mid-Term		
	Quiz		
	Homework	1	40
	Project		
	Report		
	Others (.....)		
<b>FINAL EXAM</b>		1	60
<b>PREREQUIEITE(S)</b>	None.		
<b>COURSE DESCRIPTION</b>	Derivation of the finite difference methods, parabolic, hiperbolic and elliptic equations		
<b>COURSE OBJECTIVES</b>	Finding the numerical solutions of the partial differential equations.		
<b>ADDITIVE OF COURSE TO APPLY PROFESSIONAL EDUATION</b>	Gaining the knowledges to find solution of the partial differential equations using the finiite difference methods		
<b>COURSE OUTCOMES</b>	Development of the finite difference methods and finding the approximate solutions of the partial differential equations existing in the physicaşl and social areas .		
<b>TEXTBOOK</b>	Numerical Partial Differential Equations:Finite Difference Methods ,J. W. Thomas		
<b>OTHER REFERENCES</b>	Numerical solution of differential equation M. K. Jain,		
<b>TOOLS AND EQUIPMENTS REQUIRED</b>	None.		

## COURSE SYLLABUS

WEEK	TOPICS
1	Derivation of the finite difference methods
2	Derivation of the finite difference methods
3	Stability of the finite difference methods
4	Stability of the finite difference methods
5	Parabolic equations
6	Parabolic equations
7	Solving problem
8	Midterm
9	Hyperbolic equations
10	Hyperbolic equations
11	Eliptic equations
12	Elliptic equations
13	The introduction of numerical solution of the system of time-dependent system using finite difference equations
14	The introduction of numerical solution of the system of time-dependent system using finite difference equations.
15	Solving problems
16,17	Final

NO	PROGRAM OUTCOMES	3	2	1
1	The ability to apply knowledges of Mathematics - Computer,	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 - Computer,	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 algorithms 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):** Öğr.Gör.Dr. Melis Zorşahin Görgülü

**Signature:**

**Date:**