



T.C.

ESKİŞEHİR OSMANGAZİ UNIVERSITY

FACULTY OF SCIENCES

MATHEMATICS AND COMPUTER SCIENCES DEPARTMENT



COURSE INFORMATION FORM

Course Name	Course Code
Applications of Numerical Solutions of the Partial Differential Equations I	

Semester	Number of Course Hours per Week		Credit	ECTS
	Theory	Practice		
7	2	2	-	6

Course Category (Credit)				
Basic Sciences	Engineering Sciences	Design	General Education	Social
x				

Course Language	Course Level	Course Type
Turkish	Undergraduate	Compulsory

Prerequisite(s) if any	
Objectives of the Course	Finding the numerical solutions of the partial differential equations
Short Course Content	Derivation of the finite difference methods, parabolic, hyperbolic and elliptic equations

Learning Outcomes of the Course	Contributed PO(s)	Teaching Methods *	Measuring Methods **
1 Development of the finite difference methods and finding the approximate solutions of the partial differential equations existing in the physical and social areas	1,2,3,4,5,6,7,8,9,10,11,13,14,15	1,2,6,10,11,15	D, G
2			
3			
4			
5			
6			
7			
8			

*Teaching Methods 1:Expression, 2:Discussion, 3:Experiment, 4:Simulation, 5:Question-Answer, 6:Tutorial, 7:Observation, 8:Case Study, 9:Technical Visit, 10:Trouble/Problem Solving, 11:Individual Work, 12:Team/Group Work, 13:Brain Storm, 14:Project Design / Management, 15:Report Preparation and/or Presentation

**Measuring Methods A:Exam, B:Quiz, C:Oral Exam, D:Homework, E:Report, F:Article Examination, G:Presentation, I:Experimental Skill, J:Project Observation, K:Class Attendance; L:Jury Exam

Main Textbook	Numerical Partial Differential Equations:Finite Difference Methods ,J. W. Thomas
Supporting References	Numerical solution of differential equation M. K. Jain,
Necessary Course Material	

Course Schedule	
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	Mid-term exam
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 exam

Calculation of Course Workload			
Activities	Number	Time (Hour)	Total Workload (Hour)
Course Time (number of course hours per week)	14	4	56
Classroom Studying Time (review, reinforcing, prestudy,...)	14	4	56
Homework	1	28	28
Quiz Exam			
Studying for Quiz Exam			
Oral exam			
Studying for Oral Exam			
Report (Preparation and presentation time included)			
Project (Preparation and presentation time included)			
Presentation (Preparation time included)	1	40	40
Mid-Term Exam			
Studying for Mid-Term Exam			
Final Exam			
Studying for Final Exam			
Total workload			180
Total workload / 30			180/30
Course ECTS Credit			6

Evaluation	
Activity Type	%
Homework	40
Presentation	60
Bir öge seçin.	
Bir öge seçin.	
Bir öge seçin.	
Final Exam	100
Total	40

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (PO) (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)		
NO	PROGRAM OUTCOME	Contribution
1	The ability to apply knowledges of Mathematics and Computer Sciences,	4
2	To have sufficient theoretical and practical knowledge of Mathematics at international level,	4
3	The ability of describing, modelling and solving of mathematical problems at Mathematics and related subjects,	5
4	The skill to solve and design a problem process in accordance with a defined target,	5
5	Skills to analyze data, interpret and apply to other datum and using these data on computer,	3
6	The skill to use the modern techniques and computational tools needed for mathematical applications,	4
7	The skill to make teamwork within the discipline and interdisciplinary,	3
8	The ability to improve oneself by following the developments on other modern, scientific and technological subjects as well as Mathematics and Computer Sciences,	3
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,	3
10	The skill to have professional and ethical responsibility,	2
11	The skill to have consciousness for quality issues and scientific research,	4
12	The skill to be sensitive to environmental issues related with problems and development of living area and consistent in the social relations,	1
13	Ability to solve problems in the working life faced to find an appropriate algorithm via mathematical modeling and to write computer programs,	4
14	The skill to developed design of software systems at different complex levels,	2
15	The credence of necessity of life-long learning and ability to apply the formation long-life learning.	4

LECTUTER(S)				
Prepared by	Assoc. Prof. Melis Zorşahin			
Signature(s)				

Date:19.07.2024