



T.C.

ESKİŞEHİR OSMANGAZİ ÜNİVERSİTESİ

FACULTY OF SCIENCES

MATHEMATICS AND COMPUTER SCIENCES DEPARTMENT

COURSE INFORMATION FORM

Course Name	Course Code
Differential Equations with Mathematica 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	Elective

Prerequisite(s) if any	None
Objectives of the Course	Learning how to use Mathematica package program to solve first and higher order ODEs.
Short Course Content	We give a brief summary of ordinary differential equations (ODEs). We use a computer package programs called Mathematica in order to obtain solutions of ODEs. We also produce package programs for solving some other ODEs. Subjects to be studied as follows: 1. Definition, classification and solutions of ODEs and initial-value problems for ODEs, 2. First order ODEs and their applications. 3. Higher order ODEs and their applications

Learning Outcomes of the Course	Contributed PO(s)	Teaching Methods *	Measuring Methods **
1 Learning how to use the Mathematica packet program related to ordinary differential equations.	1,2	1,2,11	D,J
2 Learning how to solve initial-value problems for higher order ordinary differential equations using Mathematica packet program.	1,2,8	1,2,8	D,J
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	M.N.Özer, D.Eser (2002), Diferensiyel Denklemler(Teori ve Uygulamaları) Birlik offset, Eskişehir. S.Wolfram,(1991),Mathematica, Asystems for doing mathematics by computer, AWP Comp. NewYork
Supporting References	D.G. Zill (1992) Diff. Equations with Boundary-value. Problems,PWS, Kent. E.D. Rainville, P.E. Bedient(1989), Elem. Diff. Eqs. MPC, New York. S.L.Ross (1989) Introduction To ODEs, MPC, New York.
Necessary Course Material	None

Course Schedule	
1	Introduction to ordinary differential equations, Definition, classification and solutions of ODEs.
2	Initial-value problems for ODEs and their solutions
3	Learning how to use Mathematica package program
4	Saving and copying files in Mathematica
5	Loading files and programs in Mathematica
6	First order ODEs , Applications of first order ODEs
7	Midterm Exam
8	How to solve first order ODEs using Mathematica
9	How to solve initial-value problems for first order ODEs using Mathematica
10	Higher order ODEs, Applications of higher order ODEs
11	How to solve higher order ODEs using Mathematica
12	How to solve initial-value problems for higher order ODEs using Mathematica
13	Graphical representation of solutions
14	General review
15	Solution examples
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	64
Classroom Studying Time (review, reinforcing, prestudy,...)	14	4	64
Homework	5	4	20
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)			
Mid-Term Exam	1	2	2
Studying for Mid-Term Exam	1	20	20
Final Exam	1	2	2
Studying for Final Exam	1	30	30
Total workload			202
Total workload / 30			6,73
Course ECTS Credit			6

Evaluation	
Activity Type	%
Mid-term	40
Quiz	
Homework	10
Bir öge seçin.	
Bir öge seçin.	
Final Exam	50
Total	100

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,	5
6	The skill to use the modern techniques and computational tools needed for mathematical applications,	4
7	The skill to make team work 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,	4
10	The skill to have professional and ethical responsibility,	2
11	The skill to have consciousness for quality issues and scientific research,	3
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 algorithms via mathematical modeling and to write computer programs,	4
14	The skill to developed design of software systems at different complex levels,	1
15	The credence of necessity of life-long learning and ability to apply the formation long-life learning.	1

LECTUTER(S)				
Prepared by	Doç. Dr. Sait SAN			
Signature(s)				

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