



ESOGÜ MATHEMATICS AND COMPUTER SCIENCES DEPARTMENT COURSE INFORMATION FORM

SEMESTER	SPRING
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COURSE CODE	821618019	COURSE NAME	Differential Equations with Mathematica II
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SEMESTER	WEEKLY COURSE PERIOD			COURSE OF			LANGUAG E
	Theory	Practice	Labratory	Credit	ECTS	TYPE	
8	2	2		3	5	COMPULSORY () ELECTIVE (X)	TURKISH

COURSE CATAGORY

		[if it contains considerable design, mark with (√)]	
		X	

ASSESSMENT CRITERIA

	Evaluation Type	Quantity	%
	MID-TERM	1st Mid-Term	1
2nd Mid-Term			
Quiz			
Homework			
Project			
Report			
Others (.....)			
FINAL EXAM		1	60

PREREQUIEITE(S)	NONE
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COURSE DESCRIPTION	1. Power series solutions of ODEs. 2. Laplace's Transformations and their applications to ODEs. 3. Sytems of Linear ODEs.
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COURSE OBJECTIVES	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.
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ADDITIVE OF COURSE TO APPLY PROFESSIONAL EDUATION	1.Understanding power series solutions of ODEs, 2.Obtaining Laplace's transformations and applying them to solve initial-value problems for ODEs, 3.Finding solutions for systems of linear ODEs
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COURSE OUTCOMES	Learning how to use Mathematica package program 1. to find power series solutions of ODEs, 2. to obtain Laplace's transformations and apply them to solve initial-value problems for ODEs, 3. to solve systems of linear ODEs.
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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.
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OTHER REFERENCES	1. M. L. Abell, J. P. Braselton (1993), Differential Equations with Mathematica, Acad. Pres. New York. 2. D.G. Zill (1992) Diff. Equations with Boundary-value. Problems,PWS, Kent. 3. E.D. Rainville, P.E. Bedient(1989), Elem. Diff. Eqs. MPC,New York. 4. S.L.Ross (1989) Introduction To ODEs, MPC, New York.
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TOOLS AND EQUIPMENTS REQUIRED	None
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COURSE SYLLABUS	
WEEK	TOPICS
1	Introduction to power series, Variable coefficients linear ODES
2	Ordinary, singular and regular singular points, Power series solutions at ordinary points
3	Power series solutions at regular singular points
4	Find power series solutions at ordinary points using Mathematica
5	Find power series solutions at regular singular points using Mathematica
6	Laplace's transformations
7	Inverse Laplace's transformations
8	Midterm
9	Apply Laplace's transformations to solve initial-value problems for ODEs,
10	Obtain Laplace's transformations using Mathematica, Obtain inverse Laplace's transformations using Mathematica
11	Apply Laplace's transformations to solve initial-value problems for ODEs using Mathematica
12	Systems of linear ODEs, Solve systems of linear ODEs using Mathematica.
13	Graphical representation of solutions
14	Preparation for the final exam.
15,16	Final examination

NO	Preparation for Final Examination	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): Assoc. Prof. Dr. Sait SAN

Signature:

Date: