TOROS ÜNİVERSİTESİ

Faculty Of Engıneerıng
Electrıcal And Electronıcs Engıneerıng (Englısh)

Course Information

DIFFERENTIAL EQUATIONS					
Code	**Semester**	**Theoretical**	**Practice**	**National Credit**	**ECTS Credit**
		Hour / Week			
MAT203	Fall	4	0	4	4

Prerequisites and co-requisites	
Language of instruction	English
Type	Required
Level of Course	Bachelor's
Lecturer	Asst. Prof. Ali Kemal HAVARE
Mode of Delivery	Face to Face
Suggested Subject	
Professional practise (internship)	None
Objectives of the Course	Introduce the types of the differential equations, give the required methods for solving the differential equations and demonstrate their engineering applications.
Contents of the Course	Types of differential equations and definitions, Solving of first order differential equations, Solving of higher order differential equations, Modeling with first order differential equations, Modeling with higher order differential equations, Series solutions of differential equations, Laplace transforms of differential equations, Numerical solutions of differential equations.

Learning Outcomes of Course

#	Learning Outcomes
1	Getting knowledge about First order differential equations: separable and linear equations
2	Getting knowledge about First order differential equations: exact equations
3	Getting knowledge about Higher order differential equations: reduction of order, homogeneous linear equations, superposition and annihilator appr.
4	Getting knowledge about Numerical solutions of ordinary differential equations: Euler method
5	Getting knowledge about Numerical solutions of ordinary differential equations: Runge-Kutta method

Course Syllabus

#	Subjects	Teaching Methods and Technics
1	Definitions, terminology and initial value problems	Lecture
2	First order differential equations: separable and linear equations	Lecture
3	First order differential equations: exact equations	Lecture
4	Modeling with first order differential equations: linear equations	Lecture
5	Modeling with first order differential equations: nonlinear equations	Lecture
6	Higher order differential equations: reduction of order, homogeneous linear equations, superposition and annihilator appr.	Lecture
7	Modeling with higher order differential equations: spring-mass systems, series circuit analogue etc.	Lecture
8	Midterm exam	

9	Series solutions of linear equations	Lecture
10	Matrix notation of differential equations	Lecture
11	Laplace transform	Lecture
12	Homogeneous linear systems	Lecture
13	Nonhomogeneous linear systems	Lecture
14	Numerical solutions of ordinary differential equations: Euler method	Lecture
15	Numerical solutions of ordinary differential equations: Runge-Kutta method	Lecture
16	Final Exam	

Course Syllabus

#	Material / Resources	Information About Resources	Reference / Recommended Resources
1	Dennis G. Zill, A First Course in Differential Equations with Modeling Applications, 10th Edition, ISBN-13: 978-1-111-82705-2.		

Method of Assessment

#	Weight	Work Type	Work Title
1	40%	Mid-Term Exam	Mid-Term Exam
2	60%	Final Exam	Final Exam

Relationship between Learning Outcomes of Course and Program Outcomes

#	Learning Outcomes	Program Outcomes	Method of Assessment
1	Getting knowledge about First order differential equations: separable and linear equations	1	1,2
2	Getting knowledge about First order differential equations: exact equations	1	1,2
3	Getting knowledge about Higher order differential equations: reduction of order, homogeneous linear equations, superposition and annihilator appr.	1	1,2
4	Getting knowledge about Numerical solutions of ordinary differential equations: Euler method	1	1,2
5	Getting knowledge about Numerical solutions of ordinary differential equations: Runge-Kutta method	1	1,2

PS. The numbers, which are shown in the column Method of Assessment, presents the methods shown in the previous table, titled as Method of Assessment.

Work Load Details

#	Type of Work	Quantity	Time (Hour)	Work Load
1	Course Duration	14	4	56
2	Course Duration Except Class (Preliminary Study, Enhancement)	14	3	42
3	Presentation and Seminar Preparation	0	0	0
4	Web Research, Library and Archival Work	0	0	0
5	Document/Information Listing	0	0	0
6	Workshop	0	0	0
7	Preparation for Midterm Exam	1	10	10
8	Midterm Exam	1	2	2
9	Quiz	0	0	0
10	Homework	0	0	0
11	Midterm Project	0	0	0

12	Midterm Exercise	0	0	0
13	Final Project	0	0	0
14	Final Exercise	0	0	0
15	Preparation for Final Exam	1	15	15
16	Final Exam	1	3	3
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