

Dersin Adı			Course Name			
DİFERANSİYEL DENKLEMLER			DIFFERENTIAL EQUATIONS			
Kodu (Code)	Yarıyıl (Semester)	Kredisi (Local Credits)	AKTS Kredisi (ECTS Credits)	Ders Uygulaması, Saat/Hafta (Course Implementation,		
				Ders (Theoretical)	Uygulama (Resitation)	Laboratuvar (Laboratory)
MAT 201	3	4	5.5	4	0	0
Bolum/Program (Department/Program)		Ortak Havuz Common Pool				
Dersin Türü (Course Type)		Temel Bilim Basic Science		Dersin Dili (Course Language)		Türkçe/İngilizce Turkish/English
Dersin Önkoşulları (Course Prerequisites)		MAT 102 MIN FF OR MAT 102E MIN FF OR MAT 104 MIN FF OR MAT 104E MIN FF				
Dersin Mesleki bileşene katkısı % (Course Category by Content, %)		Temel Bilim (Basic Science)	Temel Mühendislik (Engineering Science)	Mühendislik Tasarım (Engineering Design)	İnsan ve Toplum Bilim (General Education)	
		100%				
Dersin İçeriği (Course Description)		Birinci Mertebeden Diferansiyel Denklemler, İkinci Mertebeden Lineer Diferansiyel Denklemler, Yüksek Mertebeden Lineer Diferansiyel Denklemler, İkinci Mertebeden Lineer Denklemlerin Seri Çözümleri, Laplace Dönüşümleri, Birinci Mertebeden Lineer Denklem Sistemleri				
		First Order Differential Equations, Second Order Linear Equations, Higher Order Linear Equations, Series Solutions of Second Order Linear Equations, The Laplace Transform, Systems of First Order Linear Equations				
Dersin Amacı (Course Objectives)		1.Diferansiyel denklemleri anlamak, kurmak, çözmek ve yorumlamak için gerekli olan temel kavramları tanıtmak. 2.Çeşitli tipte diferansiyel denklem çözme teknikleri öğretmek. 3.Matematik bilgisini temel bilim ve mühendislik problemlerini çözmeye kullanabilme becerisi kazandırmak.				
		1.To introduce the basic concepts required to understand, construct, solve and interpret differential equations. 2.To teach methods to solve differential equations of various types. 3.To give an ability to apply knowledge of mathematics to engineering problems.				
Dersin Öğrenme Çıktıları (Course Learning Outcomes)		Bu dersi başarıyla geçen öğrenciler: 1. Diferansiyel denklemleri belli özelliklerine göre sınıflandırır. 2. Birinci mertebeden lineer ve belirli tipte lineer olmayan diferansiyel denklemleri çözer ve çözümleri yorumlar. 3. Lineer denklem çözümleri için varlık ve teklik koşullarını anlar. 4. İkinci ve daha yüksek mertebeden sabit katsayılı lineer denklemler için çözüm bulur ve lineer bağımsız çözümlerden tüm çözümleri üretir. 5. İkinci mertebeden lineer denklemler için adi ve düzgün tekil noktalar etrafında seri çözümler bulur. 6. Laplace dönüşümü kullanarak ilk değer problemleri çözer. 7. Lineer denklem sistemlerini lineer cebir metodlarıyla çözer.				

	Student, who passed the course satisfactorily can: 1. Classify differential equations according to certain features. 2. Solve first order linear equations and nonlinear equations of certain types and interpret the solutions. 3. Understand the conditions for the existence and uniqueness of solutions for linear differential equations. 4. Solve second and higher order linear differential equations with constant coefficients and construct all solutions from the linearly independent solutions. 5. Find series solutions about ordinary and regular singular points for second order linear differential equations. 6. Solve initial value problems using the Laplace transform . 7. Solve systems of linear differential equations with methods from linear algebra.		
Ders Kitabı (Textbook)	William E. Boyce-Richard C. Diprima, 1997, Elementary Differential Equations and Boundary Value Proble, John Wiley & Sons, Inc, ISBN:0-471-08955-.		
Diğer Kaynaklar (Other References)			
Ödevler ve Projeler (Homework & Projects)	Öğrencilerin çalışmalarına rehberlik etmesi amacıyla 5 çalışma kağıdı dağıtılacaktır.		
	There will be 5 worksheets in order to guide the students with their studies.		
Laboratuar Uygulamaları (Laboratory Work)			
Bilgisayar Kullanımı (Computer Use)			
Diğer Uygulamalar (Other Activities)			
Başarı Değerlendirme Sistemi (Assessment Criteria)	Faaliyetler (Activities)	Adedi - En az (Quantity - Minimum)	Değerlendirme Katkısı % (Effects on Grading %)
	Yılıçi Sınav(Midterm Examas)	1	40%
	Kısa Sınavlar(Quizzes)		
	Ödevler(Homeworks)		
	Projeler(Projects)		
	Dönem Ödevi(Term Paper)		
	Laboratuar Uygulaması (Laboratory Work)		
	Diğer Uygulamalar (Other Activities)		
	Final Sınavı(Final Exam)	1	60%

COURSE PLAN

Week	Topics	Outcomes
1	Introduction. First Order Differential Equations	1-2
2	First Order Differential Equations	2
3	First Order Differential Equations	2-3
4	Second Order Differential Equations	3-4
5	Second Order Differential Equations	4
6	Higher Order Differential Equations	3-4
7	Series Solutions of Second Order Linear Equations	5
8	Series Solutions of Second Order Linear Equations MIDTERM EXAM	5
9	Series Solutions of Second Order Linear Equations	5
10	Series Solutions of Second Order Linear Equations. The Laplace Transform.	5-6
11	The Laplace Transform.	6
12	The Laplace Transform.	6
13	Systems of First Order Linear Equations	7
14	Systems of First Order Linear Equations	7

Relationship between the Course and Mechanical Engineering Curriculum

	Program Outcomes	Level of Contribution		
		1	2	3
a	An ability to apply knowledge of mathematics, science, and engineering on mechanical engineering problems			X
b	An ability to design and conduct experiments, as well as to analyze and interpret data and use modern tools and equipment.			
c	An ability to select, develop and/or design a system, component, or process to meet desired performance, manufacturing capabilities and economic requirements.			
d	An ability to function on and/or develop leadership in multi-disciplinary teams.			
e	An ability to identify, formulate, and solve mechanical engineering problems.			
f	An understanding of professional and ethical responsibility			
g	An ability for effective written and oral communication in Turkish and English.			
h	An ability to understand and comment on the impact of engineering solutions in a national and global context.			
i	A recognition of the need for, and an ability to engage in life-long learning			
j	A knowledge of contemporary issues in mechanical engineering			
k	An ability to use the techniques, skills, and modern engineering tools , such as computer programs, necessary for engineering design and analysis and use modern information systems			
l	A detailed knowledge of and experience on a specific application field of mechanical engineering			

1: None, 2. Partial, 3. Full

<u>Düzenleyen (Prepared by)</u> Asst.Prof. Dr. Esin GİDON	<u>Tarih (Date)</u> 09.07.2009	<u>İmza (Signature)</u>
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