

Course Code	Course Name	Teorical	Practice	Laboratory	Credits	ECTS
FZK-2005	Mathematical Pyhysics I	3.00	2.00	0.00	4.00	6.00
Course Detail						
Course Language	: Turkish					
Qualification Degree	: Bachelor					
Course Type	: Compulsory					
Preconditions	: Not					
Objectives of the Course	: Many physical phenomena in nature can be modeled by differential equations. The aim of this course is to determine the differential equations and the solution of the differential equations encountered in nature or engineering problems.					
Course Contents	: Ordinary differential equations, Differential and homogeneous differential equations, Linear and Bernoulli differential equations, Exact differential equations, Higher order differential equations, Linear differential equations, Linear coefficients with constant coefficients, Unknown coefficients, Differential equation systems, Systems of linear differential equations, Fixed Linear differential equations with coefficients, Laplace transform and solution of differential equations, Higher order differential equations with variable coefficients.					
Recommended or Required Reading	: 1) Fizikte Matematik Yöntemler,Coşkun Önem,Birsen Yayınevi(1982) 2) Complex Variables and Applications, by R.V. Churchill, J.W. Brown, and R.F. Verhey (McGraw-Hill, 1974) 3) Mathematical Methods of Physics, by J. Matthews and R.L. Walker (Benjamin, 1970) 4) Mathematical Methods for Physicists (fifth edition), by G.B. Arfken and H.J. Weber (Harcourt Academic Press, 2001)					
Planned Learning Activities and Teaching Methods	: Oral lectures with interactive discussions, Homeworks, Applications, Pratic					
Recommended Optional Programme Components	: It is recommended that the student performs regular repetition and practice.					
Course Instructors	: Doç. Dr. Melis Ulu Doğru					
Instructor's Assistants	: Research Assistant Dr. Çağlar Püsküllü					
Presentation Of Course	: Lecture, practice and homework					

Course Outcomes

Upon the completion of this course a student :

1 Classification of differential equations.

2 To be able to analyze first order ordinary differential equations.

3 To be able to analyze higher order linear ordinary differential equations.

4 To be able to analyze systems of linear differential equations.

5 To be able to analyze higher order nonlinear differential equations.

Preconditions

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Weekly Contents					
	Teorical	Practice	Laboratory	Preparation Info	Teaching Methods
1.Week	*Differential equations and their types, ordinary differential equations, partial differential equations, linearity, degree, order of differential equations	*Differential equations and their types, ordinary differential equations, partial differential equations, linearity, degree, order of differential equations	*There is no laboratory study.	*Pre-study can be done by following the given source and homework.	*Lecture, Homework, Discussion Practice, Practical
2.Week	*the method of elimination of arbitrary moieties, dif. equivalent. and solutions	*the method of elimination of arbitrary moieties, dif. equivalent. and solutions	*There is no laboratory study.	*Pre-study can be done by following the given source and homework.	*Lecture, Homework, Discussion Practice, Practical
3.Week	*homogeneous and non-homogeneous differential equations and their solutions	*homogeneous and non-homogeneous differential equations and their solutions	*There is no laboratory study.	*Pre-study can be done by following the given source and homework.	*Lecture, Homework, Discussion Practice, Practical
4.Week	*Complete and incomplete differential equations and their solutions	*Complete and incomplete differential equations and their solutions	*There is no laboratory study.	*Pre-study can be done by following the given source and homework.	*Lecture, Homework, Discussion Practice, Practical
5.Week	*Linear differential equations and their differential equations and solutions	*Linear differential equations and their differential equations and solutions	*There is no laboratory study.	*Pre-study can be done by following the given source and homework.	*Lecture, Homework, Discussion Practice, Practical
6.Week	*first order high order differential equations and their solutions	*first order high order differential equations and their solutions	*There is no laboratory study.	*Pre-study can be done by following the given source and homework.	*Lecture, Homework, Discussion Practice, Practical
7.Week	*Homogeneous differential equations with constant coefficients, non-homogeneous differential equations and solutions with constant coefficients, midterm	*Homogeneous differential equations with constant coefficients, non-homogeneous differential equations and solutions with constant coefficients, midterm	*There is no laboratory study.	*Pre-study can be done by following the given source and homework.	*Lecture, Homework, Discussion Practice, Practical
8.Week	* Special methods for differential equations with constant coefficients	* Special methods for differential equations with constant coefficients	*There is no laboratory study.	*Pre-study can be done by following the given source and homework.	*Lecture, Homework, Discussion Practice, Practical
9.Week	*Differential equations with variable coefficients	*Differential equations with variable coefficients	*There is no laboratory study.	*Pre-study can be done by following the given source and homework.	*Lecture, Homework, Discussion Practice, Practical
10.Week	*Legendre differential equation, Cauchy differential equation and their solutions	*Legendre differential equation, Cauchy differential equation and their solutions	*There is no laboratory study.	*Pre-study can be done by following the given source and homework.	*Lecture, Homework, Discussion Practice, Practical
11.Week	*Differential coefficients of second order differential equations and their solutions	*Differential coefficients of second order differential equations and their solutions	*There is no laboratory study.	*Pre-study can be done by following the given source and homework.	*Lecture, Homework, Discussion Practice, Practical
12.Week	*In cases where the dependent variable and the argument are not present	*In cases where the dependent variable and the argument are not present	*There is no laboratory study.	*Pre-study can be done by following the given source and homework.	*Lecture, Homework, Discussion Practice, Practical
13.Week	*Total differential method	*Total differential method	*There is no laboratory study.	*Pre-study can be done by following the given source and homework.	*Lecture, Homework, Discussion Practice, Practical
14.Week	*Physical applications of differential equations	*Physical applications of differential equations	*There is no laboratory study.	*Pre-study can be done by following the given source and homework.	*Lecture, Homework, Discussion Practice, Practical

Assesment Methods %
1 Vize : 40.000
2 Final : 60.000

ECTS Workload			
Activities	Count	Time(Hour)	Sum of Workload
Vize	1	2.00	2.00
Ödev	5	1.00	5.00
Attending lectures	14	3.00	42.00
Application / Practice	14	2.00	28.00
Individual study before lecture	14	1.00	14.00
Individual study after lecture	14	2.00	28.00
Preparation for midterm	1	13.00	13.00
Preparation for final	1	14.00	14.00
Further Study	14	2.00	28.00
Total :			174.00
Sum of Workload / 30 (Hour) :			6
ECTS :			6.00

