

Fizik Bölümü / PHYSICS /						
Course Code	Course Name	Teorical	Practice	Laboratory	Credits	ECTS
FZK-3005	Special Functions in Physics	2.00	2.00	0.00	3.00	6.00
Course Detail						
<b>Course Language</b>	: Turkish					
<b>Qualification Degree</b>	: Bachelor					
<b>Course Type</b>	: Compulsory					
<b>Preconditions</b>	: Not					
<b>Objectives of the Course</b>	: Learn special functions and solution methods other than known trigonometric or exponential functions					
<b>Course Contents</b>	: Special functions except known trigonometric or exponential functions, hypergeometric functions, orthogonal polynomials. Other special functions; Error functions, elliptical integrals, Gamma functions, special functions such as Bessel functions, properties and applications are given.					
<b>Recommended or Required Reading</b>	: Selçuk Bayın, "Fen ve Mühendislikte Matematik Yöntemler", METU PRESS. Bekir Karaoğlu, "Fen ve Mühendislikte Matematik Yöntemler", Seçkin Yayıncılık, 2007 Andrews, G. E. , Askey, R. and Roy, R. "Special functions", Cambridge University Press; New Ed edition, 2001 Abramowitz, M. and Stegun, C.A. (Ed.). "Handbook of Mathematical Functions with Formulas, Graphs, and Mathematical Tables", 9th printing, 1972, New York: Dover.					
<b>Planned Learning Activities and Teaching Methods</b>	: Lecture, presentation, practice					
<b>Recommended Optional Programme Components</b>	: None					
<b>Course Instructors</b>	: Doç. Dr. Sezgin Aygün					
<b>Instructor's Assistants</b>	: None					
<b>Presentation Of Course</b>	: Face to face					

Course Outcomes	
<b>Upon the completion of this course a student :</b>	
1	To be able to recognize and solve differential equations that produce special functions
2	Ability to derive polynomials from their solutions
3	Students will have the ability and ability to apply the theoretical and practical knowledge to the solutions of physical problems.
4	recognize the special functions of physics and learn their properties.

Preconditions						
Course Code	Course Name	Teorical	Practice	Laboratory	Credits	ECTS

Weekly Contents					
	Teorical	Practice	Laboratory	Preparation Info	Teaching Methods
1.Week	*Serial Methods (Power Series Method)				
2.Week	*Serial Methods (Frobenius Series Method)				
3.Week	*Legendre Differential Equation, Legendre Polynomials, Properties, Applications				
4.Week	*Laguerre Differential Equation, Laguerre Polynomials, Properties, Applications				
5.Week	*Bessel Differential Equation, Bessel Polynomials.				
6.Week	*Bessel functions and their properties, applications.				
7.Week	*Integral transformations and their properties.				
8.Week	*Fourier series, transformations and applications				
9.Week	*Laplace transform, properties and applications				
10.Week	*Gamma and Beta Functions and applications				
11.Week	*Complex functions and properties				
12.Week	*Green functions and applications				
13.Week	*Physical applications of special functions I				
14.Week	*Physical applications of special functions II				

Assesment Methods %	
1	Md Term Exam 1 : 40.000
2	Final : 60.000

## ECTS Workload

Activities	Count	Time(Hour)	Sum of Workload
Vize	1	2.00	2.00
Ödev	4	4.00	16.00
Final	1	2.00	2.00
Attending lectures	1	56.00	56.00
Individual study before lecture	5	5.00	25.00
Preparation for midterm	1	20.00	20.00
Preparation for final	1	24.00	24.00
Problem Çözme	5	5.00	25.00
			Total : 170.00
			Sum of Workload / 30 ( Hour ) : 6
			ECTS : 6.00

## Program And OutcomeRelation

	P.O. 1	P.O. 2	P.O. 3	P.O. 4	P.O. 5	P.O. 6	P.O. 7	P.O. 8	P.O. 9	P.O. 10	P.O. 11	P.O. 12	P.O. 13	P.O. 14	P.O. 15	P.O. 16	P.O. 17	P.O. 18	P.O. 19	P.O. 20	P.O. 21	P.O. 22	P.O. 23	P.O. 24
L.O. 1	5	3	4	3	5	4	2	4	2	3	2	2	1	3	2	2	2	2	4	5	4	5	4	3
L.O. 2	2	3	4	2	4	0	0	5	2	5	4	2	3	3	3	0	2	0	2	3	4	5	2	5
L.O. 3	3	3	2	4	4	3	3	5	3	2	3	3	2	4	4	4	0	2	4	2	4	4	4	1
L.O. 4	4	4	3	4	3	5	3	5	2	3	2	4	4	4	2	5	2	0	4	4	4	2	5	3

## Ders/Program Çıktıları İlişkisi

P.O. 1	P.O. 2	P.O. 3	P.O. 4	P.O. 5	P.O. 6	P.O. 7	P.O. 8	P.O. 9	P.O. 10	P.O. 11	P.O. 12	P.O. 13	P.O. 14	P.O. 15	P.O. 16	P.O. 17	P.O. 18	P.O. 19	P.O. 20	P.O. 21	P.O. 22	P.O. 23	P.O. 24	P.O. 2
3	4	4	4	3	2	3	3	3	4	4	1	3	2	3	3	2	2	3	3	1	3	3	4	2