

Fizik Bölümü / PHYSICS /						
Course Code	Course Name	Teorical	Practice	Laboratory	Credits	ECTS
FZK-3010	Experimental Techniques in Physics	3.00	0.00	0.00	3.00	6.00
Course Detail						
<b>Course Language</b>	: Turkish					
<b>Qualification Degree</b>	: Bachelor					
<b>Course Type</b>	: Optional					
<b>Preconditions</b>	: Not					
<b>Objectives of the Course</b>	: In this course electron spin resonance, x-ray, electron diffraction, hall effect, birefringence and radioactivity events be able to worked as theoretically and experimentally.					
<b>Course Contents</b>	: Theoretical lecture about ESR, Theoretical lecture about x-ray, Theoretical lecture about electron diffraction, Theoretical lecture about hall effect, Theoretical lecture about birefringence and polarisation, Theoretical lecture about half-life and radioactivity, ESR experiment, Characteristics x-rays of copper, Electron diffraction experiment, Hall effect in p-type germanium, Polarisation by quarterwave plates, Half-life and radioactivity experiment, Make-up, Reminding					
<b>Recommended or Required Reading</b>	: Fizikte Deneysel Teknikler Deneysel Föyü Beiser A, Concept of Modern Physics Prof. Dr. Apaydın F., "Kuantum Fiziği", Hacettepe Üniversitesi Prof.Dr. Dereli T., Prof.Dr. Verçin A., "Kuantum Mekaniği temel kavramlar ve uygulamaları Cullity B.D., "Elements of x-ray diffractions"					
<b>Planned Learning Activities and Teaching Methods</b>	: Experiments (20%) Midterm (20%) Final (60%)					
<b>Recommended Optional Programme Components</b>	: To use of excell programming is necessary					
<b>Instructors</b>	: Prof. Dr. Emre Coşkun					
<b>Instructor's Assistants</b>	: Assoc. Prof. Dr Emre Coşkun					
<b>Presentation Of Course</b>	: Face to face					

Course Outcomes	
<b>Upon the completion of this course a student :</b>	
1 to make experiments of knowledge about physics learned theoretically	
2 to make advanced physical experiments	
3 to learn the Hall effect that is a basic topic in material science	
4 to expound and learn of spin-orbit interaction and zæeman effect by electron spin resonance experiment.	
5 to expound and learn of birefringence concept	
6 to learn and expound understand of half-life concept	
7 to understand of wave-particle dilemma that is one of the concepts of modern physics by electron diffraction	

Preconditions						
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Weekly Contents					
	Teorical	Practice	Laboratory	Preparation Info	Teaching Methods
1.Week	*Theoretical lecture about ESR				
2.Week	*Theoretical lecture about x-ray				
3.Week	*Theoretical lecture about electron diffraction				
4.Week	*Theoretical lecture about hall effect				
5.Week	*Theoretical lecture about birefringence and polarisation				
6.Week	*Theoretical lecture about half-life and radioactivity				
7.Week	*Midterm				
8.Week			*ESR experiment		
9.Week			*Characteristics x-rays of copper		
10.Week			*Electron diffraction experiment		
11.Week			*Hall effect in p-type germanium		
12.Week			*Polarisation by quarterwave plates		
13.Week			*Half-life and radioactivity experiment		
14.Week	*Make-up				

Assesment Methods %	
4 Ara Sınav (Bütünlemede Kullanılan) :	20.000
5 Final :	60.000
6 Laboratory :	20.000

## ECTS Workload

Activities	Count	Time(Hour)	Sum of Workload
Vize	1	3.00	3.00
Final	1	9.00	9.00
Attending lectures	14	3.00	42.00
Individual study before lecture	14	3.00	42.00
Individual study after lecture	14	4.00	56.00
Preparation for midterm	1	5.00	5.00
Preparation for final	1	12.00	12.00
			Total : 169.00
			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	4	5	4	3	2	3	2	3	5	4	4	3	1	1	2	1	2	1	2	1	1	2	2	
L.O. 2	4	5	5	1	5	5	2	5	5	5	5	5	5	5	5	2	3	2	3	1	3	3	3	2	
L.O. 3	3	4	5	5	3	4	5	4	4	5	5	4	3	4	3	3	4	5	4	4	4	1	4	2	4
L.O. 4	4	5	2	3	4	4	4	4	4	4	4	4	3	4	4	3	3	5	4	4	4	3	5	3	
L.O. 5	4	5	4	5	4	4	4	5	4	2	3	4	4	5	5	5	5	4	5	4	5	5	5	4	3
L.O. 6	5	4	5	4	2	5	3	4	3	5	2	5	2	3	4	4	3	2	5	5	4	4	5	3	
L.O. 7	4	4	4	3	1	1	2	2	3	2	2	3	2	2	2	4	2	3	0	4	3	3	2	2	

## 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
4	4	4	2	5	3	5	4	4	5	4	4	3	3	3	2	3	4	4	3	3	3	5	3	2