



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Applications of Electron Spin Resonance I							
Course Code		FZK615		Couse Level		Third Cycle (Doctorate Degree)			
ECTS Credit	7	Workload	175 (<i>Hours</i>)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		To teach electron spin resonance and applications.							
Course Content		To learn the basic principles of electron spin resonance, electron spin resonance spectrometer and working principle, electron spin resonance in liquids and solids.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Discussion, Individual Study, Problem Solving					
Name of Lecturer(s)									

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	15
Final Examination	1	60
Attending Lectures	14	10
Assignment	5	15

Recommended or Required Reading

1	Electron spin resonance John E. Wertz 1986
2	Magnetic Resonance, Fevzi Apaydin, Ankara 1996

Week	Weekly Detailed Course Contents	
1	Theoretical	Energy of magnetic dipoles in a magnetic Field, Quantization of angular momentum
3	Theoretical	Interaction of magnetic dipoles with electromagnetic radiation, characteristics of the g factor
4	Theoretical	Electron spin resonance spectrometer
5	Theoretical	Choice of experimental conditions
6	Theoretical	Spectrometer parts
7	Theoretical	Line shapes and intensities
8	Intermediate Exam	Midterm exam
9	Theoretical	Analysis of electron spin resonance spectra of systems in the liquid phase
10	Theoretical	Interpretation of hyperfine splitting in pi-type organic radicals
11	Theoretical	Mechanism of hyperfine splitting in conjugated systems
12	Theoretical	Anisotropic interactions
13	Theoretical	Interpretation of electron spin resonance spectra of systems in the solid state
14	Theoretical	Time-dependent Phenomena
15	Final Exam	Final exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	5	3	112
Assignment	12	3	1	48
Midterm Examination	1	4	2	6
Final Examination	1	7	2	9
Total Workload (Hours)				175
[Total Workload (Hours) / 25*] = ECTS				7

*25 hour workload is accepted as 1 ECTS

Learning Outcomes

1	To be able to learn the basic principles of electron spin resonance
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2	To be able to determine the conditions in experimental studies
3	To be able to learn working principle of ESR spectrometer and apply it in experiments
4	To be able to investigate different experimental model and interpret to use them their studies
5	to be able to understand the time dependent effects

Programme Outcomes (Physics Doctorate)

1	
2	
3	
4	
5	
6	
7	
8	

Contribution of Learning Outcomes to Programme Outcomes 1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High

	L1	L2	L3	L4	L5
P1	5	5	4	5	5
P2	5	4	3	4	4
P3	3	3	3	4	4
P4	4	4	4	5	5
P5	4	4	4	4	4
P6	4	4	4	4	3
P7	2	3	2	2	4
P8	5	4	5	5	4

