

Fizik Bölümü / PHYSICS /						
Course Code	Course Name	Teorical	Practice	Laboratory	Credits	ECTS
FZK-4022	Solid State Pyhsics	2.00	2.00	0.00	3.00	7.00
Course Detail						
Course Language	: Turkish					
Qualification Degree	: Bachelor					
Course Type	: Optional					
Preconditions	: Not					
Objectives of the Course	: Free Electron Fermi Gas, Electron Levels in a periodic potential: General Properties, Electrons in a weak periodic potential, The tight binding Method, Semiconductor Crystals, Fermi Surfaces and Metals, Superconductivity.					
Course Contents	: Free Electron Fermi Gas, Electron Levels in a periodic potential: General Properties, Electrons in a weak periodic potential, The tight binding Method, The tight binding Method, Semiconductor Crystals, Semiconductor Crystals, Fermi Surfaces and Metals, Midterm exam, Optical Process and Excitons, Superconductivity, Dielectrics and Ferroelectrics, Dielectrics and Ferroelectrics, Diamagnetism and paramagnetism, Ferromagnetism and antiferromagnetism, Noncrystalline Solids					
Recommended or Required Reading	: Kittel, Charles (1996). Introduction to Solid State Physics, Seventh Edition, John Wiley & Sons, Inc., Hook, J.R., & Hall, H. E (2003). Solid State Physics, 2nd Edition, John Wiley & Sons Balkemore, J.s . (1985). Solid State Physics, 2nd Edition, Cambridge University Press					
Planned Learning Activities and Teaching Methods	: Mid-term exam + Assignment + Research & Project and Presentation 40%, Final Exam 60%					
Recommended Optional Programme Components	: Knowledge of the fundamental physics courses is important.					
Instructors	: Prof. Dr. Vildan Bilgin					
Instructor's Assistants	: Prof.Dr. Vildan BİLGIN					
Presentation Of Course	: Face to face					

Course Outcomes	
Upon the completion of this course a student :	
1 1) Apply knowledge of natural sciences	
2 2) Explain free electron and nearly free electron theories	
3 3) Analyze the Bloch theorem	
4 4) Describe some physical properties of materials	
5 5) Explain optical properties of semiconductors	
6 6) Explain natural phenomena	
7 7) Identify the problems in related field	

Preconditions						
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Weekly Contents					
	Teorical	Practice	Laboratory	Preparation Info	Teaching Methods
1.Week	*1. Week Free Electron Fermi Gas	*1. Week Free Electron Fermi Gas			
2.Week	*2. Week Electron Levels in a periodic potential: General Properties, Electrons in a weak periodic potential	*2. Week Electron Levels in a periodic potential: General Properties, Electrons in a weak periodic potential			
3.Week	*3. Week The tight binding Method	*3. Week The tight binding Method			
4.Week	*4. Week The tight binding Method	*4. Week The tight binding Method			
5.Week	*5. Week Semiconductor Crystals	*5. Week Semiconductor Crystals			
6.Week	*6. Week Semiconductor Crystals	*6. Week Semiconductor Crystals			
7.Week	*7. Week Fermi Surfaces and Metals	*7. Week Fermi Surfaces and Metals			
8.Week	*8. Week Optical Process and Excitons	*8. Week Optical Process and Excitons			
9.Week	*9. Week Superconductivity	*9. Week Superconductivity			
10.Week	*10. Week Dielectrics and Ferroelectrics	*10. Week Dielectrics and Ferroelectrics			
11.Week	*11. Week Dielectrics and Ferroelectrics	*11. Week Dielectrics and Ferroelectrics			
12.Week	*12. Week Diamagnetism and paramagnetism	*12. Week Diamagnetism and paramagnetism			
13.Week	*13. Week Ferromagnetism and antiferromagnetism	*13. Week Ferromagnetism and antiferromagnetism			
14.Week	*14. Week Noncrystalline Solids	*14. Week Noncrystalline Solids			

Assesment Methods %
