Course Information

COURSE INFORMATION

Course Title	Code	Semester	L+U Hour	Credits	ECTS
Semiconductor Physics	FZK372.3	6. Semester	2 + 2	3.0	7.0

Prerequisites	None

Language of Instruction	English
Course Level	Bacheclor's Degree (First Cycle)
Course Type	Elective
Mode of delivery	Face to face
Course Coordinator	Assoc. Prof. Dr. Kıvanç SEL
Instructors	
Assistants	
Course Objectives	This course aims to help students learn the physics of semiconductors.
Course Content	Crystal structures, classification of solids, fundamentals of semiconductors, intrinsic and doped semiconductors, conduction mechanisims in semiconductors, energy band structures of metals, semiconductors and insulators, electron transitions between bands and energy levels, recombination of charge carriers, statistics of charge carriers in semiconductors, Fermi distribution function, fermi enrgy of intrinsic and doped semiconductors, diffusion of charge carriers.
Course Learning Outcomes	1) Apply the basic science knowledge. 2) Describe the structural properties of the solid materials. 3) Describe the energy band structure of the solid materials. 4) Define the natural phenomena. 5) Recognize the physical properties of semiconductor materials. 6) State the topics of superconductivity, diamagnetism, ferromagnetism, paramagnetism. 7) Associate the obtained information with technology and industry.

WEEKLY COURSE CONTENT

Week	Topics	Teaching and Learning Methods and Techniques	Study Materials
1. Week	Crystal structures	Lecture and recitation	
2. Week	Crystal structures	Lecture and recitation	
3. Week	Classification of solids	Lecture and recitation	

Quick Access

Physics
- Qualification Awarded
- Level of Qualification
- Qualification Requirements and Regulations
- Specific Admission Requirements
- Recognition of Prior Learning
- Profile of the Program
- Program Key Learning Outcomes
- Occupational Profile of Graduates
- Access to Further Studies
- Course Structure & Credits
- Exam Regulations & Assessment & Grading
- Graduation Requirements
- Mode of Study
- Programme Director(or Equivalent)
- Evaluation Questionnaire
- TYYÇ

Course Information
- Course Information
- Weekly Course Content
- Resources
- Course Category
- CONTRIBUTION OF COURSE LEARNING OUTCOMES TO PROGRAMME OUTCOMES
- ECTS credits and course workload

4. Week	Fundamentals of semiconductors	Lecture and recitation	
5. Week	Intrinsic semiconductors	Lecture, recitation and homework	
6. Week	Doped semiconductors	Lecture and recitation	
7. Week	Conduction mechanisims in semiconductors	Lecture and recitation	
8. Week	Midterm Exam	Written exam	
9. Week	Energy band structures of metals, semiconductors and insulators	Lecture and recitation	
10. Week	Electron transitions between bands and energy levels	Lecture and recitation	
11. Week	Recombination of charge carriers	Lecture and recitation	
12. Week	Statistics of charge carriers in semiconductors	Lecture and recitation	
13. Week	Fermi distribution function	Lecture, recitation and homework	
14. Week	Fermi energy of intrinsic and doped semiconductors	Lecture and recitation	
15. Week	Diffusion of charge carriers.	Lecture and recitation	
16. Week	Final Exam	Written exam	

RESOURCES

Recommended Sources
‘Introduction to Solid State Physics’, Kittel Charles, John Wiley & Sons, Inc., 047141526X (ISBN-13: 978-0471415268), 2004
‘Katıhal Fiziğine Giriş’, Karaoğlu, B. İstanbul, Güven Kitap Yayın Dağıtım, 1996, 9750203305
'Katıhal Fiziğine Giriş', Tahsin N. Durlu, Bilim Yayıncılık, 1996, 9755560009

ASSESSMENT

Measurement and Evaluation Methods and Techniques
Written exam, homework and presentations. (60% Final, 30% midterm, 10% homework and presentation)

COURSE CATEGORY

Course Category	Percentage
Core Courses	% 100

CONTRIBUTION OF COURSE LEARNING OUTCOMES TO PROGRAMME OUTCOMES

Programme Outcomes	Contribution Level	DK1	DK2	DK3	DK4	DK5	DK6	DK7
PY1	5	5	5	5	5	5	5	5
PY2	5	5	5	5	5	5	5	5
PY3	4	4	4	4	4	4	4	4
PY4	5	5	5	5	5	5	5	5
PY5	5	5	5	5	5	5	5	5
PY6	5	5	5	5	5	5	5	5

PY7	3	3	3	3	3	3	3	3
PY8	2	2	2	2	2	2	2	2
PY9	4	4	4	4	4	4	4	4
PY10	3	3	3	3	3	3	3	3
PY11	3	3	3	3	3	3	3	3
PY12	4	4	4	4	4	4	4	4
PY13	4	4	4	4	4	4	4	4
PY14	4	4	4	4	4	4	4	4
PY15	5	5	5	5	5	5	5	5

*DK = Course's Contrubution.

	0	1	2	3	4	5
Level of contribution	None	Very Low	Low	Fair	High	Very High

.

ECTS CREDITS AND COURSE WORKLOAD

Event	Quantity	Duration (Hour)	Total Workload (Hour)
Class Hours (14 weeks)	14	3	42
Final Exam Preparation	1	28	28
Mid Term Exam Preparation	1	27	27
Further Study	14	3	42
Assignment 1	1	18	18
Final Exam	1	2	2
Mid Term Exam 1	1	2	2
Assignment 2	1	18	18
		Total Workload	179
		Total Workload / 25.5 (s)	7.02
		ECTS Credit of the Course	7