



Çanakkale Onsekiz Mart University

Education Information System

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Course Information

COURSE INFORMATION

Course Title	Code	Semester	L+U Hour	Credits	ECTS
Optical Properties Of Semiconductors	FZ-6011		3 + 0	3.0	7.5

Prerequisites	None
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Language of Instruction	Turkish
Course Level	Third Cycle
Course Type	Elective
Mode of delivery	Face to face
Course Coordinator	Assoc. Prof. Dr. Vildan BİLGİN
Instructors	Assoc. Prof. Dr. Vildan BİLGİN
Assistants	
Course Objectives	To understand the optical properties of materials and semiconductors
Course Content	Electromagnetic waves in matter, light and structure of it, complex refractive index, Dipole radiation, Optical conductivity, Faraday and Kerr (rotation) effects, Optical properties of semiconductors, band structure of semiconductors and laser, Optical properties of semiconductors, laser emission, Intraband and interband optical transitions, Vibrations of molecules and the solids, Nonlinear optics
Course Learning Outcomes	1) Analyze light matter interactions 2) Use the electromagnetic theory at optical calculations 3) Explain the optical changes arise from magnetic and electric field 4) Show effects of material electronic structure to the light 5) Design optical system

WEEKLY COURSE CONTENT

Week	Topics	Teaching and Learning Methods and Techniques	Study Materials
1. Week	Electromagnetic waves in matter, light and structure of it, electromagnetic wave expression	Lecture, Problem solving, Homework	
2. Week	Electromagnetic waves in matter, complex refractive index	Lecture, Problem solving, Homework	
3. Week	Dipole radiation	Lecture, Problem solving, Homework	
4. Week	Optical conductivity	Lecture, Problem solving, Homework	

Quick Access

Physics (PhD)

- 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
- Assessment
- Course Category
- CONTRIBUTION OF COURSE LEARNING OUTCOMES TO PROGRAMME OUTCOMES
- ECTS credits and course workload

5. Week	Optical activity	Lecture, Problem solving, Homework	
6. Week	Faraday and Kerr (rotation) effects	Lecture, Problem solving, Homework	
7. Week	Optical properties of semiconductors	Lecture, Problem solving, Homework	
8. Week	band structure of semiconductors and laser	Lecture, Problem solving, Homework	
9. Week	Optical properties of semiconductors, laser emission	Lecture, Problem solving, Homework	
10. Week	Intraband and interband optical transitions	Lecture, Problem solving, Homework	
11. Week	Intraband and interband optical transitions	Lecture, Problem solving, Homework	
12. Week	Vibrations of molecules and the solids	Lecture, Problem solving, Homework	
13. Week	Light phonon interaction	Lecture, Problem solving, Homework	
14. Week	Nonlinear optics	Lecture, Problem solving, Homework	
15. Week	Nonlinear optics	Lecture, Problem solving, Homework	
16. Week	Final Exam	Exam	

RESOURCES

Recommended Sources
Semiconductor Optics, Claus Klingshirn, Spinger 2005
Optical processes in semiconductors, Jacques I. Pankove, 1971 Prentice-Hall,inc Englewood cliffs,New Jersey.
Optical properties of crystalline and amorphous semiconductors" Sadao Adachi, 1999 Kluwer Academic Publishers.

ASSESSMENT

Measurement and Evaluation Methods and Techniques		
Midterm exam, homework, Final exam		
In-Term Studies	Quantity	Percentage
Mid Term Exam 1	1	30
Assignment 1	1	20
Total	2	50
End-Term Studies	Quantity	Percentage
Final Exam	1	50
Total	1	50
Contribution Of In-Term Studies To Overall Grade		50
End-Term Studies		50
Total		100

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
PY1	4	4	4	4	4	4
PY2	3	4	3	2	3	3
PY3	3	3	3	3	3	3
PY4	3	4	3	2	3	3
PY5	3	3	3	3	3	3
PY6	4	4	4	4	4	4
PY7	0	0	0	0	0	0
PY8	3	3	3	3	3	3
PY9	4	3	4	4	5	4
PY10	0	0	0	0	0	0
PY11	3	3	3	3	3	3
PY12	3	3	3	3	3	3
PY13	0	0	0	0	0	0
PY14	2	2	2	2	2	2
PY15	0	0	0	0	0	0

*DK = Course's Contribution.

	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)
Final Exam	1	3	3
Mid Term Exam 1	1	3	3
Assignment 1	2	25	50
Final Exam Preparation	1	22	22
Mid Term Exam Preparation	1	15	15
Further Study	14	4	56
Class Hours (14 weeks)	14	3	42
Total Workload			191
Total Workload / 25.5 (s)			7.49
ECTS Credit of the Course			7