Course Information

COURSE INFORMATION

Course Title	Code	Semester	L+U Hour	Credits	ECTS
Modern Physics Laboratory	FZK224	4. Semester	0 + 4	2.0	4.0

Prerequisites	None

Language of Instruction	Turkish
Course Level	Bacheclor's Degree (First Cycle)
Course Type	Compulsory
Mode of delivery	Face to face
Course Coordinator	Assist. Prof. Dr. Ayşe KÜÇÜKARSLAN
Instructors	Prof. Dr. Serhat ÖZDER
Assistants	
Course Objectives	This course aims to help students understand the duality of light, have knowledge about the atomic levels of hydrogen, have introductory level knowledge about Quantum physics, able to perform correct physical measurement and understand the experimental precision.
Course Content	Units, metric systems, and applications, Measurement error and significant figures,error calculation, percantege error,Atomic structure,,charged and uncharged particles,energy levels, e/m experiment, Franck Hewrtz experiment, energy levels of hydrogen, Balmer series experiment, formation and the evalution of Quantum physics, Photoelectric effect, Radioactivity, radioactive particles, Geiger Müler counter experiment
Course Learning Outcomes	1) Understand the duality of light 2) Have knowledge about the atomic levels of hydrogen 3) Have introductory level knowledge about Quantum physics 4) Able to perform correct physical measurement and understand the experimental precision.

WEEKLY COURSE CONTENT

Week	Topics	Teaching and Learning Methods and Techniques	Study Materials
1. Week	Working principles of laboratory: Units	Laboratory, Team work, discussion, Practice	
2. Week	Working principles of laboratory: Metric systems and its applications	Laboratory, Team work, discussion, Practice	
3. Week	Working principles of laboratory: Measurement errors and significant	Laboratory, Team	

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

	figures	work, discussion, Practice	
4. Week	Working principles of laboratory: Error calculations, percentage errors normalisation, some statistical methods	Laboratory, Team work, discussion, Practice	
5. Week	Atomic structure, charged and neutral particles, energy levels	Laboratory, Team work, discussion, Practice	
6. Week	e/m experiment	Laboratory, Team work, discussion, Practice	
7. Week	Franck-Hertz experiment	Laboratory, Team work, discussion, Practice	
8. Week	Energy levels of atom	Laboratory, Team work, discussion, Practice	
9. Week	Energy levels of Hydrogen atom	Laboratory, Team work, discussion, Practice	
10. Week	Balmer series of Hydrogen	Laboratory, Team work, discussion, Practice	
11. Week	The born of Quantum Physics and its historical development	Laboratory, Team work, discussion, Practice	
12. Week	Photoelectric effect experiment	Laboratory, Team work, discussion, Practice	
13. Week	Radioactivity and radioactive particles	Laboratory, Team work, discussion, Practice	
14. Week	Radioactivity experiment with Geiger-Müller counter	Laboratory, Team work, discussion, Practice	
15. Week	Review of the semester	Laboratory, Team work, discussion, Practice	
16. Week	Final exam	Exam	

RESOURCES

Recommended Sources
Arthur Beiser, Concepts of Modern Physics, 6th edition, 2003, McGraw-Hill Inc.
Experiment flyers
Raymond A. Serway, Clement J. Moses, Curt A. Moyer, Modern Physics, 3rd edition, 2005, Thomson Learning, Inc.

ASSESSMENT

Measurement and Evaluation Methods and Techniques		
Mid-term exam, final exam, exp. report, quiz		
In-Term Studies	**Quantity**	**Percentage**
Laboratory	1	60
Total	1	60
End-Term Studies	**Quantity**	**Percentage**
Final Exam	1	40

Total	1	40
Contribution Of In-Term Studies To Overall Grade		60
End-Term Studies		40
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
PY1	5	5	5	5	4
PY2	5	5	5	4	4
PY3	4	5	3	4	4
PY4	0	3	3	3	3
PY5	0	3	3	3	3
PY6	4	4	4	5	4
PY7	4	4	4	4	4
PY8	0	3	3	3	3
PY9	0	4	4	4	4
PY10	0	3	3	3	3
PY11	0	3	3	3	3
PY12	0	3	3	3	3
PY13	0	2	2	2	2
PY14	0	2	2	2	2
PY15	3	4	3	3	3

*DK = Course's Contrubution.

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

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ECTS CREDITS AND COURSE WORKLOAD

Event	Quantity	Duration (Hour)	Total Workload (Hour)
Class Hours (14 weeks)	14	4	56
Final Exam Preparation	1	28	28
Quiz 1	8	2	16
Final Exam	1	2	2
		Total Workload	102
		Total Workload / 25.5 (s)	4.00
		ECTS Credit of the Course	4