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## Course Information

### COURSE INFORMATION

Course Title	Code	Semester	L+U Hour	Credits	ECTS
Nuclear Physics I	FZ5037		3 + 0	3.0	7.5

<b>Prerequisites</b>	None
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<b>Language of Instruction</b>	Turkish
<b>Course Level</b>	Second Cycle
<b>Course Type</b>	Elective
<b>Mode of delivery</b>	Face to face
<b>Course Coordinator</b>	Assist. Prof. Dr. Ayşe KÜÇÜKARSLAN
<b>Instructors</b>	Assoc. Prof. Dr. Emine Dilara AYDIN
<b>Assistants</b>	
<b>Course Objectives</b>	To investigate and understand of general properties of nuclei
<b>Course Content</b>	General Properties of Nuclei, Nuclear N-particle System, Nuclear Forces, Static properties, Models of nucleus and Shell model
<b>Course Learning Outcomes</b>	1) Explain fundamentals of atomic, molecular and nuclear structure 2) Define the fundamental of nuclear physics 3) Study the many-particle system 4) Apply Nuclear Forces and Applications 5) Solve the problems using the different theories

### WEEKLY COURSE CONTENT

Week	Topics	Teaching and Learning Methods and Techniques	Study Materials
1. Week	Fundamentals of nuclear physics	Lecture, Problem solving, Homework	
2. Week	Properties of nucleus	Lecture, Problem solving, Homework	
3. Week	Spin, parity, magnetic and electric quadrupole moments	Lecture, Problem solving, Homework	
4. Week	Nuclear Models: Liquid Drop Model	Lecture, Problem solving, Homework	
5. Week	Fermi Gas Model	Lecture, Problem solving, Homework	

### Quick Access

#### Physics (Master)

- 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

6. Week	Shell Model	Lecture, Problem solving, Homework	
7. Week	Nuclear Decay	Lecture, Problem solving, Homework	
8. Week	Midterm Exam	Exam	
9. Week	Nuclear Reactions	Lecture, Problem solving, Homework	
10. Week	Fission and Fusion	Lecture, Problem solving, Homework	
11. Week	Elementary Particles	Lecture, Problem solving, Homework	
12. Week	Elementary Particles interactions and decays	Lecture, Problem solving, Homework	
13. Week	Alpha, Beta, Gamma Decays	Lecture, Problem solving, Homework	
14. Week	Standart Model	Lecture, Problem solving, Homework	
15. Week	Classifications of particles	Lecture, Problem solving, Homework	
16. Week	Final Exam	Exam	

## RESOURCES

Recommended Sources
"An Introduction to Nuclear Physics", W.N.Cottingham and D.A.Greenwood, 2001, Cambridge University Press, United Kingdom
"Theoretical Nuclear Physics", John M. Blatt and Victor F. Weisskopf, 1979, Springer Verlag, New York
"Nuclear Physics", S.B.Patel, 2006, New Age International Ltd., Hindistan

## ASSESSMENT

Measurement and Evaluation Methods and Techniques
Midterm Exam, Homework, Final Exam

## COURSE CATEGORY

Course Category	Percentage
Area of pecialization Courses	% 50
Support Courses	% 50

## CONTRIBUTION OF COURSE LEARNING OUTCOMES TO PROGRAMME OUTCOMES

Programme Outcomes	Contribution Level	DK1	DK2	DK3	DK4	DK5
<u>PY1</u>	3	3	3	3	3	3
<u>PY2</u>	4	4	5	4	3	4
<u>PY3</u>	3	3	4	2	3	3
<u>PY4</u>	3	4	2	3	4	2
<u>PY5</u>	3	3	2	4	3	3
<u>PY6</u>	4	4	4	5	4	3
<u>PY7</u>	0	0	0	0	0	0
<u>PY8</u>	3	3	3	2	4	3

<u>PY9</u>	4	4	4	3	5	4
<u>PY10</u>	0	0	0	0	0	0
<u>PY11</u>	3	3	4	3	2	3
<u>PY12</u>	3	3	3	3	3	3
<u>PY13</u>	0	0	0	0	0	0
<u>PY14</u>	2	1	3	2	2	2
<u>PY15</u>	0	0	0	0	0	0

\*DK = Course's Contribution.

	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Level of contribution</b>	None	Very Low	Low	Fair	High	Very High

## ECTS CREDITS AND COURSE WORKLOAD

Event	Quantity	Duration (Hour)	Total Workload (Hour)
Final Exam	1	4	4
Further Study	14	3	42
Mid Term Exam Preparation	1	25	25
Final Exam Preparation	1	30	30
Assignment 1	3	15	45
Mid Term Exam 1	1	3	3
Class Hours (14 weeks)	14	3	42
<b>Total Workload</b>			191
<b>Total Workload / 25.5 (s)</b>			7.49
<b>ECTS Credit of the Course</b>			7