Course Information

COURSE INFORMATION

Course Title	Code	Semester	L+U Hour	Credits	ECTS
Introductory Nuclear Physics	FZK374.2	6. Semester	3 + 0	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	Assist. Prof. Dr. Ayşe KÜÇÜKARSLAN
Instructors	
Assistants	
Course Objectives	Atomic models, basic concepts in nuclear physics, units and dimensions; Quantum statistics, fermions, bosons, angular momentum, and parity; nuclear radius, mass, nuclear binding energy in ground state; semiempirical mass formula, nuclear elektromagnetic moments; force between the nucleons, deuteron, properties of the nuclear force; exchange force model; shell model; collective models, nuclear vibrations; nuclear rotations; radioactive decay law, half-life, mean lifetime; natural radioctivity, radioactive series; radioactive dating, units of measuring radiation; interactions of radiation with matter; measuring nuclear radiation.
Course Content	Atomic Models, Basic Concepts in Nuclear Physics, Units and Dimensions,Quantum Statistics, Fermions, Bosons, Angular Momentum, and Parity ,Nuclear Radius, Mass, Nuclear Binding Energy in Ground State ,Semiempirical Mass Formula, Nuclear Elektromagnetic Moments ,Force Between the Nucleons, Deuteron, Properties of the Nuclear Force ,Exchange Force Model ,Shell Model,Nuclear Rotations,Radioactive Decay Law, Half-Life, Mean Lifetime,Natural Radioctivity, Radioactive Series,Radioactive Dating, Units of Measuring Radiation,Collective Models, Nuclear Vibrations,Measuring Nuclear Radiation,Interactions of Radiation with Matter
Course Learning Outcomes	1) Explain the structure of atomic nucleus 2) Apply knowledge of natural sciences (Mathematics, Physics) 3) Analyze natural phenomena 4) Formulate field related problems 5) Analyze the experimental data

WEEKLY COURSE CONTENT

Week	Topics	Teaching and Learning Methods and Techniques	Study Materials
1. Week	Atomic Models, Basic Concepts in Nuclear Physics, Units and Dimensions	Lecture, Problem solving, Homework	

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

2. Week	Quantum Statistics, Fermions, Bosons, Angular Momentum, and Parity	Lecture, Problem solving, Homework	
3. Week	Nuclear Radius, Mass, Nuclear Binding Energy in Ground State	Lecture, Problem solving, Homework	
4. Week	Semiempirical Mass Formula, Nuclear Elektromagnetic Moments	Lecture, Problem solving, Homework	
5. Week	Force Between the Nucleons, Deuteron, Properties of the Nuclear Force	Lecture, Problem solving, Homework	
6. Week	Exchange Force Model	Lecture, Problem solving, Homework	
7. Week	Shell Model	Lecture, Problem solving, Homework	
8. Week	Midterm exam	Exam	
9. Week	Nuclear Rotations	Lecture, Problem solving, Homework	
10. Week	Radioactive Decay Law, Half-Life, Mean Lifetime	Lecture, Problem solving, Homework	
11. Week	Natural Radioctivity, Radioactive Series	Lecture, Problem solving, Homework	
12. Week	Radioactive Dating, Units of Measuring Radiation	Lecture, Problem solving, Homework	
13. Week	Collective Models, Nuclear Vibrations	Lecture, Problem solving, Homework	
14. Week	Measuring Nuclear Radiation	Lecture, Problem solving, Homework	
15. Week	Interactions of Radiation with Matter	Lecture, Problem solving, Homework	
16. Week	Final exam	Exam	

RESOURCES

Recommended Sources
Krane, K. S. Çeviri Editörü: Şarer, B. (2002). Nükleer Fizik. Ankara: Palme Yayınları.
Tanyel, B. (1994). Nükleer Fizik. İzmir: Ege Üniversitesi Basımevi.
Cottingham, W.N.&Greenwood, D.A. Çeviri: Açıkgöz, İ.&Yıldırım, S. (2001). Çekirdek Fiziğine Giriş. İstanbul: Literatür Yayınları.
Williams, W.S.C. (1991). Nuclear and Particle Physics. Oxford: Oxford Science Publications.

ASSESSMENT

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

COURSE CATEGORY

Course Category	Percentage
Core Courses	% 50
Area of Specialization Courses	% 50

CONTRIBUTION OF COURSE LEARNING OUTCOMES TO PROGRAMME OUTCOMES

Programme Outcomes	Contribution Level	DK1	DK2	DK3	DK4	DK5
PY1	4	4	4	3	5	4

PY2	4	4	3	4	5	4
PY3	3	4	3	3	3	2
PY4	0	0	0	0	0	0
PY5	4	5	3	4	4	4
PY6	4	4	4	5	4	3
PY7	0	0	0	0	0	0
PY8	0	0	0	0	0	0
PY9	3	3	4	3	2	3
PY10	0	0	0	0	0	0
PY11	0	0	0	0	0	0
PY12	0	0	0	0	0	0
PY13	4	4	4	4	4	4
PY14	0	0	0	0	0	0
PY15	3	2	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	3	42
Final Exam Preparation	1	25	25
Mid Term Exam Preparation	1	23	23
Further Study	14	3	42
Assignment 1	2	20	40
Mid Term Exam 1	1	3	3
Final Exam	1	3	3
		Total Workload	178
		Total Workload / 25.5 (s)	6.98
		ECTS Credit of the Course	7