



ADIYAMAN UNIVERSITY
FACULTY OF
ARTS AND SCIENCES
PHYSICS DEPARTMENT

INTRODUCTION BOOKLET

2006

2024-2025



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Our Department

The Physics Department, which was established in 2006 within the Faculty of Arts and Sciences of Adiyaman University, started its education by taking its first students in 2008. In our department, which gave its first undergraduate graduates in 2012, many undergraduate and graduate students have completed their education and training until today. The education and training activities of our department are carried out by a strong and dynamic academic staff who are experts in their fields.

In our department, it is aimed to train physicists and future scientist candidates who have gained the ability to think scientifically and have the necessary equipment to solve the problems they may encounter in their professional lives, have adapted to science and technology, and have the qualifications and basic knowledge to make their own contribution when necessary. During their education, the graduates are equipped with the knowledge to understand and interpret the notions of physics, to carry out research and development studies, and to assimilate modern analysis techniques based on theory and practice, with the help of the knowledge access techniques they have been taught, they are also conscious of staying modern, modern, and informed for a lifetime. Graduates of this department can be researchers in their fields as well as provide useful and productive services in Research and Development units of various institutions and organizations, modern analysis and quality control laboratories, and educational institutions if they gain the necessary training formation.



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Head of Department

Prof. Dr. Bayram TALİ

Vice Chairs

Prof. Dr. Niyazi YÜKÇÜ

Asst. Prof. Serkan GÜLDAL

Academic Staff

Prof. Dr. Bayram TALİ

Prof. Dr. Eda SONBAŞ DHUGA

Prof. Dr. Niyazi YÜKÇÜ

Assoc. Prof. Dr. Ali Osman AYAŞ

Assoc. Prof. Dr. Özge ERKEN

Asst. Prof. Dr. Serkan GÜLDAL

Department Secretary

Enver MAMAK

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Mission & Vision

Our Mission

To provide undergraduate and graduate education at universal standards. To equip individuals with scientific analytical thinking and analysis skills in the field of Physics. To raise tolerant individuals who match our original, creative, national, and moral values. To become a nationally and internationally recognized department in the field of physics. To establish close cooperation with research groups where similar activities are carried out by doing scientific research, publication, and consultancy at national and international level. To train researchers who can make outstanding research at national and international level, to become one of the important centers in the field of physics for national and international researchers with their opportunities and capabilities.

Our Vision

To educate individuals, to contribute to the economic and scientific development of our country, have professional knowledge at a level that can produce solutions to problems with scientific approaches, are compatible in teamwork, have high communication skills, prioritize ethical and social values, follow internationally developing technology, and takes part in higher education and institutions to conduct original research with theoretical and experimental knowledge and skills.

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Importance of Physics Departments

Physics is one of the oldest academic disciplines. Physics, which has been used in the same sense as philosophy, chemistry, mathematics, and some branches of biology throughout its historical development, has become a modern science that has determined its own framework for the last few hundred years.

Today, physics has a wide range of topics, from subatomic particles to the entire universe. From the behavior of subatomic particles to the movements of the planets in the Solar System, from the transmission of information in the nervous system to the communication between the Earth and communication satellites, from the properties of nanostructures to insulation materials, from cooling systems to solar energy, many subjects are within the field of physics. Physics is sometimes referred to as the "foundation of the sciences" because the particles being studied form the basic building blocks of matter as we know it.

Studies in the field of physics are both important and affecting society. The reason for this is that these studies can find their place in new technologies very quickly and the ideas developed can be influential in many disciplines such as biology, chemistry, mathematics, engineering, and medicine.

Physics makes human life easier with both theoretical and experimental studies. Many inventions, such as X-rays, telescopes, radios, telegraphs, electricity, LED lights, detectors, and particle accelerators, have been made by physicists.

Seeing the potential of physics to cause the birth of new technologies that can change society, we can see that it is very important to train qualified Physicists in Physics Departments.

Why Physics Department?

Physics, one of the oldest branches of science in humanity and having the same meaning as Mathematics and Astronomy in the first ages of its history, is among the important basic sciences with its established system. Humanity has made its own life easier by understanding nature better with its studies in the sub-branches of Physics. Studying in the physics department allows you to gain knowledge in a wide variety of fields. With the education they will receive in the Physics Department, students will have the infrastructure that can contribute to the efforts to solve many problems that our world will experience in the future, especially energy. Students who have studied Physics can make ideas and inventions that can be applied in Engineering with Physics subfields they will specialize in.

The Physics Department of Adiyaman University is capable of meeting all the needs of the students with its student laboratories with high infrastructure. For scientific research, besides the department's facilities, it can also benefit from the facilities of the Central Research Laboratory and Observatory owned by our university.

It has an academic staff of high quality and the sufficient number of academic staff who have worked in various research and education institutions and organizations that make a name for their success. In the Department of Physics, courses are taught by specialist academics in the important area of work such as High Energy Physics, Nuclear Physics, Astronomy-Astrophysics, Condensed Matter Physics, Magnetic Cooling Systems, Thin Film Technologies and Quantum Computing in Turkey and the world. In our rapidly growing university, undergraduate and graduate education opportunities are extremely good in terms of both laboratories and classrooms.

Along with the Physics education our students receive:

- ❖ They can work on cooling and insulation systems by specializing in thermodynamics laws.
- ❖ Nuclear, Renewable Energy and Energy Resources etc. They can work on energy systems by specializing in their field.
- ❖ Semi and superconductor materials, magnetic cooling systems, solar cells, etc., if they develop themselves on Solid State Physics. They can take place in areas with many applications such as.
- ❖ By working on the principles of electromagnetism, they can be successful in application areas such as communication systems, radars, and GPS.
- ❖ They can take place as a teacher in education sectors with the formation they will receive in education faculties.

Students who graduate from Adiyaman University, Faculty of Arts and Sciences, Department of Physics will have the opportunity to do postgraduate studies in different universities of our country and the world, having scientific and ethical equipment at international standards.

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Job Opportunities for Our Graduates

Considering the relationship in terms of changes in the definition model of the profession, our training program has been prepared by considering the needs of the age. Therefore, it is aimed for our graduate students to adapt easily to many sectors. The elective courses given during undergraduate education are aimed at meeting the personnel needs of the sector. There is a need for qualified physicists to be employed in research centers. According to the R&D objectives of the Ministry of Science, Industry and Technology prepared in the context of the law numbered 6676, it is foreseen that the salaries of the graduates of basic sciences working in R&D centers will be covered by the state for two years for the gross minimum wage. This will make a positive contribution to the employment of Physics graduates. It is known that educational institutions need physics graduate educators. Our students who graduate from the Physics Department can be appointed as teachers by the Ministry of National Education as a result of the teaching profession lessons, they have taken from the Faculty of Education. They can also find jobs in the private education sector. Students, if they wish, conduct academic work, starting with graduate programs. In addition, it will contribute to the employment of faculty members in public and private universities and other academic institutions after their graduate (master and doctorate) education. Apart from his well-taught students in the areas that needed physicists can find job opportunities in many public and private sectors such as Turkish Energy, Nuclear and Mining Research Institute (TENMAK), The Scientific and Technical Research Council of Turkey (TUBITAK), the State Statistics Institute (DIE), Telekom, TEDAŞ, the Nuclear Research and Training Centers. In our country, incentives are given to students who prefer basic sciences in recent years and new steps are taken in the employment of graduates. In the framework of these steps, Turkey Oncology Services

Restructuring Program 2011-2023¹ under each oncology hospital is expected to employ at least three physicists. Physics department students will have employment opportunities in the health sector after graduation by earning a master's degree in Health Physics.

According to the R&D targets of the Ministry of Science, Industry, and Technology prepared in the context of the law numbered 6676, the number of full-time researchers, which is 115 thousand on the basis of 2014, is aimed to be 300 thousand by 2023. Our department will be able to make important contributions to eliminating this deficiency.



¹ https://www.kanser.org/saglik/userfiles/file/11Mayis2011/turkiye_onkoloji_hizmetleri_kitapcik.pdf

Our Course Catalog

Code	Name of Course	T	W	L	ECTS	Code	Name of Course	T	W	L	ECTS
I. SEMESTER						II. SEMESTER					
FZ 101	General Physics I	4	2	5	7	FZ 102	General Physics II	4	2	5	7
MT 101	General Mathematics I	4	2	5	6	MT102	General Mathematics II	4	2	5	6
KM 101	General Chemistry I	4	0	4	5	KM 102	General Chemistry II	4	0	4	4
FZ 151	General Physics Laboratory I	0	2	1	2	FZ 104	Occupational Health and Safety	2	0	2	2
TBT 101	Basic Information Technologies	2	2	3	3	FZ 152	General Physics Laboratory II	0	2	1	2
TD 101	Turkish Language I	2	0	2	2	KM 154	General Chemistry Laboratory	0	2	1	2
AIİT 101	Ataturk's Principles and History of The Infirm I	2	0	2	2	AIİT 102	Ataturk's Principles and History of The Infirm II	2	0	2	2
						TD 102	Turkish Language II	2	0	2	2
	Foreign Languages						Foreign Languages				
YD 101	Foreign Language (English)	3	0	3	3	YD 102	Foreign Language (English)	3	0	3	3
	Total				25		Total				25
					30						30
III. SEMESTER						IV. SEMESTER					
FZ 201	Mathematics for Physics I	4	2	5	7	FZ 202	Mathematics for Physics II	4	2	5	7
FZ 203	Thermodynamic	3	0	3	7	FZ 204	Waves and Optics	4	0	4	7
FZ 205	General Programming I	2	2	3	7	FZ 206	General Programming II	2	2	3	7
FZ 207	Differential Equations	4	2	5	7	FZ 208	Electronic	4	0	4	5
FZ 251	Thermodynamics Laboratory	0	2	1	2	FZ 262	Waves and Optical Laboratory	0	2	1	2
	Total				17	FZ 272	Electronics Laboratory	0	2	1	2
					30		Total				18
											30
V. SEMESTER						VI. SEMESTER					
FZ 301	Modern Physics I	4	0	4	8	FZ 302	Modern Physics II	4	0	4	8
FZ 303	Electromagnetic Theory I	4	0	4	7	FZ 304	Electromagnetic Theory II	4	0	4	7
FZ 305	Classic Mechanical I	4	0	4	7	FZ 306	Classic Mechanics II	4	0	4	4
FZ 307	Statistics Physics	4	2	5	8	FZ 308	Atomic and Molecular Physics	4	0	4	8
	Total				17	FZ 362	Modern Physics Laboratory	0	2	1	2
					30	FZ 364	Electrical and Magnetism Laboratory	0	2	1	1
							Total				18
											30
VII. SEMESTER						VIII. SEMESTER					
FZ 401	Quantum Mechanics I	3	0	3	6	FZ 402	Quantum Mechanics II	3	0	3	6
FZ 403	Solids Physics I	4	0	4	6	FZ 404	Solids Physics II	4	0	4	6
FZ 405	Nuclear Physics I	4	0	4	6	FZ 406	Nuclear Physics II	4	0	4	6
FZ 407	Research Project I	0	2	1	2	FZ 408	Research Project II	0	2	1	2
FZ 4**	Elective Course 1	3	0	3	5	FZ 4**	Elective Course 3	3	0	3	5
FZ 4**	Elective Course 2	3	0	3	5	FZ 4**	Elective Course 4	3	0	3	5
	Total				18		Total				18
					30						30
VII. SEMESTER SEÇMELİ DERSLERİ						VIII. SEMESTER SEÇMELİ DERSLERİ					
FZ 451	Nuclear Medicine Physics and Applications I	3	0	3	5	FZ 452	Nuclear Medicine Physics and Applications II	3	0	3	5
FZ 455	Introduction to Astrophysics I	3	0	3	5	FZ 454	Liquid Crystals and Applications II	3	0	3	5
FZ 457	Introduction to Particle Physics I	3	0	3	5	FZ 456	Introduction to Astrophysics II	3	0	3	5
FZ 459	Introduction to Object-Based Programming Techniques in YEF I	3	0	3	5	FZ 460	Introduction to Object-Based Programming Techniques in HEP II	3	0	3	5
FZ 461	Contemporary Physics	3	0	3	5	FZ 458	Introduction to Particle Physics II	3	0	3	5
FZ 463	Introduction to group theory	3	0	3	5	FZ 462	Sign Language	3	0	3	5
FZ 465	Optical and Acoustic	3	0	3	5						
FZ 467	Linear Algebra	3	0	3	5						
FZ 469	Numeric Modeling	3	0	3	5						
FZ 471	History of Science	3	0	3	5						
							Compulsory Course				130
							Humanities				14
							Elective Course				12
							TOTAL				156

Abbreviations: T = Weekly theoretical lesson time; W = Weekly practice lesson time, Workshop; C = Course Credit; ECTS= European Credit Transfer System

Our Physics Department Activities

- ❖ To communicate with R&D Centers in our province and region.
- ❖ To give conferences to secondary education institutions in our province.
- ❖ To work as a coordinator or researcher in national and international projects.
- ❖ To carry out national and international cooperation.
- ❖ To participate in national and international conferences and to present papers.
- ❖ Organizing Science and Society events.



Our laboratories

In our department, advanced training is provided in modern laboratories, computer aided and in all areas of physics. For this purpose, Mechanical, Basic Electricity, Waves and Optical, Electronics, Quantum Physics, Electrical and Magnetism laboratories have been prepared for our students and our students increase their knowledge and experience by repeating the subjects they see theoretically in the laboratory environment in a unique way.

Name	Size (m ²)	Student Capacity
General Physics I Laboratory (Mechanical Lab.), General Physics II Laboratory (Basic Electrical Lab.), Electrical and Magnetism Laboratory	110	50
Thermodynamics Laboratory, Waves and Optical Laboratory,	110	50
Electronics Laboratory, Quantum Physics Laboratory,	110	50
Computer Laboratory	70	50

Test Setups in Existing Laboratories:

- 1. Mechanical Laboratory:** Air Tables are available. In the mechanical laboratory, Smooth Linear Motion, Constant Acceleration Motion, Motion on The Oblique Plane, Tilted Shot Movement, Smooth Circular Motion, Elastic Collision, Inelastic Collision, Measurement of Push and Momentum Change, Rotating Progress Movement experiments can be conducted.
- 2. Basic Electrical Laboratory:** Laboratory equipment such as analog and digital multimeters, power supplies, resistors, connection cables, capacitors, diodes, connection cables, plates, etc. are

available. In the basic electrical laboratory, Ohm Law, Serial and Parallel Connected Circuits, Kirchhoff Laws, Wheatstone Bridge, Alternating Current Circuits experiments can be conducted.

3. Waves and Optical Laboratory: Laboratory equipment such as oscilloscopes, Signal Manufacturers, Power Supplies, Wave Tank, Lenses, Light Source, etc. are available. In the Waves and Optical Laboratory; Oscilloscope and Wavelength Measurements, Linear Sum and Hit of Two Waves, Lissajous Curves for The Same and Different Frequency Waves, RLC Circuits and Oscillations-Damped Harmonic Motion, Resonance, Creation of Water Waves - Reflection in Different Obstacles, Wave Velocity and Doppler Effect, Interference and Diffraction in Water Waves, Thin Edged Lens, Thick Edge Lens, Creating slide projector, microscope, Kepler telescope and Galileo telescope using thin and thick-edged lenses, Fresnel double mirror and Fresnel double prism can be experimented with calculating the wavelength of light.

4. Electronic Laboratory: Electronic test sets are available. In the Electronics Laboratory, Diode Characteristics, Nature of an LED, Diode Arms in a Transistor, Input-Output and Control Characteristics of Transistors, Static Resistance, Phototransistor Characteristic, Darlington Circuit experiments can be conducted.

5. Quantum Laboratory: Millikan Oil Drop, Photoelectric Event, Rutherford Scattering, Compton Scattering, Hall-Effect, e/m Determination, Franck-Hertz Test sets are available, and all of these experiments can be conducted.

6. Electrical and Magnetism Laboratory: Electric Field Between Plates, Co-Potential Lines, Magnetic Field of the Earth, Magnetic Field of a Circular Conductor, Magnetic Field in Coils, Torque and Magnetic Moment in Magnetic Field, Transformers Test sets are available, and all of these experiments can be conducted.

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