SHAQRA UNIVERSITY

COLLEGE OF SCIENCE AND HUMANITIES IN DAWADMI

PHYSICS DEPARTMENT

Physics Program Introductory Guide

Bachelor of Physics

1-Physics Program Overview:

The Physics Department belongs to the College of Science and Humanities in Dawadmi, which was established by Royal Decree No. (7305/MB, dated 3/9/1430 AH) with the creation of Shaqra University. This decree stemmed from the Kingdom's government's commitment to advancing public and university education. It should be noted that the college and department were initially established in 1429 AH and were under the umbrella of King Saud University.

2-Program Mission:

To provide outstanding education and produce innovative research that serves society and contributes to its knowledge-based economic development by creating a stimulating environment for learning, creativity, and scientific research, with continuous quality that ensures the optimal use of technology and public partnerships with relevant community institutions in the field of physics.

3-Program Objectives:

- To achieve excellence in higher education, scientific research, and community service.
- To develop methods to ensure the quality of performance and outcomes.
- To optimize the use of modern technologies.
- To provide a stimulating administrative and academic environment.
- To attract the best faculty, staff, and students.
- To establish effective local and international partnerships with universities and relevant community sectors.
- To promote scientific culture and its activities.

4-The program learning outcomes:

Code	Program Learning Outcomes (PLOs)
1	**Knowledge and understanding**
K1	Demonstrate a broad and deep knowledge of the fundamental theories, principles, and concepts across the fields of physics.
K2	Recognize the techniques, materials, practical procedures, and scientific assumptions underlying experimental physics and the use of laboratory equipment and software.
K3	Possess a comprehensive understanding of research methodology, methods of scientific inquiry, and recent developments in the field of physics.
2	**Skills**
S1	Applying knowledge, theories, and physical laws to solve problems in the fields of Physics.
S2	Design experiments in physics, utilizing appropriate instrumentation and statistical methods to evaluate and interpret experimental results in accordance with physical laws and principles.
S3	Analyze and model complex physical systems and phenomena by applying fundamental principles and theories of physics.
S4	Communicate effectively with a range of audience in various ways to demonstrate an understanding of theoretical knowledge, imparting knowledge, specialized skills and complex ideas.
S5	Utilize mathematical tools and digital technology applications, along with computer programs, to describe, model, and analyze physical phenomena.
3	**Values, Autonomy, and Responsibility**
V1	Demonstrate commitment to values, standards, and professional ethics, embodying responsible citizenship, coexisting with others, and actively engaging in the advancement of the community.
V2	Collaborate effectively within a team, taking on roles as a cooperative member or a flexible leader, to foster a collaborative and inclusive environment, establish goals, plan tasks, and achieve objectives.
V3	Develop plans for professional and academic self-improvement in the field of physics, manage activities effectively and independently, evaluate performance, and make evidence-based decisions.

5- Program Educational Objectives

- Graduates will apply the fundamentals of physics, along with their analytical, design, and technical skills, to resolve problems in effective and innovative ways .
- Graduates will demonstrate responsibility and professional ethics in their interactions across diverse workplace environments .
- Graduates will effectively collaborate within interdisciplinary teams, assume leadership roles, and communicate clearly and professionally with a variety of stakeholders .
- Graduates will engage in continuous learning and professional development to adapt to advancing technology and evolving career opportunities

6- Graduate Attributes

The physics curriculum at the undergraduate level plays an important role in achieving the general objectives of the stage by providing students with physical information that helps them understand their environment, develop their scientific attitudes, and acquire the practical skills necessary to use the achievements, methods, and technologies of science effectively in serving society, solving its problems, and developing it. These are objectives that ensure the development of scientific culture among members of society, enabling them to actively participate in scientific advancements, keep pace with global technological developments, and benefit from the information revolution. In light of the future role of teachers in general, and physics teachers in particular, it has become essential for physics teachers to possess fundamental competencies. Among the most important of these competencies are the ability to:

- Be familiar with all the laws and principles of physics.
- Integrate practical and theoretical knowledge and analyze physical measurements to draw sound conclusions.

- Identify appropriate tools and techniques that can be used to solve complex problems and find innovative solutions based on their studies.
- Work effectively in a team environment, demonstrate positive leadership and team building skills, and acquire the necessary project management skills.
- The ability to apply mathematical calculations, analyze physical phenomena, and explain them scientifically.
- Understanding the everyday applications of most physical phenomena in our daily lives and how to interpret them.
- Demonstrating personal responsibility towards the profession through participation in community activities related to the profession and developing self-learning skills to enhance the teaching process.
- Commitment to continuous learning for personal development and excellence in professional practice.
- The ability to plan and organize effectively, communicate effectively, work collaboratively, be creative, and demonstrate responsibility.

7-The organizational structure of the Physics Program

The program works with 11 committees, as demonstrated by following visual organizational structure.

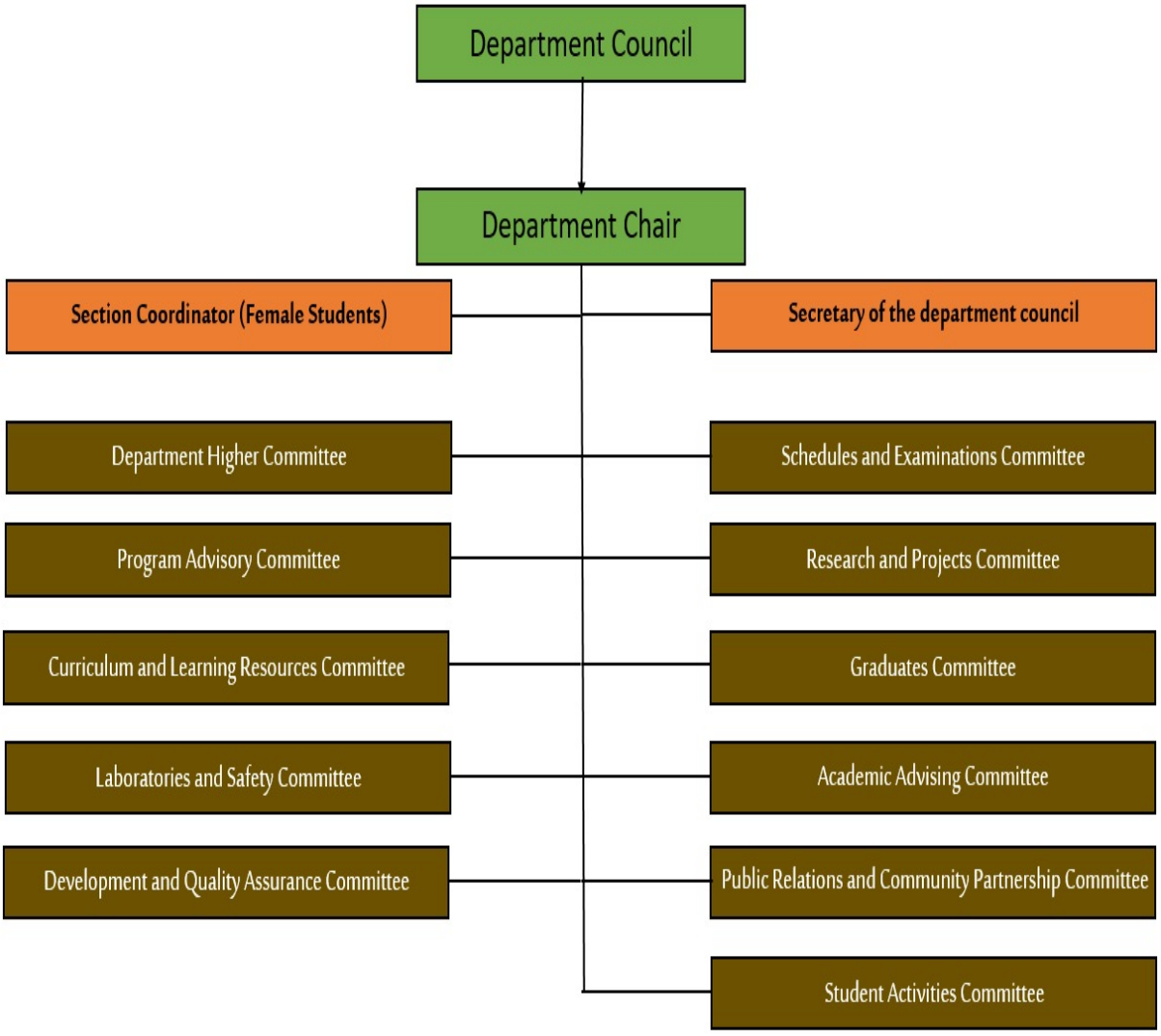


Figure 1: The organizational structure of the Physics Program

8- Study plan

First							
code	course name	H	G	L	H	requisite	Yrl
CHEM 1301	Chemistry 1	3				-	-
CIT 1301	Computer Skills	3				-	-
MATH 1304	Introduction to Probability & Statistic	3				-	-
MATH 1307	Calculus 1	3				-	-
PHYS 1401	Physics 1	4				-	-
SLM 1202	Social Values in Islam	2				-	-
Total							18

Second							
code	course name	H	G	L	H	requisite	Yrl
CUR 1201	Academic Skills	2				-	-
ENGL 1301	English Language	3				-	-
MATH 1308	Calculus 2	3				MATH 1307 - / P	-
PHYS 1321	Classical Mechanics 1	3				PHYS 1401 - / P	-
PHYS 1402	Physics 2	4				PHYS 1401 - / P	-
PHYS 1403	Methods of Theoretical Physics 1	4				MATH 1307 - / P	-
Total							19

Third							
code	course name	H	G	L	H	requisite	Yrl
MATH 1306	Differential Equations	3				MATH 1308 - / P	-
PHYS 2311	computer application in physics	3				PHYS 1403 - / P	-
PHYS 2312	Electricity and Magnetism 1	3				PHYS 1402 - / P	-
PHYS 2313	Classical Mechanics 2	3				PHYS 1321 - / P	-
PHYS 2314	Vibrations and Waves	3				PHYS 1402 - / P	-
PHYS	Methods of	4				PHYS 1403 - / P	-

Sixth							
code	course name	H	G	L	H	requisite	Yrl
3324							
PHYS 3326	computational physics	3				PHYS 1402 - / P PHYS 1403 - / P	-
PHYS 3421	Thermal & Statistical Physics	4				PHYS 2325 - / P	-
PHYS 3422	Solid-state physics	4				PHYS 3412 - / P	-
Total							18

Seventh							
code	course name	H	G	L	H	requisite	Yrl
PHYS 4113	Physics Seminar	1				-	-
PHYS 4211	Solid state Physics Lab	2				PHYS 3422 - / P	-
PHYS 4312	Atomic & Molecular Physics	3				PHYS 3412 - / P	-
PHYS 4314	Semiconductor Physics	3				PHYS 3422 - / P	-
PHYS 4315	Selected Topics in Applied Physics	3				PHYS 3422 - / P	-
PHYS 4399	Undergraduate Research Projects	3				PHYS 4211 - / C	-
Total							15

Eighth							
code	course name	H	G	L	H	requisite	Yrl
PHYS 4699	Collaborative training	6				PHYS 4399 - / P	-
Total							6

Third							
code	course name	H	G	L	H	requisite	Yrl
2415	Theoretical Physics 2						
Total							19

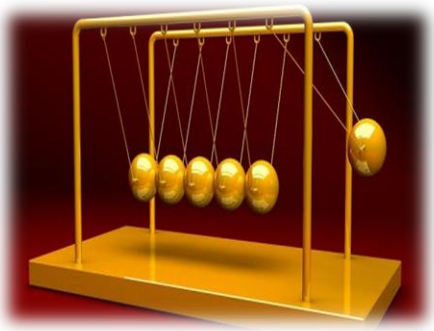
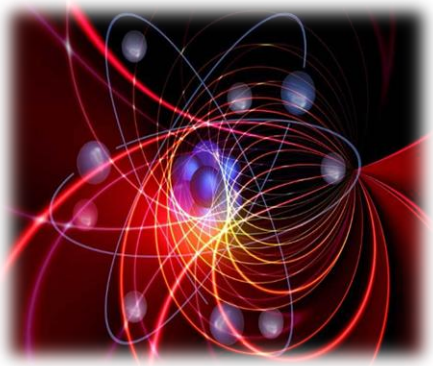
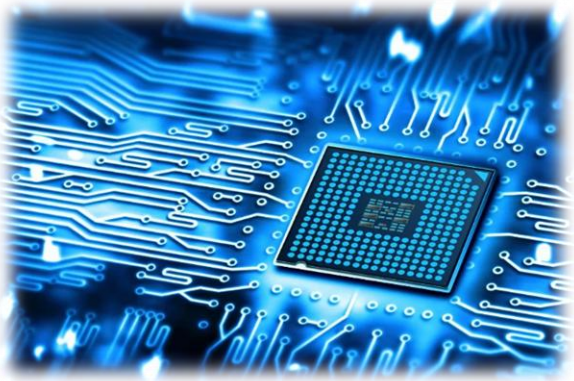
Forth							
code	course name	H	G	L	H	requisite	Yrl
PHYS 2221	Electromagnetic Lab	2				PHYS 2312 - / P	-
PHYS 2224	Wave Physics Lab	2				PHYS 2314 - / P	-
PHYS 2322	Electricity and Magnetism 2	3				PHYS 2312 - / P	-
PHYS 2323	Optics	3				PHYS 2314 - / P	-
PHYS 2325	Modern Physics	3				PHYS 1402 - / P	-
Total							13

Fifth							
code	course name	H	G	L	H	requisite	Yrl
ARB 1201	Language Skills	2				-	-
PHYS 3213	Modern Physics Lab	2				PHYS 2325 - / P	-
PHYS 3311	Electronics	3				PHYS 1402 - / P	-
PHYS 3314	Nuclear Physics	3				PHYS 2325 - / P	-
PHYS 3412	Quantum Mechanics	4				PHYS 2325 - / P	-
SLM 1201	Principles of Islam	2				-	-
Total							16

Sixth							
code	course name	H	G	L	H	requisite	Yrl
PHYS 3223	Introduction to Nanoscience and Nanotechnology	2				PHYS 3422 - / C	-
PHYS 3225	Nuclear Physics Lab	2				PHYS 3314 - / P	-
PHYS	Laser Physics	3				PHYS 2325 - / P	-

Forth							
code	course name	H	G	L	H	requisite	Yrl
CHEM 1302	Physical Chemistry	3				CHEM 1301 - / P PHYS 1401 - / P	-
PHYS 3327	Physics of Solar cells	3				PHYS 3422 - / P	-
PHYS 3328	Introduction to Materials Science	3				PHYS 3422 - / P	-
PHYS 3329	Plasma Physics	3				PHYS 2312 - / P	-
PHYS 3330	Renewable energy	3				PHYS 1402 - / P	-
PHYS 4325	Physical spectroscopic analysis	3				PHYS 2325 - / P	-
PHYS 4326	Introduction to Quantum Information and Computing	3				PHYS 3412 - / P	-
PHYS 4327	Cosmology and the Early universe	3				PHYS 1402 - / P	-
PHYS 4328	Radiation and Health Physics	3				PHYS 3314 - / P	-
Total							27

9- Department Laboratories

Optical Physics Laboratory 	General Physics Laboratory 
Modern Physics Laboratory 	Electromagnetism Laboratory 
Nuclear Physics Laboratory 	Solid State Physics Laboratory 
Electronics Laboratory 	

10-Faculty members

Name	Grade	Specialization	Email
Dr. Fahd Nayef Al-Mutairi	Assistant Professor	Applied Physics	f_almutairi@su.edu.sa
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Dr. Mohammed Obaid Al-Ziyadi	Associate Professor	Computational Materials Science	malziyadi@su.edu.sa
Dr. Boubaker Mohammed Zaidi	Associate Professor	Nanomaterials Physics	boubaker@su.edu.sa
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Dr. Ahmed Al-Jumai Zahiri	Associate Professor	Materials Science	adhahri@su.edu.sa
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11- Distribution of committees in the department

	Departmental Committees	Committee members
1	Departmental Higher Committee	Dr. Fahd Nayef Anan Al-Mutairi + Dr. Boubaker Mohamed Ali Zaidi + Dr. Muawiya Mohamed Al-Hadi Abdel-Baqi + Dr. Ahmed Jumai Zahiri + Dr. Tawfiq Masoud Nafouti + Dr. Ali Mohamed Hassanein + Dr. Naji Ali Al-Khalifi + Dr. Ayman Abdel-Aziz Al-Sayed + Dr. Ammar Mohamed Mohsen Al-Muhammadi + Dr. Rateb Mohamed Khalil Al-Rajoub + Dr. Afaf Al-Taher Harizi + Dr. Manal Mahmoud Al-Sayed
2	Program Advisory Committee	Dr. Fahd Nayef Anan Al-Mutairi + Prof. Dr. Nabil Balnasib + Dr. Ali Ismail Abdel-Rahim + Dr. Abdel-Aziz Ibrahim Al-Maliki + Azzam Nayef Al-Mutairi
3	Curriculum and Learning Resources Committee	Dr. Manal Mahmoud Al-Sayed + Dr. Tawfiq Masoud Al-Nafouti + Dr. Lamia Al-Amin Mohamed Al-Saleh Thamri
4	Development and Quality Assurance Committee	Dr. Muawiya Mohamed Al-Hadi Abdel-Baqi + Dr. Boubaker Mohamed Ali Zaidi + Dr. Afaf Al-Taher Harizi + Ms. Manahil Idris Al-Toumi + Dr. Ali Mohamed Hassanein + Dr. Hala Jaafar Al-Amin
5	Research and Projects Committee	Dr. Ali Muhammad Hassanein + Dr. Naji Ali Al-Khalifi + Dr. Manal Mahmoud Al-Sayed
6	Graduates Committee	Dr. Afaf Al-Taher Harizi + Dr. Ayman Abdul Aziz Al-Sayed + Ms. Khadija Fadl Al-Mukhtar
7	Academic Advising Committee	Dr. Tawfiq Masoud Al-Nafouti + Dr. Lamia Al-Amin Muhammad Al-Saleh Thamri + Ms. Hajar Abdul Mohsen Muhammad Ahmad
8	Schedules and Examinations Committee	Dr. Ammar Muhammad Mohsen Al-Muhammadi + Dr. Rateb Muhammad Khalil Al-Rajoub + Dr. Hala Jaafar Al-Amin
9	Public Relations and Community Partnership Committee	Dr. Ayman Abdul Aziz Al-Sayed + Dr. Ahmad Juma'i Zahiri + Ms. Hajar Abdul Mohsen Muhammad Ahmad
10	Laboratories and Safety Committee	Dr. Naji Ali Al-Khalifi + Dr. Rateb Muhammad Khalil Al-Rajoub + Ms. Sultana Dhaif Allah Al-Malafikh
11	Student Activities Committee	Dr. Ahmad Juma'i Zahiri + Ms. Khadija Fadl Al-Mukhtar + Ms. Nouf Dhaif Allah Al-Malafikh

12- Regulations and Guidance Service Guide

-Link to the Study and Examination Regulations:

https://www.su.edu.sa/sites/default/files/2024-11/%D9%84%D8%A7%D9%8A%D9%94%D8%AD%D8%A9%20%D8%A7%D9%84%D8%AF%D8%B1%D8%A7%D8%B3%D8%A9%20%D9%88%D8%A7%D9%84%D8%A7%D8%AE%D8%AA%D8%A8%D8%A7%D8%B1%D8%A7%D8%AA.pdf?csrt=7980355740850923767

- Link to the list of student rights and responsibilities:

https://www.su.edu.sa/sites/default/files/2024-10/%D9%84%D8%A7%D8%A6%D8%AD%D8%A9%20%D8%A7%D9%84%D8%AD%D9%82%D9%88%D9%82%20%D8%A7%D9%84%D8%B7%D9%84%D8%A7%D8%A8%D9%8A%D8%A9.pdf?csrt=7980355740850923767

- Link to the guide for contacting the academic advisor:

https://www.su.edu.sa/sites/default/files/2023-08/%D8%AF%D9%84%D9%8A%D9%84%20%D8%AE%D8%AF%D9%85%D8%A9%20%D8%A7%D9%84%D8%AA%D9%88%D8%A7%D8%B5%D9%84%20%D9%85%D8%B9%20%D8%A7%D9%84%D9%85%D8%B1%D8%B4%D8%AF%20%D8%A7%D9%84%D8%A3%D9%83%D8%A7%D8%AF%D9%8A%D9%85%D9%8A.pdf?csrt=7980355740850923767