

Kingdom of Saudi Arabia
Ministry of Education
Al-jouf University
College of science
Physics department



المملكة العربية السعودية
وزارة التعليم
جامعة الجوف
كلية العلوم
قسم الفيزياء

Physics Handbook

*Preparation of the Quality and Academic Accreditation
Committee*

2020

VISION, MISSION AND GOALS OF THE PHYSICS DEPARTMENT

VISION

Excellence, creativity and keeping pace with developments in physics and its applications, at the local and international levels, to achieve community development.

MISSION

Commitment to excellence in education and creativity in scientific research by creating a stimulating environment of quality, and ensuring optimal employment of modern technology and effective cooperation with relevant local and regional institutions to serve and develop the surrounding community to meet the development plans in the Kingdom.

Objectives:

1. Permanent excellence in education, scientific research and community service.
2. Continuous development to ensure the quality of education and its outputs.
3. Accompanying and being able to use the latest technology in the field of education and scientific research.
4. Preparing scientifically qualified cadres in the field of physics and its applications to meet the needs of the labor market in the Kingdom for both the public and external sectors.
5. Activating the department's role in supporting the Kingdom's development programs and plans and contributing to solving scientific and industrial problems facing it.
6. Attracting the best from the faculty.
7. Promote and activate the scientific culture for the development of society .Establishing productive local and regional partnerships with relevant universities and research institutions.

The Department head message

Praise be to Allah who taught by the pen, taught man that which he knew not, peace be upon our Prophet, Muhammad, his family and all of his companions

It is my great pleasure to share with you this speech on behalf of the staff in the Physics Department at the Faculty of Science at Jouf university. I am *grateful* to Allah Almighty for giving me the opportunity to serve my religion, and my country through this position.

Allow me to extend a special thanks to the President of the university, his Vices-President, Deans and all my colleagues in the Faculty of Science, in general, and in the Department of Physics, in particular, for all their continued efforts to better *serve our* university to be among the top universities in KSA.

The physics is a fundamental science, all-natural science such as, biology, chemistry and astronomy are based on physical laws. Physics also is present into our everyday life. All technologies around us are linking to the physics. In short, physics is the mother of all the sciences.

The science of physics can be classified into two areas first is the theoretical physics, which is concerned in modeling and simulation and the second is experimental physics that tests and investigates these theories, as well as detects new natural phenomena. Therefore, wherever the technology is found, the job of a physicist is found. The qualified physicist should possess the information that makes him deal with the fundamental principles of technology.

By choosing physics, students should go through eight levels and pass them successfully. Then, they will award Bachelor of Science in *Physics*. The curriculum was well prepared and were developed in the physics department and was benchmarked with local, regional and international universities. The new curriculum was implemented in the academic year of 1439/1440 AH

The university has also approved a master program with two paths for now which is material science and medical physics, and this will be started in the first semester of 1440/1441.

Head of department of Physics

Admission Requirements

The University Council determines the number of students to be admitted in the upcoming academic year according to the recommendations of Colleges' Councils and respective bodies.

Admission of prospective students requires the following:

- a. The applicant must hold the General Secondary Certificate or its equivalent from inside outside Saudi Arabia.
- b. The General Secondary Certificate or its equivalent must have been obtained within the last five years (Exceptions can only be decided by the University Council in light of persuasive reasons).
- c. The applicant must enjoy a good conduct.
- d. The applicant must pass any interviews or tests decided by the University Council.
- e. The applicant must be medically fit.
- f. The applicant must obtain an approval to the study from his/ her employer if he/she works in any government or private institution.
- g. The applicant must meet any other conditions determined and announced by the University Council at the time of application.
- h. The applicant must have not been dismissed from another university for disciplinary reasons.
- i. Holders of a bachelor's degree or its equivalent may not be admitted to study another BA degree (exceptions can be decided only by the University Rector).
- j. Applicants who are currently registered for another university degree or less, in this university or another one, may not be admitted.

Selection of admitted students from applicants who meet all admission requirements is taken on the basis of their grades in the general secondary certificate, personal interviews and admission tests (if any).

Rules and Regulations of Study and Examinations

The study and evaluation guide is available on the website of the Deanship of Admission and Registration, the URL is:

https://dar.ju.edu.sa/forms/list_laws_E.pdf

Guidance to Advising:

At the beginning of each academic year, the dean and staff members of each college conduct a welcome orientation of its newly admitted students. The objectives of such an orientation include but not limited to:

1. A welcoming message from the Dean aimed at facilitating their integration into the various services of the university and also to the departments of the college.
2. Introducing the students to the Academic and Student Advising Unit in the college.
3. Distributing the university Advising Guide.
4. Assigning faculty advisors to the individual students.
5. The meeting of coordinators of the academic guidance to consult on the academic guidance plan in the college and about ways to develop it through practical proposals by each department under the supervision of the academic guidance unit.
6. Activate the service of an academic guide for the new faculty members and connect students with them to establish a balance in the service of guidance among all members of the faculty without full-time assignments.

Advising and Career Guidance:

The academic student guide is available in Arabic language on the website of the Deanship of Admission and Registration, the URL is:

http://dar.ju.edu.sa/forms/Acadmic_Student.pdf.

Study Plan of Physics Department

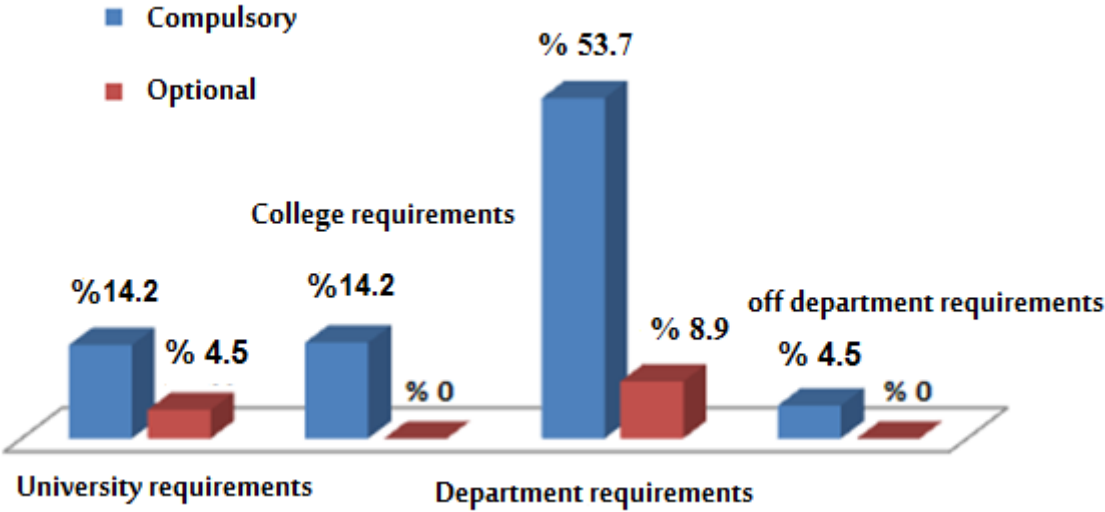
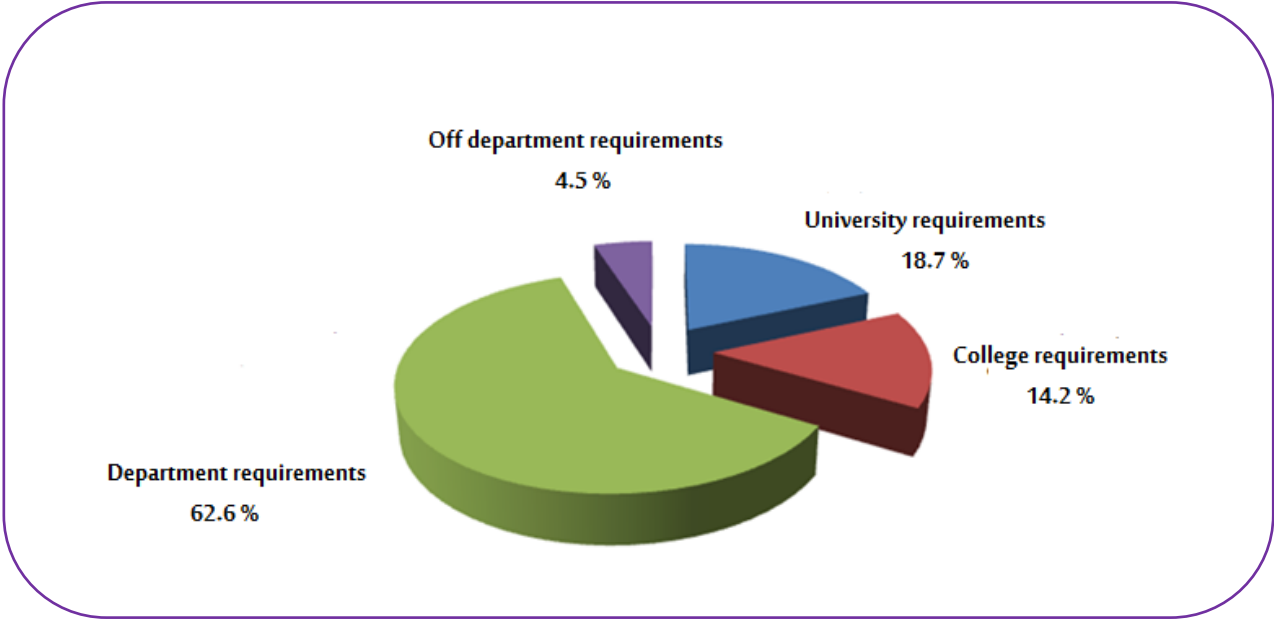


جامعة الجوف
Al Jouf University

Distribution of Credit Hours in the Course Plan per Specialization

The study plan of the Physics Department consisting of 135 study units distributed as follows:

Percentage Out Of Total Course Plan Hours	Total Credit Hours	Type	Requirements
14.1	91	Compulsory	University Requirements
44.	06	Optional	
.211	51	Compulsory outside specialization	College Requirements
03	04	Compulsory inside specialization	
0	0	Optional	
45	73	Compulsory	Department Requirements
8.9	12	Optional	
44.	06	Compulsory	Off Department Requirements
0	0	Optional	
%100	135	TOTAL	



Coding courses

The course codes consist of literal as well as numerical classifications.

The literal classification refers to the section, and the numerical classification consists of three digits as follows:

1. The number at hundreds place indicates the year.
2. The number at tens place indicates the specialization.
3. Last digit symbolizes the sequence of the course within the specific specialization of the department.

The meaning of the number at tens place in the coding of physics department courses

Specific Specialization	Numbers Indicators
Mathematical Physics-General Physics	0
Classical Mechanics- Vibrations and Waves- Fluid Physics	1
Thermal and Statistical Physics - Quantum Mechanics	2
Electromagnetism- Electromagnetism lab - Electronics- Electronics Lab- Computational Physics	3
Modern Physics- Modern Physics Lab - Renewable energy transformations and environment - Astronomy physics – Atomic physics and spectroscopy	4
Optics- Optics Lab- Laser Physics & its Application	5
Solid State Physics Lab- Plasma Physics- -Solid State Physics Semiconductor - Material Sciences Physics- Introduction to Nanoscience and Nanotechnology	6
Nuclear Physics- Radiation Physics- Nuclear Physics Lab- Biophysics- Medical Physics - Physics of Nuclear Reactors and accelerators	7
Field Training- Research Project–Selected Topics	9

University Compulsory Courses (19 units)

Prior requirements	Hours				Course Name	Course Number/Code
	Accredited	Training/ Exercises	Practical	Theoretical		
	3	2	0	2	English Language I	ENGL 103
	2	0	0	2	Fundamentals of Islamic Culture	ISL 101
	3	0	2	2	Computer Skills	CIS 101
	2	0	0	2	University Life Skills	EDU 101
ENGL 103	3	2	0	2	English Language (2)	ENGL 104
	2	0	0	2	Language Skills	100ARB
100ARB	2	0	0	2	Editing	ARB 102
	2	0	0	2	Studies in the Biography of the Prophet	ISL 100

University Optional Courses (6 units) out of 10 units

Prior requirements	Hours				Course Name	Course Number/Code
	Accredited	Training/ Exercises	Practical	Theoretical		
	2	0	0	2	The Role of Women in Development	ISL 109
	2	0	0	2	Professional Ethics	ISL 107
	2	0	0	2	Contemporary Issues	ISL 108
	2	0	0	2	Volunteer Work	EDU 102
	2	0	0	2	Entrepreneurship	BUS 101

College Compulsory Courses (19) units

Prior requirements	Hours				Course Name	Course Number/Code
	Accredited	Training/ Exercises	Practical	Theoretical		
	3	2	0	2	Introductory Mathematics	MTH 101
	3	0	2	2	General Biology	BIOL 101
MTH 101	3	2	0	2	Differential Calculus	MTH 102
	4	0	2	3	General Physics (1)	PHS 101
MTH 101	2	2	0	1	General Statistics	MTH 201
	4	0	2	3	General Chemistry (1)	CHM 101

Off department Compulsory Courses (6) units

Prior requirements	Hours				Course Name	Course Number/Code
	Accredited	Training/ Exercises	Practical	Theoretical		
MTH 102	3	2	0	2	Integral Calculus	MTH 203
MTH 203	3	2	0	2	Introduction to differential Equations	MTH 294

Percentage of Department's Compulsory Courses 54.7 % of the Total 135 Units

Prior requirements	Hours				Course Name	Course Number/Code
	Accredited	Training/ Exercises	Practical	Theoretical		
1PHS 10	4	0	2	3	General Physics (2)	PHS 202
1PHS 10	3	0	0	3	Classical Mechanics (1)	PHS 211
1PHS 10	3	0	0	3	Mathematical Physics (1)	PHS 203
PHS 211	3	0	0	3	Classical Mechanics (2)	PHS 212
PHS 101	3	0	0	3	Vibrations and Waves	PHS 213
2PHS 20	3	0	0	3	Thermal and Statistical Physics	PHS 321
2PHS 20	4	2	0	3	Electromagnetism	PHS 231
PHS202	3	0	0	3	Modern Physics	PHS 341
31PHS 2	2	0	4	0	Electromagnetism lab	PHS 332
PHS 203	2	0	0	2	Mathematical Physics (2)	PHS 304
PHS 202	3	0	0	3	Optics	PHS 351
PHS 202, Synchronous with PHS 351	2	0	4	0	Optics Lab	PHS 352
PHS 341	2	0	4	0	Modern Physics Lab	PHS 342
PHS 231	3	0	0	3	Electronics	PHS 333
PHS 231, Synchronous with PHS 333	2	0	4	0	Electronics Lab	PHS 334
PHS 304+MTH294	3	0	2	2	Computational Physics	PHS 335
PHS 341	3	0	0	3	Solid State Physics (1)	PHS 361
PHS 341	3	0	0	3	Quantum Mechanics (1)	PHS 422
PHS 341	3	0	0	3	Nuclear Physics	PHS 471
PHS 361	3	0	0	3	Solid State Physics (2)	PHS 462
Pass 90 units	3	0	6	0	Field Training	PHS 498
PHS 422	3	0	0	3	Quantum Mechanics (2)	PHS 423
PHS 471	3	0	0	3	Radiation Physics	PHS 472
PHS 471	2	0	4	0	Nuclear Physics lab	PHS 473
PHS 462	2	0	4	0	Solid State Physics lab	PHS 463
Pass 100 units	3	0	6	0	Research Project	PHS 499

Department's Optional Courses (12) Units

Prior requirements	Hours				Course Name	Course Number/Code
	Accredited	Training/ Exercises	Practical	Theoretical		
PHS 351	3	0	0	3	Laser Physics & its Application	PHS 353
PHS 202	3	0	0	3	Biophysics	PHS 374
PHS 333	3	0	0	3	Semiconductors Physics	PHS 365
PHS 321	3	0	0	3	Renewable energy transformations and environment	PHS 343
PHS 231	3	0	0	3	Plasma Physics	PHS 364
PHS 374	3	0	0	3	Medical Physics	PHS 475
PHS 202	3	0	0	3	Astronomy physics	PHS 444
PHS 361+PHS 364	3	0	0	3	Materials Science	PHS 366
PHS 101	3	0	0	3	Fluid Physics	PHS 414
PHS 422	3	0	0	3	Atomic physics & spectra	PHS 445
PHS 471+PHS 475	3	0	0	3	Physics of Nuclear Reactors and accelerators	PHS 476
PHS 462+PHS 365	3	0	0	3	Introduction to Nanoscience and Nanotechnology	PHS 467
Pass 90 units	3	0	0	3	Selected Topics (Department Approval)	PHS 491

Distribution of Credit Units into Eight Levels

First Level

Prior requirements	Hours				Course Name	Course Number/Code
	Accredited	Training/Exercises	Practical	Theoretical		
	3	2	0	2	English Language (1)	ENGL 103
	3	2	0	2	Introductory Mathematics	MTH 101
	3	0	2	2	General Biology	BIOL 101
	2	0	0	2	Fundamentals of Islamic Culture	ISL 101
	3	0	2	2	Computer Skills	CIS 101
	2	0	0	2	University Life Skills	EDU 101
No. of Units - 16 units						

Second Level

Prior requirements	Hours				Course Name	Course Number/Code
	Accredited	Training/Exercises	Practical	Theoretical		
ENGL 103	3	2	0	2	English Language (2)	ENGL 104
	4	0	2	3	General Physics (1)	PHS 101
MTH 101	3	2	0	2	Differential Calculus	MTH 102
	4	0	2	3	General Chemistry (1)	CHM 101
	2	0	0	2	Language Skills	ARB 100
	2	0	0	2	Studies in the Biography of the Prophet	ISL 100
units18No. of Units -						

Third Level

Prior requirements	Hours				Course Name	Course Number/Code
	Accredited	Training/Exercises	Practical	Theoretical		
ARB 100	2	0	0	2	Editing	ARB 102
MTH 102	3	2	0	2	Integral Calculus	MTH 203
PHS 101	4	0	2	3	General Physics (2)	PHS 202
PHS 101	3	0	0	3	Classical Mechanics (1)	PHS 211
MTH 101	2	2	0	1	General Statistics	MTH 201
	2	0	0	2	Elective course from University requirement*	ISL xxx
No. of Units - 16 units						

*The student has the right to choose one of the following courses: The Role of Women in Development (ISL 109), professional ethics (ISL 107), Contemporary Issues (ISL 108).

The Fourth Level

*The student has the right to choose one of the following courses: The Role of Women in Development (ISL 109), professional ethics (ISL 107), Contemporary Issue (IS 108).

Prior requirements	Hours				Course Name	Course Number/Code
	Accredited	Training/Exercises	Practical	Theoretical		
PHS 211	3	0	0	3	Classical Mechanics (2)	PHS 212
PHS 101	3	0	0	3	Vibrations and Waves	PHS 213
PHS 101	3	0	0	3	Mathematical Physics (1)	PHS 203
PHS 202	4	2	0	3	Electromagnetism	PHS 231
MTH 203	3	2	0	2	Introduction to differential Equations	MTH 294
	2	0	0	2	Elective course from University requirement*	ISL xxx
No. of Units - 18 units						

Fifth Level

Prior requirements	Hours				Course Name	Course Number/Code
	Accredited	Training/Exercises	Practical	Theoretical		
PHS 202	3	0	0	3	Modern Physics	PHS 341
31PHS 2	2	0	4	0	Electromagnetism lab	PHS 332
PHS 203	2	0	0	2	Mathematical Physics (2)	PHS 304
PHS 202	3	0	0	3	Optics	PHS 351
PHS 202, Synchronous with PHS 351	2	0	4	0	Optics Lab	PHS 352
PHS 202	3	0	0	3	Thermal and Statistical Physics	PHS 321
	2	0	0	2	Elective course from University requirement*	EDU 101 Or BUS 102
No. of Units - 17 units						

*The student has the right to choose one of the following courses: Volunteer Work (EDU 101), Entrepreneurship (BUS 102).

Sixth Level

Prior requirements	Hours				Course Name	Course Number/Code
	Accredited	Training/Exercises	Practical	Theoretical		
PHS 341	2	0	4	0	Modern Physics Lab	PHS 342
PHS 231	3	0	0	3	Electronics	PHS 333
PHS 231, Synchronous with PHS 333	2	0	4	0	Electronics Lab	PHS 334
PHS 304+MTH294	3	0	2	2	Computational Physics	PHS 335
PHS 341	3	0	0	3	Solid State Physics (1)	PHS 361
PHS xxx	3	0	0	3	Elective course (List A)	PHS xxx
No. of Units - 16 units						

Seventh Level

Prior requirements	Hours				Course Name	Course Number/Code
	Accredited	Training/Exercises	Practical	Theoretical		
PHS 341	3	0	0	3	Quantum Mechanics (1)	PHS 422
PHS 341	3	0	0	3	Nuclear physics	PHS 471
PHS 361	3	0	0	3	Solid State Physics (2)	PHS 462
Pass 90 units	3	0	6	0	Field Training	PHS 498
PHS xxx	3	0	0	3	Elective course (List B)	PHS xxx
PHS xxx	3	0	0	3	Elective course (List B)	PHS xxx
No. of Units - 18 units						

Eighth Level

Prior requirements	Hours				Course Name	Course Number/Code
	Accredited	Training/Exercises	Practical	Theoretical		
PHS 422	3	0	0	3	Quantum Mechanics (2)	PHS 423
PHS 471	3	0	0	3	Radiation Physics	PHS 472
PHS 471	2	0	4	0	Nuclear Physics lab	PHS 473
PHS 462	2	0	4	0	Solid State Physics lab	PHS 463
Pass 100units	3	0	6	0	Research Project	PHS 499
PHS xxx	3	0	0	3	Elective course (List C)	PHS xxx
No. of Units - 16 units						

Elective course (A)

*The student has the right to choose one course from five

Prior requirements	Hours				Course Name	Course Number/Code
	Accredited	Training/Exercises	Practical	Theoretical		
PHS 351	3	0	0	3	Laser Physics & its Application	PHS 353
PHS 202	3	0	0	3	Biophysics	PHS 374
PHS 333	3	0	0	3	Semiconductors Physics	PHS 365
PHS 321	3	0	0	3	Renewable energy transformations and environment	PHS 343
PHS 231	3	0	0	3	Plasma Physics	PHS 364

Elective course (B)

*The student has the right to choose two courses from four

Prior requirements	Hours				Course Name	Course Number/Code
	Accredited	Training/Exercises	Practical	Theoretical		
PHS 374	3	0	0	3	Medical Physics	PHS 475
PHS 202	3	0	0	3	Astronomy physics	PHS 444
PHS 361+PHS 364	3	0	0	3	Materials Science	PHS 366
PHS 101	3	0	0	3	Fluid Physics	PHS 414

Elective course (C)

*The student has the right to choose one course from four

Prior requirements	Hours				Course Name	Course Number/Code
	Accredited	Training/Exercises	Practical	Theoretical		
PHS 422	3	0	0	3	Atomic physics & spectra	PHS 445
PHS 471+PHS 475	3	0	0	3	Physics of Nuclear Reactors and accelerators	PHS 476
PHS 462+PHS 365	3	0	0	3	Introduction to Nanoscience and Nanotechnology	PHS 467
Pass 90 units	3	0	0	3	Selected Topics (Department Approval)	PHS 491