



Program Specification

— (Postgraduate)

Program Name: Ph.D. in Physics
Program Code 053301
Qualification Level: 8
Department: Physics
College: College of Science
Institution: King Khalid University
Program Specification: New <input type="checkbox"/> updated* <input checked="" type="checkbox"/>
Last Review Date: 20/10/2023

*Attach the previous version of the Program Specification.



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A. Program Identification and General Information:

1. Program's Main Location:

B14 - Department of Physics, Collage of Science, King Khalid University- Al-Faraa, Abha

2. Branches Offering the Program (if any):

None

3. System of Study:

Coursework & Dissertation

Coursework

4. Mode of Study:

On Campus

Distance Education

Other(specify)

5. Partnerships with other parties (if any) and the nature of each:

- Partnership Arrangement:
- Type of Partnership:
- Duration of Partnership:

6. Professions/jobs for which students are qualified:

Graduates are qualified to work in:

- Public and private universities.
- Research centers.
- Public and private companies with R&D centers including automotive and aerospace industry, defense, healthcare, energy, materials, technology, computing and IT.

7. Relevant occupational/ Professional sectors:

The PhD program in Philosophy of Physics relates to a wide range of relevant professional/professional sectors including

- Educational and research
- Energy
- water
- electricity
- Space
- electricity
- Industrial
- chemicals
- Radiation
- Nuclear resonance
- Metals and Mining
- Building materials
- Communication and Information Technology



8. Major Tracks/Pathways (if any):

Major track/pathway	Credit hours (For each track)	Professions/jobs (For each track)
1. NA		

9. Total credit hours: 32 hours (23+ 9 Dissertation)

B. Mission, Goals, and Program Learning Outcomes

1. Program Mission:

Conduct advanced and internationally recognized research in various fields of applied and theoretical physics to prepare qualified scholars who contribute to scientific research, sustainable community services and development.

2. Program Goals:

- Acquire a rigorous advanced knowledge and a firm understanding of physics.
- Develop required skills to conduct independent research in physics and become leader in the chosen career.
- Foster abilities to identify, formulate, and solve challenging scientific and technical problems encountered in physics academic, research, and industry fields.
- Gain skills in reading scientific literature and communicating scientific findings in both oral and written forms.
- Demonstrate original and profound contributions to knowledge in the related physics disciplines.
- Extend expertise, competence, knowledge, laboratory experience, training, and critical thinking to post graduate students to prepare them for advanced study and research in physics and/or for employment.
- Participate in the realization of national development plans and the objectives outlined in the Kingdom's vision 2030.

3. Program Learning Outcomes:*

Knowledge and Understanding:

K1	Describe the recent developments in field of specialization .
K2	Know the principles, methodologies and ethics of scientific research and its different tools.
K3	Recall the knowledge acquired from scientific research.

Skills:

S1	Perform a systematic scientific investigation on a research problem in the field of specialization.
S2	Analyze scientific data to explain the physical phenomena under investigation..
S3	Apply the acquired original knowledge to play an essential role in community development.





Values, Autonomy, and Responsibility:

V1	Be able to conduct scholarly activities in an ethical manner
V2	Be able to communicate concepts and results to both other experts in the field and to people outside the field

* * Add a table for each track (if any)





C. Curriculum:

1. Curriculum Structure:

Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Course	Required	5	11	34%
	Elective	4	12	38%
Graduation Project (if any)	NA	---	---	---
Dissertation	Required	1	9	28%
Field Experience(if any)	----	-----	-----	
Comprehensive Examination (written and oral)	required	-----	-----	-----
Total		10	32	100%

* Add a separated table for each track (if any).

2. Program Courses:

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
Level 1	7000 Phys	Physics Research Seminar	required	-----	1	Program
	7001 Phys	Advanced Quantum Mechanics	required	-----	3	Program
	7002 Phys	Advanced Electrodynamics	required	-----	3	Program
Level 2	7005 Phys	Lab Safety	required	-----	1	Program
	7006 Phys	Advanced Statistical Physics	required	-----	3	Program
	To be chosen	Elective Course	Required	-----	3	Program
Level 3	To be chosen	Elective Course	required	-----	3	Program
	To be chosen	Elective Course	required	-----	3	Program
	To be chosen	Elective Course	required	-----	3	Program
Level 4	7500Phys	Comprehensive Examination	required	-----	-----	Program/University
	7501phys	Advanced research topics	required	-----	-----	Program
Level 5	7502 Phys	Dissertation	required	Completion of courses and comprehensive examination	9	Program/University

* Include additional levels (for three semesters option or if needed).

** Add a table for the courses of each track (if any)





3. Course Specifications:

Insert hyperlink for all course specifications using NCAA template (T-104)

4. Program learning Outcomes Mapping Matrix:

Align the program learning outcomes with program courses, according to the following **desired levels** of performance (*I = Introduced P = Practiced M = Mastered*).

Course code & No.	Program Learning Outcomes							
	Knowledge and understanding			Skills		Values, Autonomy, and Responsibility		
	K1	K2	K3	S1	S2	S3	V1	V2
7000phys	P	P	P	P	P	P	P	P
7001phy	P	P	P	P	P	P	P	P
7002phys	P	P	P	P	P	P	P	P
7005phy	P	P	P	P	P	P	P	P
7006phys	P	P	P	P	P	P	P	P
7501phys	P	P	P	P	P	P	P	P
7101Phys	M	M	M	M	M	M	M	M
7301Phys	M	M	M	M	M	M	M	M
7201Phys	M	M	M	M	M	M	M	M
7305Phys	M	M	M	M	M	M	M	M
7306Phys	M	M	M	M	M	M	M	M
7102Phys	M	M	M	M	M	M	M	M
7103Phys	M	M	M	M	M	M	M	M
7104Phys	M	M	M	M	M	M	M	M
7105Phys	M	M	M	M	M	M	M	M
7106Phys	M	M	M	M	M	M	M	M
7107Phys	M	M	M	M	M	M	M	M
7108Phys	M	M	M	M	M	M	M	M
7109Phys	M	M	M	M	M	M	M	M
7110Phys	M	M	M	M	M	M	M	M
7111Phys	M	M	M	M	M	M	M	M
7401Phys	M	M	M	M	M	M	M	M
7402Phys	M	M	M	M	M	M	M	M
7403Phys	M	M	M	M	M	M	M	M





Course code & No.	Program Learning Outcomes							
	Knowledge and understanding			Skills		Values, Autonomy, and Responsibility		
	K1	K2	K3	S1	S2	S3	V1	V2
7209Phys	M	M	M	M	M	M	M	M
7708Phys	M	M	M	M	M	M	M	M
7302Phys	M	M	M	M	M	M	M	M
7404Phys	M	M	M	M	M	M	M	M
7405Phys	M	M	M	M	M	M	M	M
7303Phys	M	M	M	M	M	M	M	M
7304Phys	M	M	M	M	M	M	M	M
7307Phys	M	M	M	M	M	M	M	M
7308Phys	M	M	M	M	M	M	M	M
7309Phys	M	M	M	M	M	M	M	M
7310Phys	M	M	M	M	M	M	M	M
7202Phys	M	M	M	M	M	M	M	M
7203Phys	M	M	M	M	M	M	M	M
7204Phys	M	M	M	M	M	M	M	M
7205Phys	M	M	M	M	M	M	M	M
7206Phys	M	M	M	M	M	M	M	M
7207Phys	M	M	M	M	M	M	M	M
7208Phys	M	M	M	M	M	M	M	M
7500 Phys (Comp.exam)	M	M	M	M	M	M	M	M
7502 Phys (dissertation)	M	M	M	M	M	M	M	M

* Add a separated table for each track (if any).

5. Teaching and learning strategies applied to achieve program learning outcomes:

Describe teaching and learning strategies, to achieve the program learning outcomes in all areas.

In class lectures, self-learning, reading and delivering oral presentation, group discussion, experimental work in the lab

6. Assessment Methods for program learning outcomes:

Describe assessment methods (Direct and Indirect) that can be used to measure the achievement of program learning outcomes in all areas.

The program should devise a plan for assessing Program Learning Outcomes (all learning outcomes should be assessed at least once in the program's cycle).

- Faculty members attend training courses conducted by specialists in teaching and learning strategies.



- Questionnaires of students are used for evaluating the adequacy of courses and skill of teaching staff in using different strategies.
- Student's feedback is used to evaluate and improve the strategies for developing learning outcomes.

D. Thesis and Its Requirements (if any):

1. Registration of the thesis:

(Requirements/conditions and procedures for registration of the thesis as well as controls, responsibilities and procedures of scientific guidance)

- Successful completion of all course work.
- Successful completion of Comprehensive Examination (written and oral).

2. Scientific Supervision:

(The regulations of the selection of the scientific supervisor and his/her responsibilities, as well as the procedures/mechanisms of the scientific supervision and follow-up)

Under the regulation of King Khalid University, associate professors and above can supervise the PhD dissertation, and should be approved by council meeting of the department of physics.

The responsibility of the supervisor at the department of physics can be summarized in:

- Guiding a student to choose the point of research.
- Guiding a student to write and submit the research proposal.
- Writing a progress report every semester.
- Tackling and reporting to the department problems or obstacles that might hinder the progress of a student.
- Guiding a student in analyzing data, writing reports, and delivering presentations,
- Guiding a student in writing her/his dissertation.
- Guiding a student in preparation for the final defense
- Urging and guiding a student to participate in scientific conferences.

3. Thesis Defense/Examination:

(The regulations for selection of the defense/examination committee and the requirements to proceed for thesis defense, the procedures for defense and approval of the thesis, and criteria for evaluation of the thesis)

After the submission of dissertation, the committee of higher studies in the department choose the examination committee according to the regulation of king Khalid University.

- The fields of examination committee members should be related to the content of the dissertation.
- The examination committee should include at least one external examiner.

H. Student Admission and Support:

1. Student Admission Requirements:

Certain requirements should be met to apply for the Ph.D. program in physics at King Khalid University:

- General requirements stated in Regulations of Postgraduate Studies in king Khalid University:
 - The applicant must be Saudi citizen or have an official postgraduate scholarship if he is not Saudi.





- The applicant must have a master degree from a recognized university with GPA "very good" at least.
- The applicant must be of good conduct and physically fit.
- The applicant must arrange for three letters of recommendation from professors who have taught him at the Master level.
- The applicant must be a Full-time Ph.D. student and the University Council may exempt the student from this condition when necessary.

b. Special requirements for the Department of Physics at King Khalid University

- The applicant must have passed one of the following English tests (except: students who obtained the master degree from countries whose mother tongue is English)

Language Proficiency test	Grade
ILETS	5.5
TOEFL iBT	60

This condition might vary from year to year.

- The applicant must pass the admission exam and the personal interview held by the department

2. Guidance and Orientation Programs for New Students:

(Include only the exceptional needs offered to the students of the program that differ from those provided at the institutional level).

The orientation program aims to facilitate the admission process and is conducted annually at the beginning of the school year to complete all admission procedures for new students and to inform them of their rights and obligations. The initiation program also takes students to visit scientific research laboratories.

3. Student Counseling Services:

(Academic, professional, psychological and social)

(Include only the exceptional needs offered to the students of the program that differ from those provided at the institutional level)

4. Special Support:

(Low achievers, disabled, , and talented students).

Low achievers: The university's grading policy does not allow low-achieving students to continue in the program (a student with a total GPA below C+ is dismissed from the program).

Disabled: under the policy of King Khalid University, there are special places, special bathrooms for disabled people, and special entrances.

Talented students: The strategy for attracting talent and creative people at King Khalid University gives talented students the highest priority in employment.





E. Faculty and Administrative Staff:

1. Needed Teaching and Administrative Staff:

Academic Rank	Specialty		Special Requirements / Skills (if any)	Required Numbers		
	General	Specific		M	F	T
Professor	Physics	- Condensed matter physics - Photonics and quantum optics, - Nuclear physics - Atomic physics	Good and UpToDate publication record	4	2	6
Associate Professor	Physics	- Condensed matter physics - Photonics and quantum optics, - Nuclear physics - Atomic physics	Good and UpToDate publication record	8	4	12
Assistant Professor	Physics	- Condensed matter physics - Photonics and quantum optics, - Nuclear physics - Atomic physics	Good and UpToDate publication record	10	5	15
Technicians and Laboratory Assistant	Physics /Engineering	Physics/Engineering/ electronics	Skills to program with LABview Good experience	1	1	2

F. Learning Resources, Facilities, and Equipment:

1. Learning Resources:

Learning resources required by the Program (textbooks, references, and e-learning resources and web-based resources, etc.)

- All textbooks mentioned in the course specifications.
- Use of electronic library
- Adoption of the references and books required by the Council of the Department of Physics.
- Use of major scientific databases subscribed by the university.

2. Facilities and Equipment:

(Library, laboratories, classrooms, etc.)

- Use of the Central Library of the University and the physics library



- 8 research laboratories in the department of physics.
- All research labs in the department of physics
- Central laboratories at King Khalid University.

3. Procedures to ensure a healthy and safe learning environment:

(According to the nature of the program)

- All research laboratories in the Physics Department provide all safety equipment such as fire extinguishers, eyewash fountains, safety showers, and emergency exits.
- All doctoral students take the laboratory safety course (PHYS 7005).
- The Health and Safety Guide issued by King Khalid University is distributed in all laboratories and on the department's website and is accessible to faculty members and students.

G. Program Quality Assurance:

1. Program Quality Assurance System:

Provide a link to quality assurance manual.

2. Program Quality Monitoring Procedures:

- Faculty members attend training courses conducted by specialists in teaching and learning strategies.
- Questionnaires of students are used for evaluating the adequacy of courses and skill of teaching staff in using different strategies.
- Students' feedback is used to evaluate and improve the strategies for developing learning outcomes.
- Course reports at the end of every semester.
- Regular seminars organized by the department for all PhD students.

3. Procedures to Monitor Quality of Courses Taught by other Departments:

NA

4. Procedures Used to Ensure the Consistency between within the main campus:

(including male and female sections).

NA

5. Assessment Plan for Program Learning Outcomes (PLOs):

In addition to the regular assessment methods, which include:
Written, Oral and Practical Assessments, Home works, Regular Discussion, Regular Brainstorming, Research projects, Oral Presentations, Posters, and Original Ph.D. thesis,
The quality and development committee evaluates and approves:

- Course description at the beginning of every semester.
- Course report at the end of every semester.



- Periodic seminars are delivered by the PhD students.

The Department's Postgraduate Studies and Scientific Research Committee undertakes the following tasks:

- Evaluation Research proposals submitted by PhD students.
- Selection of the Examination committee for final dissertation defense based on the field of specialization.
- Holding a series of research seminar events in the department, and evaluation of all presentations delivered by students.

6. Program Evaluation Matrix:

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time
effectiveness of teaching & assessment	Program leaders/ Advisory committee/students	Survey, meeting	The end of the year
learning resources	Students/ faculty members	Survey, meeting	Five years
Facilities	Student/ faculty members	Survey, meeting	End of the academic year.

Evaluation Areas/Aspects (e.g., leadership, effectiveness of teaching & assessment, learning resources, services, partnerships, etc.)

Evaluation Sources (students, graduates, alumni, faculty, program leaders, administrative staff, employers, independent reviewers, and others.)

Evaluation Methods (e.g., Surveys, interviews, visits, etc.)

Evaluation Time (e.g., beginning of semesters, end of the academic year, etc.)

7. Program KPIs:*

The period to achieve the target (3-4) years.

No.	KPIs Code	KPIs	Targeted Level	Measurement Methods	Measurement Time
1	KPI-PG-01	Students' Evaluation of Quality of learning experience	75%	Survey: Average of overall rating of students for the quality of learning experience in the program.	Final year students
2	KPI-PG-02	Students' evaluation of the quality of the courses	75%	Survey:(Average students' overall rating of the quality of courses)	End of year
3	KPI-PG-03	Students' evaluation of the quality of academic supervision	75%	Survey: Average students' overall rating of the quality of scientific supervision.	Annual





No.	KPIs Code	KPIs	Targeted Level	Measurement Methods	Measurement Time
4	KPI-PG-04	Average time for students' graduation	≤ 10 semesters	Survey: Average time (in semesters) spent by students to graduate from the program.	End of year
5	KPI-PG-05	Rate of students dropping out of the program	<10%	Percentage of students who did not complete the program to the total number of students in the same cohort	Cohort
6	KPI-PG-06	Employers' evaluation of the program graduates' competency	70%	Survey: Average of the overall rating of employers for the competency of the program graduates.	Annual
7	KPI-PG-07	Students' satisfaction with services provided	3/5	Survey: Average of students' satisfaction rate with the various services provided by the program	Annual
8	KPI-PG-08	Ratio of students to faculty members	≤3/1	The ratio of the total number of students to the total number of full-time and fulltime equivalent faculty members participating in the program.	Annual
9	KPI-PG-09	Percentage of publications of faculty members	90%	Percentage of faculty members participating in the program with at least one research publication during the year to total faculty members in the program	Annual
10	KPI-PG-10	Rate of published research per faculty member	1/1	Total number of refereed and/or published research to the total number of faculty members during the year	Annual
11	KPI-PG-11	Citations rate in refereed journals per faculty member	5	Total number of citations in refereed journals from published research for faculty members to the total published research	Annual





No.	KPIs Code	KPIs	Targeted Level	Measurement Methods	Measurement Time
12	KPI-PG-12	Percentage of students' publication	60%	Percentage of students who: a. published their research in refereed journals. b. presented papers at conferences to the total number of students in the program during the year.	Annual
13	KPI-PG-13	Number of patents, innovative products, and awards of excellence	10%	Number of: a. Patents and innovative products b. National and international excellence awards obtained annually by the students and staff of the program.	Annual

*including KPIs required by NCAAA

H. Specification Approval Data:

Council / Committee	Committee of programs and Curricula
Reference No.	02/45
Date	5/9/2023

Council / Committee	Physics Department Council/Plans and Curriculum Committee
Reference No.	04/45
Date	20/10/2023

