COURSE SPECIFICATIONS
(CS)

Nuclear Physics Laboratory

PHYS 492

June 2018

Course Specifications

Institution: King Saud University	Date
College/Department: College of Science, Physics &Astronomy Department	

A. Course Identification and General Information

1. Course title and code: Nuclear physics laboratory (492 PHYS)		
2. Credit hours: 2(0+0+4)		
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) Physics and other science and engineering programs		
4. Name of faculty member responsible for the course		
5. Level/year at which this course is offered: 8 level		
6. Pre-requisites for this course (if any): Nuclear Physics (PHYS 481)		
7. Co-requisites for this course (if any):		
8. Location if not on main campus 1. Main campus in Diriyah, College of Science, Department of Physics & Astronomy2A 38, 2A40, 2A42, 2A44		
9. Mode of Instruction (mark all that apply)		
a. traditional classroom	What percentage?	
b. blended (traditional and online)	What percentage?	
c. e-learning	What percentage?	
d. correspondence	What percentage?	
f. LAB	√ What percentage?	100%
Comments:		

B Objectives

1. What is the main purpose for this course?

a- Awareness of student with knowledge of the nuclear physics models using nuclear electronics and equipmentassociated with each experiment.

b) students gain technical skills of the calculation and measurements of the nuclear properties

c) the student will be trained on the technical methods and the equipment used in nuclear physics research

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- There is staff web page contain the terms of the syllabus and the objective of the course.
- Using different references.
- Discussion during the preparation and operation of the experiment.
- Assignment given to the student every week to prepare the theoretical part of the experiment.

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C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description:

characteristics of Geiger Counter, Absorption of nuclear radiation, Counting statistics, Detection of Gamma raySpectroscopy using NaI (Tl) and SCA, Detection of Gamma ray Spectroscopy using NaI (Tl) and MCA,Determination of half-life time for radioactive element, Study of β-Ray Spectrum using MagneticSpectrometer, Studyof β-Ray Spectrum using MCA, Neutron Diffusion, Study of alpha particle Spectra,Compton scattering

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
characteristics of Geiger Counter	1	4
Absorption of nuclear radiation	1	4
Counting statistics	1	4
Detection of Gamma ray Spectroscopy using NaI (Tl) and SCA,	1	4
Detection of Gamma ray Spectroscopy using NaI (Tl) and MCA	1	4
Determination of half-life time for radioactive element	1	4
Study of β-Ray Spectrum using Magnetic Spectrometer	1	4
Study of β-Ray Spectrum using MCA	1	4
Neutron Diffusion	1	4
Study of alpha particle Spectra	1	4
Compton scattering	1	4
revision	2	8

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours				52		52
Credit				26		26

3. Additional private study/learning hours expected for students per week. 4hours

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	- **Increase the knowledge with the nuclear physics concepts and research.** - **Train the students on the using of some nuclear physics equipment and instrument -Awareness of the students with the radiation hazards and safety. d)The student became familiar with the techniques and the equipment usually available in nuclear physics research laboratory such as detectors preamplifiers amplifiers, multichannel analyzer and single channel analyzer** - **laboratory such as detectors preamplifiers amplifiers, multichannel analyzer and**	**-discussion with the students the theory of each experiment before the experiment starts and during the experiment.** **-home assignment** **-self study and report preparation.**	**-home assignments** **- short quizzes** **--final exams**
2.0	**Cognitive Skills**		

2.1	**- the ability to imagine and understand the principles of nuclear properties and models to reach the objectives of each experiment) -Accuracy of the calculations. -learning of other technical methods of calculations. -write report.**	**Through the information given to the student before the beginning of each experiment.**	**- follow up of what was the student achieved. -short quizzes -through the explanations of the students.- -Final exam**
2.2			
3.0	**Interpersonal Skills & Responsibility**		
3.1	**Assessment of the student performance by the academic staff during the preparation of the experiment.**	**interaction with the students and encouragement for discussion. -encourage the student to do their individual and team home work**	**learning the methods of scientific discussions through the questions related to each experiment. -enhancement the soul of the team and individual work.**
3.2	**the checkup for the reports and the results obtained by the student and encourage the student to submit the reports in time.**		
4.0	**Communication, Information Technology, Numerical**		
4.1	**- Communication with others: the lecturer – students in the class**	**1- Advise the students to: help each other in education, communicate with the lecturer to discuss difficulties. - Ask students to: make search on the internet on some related interesting topics, writing reports on the computer - Asking for solving some problems and recalculating some examples.**	**- Discussing reports - internet search - Making discussion about an explored point - Comments on some resulting numbers - Exams**
4.2	**- IT through: the Internet – computer skills - Numerical skills through calculations- computation – data analysis – feeling physical reality of results**		

5.0	**Psychomotor**		
5.1	**NA**		

6. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	**Laboratory activates (in class quizzes, and homework)**	**During the term**	**60**
2	**Final exam(experimental and oral)**	**16th Week**	**40**
3			

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Office hours 8hrs./ week

E Learning Resources

1. List Required Textbooks

1- Notes onNuclear experiments written in Arabic, byDr. M. S. Garawi
2-Radiation detection and Measurements, by: Glenn F. Knoll
John Wiley & Sons, Inc., 2000
3-Principles of Radioisotope Methodology, by: Grafton D. Chase and Joseph L. Rabinowitz Minneapolis: Burgess Pub. Co. 1967
4- Practical Physics, , third Edition. Cambridge University Press G.L. Squires 2001.

2. List Essential References Materials (Journals, Reports, etc.)

3. List Recommended Textbooks and Reference Material (Journals, Reports, etic)

4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

Websites on the internet that are relevant to the course topics

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

Multimedia associated with the text book and the relevant websites

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) • Laboratory with at least 25 benches. • Equipment and computer attached to each experiment.
2. Computing resources (AV, data show, Smart Board, software, etc.) • Scientific calculator for each student.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) • Availability of computers and software

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching • Course evaluation by student • Students- faculty meetings
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department • Peer consultation on teaching • Departmental council discussions • Discussions within the group of faculty teaching the course
3 Processes for Improvement of Teaching • Conducting workshops given by experts on the teaching and learningMethodologies. • Periodical departmental revisions of its methods of teaching. • Monitoring of teaching activates by senior faculty members.
4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) • Providing samples of all kind of assessment in the departmental course portfolio of each course • Assigning group of faculty members teaching the same course to grade same questions for various students. Faculty from other institutions are invited to review the accuracy of the grading policy.
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. • The course material and learning outcomes are periodically reviewed and the changes to be taken are approved in the departmental and higher councils. • The head of department and faculty take the responsibility of implementing the proposed

changes.

Name of Instructor: _____

Signature:_____Date Report Completed:_____

Name of Field Experience Teaching Staff _____

Program Coordinator: _____

Signature: _____ Date Received:_____