هيئة تقويم التعليم
Education Evaluation Commission
المركز الوطني للتقويم والاعتماد الأكاديمي
National Center for Academic Accreditation and Evaluation

COURSE SPECIFICATIONS
(CS)

Nuclear Physics 2

PHYS 483

June 2018

Course Specifications

Institution: King Saud University	Date: 30/1/2017
College/Department: College of Science/ Department of Physics and Astronomy	

A. Course Identification and General Information

1. Course title and code: Nuclear Physics-2 (PHYS 483)

2. Credit hours: 2 (2+0+0)

3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs)

B.Sc. of Science in Physics

4. Name of faculty member responsible for the course:
Dr. Safar S. Al-Ghamdi

5. Level/year at which this course is offered: level 8th /4th year

6. Pre-requisites for this course (if any)
Nuclear Physics 1PHYS 481

7. Co-requisites for this course (if any)

8. Location if not on main campus:
Main Campus for Male and Female students

9. Mode of Instruction (mark all that apply)

a. traditional classroom	√	What percentage?	95
b. blended (traditional and online)	√	What percentage?	5
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

The student relies on the Internet to find the values of the constants and the updated experimental values in addition to looking up and following the useful lectures and programs available on the internet. This improves their search for information skills and contributes to improving their English language.

B Objectives

1. What is the main purpose for this course? This course introduces the student to the main experimental and theoretical outcome of nuclear physics which contributed to explaining many phenomena related to the atomic nuclei through the experimental results of research carried out on the nucleus to understand its nature which is achieved by comparing measured physical quantities to those predicted by the nuclear models. In addition to an introduction to particle physics
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) Make available to all students, the course contents/ objectives and past exams Use additional learning sources, Books, Internet sites Give homework some of which is by internet search Encourage students to look up new information on the internet

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

Course Description: This course introduces the simplest nucleus, the deuteron which is used to study the nuclear force through nuclear bound states of a nucleon pair. It also introduces the main nuclear models, the shell and collective models in addition to introduction to particle physics.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
Revision of nuclear propertiesand some quantum mechanics concepts	2	4
Deuterium/ quantum study/nucleon-nucleon: reaction of p-n, n-n and p-p/ nuclear force properties	5	10
Shell model/ experimental evidence/magic numbers/nuclear potential/ magnetic dipole moment/ electric quadrupole moment	3	6

Collective model/shell model limits/even Z and even N nuclei/ collective structure: vibrational and rotational	3	6
Particles families/leptons and quarks properties/light hadrons formation/Feynman diagrams	2	4

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

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	30	0	0	0	-	45
Credit	30	0	0	0	-	45

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

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	Course Teaching	Course Assessment

#	And Course Learning Outcomes	Strategies	Methods
1.0	**Knowledge**		
1.1	This course, gives the students a wide and general look at the different aspects of nuclear physics that Deuteron nucleus is made of two nucleons bound by the strong nuclear force and the properties of nuclear force.Introduction to particle physics	1- lecture 2- Text books 3. Class Notes	• In class short MCQs quizzes. • Major and final examinations .
1.2	Using shell and collective (vibrational and rotational) models describe their applications	1- lecture 2- Text books	• In class short MCQs quizzes. • Major and final examinations • Home work
2.0	**Cognitive Skills**		
2.1	Students are Able to solve problems related to Topics covered and write essays about the nuclear models	1. Discussion 2. Problem solving during Lecture	• In class short MCQs quizzes. • Checking the Solution of problems as well as homework assignments
2.2	Students are able to understand general research papers, lectures and scientific programs found on the internet	Discussion	discussion
3.0	**Interpersonal Skills & Responsibility**		
3.1	Self- learning	Inverted class	Discussion\presentations
3.2	Students are able to work in groups	Solving problems in groups during tutorial at the end of each chapter	Discussion\presentations
4.0	**Communication, Information Technology, Numerical**		
4.1	students are able to use the internet for communication and homework solving	Submission of home work and communicating by email	Discussion presentation
5.0	**Psychomotor**		
5.1	NA		
5.2			

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	Mid Term Exam 1	7	20%
2	Mid Term Exam 2	12	20%
3	Home work every two weeks (5 home works)	End of every two weeks	20%
4	Final exam	16	40%

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) 15 office hours (1 hour per week) 5 hours per week for academic counselling available by the department academic counselling unit

E Learning Resources

1. List Required Textbooks
Introductory Nuclear Physics by Kenneth S. Krane, Publisher: John Wiley, 1988.
2. List Essential References Materials (Journals, Reports, etc.)
All essential journals and papers are included in the course main text book which is: Introductory Nuclear Physics by Kenneth S. Krane, Publisher: John Wiley, 1988
3. List Recommended Textbooks
1- **Introduction to Nuclear Physics, by Enge, Publisher: Addison Wisley, 1975.** 2- **Nuclear Physics an introductory, by W. E. Burcham, Publisher: McGraw- Hill, New York.**
4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

Links to Research centers Table of Isotopes Lectures and scientific programs on the internet
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

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.) Lecture room Presentation room or projector
2. Computing resources (AV, data show, Smart Board, software, etc.)
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching Students evaluation through university education gate
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department Peers consultation
3 Processes for Improvement of Teaching Continuous revision of course material and discussion with students on teaching methods and marks distribution at the beginning and end of each term

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) The required material is submitted at the end of each term to the Academic Accreditation unit in the department
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. The results and progress level of the students are discussed by members of the nuclear research group to compare results and discuss progress in other courses given by the group.

Name of Instructor: Safar S. Al-Ghamdi

Signature:_____Date Report Completed:1/12/2017

Name of Field Experience Teaching Staff _____

Program Coordinator:_____

Signature: _____ Date Received:_____