المركز الوطني للتقويم والاعتماد الاكاديمي
National Center for Academic Accreditation and Evaluation

ATTACHMENT 5.

T6. COURSE SPECIFICATIONS (CS)

هيئة تقويم التعليم
Education Evaluation Commission

Course Specifications

Institution: University of Tabuk	Date: 18/4/2019
Faculty/Department : Science/Physics	

A. Course Identification and General Information

1. Course title and code:
   Modern Physics 2. PHYS342
2. Credit hours: 3
3. Program(s) in which the course is offered.
(If general elective available in many programs indicate this rather than list programs)
Bachelor of Science
4. Name of faculty member responsible for the course
Rachid Ayad
5. Level/year at which this course is offered: 5/3
6. Pre-requisites for this course (if any):
MODERN PHYSICS I, PHYS341
7. Co-requisites for this course (if any):
8. Location if not on main campus:
9. Mode of Instruction (mark all that apply):

a. traditional classroom	■	What percentage?	100%
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course?

The primary emphasis is on developing basic understanding of modern physics topics and its development starting in the 20th century. It is the second part of the "modern physics I" course Phys241.Others topics on atomic physics, nuclear physics, particle physics, solid state physics are also covered. The students will therefore acquire elementary basics of such topics before studying them in detail in advanced courses within the program such as: nuclear physics, quantum mechanics, solid state physics, and statistical mechanics courses.

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)

The course does not need further updates.

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

Course Description:

The course covers: The Schrodinger equation and its applications, the hydrogen atom in quantum physics, quantum numbers, angular momentum, intrinsic spin, energy levels and spectroscopy, Zeeman effect; fine structure, the Pauli's exclusion principle, the periodic table, properties of elements, x-rays, optical spectra, the band theory in solids, electrons in metals, superconductivity, semiconductors. Nuclear structure and Radioactivity., and Particle Physics.

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
The Schrödinger equation and its applications, the hydrogen atom in quantum physics, quantum numbers	3	9
Angular momentum, intrinsic spin, energy levels and spectroscopy, Zeeman effect; fine structure, the Pauli's exclusion principle, the periodic table, properties of elements	4	12
X-rays, optical spectra	2	6
The band theory in solids, electrons in metals, superconductivity, semiconductors	3	9
Nuclear structure and radioactivity, particle physics.	2	6

2. Course components (total contact hours and credits per semester): 42

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	42					42
	Actual	42					42
Credit	Planed	3					3
	Actual	3					3

3. Additional private study/learning hours expected for students per week: **20**

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	Understanding the theoretical basis of the fundamental concepts of various topics of modern physics	- Introductory lecture about the significance of the course and the topics to be covered - Learn to use the library in the self-learning fashion - Students are assigned home-work problems - Solving selected home assigned problems from	- Homework exams - Two midterm tests - Final examination

		each text book chapter. - On-line web-based learning	
1.2			
2.0	**Cognitive Skills**		
2.1	Be able to apply mathematical concepts, strategies and procedures to solve problems in various fields of physics	- Introductory lecture about the significance of the course and the topics to be covered - Learn to use the library in the self-learning fashion - Students are assigned home-work problems - Solving selected home assigned problems from each text book chapter. - On-line web-based learning	- Homework exams - Written exams
2.2	Be able to communicate effectively with a range of audiences in particular with students, teachers, working groups.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Directing the student to self-learning and greater knowledge in the field of the course	-Assign students projects on topics related to the subject - Give students critical thinking questions	-Presentations -Participation
3.2	Encouraging students to communicate among themselves under instructor guidance		
4.0	**Communication, Information Technology, Numerical**		
4.1	None		
4.2			
5.0	**Psychomotor**		
5.1	None		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	HW, Quizzes and participation	All the semester	10%
2	Midterm exam 1	6	25%
3	Midterm exam 2	11	25%
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)

Students are split in groups and a Faculty member is assigned to a group as adviser. The adviser is responsible of:

1) Providing career guidance for students
2) Inform Students of Faculty and University Policies
3) Monitor Student Performance.
4) Conducting Orientation Sessions.
5) Informing Students of available Resources(library, classrooms, Labs, ….)

The course teacher has, as well, definite office hours to be available for student counseling and problems solving. The teacher uses every way possible to let students know when he hold office hours; He post them on his door office, mention them on the course syllabus, post them on the course website, and announce them in class.

E Learning Resources

1. List Required Textbooks

Modern Physics, for Scientists and Engineers", by J.R . Taylor, C.D. zafiratos, and M.A. Dubson, second edition

2. List Essential References Materials (Journals, Reports, etc.)
a- Modern physics and students' conceptions
Helmut Fischler & Michael Lichtfeldt,
https://www.tandfonline.com/doi/abs/10.1080/0950069920140206
b- Physics education research and teaching modern Modern Physics
https://aapt.scitation.org/doi/full/10.1119/1.4953824

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

a- MIT Open Courseware: https://ocw.mit.edu/courses/physics/
b- Many youtube channels and videos like: Dr PhysicsA channel

https://www.youtube.com/channel/UCIVaddFslWk1TFoKNrvh99Q
4. 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.) Smart Classrooms
2. Technology resources (AV, data show, Smart Board, software, etc.) - Data show. - Internet
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 - Regular evaluation of the course teaching to identify the weak areas - Performance appraisal form filled up by students to show level of fulfillment - Confidential completion of standard course evaluation questionnaire
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department - A regular statistical review and analysis of the students' achievement in the department. - Prepare a questionnaire which should be filled by the students at the end of the term. Questionnaires should be analyzed and carefully studied.
3. Processes for Improvement of Teaching - Provide training and workshop opportunities for the teaching staff to improve their teaching strategies. - Form committees to follow up progress and work on improvement. - Provide opportunities to improve academic courses and research through conferences. - Provide the teaching staff members with all the references and electronic resources. - Updating teaching strategies through reading new articles about related topics to the course - Improve relations between instructor and students

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 department is working towards Standardization of exams in case of a multi-sections course. The department is scheduling regular visits of external examiners to evaluate the teaching at overall and to verify standardization of student's assessment, as well its alignment with international quality assurance guidelines. The quality assurance deanship at the faculty and at the university level have also the task to ensure that students assessment is aligned with local and international curriculum.
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. - Student's feedback on the quality of the course. - Consulting other faculty members or collaborator in overseas universities for their views on the method of quality of improvement - Check other universities teavhing websites - Improve course syllabus following syllabus templates from standard universities. - Create a specialized committee from the department to review the progress of teaching and update the resources - Consult distinguished students and discuss with them how to improve Lecturing issues.

Name of Course Instructor: Rachid Ayad

Signature: *Rachid Ayad* Date SpecificationCompleted: 18/4/2019

Program Coordinator: Dr. Fahad Alharbi
Signature: *Dr. Fahad Alharbi* Date Received: 19/4/2019