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

COURSE SPECIFICATIONS
(CS)

Modern Physics Lab

PHYS 393

June 2018

Course Specifications

Institution: **King Saud University**	Date:20/3/1439
College/Department: **College of science/ Physics & Astronomy dep.**	

A. Course Identification and General Information

1. Course title and code: **Modern Physics lab (PHYS 393)**			
2. Credit hours: **2(0+0+4) hours**			
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) **Physics program**			
4. Name of faculty member responsible for the course			
5. Level/year at which this course is offered: **6th level/3rd year**			
6. Pre-requisites for this course (if any): **PHYS 353**			
7. Co-requisites for this course (if any):			
8. Location if not on main campus: **On main campus in College of Science building 4 - for Male.**			
9. Mode of Instruction (mark all that apply)			
a. traditional classroom		What percentage?	
b. blended (traditional and online)	X	What percentage?	10%
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other (lab.)	X	What percentage?	90%
Comments:			

B Objectives

1. What is the main purpose for this course?

Summary of **the main learning outcomes** for students enrolled in the course:

1- The student should be able to Consolidate the theoretical concepts in the practical application of modern physics
2- The student should be able to development his skills in dealing with the experimental devices and the deepening of the spirit of research and discovery
3- The student should be able to develop his/her skills in data analysis

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)

-Motivate students to learn about recent experiments in the field of modern physics.
- New laboratory instruments, electronic if possible.

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

Course Description:
Experiments will be performed by the students:
Michelson interferometer, Fabry-Perot interferometer, Laser Diffraction in Ultrasonic phase grating. Electro-optic Kerr-Effect, Magneto-optic Faraday Effect. Measurement of Line Spectra using Spectrograph. Rydberg Constant measurement. Determination of Planck's constant, Zeeman Effect. Franck-Hertz experiment. Study X-ray spectrum. Characteristics of Microwaves.

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Michelson interferometer.	1	4
Fabry-Perot interferometer.	1	4
Determination of Planck's constant	1	4
Rydberg Constant measurement Laser Diffraction in Ultrasonic phase grating	1	4
Zeeman Effect	1	4
Characteristics of Microwaves. Waveform analysis and synthesis	1	4
Franck-Hertz experiment	1	4
Electro-optic Kerr-Effect, Magneto-optic Faraday Effect	1 1	4 4
Study X-ray spectrum	1	4

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

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours				40	4	44
Credit				20	2	22

3. Additional private study/learning hours expected for students per week. **2 hour weekly**

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	Explain the enormous variety of electromagnetic phenomena in terms of a few relatively simple laws, and the laws of electromagnetism from our everyday experience and how electromagnetic phenomena manifest themselves.	Experimentation: there are 4 experiments focused on that : X-rays, black body, microwaves and interference.	Quizzes during the session, reports and theoretical and practical exam
1.2	Develop the ability to use experimental devices and compare between the experimental results and what are already exist in the literatures.	Lectures on statistics and statistical inference . Studying the manuals of devices	Quizzes and theoretical reports. Real-time evaluation of student's performance during session
2.0	**Cognitive Skills**		
2.1	Analyze and explain natural phenomena.	Group discussion	Lab report evaluation peer assessment
2.2	Explain the physics behind the experiments		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Scientific integrity	Discussions and presentation of results	Peer evaluation
3.2	Accuracy and precision	Discussion of results	Lab report evaluation,

			self-evaluation
4.0	**Communication, Information Technology, Numerical**		
4.1	Calculate and analyze the data acquired by experiment via computer programs	Lecture, report	Evaluation of the performance during the experiments and in the report
5.0	**Psychomotor**		
5.1	Accuracy in handling sensitive equipment and gauges	Demonstrations and group discussion	Peer evaluation

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	First midterm test	6	20%
2	written reports	weekly	10%
3	Class activates (in class quizzes, and homework)	weekly	5%
4	Small project	11	5%
5	Second midterm test	12	20%
6	Final exam	16	40%
7			

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 during the day, average two hours a day.

E Learning Resources

1. List Required Textbooks: - Experiments in modern physics, by: Dr Al-Aqil Ibrahim - Dr. Mira Ahmed Fuad and Dr. Dugaish Ziad Hussen (1999) Note (experiments in modern physics) the preparation of: Hasan Alammari and Dr Ahmed Fuad Mira (students) . -
2. List Essential References Materials (Journals, Reports, etc.) - Experiments in Modern Physics, by Adrian Melissinos Jim Napolitano, Academic Press, 2003
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc.
- hazemsakeek.com - http://hyperphysics.phy-astr.gsu.edu/hbase/hph.html
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. CASSY Microsoft Excel

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.) - Lab room with smart board and blackboard.
2. Computing resources (AV, data show, Smart Board, software, etc.) Computer, Originlab 10 program, and data show.
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 - Course evaluation by students. - Students- faculty meetings.
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department - Peer consultation on teaching.

- Analysis of the student evaluation questionnaire. - Discussions within the group of the faculty members teaching the course.
3 Processes for Improvement of Teaching - Conducting workshops given by experts on the teaching and learning methodologies - Periodical departmental revisions of its methods of teaching - Monitoring of teaching activates by senior faculty.
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) -Check marking by the lab supervisor.
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. - Review the content of the course and the textbook every five years. - Improving the labs, electronic labs.

Name of Instructor: ____Dr. Zeyad Alahmed_____

Signature: _____ Date Report Completed: _____

Name of Teaching Staff _____

Program Coordinator:_____

Signature: _____ Date Received: _____