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

COURSE SPECIFICATIONS
(CS)

Physics of waves lab

PHYS 395

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: **Physics of waves lab (PHYS 395)**			
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**			
6. Pre-requisites for this course (if any): **PHYS 331**			
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 percentag	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 identify frequencies and their characteristics and provide a connection between theory and practice for the principles introduced in 331 phys ,234 phys lectures.
2- The student should be able to develop his technical skills provided by use of specialized equipment, materials and tools and how to be good observant.
3- The student should be able to develop his Technical, practical, observational, manipulative and measurement skills
4- The student should Promote teamwork skills necessary to perform effectively as a physics student, the sense of ethical and professional responsibility.
5- The student should acquire the skills for measurement techniques. In addition, a strong emphasis on laboratory documentation, writing a report .
6- The student should be able to use the methods of data analysis, how to think about and draw conclusions from such data.

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 wave physics.
- New laboratory instruments, electronic if possible.

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

Course Description:
Young's double slit experiment- Measuring the Effect of Sugar Concentration on the Refractive Index by using Abbe refractometer- Verification of inverse square law and measure the absorption coefficient of light in the glass using photovoltaic cell- Determine specific rotation using the Polarimeter - Newton's Rings in Transmitted Monochromatic Light- Lloyd's mirror experiment- Interference at a Fresnel's biprism- Measurement of the Refractive Index of a Prism by spectrometer- Measuring wavelengths with a diffraction grating- Melde's Experiment.

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Young's double slit experiment, Diffraction grating	2	6
Newton's rings	1	4
Measuring the Effect of Sugar Concentration on the Refractive Index by using Abbe refractometer	2	6
Lloyed's Mirror, Fresnel biprism experiment	2	6

Verification of the inverse square law for light radiation and determination of the absorption coefficient of light in glass using a photocell	2	6
Determination of refractive index Meld's experiment	2	6
Specific rotation measurements using polarometer	2	6
Determined AC frequency and investigating circularly polarized thread waves in the experiment setup after Melde	1	4

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

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours				40		40
Credit				20		20

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	The student will gain an ability to: apply knowledge in the areas of optics and waves and describe it, define and state the optics phenomena	- lecture, - Preparing of laboratory experiments reports on their outcomes, completing tutorial prelab questions designed to give further	- going through the student notebook and discussing the results - Written and Experimental Exams at the end of the
1.2	The students have to know how to : register the name and purpose of the		

	experiment, put appropriate words to explain the experiment, aim and set appropriate settings.	practice in application of theory. - Lab demonstrations, memorization, individual presentation.	semester. - exams, portfolios, long and short essays, log books, analytical reports, individual and group
1.3	use laboratory equipment conduct relevant experiments, to generate data, save and record results, re-experiment to obtain accuracy in readings and measurements.		
2.0	**Cognitive Skills**		
2.1	Prepare the experiment and install it. Demonstrates experience and how it works,	- Through teaching by focusing on the above mentioned points - Define duties for each experiment - Advise students to search on some of the mentioned technologies either on websites or in library and make reports. individual presentation, brainstorming,	- Written and verbal assessment. - Debates, - lab reports, - portfolios, - long and short essays, - exams.
2.2	Ability to calculates some numerical issues, interpret expected and unexpected results,		
2.3	Answers questions and raises questions if there is something unclear, Work collectively to achieve the best results, summarize the results and evaluate the experience. Criticizes and evaluates results.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	The student must have the ability to: explain, the importance of the experiment and the steps of work in it choose the right tools to do the experiment and the appropriate parameters.	- Work independently and as part of a team. - Manage resources, time and other members of the group. lecture, small group work, research activities, lab demonstrations,	- Discussion. interaction with the lectures and discussions, interviews, - presentation.
3.2	Able to communicate effectively and clearly interact professionally with others in the lab, to engage effectively in teamwork, and to function productively on multidisciplinary group projects.	- whole group and small group discussion, - Analysis and interpretation of the data should be done independently by each student. - Submission of the experimental report every week.	Discussion. Written and verbal assessment.
4.0	**Communication, Information Technology, Numerical**		
4.1	The student should be able to demonstrate the purpose of the experiment, calculate some problems, illustrate the data and result.	Incorporating the use and utilization of computer in the course requirements	- demonstrations. - analytical reports, - discussion forums, - interviews.
4.2	Report writing	Writing reports on related topics	- lab reports, - tables,

			- demonstrations, - graphic organizers,
5.0	**Psychomotor**		
	NA		

5. 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	Attendance and proceeding experiments	weekly	10%
2	Analyzing the data and written reports	weekly	15%
3	Class activities (homework)	weekly	10%
4	Discussion	weekly	5 %
5	Final theoretical exam	15	20%
6	Final Practical exam	15	40%

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	30%
3	Class activities (in class quizzes, and homework)	weekly	10%
5	Final exam	15	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).

- Office hours during the day, average two hours a day.

E Learning Resources

1. List Required Textbooks: - Introduction to Optics, by Frank J. Pedrotti, Leno M, Leno S. Pedrotti, Prentice Hall, upper saddle river, New Jersey 07458
2. List Essential References Materials (Journals, Reports, etc.) -An introduction to modern optics by Ghata, Ajoy K . New York: McGraw-Hill Book Company, 1972. - Optics by Eugene Hecht, 4th ed. 2002, Publisher: Addison Wesle - Introduction to optics by M. AlSalhi, A. Al-dwaian, 1st ed. 2009, King Saud University,
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. - Websites on the internet that are relevant to the topics of the course like: LD Didactic - Physics Leaflets.
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.) - 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: _____

Signature: _____ Date Report Completed: _____

Name Teaching Staff _____

Program Coordinator:_____

Signature: _____ Date Received: _____