ATTACHMENT 5.

T6. COURSE SPECIFICATIONS (CS)

هيئة تقويم التعليم
Education Evaluation Commission

Course Specifications

Institution: **King Saud University**	Date: 12.04.1439 H 29.12.2017 G
College/Department : **College of Science- Department of Physics and Astronomy**	

A. Course Identification and General Information

1. Course title and code:
Advanced Optics Phys 537
2. Credit hours: **3(3+0)**
3. Program(s) in which the course is offered.
(If general elective available in many programs indicate this rather than list programs)
Physics MSc degree (Laser & Spectroscopy Track)
4. Name of faculty member responsible for the course
Prof. Abdullah Aldwayyan
5. Level/year at which this course is offered:
3rd Semester / Second Year
6. Pre-requisites for this course (if any):
-
7. Co-requisites for this course (if any):
-
8. Location if not on main campus:
Femal & Male campus
9. Mode of Instruction (mark all that apply):

a. traditional classroom	√	What percentage?	90%
b. blended (traditional and online)		What percentage?	
c. e-learning	√	What percentage?	10%
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

Using smart board

B Objectives

1. What is the main purpose for this course?
   To provide the student with a strong background on some advanced optical concepts in order to understand and deal with various laser components.

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)

   This course is elective in the study plan and has not been taught yet.

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

Course Description:

Coherence; coherence time and coherence length, temporal and spatial coherence. Matrix treatment of polarization, Jones vectors and Jones matrices. Fourier optics; Fourier analysis and transform. Holography. Nonlinear optics; non-linear susceptibility, second harmonic generation, wave mixing, effects of Pockel, Kerr, Faraday and acousto-optics, phase conjugation.

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Coherence	3	9
Matrix Treatment	2	6
Fourier Optics	2	6
Holography	2	6
Nonlinear optics	5	15

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

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

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.)

Showing animation using smart-board, it helps to understand the optical concepts visually
The achieved applications
Using black board in describing the optics and how it builds

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Define types of coherence.	Lectures using smart-board.	Quizzes, Written exams
1.2	Recognize between various types of Holography.	Lecture with visual animation	Quizzes
1.3	Calculate the coherence length of lasers.	Tutorials	Quizzes, Written exams, Homework
2.0	**Cognitive Skills**		
2.1	Apply matrices methods to represent laser cavity components.	Lecture with visual animation	Homework
2.2	Compare between the origin off various nonlinear phenomena .	Lectures using smart-board	Quizzes
2.3	Apply the principles of atomic and molecular physics in nonlinear optics.	Lectures	Written exams, Homework
3.0	**Interpersonal Skills & Responsibility**		
3.1			
4.0	**Communication, Information Technology, Numerical**		
4.1	Apply Fourier transform on different cases.	Lectures with Tutorials	Homework
4.2	Integrate various optics covered in the course in the context of a new system.	Lectures, seminars, animation	Essay, Presentation
4.3	Analyze related scientific papers	Library	Presentation
5.0	**Psychomotor**		
5.1			

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	1st Midterm Exam	5	15%
2	2nd Midterm Exam	10	15%
3	Class Activities (Quizzes- Essay)	weekly	15%
4	Homework	weekly	15%
5	Final Exam.	15	40%
6			

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) 6 Office hours per week, teaching staff will be available

E Learning Resources

1. List Required Textbooks - Fundamentals of Photonics, by Saleh and Teich (2007) Wiley. - Quantum Optics, an Introduction, by Mark Fox (2006) Oxford University Press. - Fundamentals of Nonlinear Optics, by P. E. Powers and J. W. Haus (2017) CRC Press.
2. List Essential References Materials (Journals, Reports, etc.) - OPTICS GRADUATE HANDBOOK (2017), The Institute of Optics Hajim School of Engineering & Applied Sciences University of Rocheste, USA.
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. ---
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. - Mathematica 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 for 10 students
2. Technology resources (AV, data show, Smart Board, software, etc.) - Smartboard - Computers for the software application.
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 - Questioner giving to student through KSU-edugate at the end of the semester.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department - Last year evolution application filled by the chairman of the department.
3. Processes for Improvement of Teaching - Updating the teacher knowledge by following up the new ideas through relevant data bases.
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) - Department chairman will evaluate the final results of students.
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. - By filling the course report at the end of the semester.

Name of Course Instructor: ____ **Prof. Abdullah Aldwayyan** _____

Signature: _____ Date Specification Completed: _____

Program Coordinator: _____ **Prof. Mohammad Al-Salhi** _____

Signature: _____ Date Received: _____