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

ATTACHMENT 5.

T6. COURSE SPECIFICATIONS (CS)

PHYS 635
Applications of Lasers

هيئة تقويم التعليم
Education Evaluation Commission

Course Specifications

Institution: King Saud University	Date: 1-3-2017
College/Department : Faculty of Science/Department of Physics and Astronomy	

A. Course Identification and General Information

1. Course title and code: Phys 635
2. Credit hours: 3(2+1)
3. Program(s) in which the course is offered.
(If general elective available in many programs indicate this rather than list programs)
3rd Level
4. Name of faculty member responsible for the course: Dr Rabia Qindeel
5. Level/year at which this course is offered: 3rd Level
6. Pre-requisites for this course (if any): None
7. Co-requisites for this course (if any): 3rd Level
8. Location if not on main campus: Main campus
9. Mode of Instruction (mark all that apply):

a. traditional classroom		What percentage?	
b. blended (traditional and online)	*	What percentage?	50
c. e-learning	*	What percentage?	50
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course?

To introduce the types of laser and its profound applications

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)

Familiarizing the student with the advance methods of lasers and use of laser in different scientific fields such as:
Spectroscopy, Heat Treatment, Lunar laser ranging, Photochemistry, Laser scanner, Laser Cooling, Nuclear fusion, Microscopy etc.
Introduce the students not only scientific applications but use of laser in Military, Medical, Industrial and commercial, Images also

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

Course Description:
Laser safety, Lasers in Optical Communication and Data Storage, Medical Applications: Optical properties of tissue – Models of laser-tissue propagation – Montecarlo simulation of laser tissue interaction – Laser effects on tissue (thermal, photochemical, photmechanical, ionizing..) – Medical applications (Opthalmology, dermatology, dentistry, surgery, NET, gynecology, urology, neursurgery…..) - Low level laser therapy(LLLT) – Laser safety and precautions- Diagnostic by laser – Laser types in medicine. Industrial Applications, Metrological Applications, Holography. Detectors, Laser system for remote sensing (CO2, Excimer, dye, semiconductor lasers. Optics. Telescopes). Basic equation for sensors. LIDAR, Differential Absorption, LIF, Raman, Atmospheric & Hydrospheric Monitoring., Industrial Pollution, Atmospheric / Underwater transmission, Practical Considerations, Deep Sea Coral Reefs, Industrial Pollution, Oil Spills.

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Laser safety	3	9
Medical Applications	3	9
Laser safety and precautions- Diagnostic by laser	3	9
Laser types in medicine	2	6
Industrial Applications	3	7

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

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	40					40
	Actual						
Credit	Planed	40					40
	Actual						

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

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 use of laser in different fields and apply it in required applications	Developing the student knowledge to understand the use of laser and its safety	• Assignments of specific homework task to initiate and develop the sense of scientific articles searching for a given topic related to the course • In class quizzes and discussions for better assessment of understandin
1.2	Evaluation of the actual and future devices/applications performance based on the new techniques of laser use.		

			g • Midterm and final exams
2.0	**Cognitive Skills**		
2.1 2.2	Collecting and analyzing useful up to date information from reference works in the field of Physics Applications of Laser	Using internet scientific search engine (Scopus, ISI web of science…..)	• Student report • Short quizzes in class • Homework assignment • Exams
3.0	**Interpersonal Skills & Responsibility**		
3.1 3.2	Performing collective works Preparing oral presentation of each work part	Assignment of collective theoretical and/or practical works.	• Access to research lab facilities • Using computational and simulation tools
4.0	**Communication, Information Technology, Numerical**		
4.1 4.2	Using computational tools Report writing and slides preparation	• Writing bibliographic reports • Visualization of physical and computational research of laser and its applications	• Reports evaluation and discussion • Home works
5.0	**Psychomotor**		
5.1			
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	Homework assignment	2	2
2	Quizzes	4	2
3	1st Exam	6	25
4	Web-based assignment, mini-project	10	2
5	2nd Exam	12	25
6	Quizzes	14	2
7	Final Exam	16	40

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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)

E Learning Resources

1. List Required Textbooks • Lasers: Principles, Types and Applications. K.R. Nambiar, New Age International Publishers, 2006 • Lasers: Fundamentals and Applications. Ajoy Ghatak, K. Thyagarajan, Springer, 2010
2. List Essential References Materials (Journals, Reports, etc.)
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.

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.)
2. Technology 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 Exams, quizzes, reports
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department
3. Processes for Improvement of Teaching
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)
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

Name of Course Instructor: _____Dr. Rabia Qindeel_____

Signature: _____ Date Specification Completed: __1-3-2018___

Program Coordinator: _____

Signature: _____ Date Received: _____