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 632

Ultra Fast Phenomena

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Education Evaluation Commission

Course Specifications

Institution: KSU	Date: Jan 1st , 2018
College/Department : Physics and Astronomy Department	

A. Course Identification and General Information

1. Course title and code: **Ultra Fast Phenomena** - Code: Phys 632

2. Credit hours: (3+0) per week

3. Program(s) in which the course is offered.
(If general elective available in many programs indicate this rather than list programs)
PhD degree in Physics - Laser physics and spectroscopy program

4. Name of faculty member responsible for the course
Dr. Zeyad A. Alahmed

5. Level/year at which this course is offered: PhD 3rd Level

6. Pre-requisites for this course (if any):

7. Co-requisites for this course (if any):

8. Location if not on main campus:
Main campuses for Male and female

9. Mode of Instruction (mark all that apply):

a. traditional classroom		What percentage?	
b. blended (traditional and online)	X	What percentage?	100
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?
This course covers the fundamental concepts and applications of Ultra fast phenomena and spectroscopy.

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)
a. Implement Blackboard to highlight interesting links for the relative topics.
b. Use simulation software to visualize and understand the basic knowledge.
c. Introducing students to a specialized software to deal with advanced problems.
c. Lab visit to observe some studied experiment.

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

Course Description:
Nano, pico, femto second pulse generation. Q-switching, mode-locking, DFB, relaxation oscillation. Measurement: auto and cross correlation function, two photon, SH generation for detection, optical time delay, femto second, chirping, cooling pulses-generating compression. Applications in molecular relaxation, biology, semiconductor dynamics…etc.

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Introduction, nano, pico, femto second pulse generation	**3**	**9**
Mode locking and Kerr-Lens Mode-Locking	**2**	**6**
Group velocity dispersion and Dispersion compensation	**2**	**6**
Measurement: auto and cross correlation function, SH generation for detection, optical time delay, FROG, SPIDER	**4**	**12**
Application in molecular relaxation, biology, semiconductor dynamics	**3**	**9**

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

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	40	0	0	0	0	40
	Actual	40					40
Credit	Planed	40	0	0	0	0	40
	Actual	40	0	0	0	0	40

3. Additional private study/learning hours expected for students per week.	6

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	Define the ultra fast laser	Lecturing	Presentation
1.2	Describe the components of ultra fast laser	Lecturing	Mid-term exam
2.0	**Cognitive Skills**		
2.1	Analyze the short pulse of laser in different cases	Class discussion	Mid-term exam
2.2		Problem solving	
3.0	**Interpersonal Skills & Responsibility**		
3.1	Present a short report	Group presentation	Presentation
3.2			
4.0	**Communication, Information Technology, Numerical**		
4.1	Demonstrate advanced functions using simulation software	Demonstration	Write report
4.2			
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	HW (Problem solving)	3rd, 6th, 9th, and 12th	18%
2	Mid-Exam	4th,8th	40%
3	Final Exam	15th	40%
4	Report and Presentation	14th	2%
5			
6			
7			

8			

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: 3 hours per week

E Learning Resources

1. List Required Textbooks • **Ultrashort laser pulse phenomena**, by Jean-Claude Diels and Wolfgang Rudolph, (Academic Press, 2006). • **Femtosecond Laser Spectroscopy**, by Peter Hannaford, Springer (2006).
2. List Essential References Materials (Journals, Reports, etc.) • **Ultrashort Light Pulses**, Editor: Shapiro Spr. Verlag. NY (1977). • **Picosecond Phenomena II and III,** by K. B. Eisenthaal et al. Spr. Verlag(1980,1982). • **The Super Continuum Laser Source**, by R. R. Alfano. Spr. Verlag NY (1989). • **Femtosecond Laser Pulses**, by Claude Rulli`ere (Ed.), 2nd Ed., Springer (2003). • **Femtosecond technology - from basic research to application prospects,** by T. Kamiya, et. al (Eds.), Springer Series in Photonics, (Springer-Verlag, 1999).
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.) • Classroom for 10 students • Library
2. Technology resources (AV, data show, Smart Board, software, etc.) • Smart Board • Black Board
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 Student evaluation electronically organized by the University
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department Lecturers Committee to review the final results Departmental review of the final results
3. Processes for Improvement of Teaching • Course report • Program report • Program Self study
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. • Student evaluation • Course report • Program report • Program Self study

Name of Course Instructor: _____ **Zeyad A. Alahmed** _____

Signature: _____ Date Specification Completed: **Jan 1st, 2018**_

Program Coordinator: _____

Signature: _____ Date Received: _____