

T6. Course Specification (CS)

Institution : Najran University	Date of Report: 6 /2017
College/Department : Science & Arts Faculty - Physics	

A. Course Identification and General Information

1. Course title and code: Modern Optics and Laser (453Phys– 2)			
2. Credit hours: 2 credit hr			
3. Program(s) in which the course is offered. Physics Program (If general elective available in many programs indicate this rather than list programs)			
4. Name of faculty member responsible for the course: Dr Tayseer Al-Naggar& Dr/ Mohamed Aesa			
5. Level/year at which this course is offered: 7 th level			
6. Pre-requisites for this course (if any): Optics (231Phys– 3) & Waves and Vibrations (212Phys – 2)			
7. Co-requisites for this course (if any): Nil			
8. Location if not on main campus: Males and females division in New campus			
9. Mode of Instruction (mark all that apply)			
a. Traditional classroom	<input type="checkbox"/>	What percentage?	<input type="checkbox"/>
b. Blended (traditional and online)	<input checked="" type="checkbox"/>	What percentage?	100
c. e-learning	<input type="checkbox"/>	What percentage?	<input type="checkbox"/>
d. Correspondence	<input type="checkbox"/>	What percentage?	<input type="checkbox"/>
f. Other	<input type="checkbox"/>	What percentage?	<input type="checkbox"/>
Comments: NO Comments			

B Objectives

<p>1. What is the main purpose for this course?</p> <p>The course aims to study the precise processing of solids optics using Maxwell's equations, and deduces its various properties, then study what is laser, How laser emits, The technology of laser, knowing different types of lasers, also recognition techniques applied to laser in various fields. The student understands the importance of the laser.</p>
<ul style="list-style-type: none"> • Briefly describe any plans for developing and improving the course that are being implemented. • Studying the course on Blackboard • Update the references of the course. • Establish a special laboratory for laser • To benefit from of the Web sites associated with the topics of the course; • Present the course work using powerpoint presentation • Update the content of the course on the basis of recent developments; • Distribute Summary of the content among the students at the beginning of the semester.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

<p><u>Course description</u></p> <p>Modern Optics and Laser course is one of the advanced courses in physics, this course presents the precise treatment of solid matter optics using Maxwell's equations, and deduces its various properties and then moves on to laser physics. It includes the optical resonances, methods of producing lasers, the characteristics of these radios and their applications in various fields, as well as some real lasers.</p> <p>1. Topics to be Covered</p>		
List of Topics	No. of Weeks	Contact Hours

Polarization: the definition of the phenomenon of polarization Dynamic polarization: 1) polarization of the light dispersion 2) polarization of light reversal 3) Selective polarization of light absorption 4) Dual polarization of light by diffraction Nicole prism - a measure of polarization - Solved Problems – Solving the Questions at the end of the Chapter - homework.	4	8
Wave motion: differential wave equation - sinusoidal waves - phase and phase velocity - representation of preparing the vehicle - three-dimensional waves - the wave fronts - issues unresolved. Electromagnetic waves and photons: Maxwell's equations and electromagnetic waves - refractive index - radiation (brightness) - photons - energy and momentum - the electromagnetic spectrum of photon – Solved problems.	5	10
Laser and its applications: transfer automatic and motivating - the nature of laser light - Zoom laser light - Types of emission - patterns of electromagnetic radiation - the excitement and distribution inverted - circles effective - collection - vibrational laser - lasers, solid-state (sapphire laser and laser Nd: YAG) - Lasers semiconductors - gas lasers (laser helium - neon, copper vapor laser) - Laser dye - some laser applications (printing - the transfer of information - Medicine - Construction Industry - communications) - Solved Problems - Solved General exercises.	5	10

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30	----	-----	-----	-----	30
Credit	2					2

3.Additional private study/learning hours expected for students per week. 2hr/week = 28 /semester

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge Characterization of Knowledge Skills so that the student will be able to:		
1.1	Define: Polarization, polarization angle, the optical axis, refractive index, dynamic polarization, Laser , inductive transitionetc	- The modified Lecture -Brainstorming	2 midterm exams& final exam
1.2	Explain: The characteristics of laser waves, the main components of laser, types of lasers.	- The modified Lecture - Brainstorming	2 midterm exams& final exam
2.0	Cognitive Skills Characterization of Cognitive Skills so that the student will be able to:		
2.1	Deduce: Physical laws are related to Maxwell equations, types of polarizations, wave equation.	- The modified Lecture -Brainstorming	2 midterm exams& final exam
2.2	Interpret: Physical phenomena are related to Laser, types of atomic transitions, types of polarizations,	- The modified Lecture -Brainstorming	2 midterm exams& final exam
2.3	Calculate: The angle of refraction - The polarization angle - The angle of rotation of polarization plate - The wavelength – The frequency – The periodic time of the wave - the amount of energy. Amplification of laser.	- The modified Lecture -Brainstorming	2 midterm exams& final exam
3.0	Interpersonal Skills & Responsibility Characterization of Interpersonal Skills & Responsibility so that the student will be able to:		
3.1	Responds with other students while doing projects and writing scientific reports	Self and cooperative education	observation card
3.2	Committed to teamwork and cooperative and bear responsibility, and Participate in discussions and to accept others' opinions...	Self and cooperative education	observation card
4.0	Communication, Information Technology, Numerical Characterization of Communication, Information Technology, Numerical Skills so that the student will be able to:		
4.1	Use IT in the delivering information to others	Self and cooperative education	observation card
4.2	Use Internet is in searching for sites and information related to the course, and use computer in the preparation of reports and be able correspondence by e-mail.	Self-education	observation card
5.0	Psychomotor Not applicable		

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task	Week Due	Proportion of Total Assessment
1	Observation card (activities of students in the course)	From 1-12th week	10%
2	Midterm exam (1)	6 th week	20%
3	Midterm exam (2)	12 th week	20%
5	Final exam	18 th week	50%

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)

- One office hour Weekly to help students in problem-solving and homework in addition to the direct supervision of the students activities and preparing essays
- Students communicating by my personal email.

E. Learning Resources

1. List Required Textbooks.

- G.R. Fowls, Introduction to Modern Optics.
- R. Loudon, Quantum Theory of Light.

2. List Essential References Materials (Journals, Reports, etc.)

Arabic reference (د/محمد الكوسا – الليزر وتطبيقاته- منشورات جامعة دمشق كلية العلوم-2006)

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

Dr. Jalali educational site for physics.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

Forum physicists Arabs

- 1 - Book Forum Arabs
- 2 - Saudi Society for Physical Sciences.

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

Not needed

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.)

- Class room can accommodate up to 30 students equipped with all IT equipment's - connected to the Internet to help the prof and students to display their presentation.

2. Computing resources (AV, data show, Smart Board, software, etc.)
<ul style="list-style-type: none"> Number of computers connected to the Internet to help the students in self-learning and to search
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
<ul style="list-style-type: none"> class room equipped with smart board and tabs for each student

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching <ul style="list-style-type: none"> Solving the examples + Solving the midterm Exams immediately after the exam on the blackboard Monitor the performance of the students during the lectures Questionnaires that are filled out by the students on the university Web site. Course Evaluation by Students about the effectiveness of teaching strategies and learning outcomes
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor <ul style="list-style-type: none"> Section council discussions Evaluate the course portfolio P. Review
3 Processes for Improvement of Teaching <ul style="list-style-type: none"> improve education through feedback from student's questionnaires attending workshops held by experts in education Use a modern strategies for teaching. Attending workshops and training courses for the development of teaching skills and strategies used in modern education

1. 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 random sample of student work by an independent faculty member
 - Mutual exchange of correcting sample assignments with a faculty member
 - Create a course portfolio and provide them with samples of all kinds of assessment

- 5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.
- Periodic review of the course to amend the course plan.
 - Review and update the course to fulfill the needs of the labor market.
 - Update the content of the course in line with recent developments in the field.
 - Compare the content of the course with those given at other universities.
 - Update learning resources for the course regularly using the Internet.

Faculty or Teaching Staff: **Dr Tayseer Al-Naggar & Dr/ Mohamed Aesa**

Signature: _____

Date Report Completed: 17-4-2018

Received by: _____

Dean/Department Head

Signature: _____

Date: 17-4-2018