

مواصفات مقرر فيزياء الليزر

- البرنامج الذي يقدم المقرر من خلاله (إعداد معلم الفيزياء)
- يمثل المقرر عنصرا (رئيسيا) بالنسبة للبرنامج
- القسم العلمي المسئول عن البرنامج (متعدد)
- القسم العلمي المسئول عن تدريس المقرر (قسم الفيزياء)
- السنة الدراسية / المستوى (الفرقة الرابعة عام. شعبة الفيزياء / الفصل الدراسي الأول)
- تاريخ اعتماد توصيف البرنامج ()

Basic Data

بيانات أساسية

(1) Course Title:	Laser Physics	العنوان : فيزياء الليزر	(1)
(2) Course Code No.:	413 ph	الكود : 413 ph	(2)
(3) Credit Hours:	Four credit hours	الساعات المعتمدة:	(3)
Lectures:	2 credit hours	المحاضرة :	•
Laboratory practice:	2 credit hour	الدروس العملية :	•
Total hours:	4 credit hours	المجموع :	•

Professional Data

بيانات مهنية

1) General goals of the course

(1) الأهداف العامة للمقرر

The course is designed to help student-teachers achieve the following goals:

- The students have to know fundamental of quantum transitions in atomic systems, basis of coherence, Lase production, interactions and applications, optical fibers and optical processing of the images.

2) Operational learning objectives of the course

(2) الأهداف الإجرائية للمقرر

By the end of this course, student teachers are expected to achieve the following objectives:

A) Knowledge and Comprehension:

أ- المعرفة والفهم:

The students have to recognize the following :

- a.1 Monochromaticity, directionality and brightness.
- a.2 Laser production and properties.
- a.3 Types of laser and its applications.
- a.4 Non linear optics.

B) Cognitive Skills:

ب- المهارات العقلية:

- b.1 Develop an understanding and appreciation for the nature of scientific inquiry
- b.2 Apply mathematics, including statistics and calculus and introductory differential equations, to investigations in physics and the analysis of data.
- b.3

- b.4 Locate resources, design and conduct inquiry-based open-ended investigations in physics, interpret findings, communicate results, and make judgments based on evidence.

C) Practical Skills:

ج- المهارات العملية:

- c.1 the appropriate use and storage of scientific equipment.
c.2 safe storage, use, and disposal of materials.
c.3 Doing Laboratory experiments.

D) Enabling Skills:

د- المهارات العامة والمنقولة:

- d.1 Relate the concepts of physics to contemporary, historical, technological, and societal issues; in particular.
d.2 Relate concepts of physics to current controversies and other issues.
d.3 Construct new knowledge for themselves through research, reading and discussion, and reflect in an informed way on the role of physics in human affairs

Contents

المحتويات

Week	Topic	Assigned hours		
		Lectures	Labodatory	Total
First	Introduction	2	2	4
Second	Quantum transition in an atomic system.	2	2	4
Third	Properties of laser beam.	2	2	4
Fourth	Basics of coherence theory.	2	2	4
Fifth	Monochromaticity, directionality and brightness.	2	2	4
Sixth	Types of laser beam.	2	2	4
Seventh	Optical feedback and laser resonator.	2	2	4
Eighth	Laser applications: speckles, holography and materials interactions.	2	2	4
Ninth	• Fibre optics: materials and manufacture.	2	2	4
Tenth	• Integrated optics.	2	2	4
Eleventh	• Optical processing of images (endscopy)	2	2	4
Twelfth	• Optical processing of images (wave carrier)	2	2	4
Thirteenth	• Non linear optics.	2	2	4

Activities, tasks and assignments:

أساليب التعلم والتعلم:

- Lectures
- Laboratory experiments.
- Demonstrations
- report writing
- brainstorming
- discussions
- Problems and essay assignments.

Assessment and Evaluation tools:

أساليب التقييم

- Semester activities including classroom interactions and Quizzes.
- Oral exam.
- Final exam.
- Lab performance evaluation

Summative Evaluation table

جدول التقييم

Assessment	Final exam	Fifteenth Week	الأسبوع الخامس عشر	نهاية الفصل الدراسي	التقييم
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النسبة المئوية لكل تقييم

Assessment		التقييم
1. Midterm exam		1. امتحان نصف الفصل الدراسي
2. Final written exam	%70	2. امتحان نهاية الفصل الدراسي
3. Final oral exam	%20	3. الامتحان العملي
4. assignments	%10	4. أعمال السنة
Total	%100	المجموع

References:

▪ قائمة المراجع

- "Principles of Optics", M.Bon and e.Wolf, Cambridge Univ. Press, England.
- "Fundamental of photonics", **B.E.A** Saleh ,John Wiley &Sons, Inc.
- "Laser Fundamentals", W.T.Silfvast, Cambridge Univ.Press, New York.
- "Optical Holography", P.Hariharam, Cambridge Univ. Press, New York.

Educational Resources

الإمكانات المطلوبة للتعليم والتعلم

- Computer simulation programs and slides.
- Transparencies.
- Manual of solved problems (answer and solutions)
- Text books.

Course coordinator:

• منسق المقرر:

Head of the Department:

• رئيس القسم:

Date:

• التاريخ: