

مختصر توصيف المقرر

(Course Information)

معلومات المقرر*

اسم المقرر:	فيزياء حديثة
رقم المقرر:	فيز 2512
اسم ورقم المتطلب السابق:	فيز 2032
اسم ورقم المتطلب المرافق:	--
مستوى المقرر:	الرابع
الساعات المعتمدة:	3 (0+0+3)
Module Title:	Modern Physics
Module ID:	PHYS 2512
Prerequisite:	PHSY 2032
Co-requisite:	--
Course Level:	Fourth
Credit Hours:	3 (3+0+0)

Module Description

وصف المقرر :

Electromagnetic waves, Blackbody radiation, The Photoelectric effect, The Compton effect, X-rays, The particle like properties of electromagnetic radiation, Wave-like properties of particles, de-Broglie hypothesis for wave particle duality, Electron diffraction experiment of Davison and Germer, Electron microscope, Uncertainty principle, Atomic structure, Atomic properties, Thomson model and Rutherford model of atomic nuclei, Bohr atom - quantization of energy, quantum theory of atoms- Hydrogen atom. Special theory of relativity: wave propagation, Michelson Morley experiment, Galilean transformation, Lorentz transformation, Relative velocity, Time dilation, Length contraction, Relativity of mass, Mass and energy Application.

Module Aims

أهداف المقرر :

1	To teach relation between light frequency to photon energy and apply the wave particle complementarity.	1
2	To introduce light quantization through black body radiation catastrophe.	2
3	To introduce postulates of special relativity in order to Construct Galilean and Lorentz transformations.	3
4	To apply the relation of length contraction and time dilation along with the concept of simultaneity.	4
5	To demonstrate the energy – momentum relationship in relativistic terms.	5

Learning Outcomes:

مخرجات التعليم:

1	Students will be able to relate light frequency to photon energy.	1
2	Students can apply the wave particle complementarity in solving modern physics problems.	2

3	Students will be able to relate black body radiation to light quantization.	3
4	Students can demonstrate the postulates of special relativity and construct Lorentz transformations to apply them.	4
5	Students can deduce and apply the relation of length contraction and time dilation	5
6	Students can apply the concept of simultaneity and energy – momentum relationship in relativistic terms	6

Course Contents:

محتوى المقرر:

ساعات التدريس (Hours)	عدد الأسابيع (Weeks)	قائمة الموضوعات (Subjects)
6	2	Electromagnetic waves, Blackbody radiation
3	1	The Photoelectric effect, The Compton effect, X-rays,
6	2	The particle like properties of electromagnetic radiation, Wave-like properties of particles, de-Broglie hypothesis for wave particle duality, Electron diffraction experiment of Davison and Germer
3	1	Electron microscope, Uncertainty principle
6	2	Atomic structure, Atomic properties, Thomson model and Rutherford model of atomic nuclei
6	2	Bohr atom - quantization of energy, quantum theory of atoms- Hydrogen atom
6	2	Special theory of relativity: wave propagation, Michelson Morley experiment
3	1	Galilean transformation, Lorentz transformation
3	1	Time dilation, Length contraction, Relative velocity
3	1	Mass and energy Application

Textbook and References:

الكتاب المقرر والمراجع المساندة:

سنة النشر Publishing Year	اسم الناشر Publisher	اسم المؤلف (رئيسي) Author's Name	اسم الكتاب المقرر Textbook title
Sixth Edition	McGraw-Hill	Arthur Beiser	Concepts of Modern Physics
سنة النشر Publishing Year	اسم الناشر Publisher	اسم المؤلف (رئيسي) Author's Name	اسم المرجع Reference
1118061144	Wiley	K. Krane	Modern Physics
0534408443	Brooks Cole	Raymond A. Serway and John W. Jewett	Physics for Scientists and Engineers with Modern Physics