مختصر توصيف المقرر

معلومات المقرر * **:(Course Information)**

اسم المقرر:	كهرومغناطيسية 2
رقم المقرر:	فيز 3222
اسم ورقم المتطلب السابق:	فيز2212
اسم ورقم المتطلب المرافق:	--
مستوى المقرر:	**السادس**
الساعات المعتمدة:	3 (3+0+0)

Module Title:	Electromagnetism 2
Module ID:	PHYS 3222
Prerequisite:	PHYS 2212
Co-requisite:	**--**
Course Level:	**Sixth**
Credit Hours:	3 (3+0+0)

وصف المقرر : **Module Description**

The aim of this module is a survey of the basic electromagnetic phenomena, such as: Electromagnetic induction; Faraday's and Lenz's laws; transformer and motional electromotive force; induction heating; transformer; displacement current; time-varying fields; Maxwell's equations; wave equations; time-harmonic fields; complex phasors; scalar and vector potential functions; plane waves in vacuum; plane waves in dielectrics and conductors; polarization; skin effect; electromagnetic energy and power; Poynting's theorem; reflection and refraction of plane waves at dielectric interfaces; Snell's laws; Fresnel formulas; critical angle; total internal reflection; total transmission; Brewster's angle; standing waves; transmission line theory; TEM waves; transmission line parameters; loss and lossless lines; matching of transmission lines to their loads.

أهداف المقرر : **Module Aims**

1	Electrostatic fields	1
2	Magnetostatic fields	2
3	Introduction to Electrodynamics	3
4	Maxwell equations	4
5	Electromagnetic plane wave propagation.	5
6	Electromagnetic radiations and transmission line theory	6

Learning Outcomes: **مخرجات التعليم:**

1	Students will become know the basic laws of electromagnetism and its related concepts, for stationary and moved charges.	1
2	Students will become more familiar with fundamental theory of electrodynamics.	2
3	Students will learn the basic applications of Maxwell's equations.	3
4	Students will learn basic properties of electromagnetic plane waves.	4
5	Students will learn basic transmission line theory.	5

Course Contents: **محتوى المقرر:**

ساعات التدريس (Hours)	عدد الأسابيع (Weeks)	قائمة الموضوعات (Subjects)
6	2	Recall to: Electric field, electric force, magnetic field, magnetic force, Lorentz force, Ohm's Law, Ampere's Law, Magnetic flux.
6	2	Electromotive force, electromagnetic induction, Faradya's Law, Lenz Law.
3	1	Induced electric field, Inductance, Energy stored in magnetic fields, Energy stored in electric fields, electromagnetic density.
6	2	Maxwell's equations in vacuum, Maxwell's equations in dielectric, Maxwell's equations in conductor, Maxwell's equations in plasma.
6	2	Electromagnetic wave propagation, Poynting's theorem, Newton's third law in electrodynamics and momentum,
9	3	Electromagnetic waves in vacuum, Monochromatic plane waves, Energy and momentum in electromagnetic waves, Electromagnetic waves in matter, Propagation in linear media, Reflection and transmission at normal incidence, Reflection and transmission at oblique incidence, Absorption and dispersion.
6	2	Guided waves and wave guides, Transversal electric waves in a rectangular wave guide, The coaxial transmission lines, Electric dipole radiation.

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
2007	Oxford University Press	Metthew N.O Sadiku	Elements of electromagnetics
سنة النشر Publishing Year	**اسم الناشر Publisher**	**اسم المؤلف (رئيسي) Author's Name**	**اسم المرجع Reference**
2013	Cengage Learning	Serway Jewett.	Physics for scientists and Engineers
2011	McGraw-Hill	William H. Hayt	Engineering Electromagnetics