جامعة: المنصورة

كـــلية: العلـــوم

قـــســـم: الفيزياء

توصيف مقرر دراسى

١- بيانات المقرر		
الرمز الكودى :Phys 104	**أسم المقرر: Electromagnetic Theory**	**المستوى: الأول**
التخصص: رياضيات	**عدد الوحدات الدراسية: ٣ ساعة معتمدة نظرى ٢: تمارين: ١ عملى: ٢**	

١- هدف المقرر:	**For students undertaking this course, the aims are to:** 1- Introduce the principles of the bases of the electromagnetic theory from the definitions of the electrostatic and electromagnetic fields and Maxwell's equations for steady-state. 2- Study the varying-time effects of the electromagnetic fields and Maxwell's equations in time-dependent case. 3- Outline the basic information of the electromagnetic waves and their propagation in media.
٢- المستهدف من تدريس المقرر:	
أ- المعلومات والمفاهيم:	**a- Knowledge and Understanding :** **On completing this course, students will be able to:** a1- Introduce the principles of vector analysis and Coulomb's law and electric field. a2-Outline the basic information of electrostatic potential and electrostatic dipole. a3-Introduce the basic concepts of dielectric polarization, Poisson and Laplace equations for magnetic potentials, Electromagnetic induction and Faraday's law a4-Introduce the principles of Maxwell's equations and Electromagnetic wave equations. a5-Introduce the principles of Electromagnetic plane wave propagation.
ب-المهارات الذهنية	**b- Intellectual Skills:** **On completing this course, students will be able to:** b1-Know more information about vector analysis and Coulomb's law and electric field. b2-Define the physial terms like vector analysis, Coulomb's law and electric field and electrostatic potential and electrostatic dipole.

b3-Explain the principles of dielectric polarization, Poisson and Laplace equations for magnetic potentials, Electromagnetic induction and Faraday's law. b4 -Derive Maxwell's equations, Electromagnetic wave equations and Electromagnetic plane wave propagation.	
c-Professional and Practical Skills: **On completing this course, students will be able to:** c1- Choose and classify data obtained from physics experiments. c2-Design physics experiments to apply electrostatic potential and electrostatic dipole. c3-Design a diagram graphically for dielectric polarization, Poisson and Laplace equations for magnetic potentials, Electromagnetic induction and Faraday's law. c4-Use mathematical formula in solving problems related to Maxwell's equations, Electromagnetic wave equations and Electromagnetic plane wave propagation.	**ج- المهارات المهنية الخاصة بالمقرر:**
d-General and Transferable Skills: **On completing this course, students will be able to:** d1-Search for information about the vector represenations to model a physical problem in mathematical form. d2-Solve the problems of different equation of electric and magnetic potentials. d3-Work effectively both in a team and independently on solving Maxwell's equations problems in fifferent media. d4-Collect and analyze the data using the internet.	**د- المهارات العامة :**
Vector analysis Coulomb's law and electric field Electrostatic potential Electrostatic dipole Dielectric polarization Poisson and Laplace equations for magnetic potentials Electromagnetic induction and Faraday's law Maxwell's equations Electromagnetic wave equations	**٣- محتوى المقرر:**

Electromagnetic plane wave propagation	
5-Teaching and Learning Methods 1- Lectures using data show and board 2-Collecting data about scientific subject 3-Discussion sessions and class activity 4-Problem classes and group tutorial	**٤- اساليب التعليم والتعلم:**
The same as normal students, only skeletal disabilities are allowed in the Faculty of Science.	**٥- أساليب التعليم والتعلم للطلاب ذوى القدرات المحدودة:**
٦- تقويم الطلاب :	

أ- الأساليب المستخدمة :

Final exam	to assess	a1-a5, b1-b4, c1-c4, d2-d3
Oral exam	to assess	a1-a5, b1-b4 and c1-c4
Practical exam	to assess	a1-a3, b1-b2,c1-c3,d1,d3,d4
Mid-Term Exam	to assess	a1-a5, b1-b4, c1-c4, d2-d3

ب- التوقيت :

Final exam	Week	16
Oral exam	Week	16
Practical exam	Week	15
Mid-Term Exam	Week	8

ج- توزيع الدرجات :

Final-Term Examination	60%
Oral Examination	10 %
Practical Examination	20%
Mid-Term Examination	10%
Total	100%

٨- قائمة الكتب الدراسية والمراجع :

أ- مذكرات:

Department Notes on "Electromagnetic Theory"

ب- كتب ملزمة

ج- كتب مقترحة :

- P. Herbert ,Neff Jr, Introductory Electromagnetic, John Wiley & Sons, Singapore, 1991

-T. D. J. Griffiths, Introduction to Electrodynamics, Prentice-Hall, New Jersey,1999

- Reitz, John R. and Milford, Frederick J, Foundations of Electromagnetic theory , 2nd ed.

Addison-Wesley, Reading, Massachusetts, USA, 1967. - Reitz, John R. and Milford, Frederick J,Applied Electromagnetic, The Macmillan Press Ltd., London and Basingstoke, Great Britain,1967 - Frankl, Daniel R,Electromagnetic Theory, Prentice-Hall, Englewood Cliffs, New Jersey, USA, 1986	
http://en.wikipedia.org	**د- دوريات علمية أو نشرات..**

(أ) مصفوفة المعارف والمهارات المستهدفة من المقرر الدراسى

المحتويات للمقرر	أسبوع الدراسة	المعارف الرئيسية	مهارات ذهنية	مهارات مهنية	مهارات عامة
Vector Analysis	1-2	a1	b1-b2		d1
Coulomb's law and electric field	3-4	a1	b1-b2	c1	d1
Electrostatic potential	5	a1	b3	c2	d1,d2
Electrostatic dipole	6	a2	b3	c3	
Dielectric polarization	7	a2	b3		d1,d2
Poisson and Laplace equations for magnetic potentials	8	a3	b3		
Electromagnetic induction and Faraday's law	9	a2	b3		
Electromagnetic induction and Faraday's law	10	a3	b3	c3	
Maxwell's equations	11-12	a4	b4	c4	d3
Electromagnetic wave equation	13	a4	b4		
Magnetic plane wave propagation	14-15	a5	b4		d4

أستاذ المادة: د./ عبير عوض محمود

رئيس مجلس القسم العلمي : أ.د./ المتولى محمود عبد الرازق