كـــلية: العلـــوم
قـــســـم: الفيزياء

توصيف مقرر دراسى

١- بيانات المقرر		
الرمز الكودى :Phys 104	**أسم المقرر: Electromagnetic Theory**	**المستوى: الأول**
التخصص: إحصاء وعلوم الحاسب	**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.
ج- المهارات المهنية الخاصة بالمقرر:	**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.
د- المهارات العامة :	**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.

٣- محتوى المقرر:

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
Electromagnetic plane wave propagation

٤- اساليب التعليم والتعلم:

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

٥- أساليب التعليم والتعلم للطلاب ذوى القدرات المحدودة:

The same as normal students, only skeletal disabilities are allowed in the Faculty of Science.

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