College of Science
Physics and Astronomy
Department

جامعة الملك
سعود
كلية العلوم
قسم الفيزياء والفلك

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Course Code	**Phys 222**	ЭуТ , , ,	иЭврм ρƆЧгЮF бЦρ
Course Name	**Electromagnetism**	щуҐуВрзПв мЭлЪ	ρƆЧгЮF бЂF
Credit hours	**4**	4	щуЂFρСЮF ЧFСснЮF ЩСгэЛгЮF
Level	**4rd**	ЙЋFƆЮF	онэҐгЮF
Pre-requisites	**Phys 111**	ЭуТ/ / /	ХЋFЂ ЅяГэв
Co-requisites			ХТFƆв ЅяГэв
Credit distribution	**4(3+1+0)**	(✓ +/ +_)。	ЧрКрЂ ЙтСнЋ ρƆЧгЮF

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Course Description:
Gauss law and its applications, Electric Potential, Potential gradient and applications, Capacitors and Dielectrics, Dielectrics and Gauss theory, Electric displacement, polarization, Susceptibility, Dielectric Strength. The magnetic field of conductors, Ampere's law and its applications. Motion of charged particle in magnetic field and its applications. Electromagnetic induction, Induced electromotive force, Faraday's law& Lenz's law, Self and mutual Induction, Current in inductive circuit. Vector operations; Electric and magnetic fields in materials; magnetic potential vector, Electrostatic and magnetic energy; Maxwell's equations in differential forms ; Electromagnetic waves , propagation and radiation. Ac Circuit, Series and Parallel connection, Resonance AC Circuit, Complex Numbers in AC Circuit.

Course Objectives.
Upon successful completion of Phys 111, the student will be able to:
-Understand the laws of electricity and magnetism, the source of electricity and magnetism.
-Know how to drive the Maxwell's equations, Electromagnetic waves and know Complex Numbers in AC Circuit.

Course outcomes:
The Main ILOs are: 1- basis of electromagnetism..
2- Generic skills such as communication, problem solving and reporting some topics.

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Textbooks and References:

1- **Physics for scientists and Engineering with modern Physics, Raymond A. Serway.**
SAUNDERS GOLDEN SUNBRUST SERIES , SAUNDERS COLLEGE PUBLISHING
2- **Electromagnetic fields and waves, Paul Lorrain, Dale R. Corson and Francois Lorraine , Freemann.**

ЬнЛЂ ЩЯгЮF щЛврҐ :ƆІрзЮF - пҐуК Ьв сЯК Сгjв :СуЮЋ_ щуҐуВрзПгЮFм щуЋЭлЫЮF

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