Qassim University
Unaizah College of Engineering

جامعة القصيم
كلية الهندسة بعنيزة

Course Description وصف مقرر دراسي

رقم ورمز المقرر	اسم المقرر	المعتمدة/CR	الاتصال / Contacts			متطلب	
						سابق	متزامن
Course Code	Course Title	وحدة UNIT	نظري LT	عملي LAB	تمارين TU	Pre-Req.	Co-Req.
٢٠٣ كهر EE 203	الكهرو مغناطيسية Electromagnetics	3	3	-	1	٣٤٣ فيز PHYS 131	

محتويات المقرر:

حساب المتجهات؛ المجالات الكهربائية؛ قانون جاوس والتشتت؛ الجهد الكهربائي؛ العوازل والمواسعة؛ معادلات بواسون ولابلاس؛ صور الشحنات؛ كثافة التيار والموصلات؛ المجالات المغناطيسية؛ قانون أمبير؛ نظرية الالتفاف ونظرية ستوكس؛ الجهود المغناطيسية؛ القوى والعزوم؛ المواد والدوائر المغناطيسية؛ المحث والحاثية؛ الطاقة في المجالات الساكنة، مقدمة للموجات الكهرومغناطيسية.

Course Description:

Review to vector calculus; Electrostatic fields; Gauss's law and divergence; Electric potential; Dielectrics and capacitance; Poisson's and Laplace's equations; Charge images; Current density and conductors; Magnetostatic fields; Biot–Savart and Ampere's laws; Curl and Stoke's theorem; Magnetic materials and circuits; Self and mutual inductances; Energy in static Fields, Introduction to electromagnetic waves.

Course Objectives:

Upon completion of this course, the student will be taught:

1- Basic knowledge of static electric and magnetic fields including Coulomb's law, Gauss's law, Biot-Savart's law, Ampere's law, Lorentz's law, Laplace's equation, Poisson's equation, and Faraday's law.
2- Behavior of electric and magnetitic fields in material space and at the interface between two mediums
3- Solving problems associated with the phenomena of polarization and magnetization and boundary conditions between two medias.
4- Calculation of the electrostatic and magnetostatics fields for various charge and current distributions respectively in cartesian, spherical and cylindrical configurations.
5- Finding energy densities and total energy in a region of electrostatic and magnetostatic fields distributions.
6- Solving electrostatic and magnetostatics boundary value problems in cartesian, cylindrical, and spherical coordinate systems using Laplace's and Poisson's Equation

Evaluation methods:

1- Reports, homework and assignments
2- Quizzes
3- Midterms exams
4- Final exam

Text book and references:

1- Sadiku, "Elements of Electromagnetics", Oxford

الختم