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Course	Course Name	: Physics II
	Course Code	: SF184202
	Credit	: 3
	Semester	: 2

Description of Course	
<p>In this course students will learn to understand the basic laws of physics, the Electric Field; Electric Potential; Electric current; Magnetic field; Electric Motion Force (EMF) Induction and Alternating Current, through simple mathematical descriptions and introducing examples of the use of concepts.</p>	
Learning Outcome	
PLO-01	Able to apply Natural Sciences and Mathematics in the field of Biomedical Engineering.
PLO-03	Able to design and implement laboratory experiment and / or field experiments, analyze and interpret data, and use objective assessments to draw conclusions.
PLO-06	Able to apply the latest knowledge, skills and methods in solving problems in the field of Biomedical Engineering
Course Learning Outcome	
CLO 1	Students understand particles that compose a matter and it's electrical properties, substantial of conductor and dielectric
CLO 2	Students understand the strength of an electric field based on Coulomb force and Gauss's law.

CLO 3	Students are able to understand various forms of electric potential in charged conductors..
CLO 4	Students understand the capacitance principle of various form of capacitor in capacitor circuits, series, parallel and mixed.
CLO 5	Able to use magnetic field force formulas for electric currents and moving charges
CLO 6	Able to mention the role of magnetization in magnetic material and hysteresis loop.
CLO 7	Understand the principle of electromotive force emergences, and current in resistor, capacitor and inductor
CLO 8	Able to determine the magnitude of impedance, electric current and phase angle in parallel and series circuit R-L, R-C, RL-C

Electric charge and electric field

Electric charge, electrical properties of materials, Coulomb's Law; electric field strength, line force, electric field strength calculation;

Gauss's Law: flux, Gauss's Law and its applications;

Electric potential: potential energy, electric potential difference, electric potential calculation, potential gradient;

Capacitor: Capacitance, capacitance calculation capacitor, capacitor circuit, dielectric material, capacitor energy;

Electric current: current and motion of charge, resistivity, resistance, Ohm's law, emf, energy and electric power;

Direct current circuit: resistor circuit, Kirchoff's law, electric measuring instruments, R-C Transient Symptoms:

Magnetic fields: magnetic flux and induction, Lorentz force, Biot Savard-Ampere law, computation of magnetic fields;

Induced EMF: Faraday's Law, Lenz's Law, Induced EMF, Self-Inductance and Coupled Inductance; energy in the inductor;

Alternating current \rightarrow reverse:, reactance, impedance, phasor diagram, R-L-C series and parallel circuits, Power, Resonance, transformer.

Prerequisites

Reference

1. Halliday, Resnic, Jearl Walker ; 'Fundamental of Physics'. John Wiley and Sons, 10th ed, New York, 2014
2. Douglas C. Giancoli, 'Physics for Scientists and Engineers , Pearson Education, 4th ed, London, 2014
3. Tim Dosen, "Diktat Fisika II", Fisika FMIPA-ITS
4. Tim Dosen, "Soal-soal Fisika II", "Soal-soal Fisika II", Fisika FMIPA-ITS

Supporting Reference

1. Sears & Zemanky, "University Physics", Pearson Education, 14thed, USA, 2016
2. Tipler, PA, 'Physics for Scientists and Engineers ',6th ed, W.H. Freeman and Co, New York, 2008