



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

COURSE DESCRIPTION
Students will learn to understand the basic laws of physics, electric fields; electric potential; current; magnetic fields; Faraday's law of induction; alternating current, with simple mathematic equations also to introduce applying the concept.
GENERAL LEARNING OUTCOME
Understanding the theoretical concept of classical physics and modern physics in depth.
COURSE LEARNING OUTCOME
<p>Students should be able to understand:</p> <ol style="list-style-type: none"> 1. Electric charge, charged particle, Coulomb's law; 2. The energy of electric fields, calculating the energy of the electric field; 3. The concept of Gauss's law and its applications 4. Electric potential on charged conductor and calculating the electric potential. 5. The concept of capacitance, capacitors in parallel and in series, and capacitor with a dielectric. 6. Magnetic fields due to current and movement charge. 7. The concept of current and resistance, the concept of ohm's law, Kirchhoff's law. 8. Magnetic properties of materials and calculating the magnetic fields. 9. The principle of Faraday's Law of Induction, inductance. 10. The concept of impedance and phase angle on R-L- C circuit.
TOPIC
<p>Electric Charge and Electric Field Electric charge, charged particle, Coulomb's law; Energy of electric field, line of charge, calculating the Energy of the electric field; Gauss's Law: flux, Gauss's law, and the application; Electric Potential: Potential energy, potential difference, calculating the potential difference, potential gradient; Capacitor: Capacitance, calculating the capacitance, capacitors in parallel and in series, capacitor with a dielectric, energy of capacitor; Current: current and direction of current, resistance, resistivity, Ohm's law, an electromotive force (emf), energy and electric power; Direct Circuit (DC): resistors in parallel and in series, Kirchhoff's law, the instrument used with the circuit, R-C circuit; Magnetic Fields: flux and magnetic, Lorentz force, BiotSavard-Ampere's law, calculating the magnetic fields; Faraday's Law of Induction: Faraday's Law, Lenz's Law, Faraday's Law of Induction, Self Induction and mutual induction; energy in inductor; Alternating Current (AC): reactance, Impedance, phase or diagram, R-L-C in parallel and in series, Power, Resonance, transformer.</p>



REFERENCES

Main references:

1. Halliday, Resnick, 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 references:

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

PREREQUISITE

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PROGRAM

