MATA KULIAH ***COURSE***	**Nama Mata Kuliah** ***Course Name***	:	**Fisika Listrik dan Magnet**
	Kode MK *Course Code*	:	**SF234203**
	Kredit / *Credits*	:	3 SKS (3/0/0)
	Semester	:	II (GENAP)

DESKRIPSI MATA KULIAH

Pada mata kuliah ini mahasiswa akan belajar memahami hukum-hukum dasar fisika, Medan Listrik; Potensial Listrik; Arus Listrik ; Medan magnet; Gaya Gerak Listrik (GGL) Induksi dan Arus Bolak Balik, melalui uraian matematika sederhana serta memperkenalkan contoh pemakaian konsep.

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, and conduct material analysis in the form of practicum.

CAPAIAN PEMBELAJARAN MATA KULIAH
Course Learning Outcome

- Mahasiswa memahami butir-butir penyusun materi serta sifat kelistrikannya, hakekat konduktor dan dielektrik.
- *Students understand the constituent points of the material as well as its electrical properties, conductor and dielectric nature.*

- Mahasiswa Memahami kuat medan listrik berdasarkan gaya coulomb dan hukum gauss
- *Students understand the electric field strength based on the coulomb force and Gauss law*

- Mahasiswa mampu memahami berbagai bentuk potensial listrik pada konduktor bermuatan
- *Students are able to understand various forms of electric potential in charged conductors*

- Mahasiswa Memahami azas kapasitansi berbagai bentuk kapasitor pada rangkaian kapasitor, seri, paralel dan campuran
- *Students understand the capacitance principle of various capacitor forms in capacitor, series, parallel and mixed circuits*

- Mampu menggunakan rumus gaya medan magnit terhadap arus listrik dan muatan bergerak
- *Able to use the magnetic field force formula to electric current and moving charges*

- Mampu menyebutkan peranan magnetisasi dalam material magnetik dan hystensis loop
- *Be able to mention the role of magnetization in magnetic material and loop hystensis*

- Memahami prinsip timbunya gaya gerak listrik, dan arus dalam resistor, kapasitor dan induktor
- *Understand the principles of generating electromotive force and currents in resistors, capacitors and inductors*

- Mampu menentukan besar impendansi, besar arus listrik, dan sudut fasa pada rangkaian seri, paralel R-L, R-C, R-L- C
- *Able to determine impedance, amount of electric current, and phase angle in series, parallel R-L, R-C, R-L-C*

POKOK BAHASAN
Main Subject

Muatan listrik, Hukum Coulomb;
Medan listrik: kuat medan listrik, garis gaya, perhitungan kuat medan listrik untuk muatan titik, muatan garis, cincin, piringan, silinder;
Hukum Gauss: fluks, garis gaya, Hukum Gauss dan aplikasinya untuk muatan silinder dan bola;
Potensial listrik: energi potensial, beda potensial listrik, hubungan potensial listrik dan medan listrik, perhitungan potensial listrik untuk muatan titik, muatan garis, cincin, piringan, silinder dan bola;
Kapasitor: Kapasitansi, perhitungan kapasitansi untuk kapisitor keping sejajar, kapasitor silinder dan kapasitor bola, rangkaian kapasitor seri dan paralel, bahan dielektrik, energi kapasitor;
Arus listrik: arus dan gerak muatan, hukum Ohm, resistivitas, resistansi, daya listrik;
Rangkaian arus searah: rangkaian resistor seri dan paralel, hukum Kirchoff;
Medan magnet: fluks dan induksi magnet, gaya Lorentz, hukum Biot Savard-Ampere, perhitungan medan magnet untuk kawat lurus berarus, cincin, solenoida dan toroida;
GGL Induksi : Hukum Faraday, Hukum Lenz, GGL induksi, Induktansi diri dan induktansi gandeng; energi pada induktor;
Gejala Transien: perhitungan perubahan arus terhadap waktu untuk rangkaian RC dan CL seri
Arus bolak balik: arus bolak-balik dalam resistor, induktor, kapasitor, Impedansi, rangkaian R-L dan R-C untuk seri dan pararel, R-L-C seri, Daya, dan Resonansi

Electric charge, Coulomb's Law;
Electric field*: electric field strength, line force, calculation of electric field strength for point charge, line charge, ring, disk, cylinder;*
Gauss's Law*: flux, lines of force, Gauss's Law and its application to cylindrical and spherical charges;*
Electric potential*: potential energy, electric potential difference, relationship between electric potential and electric field, calculation of electric potential for point charge, line charge, ring, disk, cylinder and sphere;*
Capacitors*: Capacitance, capacitance calculation for parallel plate capacitors, cylindrical capacitors and spherical capacitors, series and parallel capacitor circuits, dielectric materials, capacitor energy;*
Electric current*: current and motion of charge, Ohm's law, resistivity, resistance, electric power;*
Direct current circuit: series and parallel resistor circuit, Kirchhoff's law;
Magnetic fields*: magnetic flux and induction, Lorentz force, Biot-Savard-Ampere law, magnetic field calculations for current-carrying straight wires, rings, solenoids and toroids;*
EMF Induction*: Faraday's law, Lenz's law, induced emf, self-inductance and coupled inductance; energy in the inductor; transient Symptom: calculation of the change in current with time for series RC and CL circuits*
Alternating current*: alternating current in resistors, inductors, capacitors, Impedance, R-L and R-C circuits for series and parallel, R-L-C series, Power and Resonance*

PRASYARAT
Prerequisite

-

PUSTAKA UTAMA
Main References

1. Halliday & Resnic; 'Fundamental of Physics'. John Wiley and Sons, New York, 1987
2. Tim Dosen, "Diktat Fisika II", ”Soal-soal Fisika II", Fisika FMIPA-ITS
3. Giancoli, DC., (terj, Yuhilza H), 'Fisika, jilid 2', Ertangga, Jakarta, 2001

PUSTAKA PENDUKUNG ***Secondary References***
1. Alonso & Finn,"Fundamental University Physics", Addison Wesley Pub Comp Inc,1$^{3`}$.ed, Calf, 1990 2. Tipler, PA,(ted. L Prasetio dan R.W.Adi), "Fisika : untuk Sains dan Teknik, Jilid 2", Erlangga, Jakarta, 1998