

Mata Kuliah Course	Nama MK <i>Name</i>	: Medan Elektromagnetik <i>Electromagnetic Fields</i>
	Kode MK <i>Code</i>	: EE184303
	Kredit <i>Credits</i>	: 4 sks
	Semester <i>Semester</i>	: III (Wajib) <i>III (Compulsory)</i>
	Beban Belajar <i>Workload</i>	: Kuliah : 4 x 50 = 200 menit/minggu Latihan/tugas : 4 x 60 = 240 menit/minggu Belajar mandiri : 4 x 60 = 240 menit/minggu <i>Lectures : 4 x 50 = 200 min/week</i> <i>Exercises/Assignments : 4 x 60 = 240 min/week</i> <i>Self learning : 4 x 60 = 240 min/week</i>
	Tingkatan <i>Module Level</i>	: Sarjana (S1) <i>Undergraduate</i>
	Penanggung Jawab <i>PIC</i>	: Dr. Feby Agung Pamuji, ST, MT
	Pengajar <i>Lecturer</i>	: Dr. Feby Agung Pamuji, ST, MT Dr. Ir. Achmad Mauludiyanto, MT Dr. I Made Yulistya Negara, ST, M.S Devy Kuswidiastuti, ST, M.Sc Dr. Ir. Ni Ketut Aryani, MT Eko Setijadi, ST, MT, PhD Dr. I Gusti Ngurah Satriyadi Hernanda, ST, MT Dr. Prasetiyono Hari Mukti, ST, M.Sc Dr. Dimas Fajar Uman Putra, ST, MT Dr. Ir. Puji Handayani, MT Dr. Dimas Anton Asfani, ST, MT Sri Rahayu, ST, M.Kom Vita Lystianingrum B P, ST, M.Sc, PhD Prof. Dr.Ir. Gamantyo Hendratoro, M.Eng
	Bahasa <i>Language</i>	: Bahasa Indonesia dan Bahasa Inggris <i>Bahasa Indonesia and English</i>
	Persyaratan dan Peraturan <i>Requirement and Regulation</i>	: Setiap mahasiswa harus menghadiri setidaknya 75% dari jumlah perkuliahan untuk dapat mengikuti ujian <i>A student must have attended at least 75% of the lectures to sit in the exams</i>

Deskripsi Mata Kuliah

Description of Course

Mata kuliah Medan Elektromagnetik merupakan mata kuliah yang membahas teori dasar medan elektromagnetik serta aplikasinya pada teori bahan konduktor, semionduktor dan kapasitor. Selain itu, Mata kuliah ini memberikan pengetahuan mengenai konsep medan elektromagnetik

yang tetap dan berubah terhadap waktu serta penerapannya dalam komponen maupun mesin listrik. Juga membahas medan magnet statis, medan dinamis dan aplikasinya.

Electromagnetic Field discusses the basic theory of electromagnetic fields and their application to the theory of conductor materials, semiconductors and capacitors. In addition, this course provides knowledge about the concepts of static and time-varying electromagnetic fields and their application in electrical components and machines. Also discusses static magnetic fields, dynamic fields and their applications.

CPL Prodi yang Dibebankan

Learning Outcomes

(CPL-01) Mampu menerapkan ilmu pengetahuan alam dan matematika pada bidang teknik elektro

(PLO-1) Capable to apply knowledge of natural sciences and mathematics to solve electrical engineering problem

(CPL-10) Mampu mengetahui dan menyikapi perkembangan terkini dibidang ilmu pengetahuan dan teknologi dengan mengedepankan nilai-nilai universal

(PLO-10) Capable to know and respond to the latest developments in science and technology by promoting universal values

Capaian Pembelajaran Mata Kuliah

Course Learning Outcomes

(CPMK-01) Menguasai konsep teori dasar medan elektromagnetik yang mencakup teori medan elektrostatik, elektromagnet tetap dan berubah terhadap waktu, serta hukum – hukum dasar yang mendukung.

(CLO-01) Mastering the basic concepts of electromagnetic fields which include electrostatic field theory, electromagnetics field which either is static or changing against time, as well as related basic laws.

(CPMK-02) Menguasai konsep medan magnet statis, konsep medan elektromagnet dinamis, persamaan Maxwell serta aplikasinya.

(CLO-02) Mastering the concept of static magnetic fields, the concept of dynamic electromagnetic fields, Maxwell's equations and their applications.

(CPMK-03) Mampu menganalisis permasalahan medan elektrostatik, elektromagnet tetap dan berubah terhadap waktu, dan menggunakan hukum-hukum dasar yang berkaitan.

(CLO-03) Able to analyze the problems of the electrostatic field and to use the related basic laws.

(CPMK-04) Mampu menganalisis persoalan-persoalan medan magnet statis dan medan elektromagnet dinamis serta mampu menganalisis perambatan gelombang datar serbasama di berbagai medium.

(CLO-04) Able to analyze the problems of static magnetic fields and dynamic electromagnetic fields and be able to analyze the propagation of flat waves together in various mediums.

(CPMK-05) Mampu menunjukkan kinerja mandiri, bermutu, dan terukur dalam menganalisis permasalahan.

(CLO-05) Able to work independently, to show quality and measurable performance in analyzing problems.

(CPMK-06) Mampu menganalisis permasalahan medan elektrostatik, elektromagnet tetap dan berubah terhadap waktu.

(CLO-06) Able to analyze problems in electrostatic fields and electromagnetics in static and changing against time.

(CPMK-07) Mampu bertanggung jawab atas hasil kerja, baik secara individu maupun kelompok.

(CLO-07) Able to be responsible for the work, both individually and in groups.

Topik/Pokok Bahasan

Main Subjects

1. Vektor, Hukum Coulomb, dan Intensitas Medan Listrik
Vector, Coulomb Law, and Electric Field Intensity
2. Kerapatan Fluks Listrik, Hukum Gauss, dan Divergensi
Electric Flux Density, Gauss Law, and Divergence
3. Energi dan Potensial
Energy and Potential
4. Konduktor, Dielektrikum, dan Kapasitansi
Conductor, Dielectric and Capacitance
5. Medan Magnet Statis
Static Magnetic Field
6. Bahan & Gaya Magnet, Induktansi
Material & Magnetism, Inductance
7. Medan yang berubah terhadap waktu, Teorema Maxwell
The field changes with time, Maxwell's theorem
8. Gelombang Datar Serbasama
Uniform Plane Wave

Pembelajaran dan ujian

Study and examination

- Latihan di kelas
In-class exercises
- Tugas 1, 2, 3
Assignment 1, 2, 3
- Ujian tengah semester
Mid-term examination
- Ujian akhir semester
Final examination

Pustaka

Reference(s)

- [1] William H. Hayt, Jr. John A. Buck, 8th Edition of Engineering Electromagnetics, McGraw-Hill, 2010
- [2] Joseph Edminister, Schaum's Outline of Electromagnetics Schaum's Outline of Electromagnetics, 2013

Prasyarat

Prerequisite(s)

EE184201 Aljabar Linier dan Struktur Diskrit
EE184201 Linear Algebra and Discrete Structures