



INSTITUT TEKNOLOGI SEPULUH NOPEMBER (ITS)
FAKULTAS TEKNOLOGI ELEKTRO DAN INFORMATIKA CERDAS
DEPARTEMEN TEKNIK ELEKTRO
Program Studi Sarjana (S1) Teknik Telekomunikasi

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| 1 | Nama Mata Kuliah / Course Name : Pengantar Teknologi Elektro / <i>Introduction to Electrical Technology</i> |
| 2 | Kode Mata Kuliah / Course Code : EE234101 |
| 3 | Kredit / Credits : 3 SKS |
| 4 | Semester / Semester : 1 |

Deskripsi Mata Kuliah / Course Description

Mata kuliah Pengantar Teknologi Elektro membahas dasar-dasar teknologi elektro yang meliputi materi pengantar ke teknik sistem tenaga, teknik sistem pengaturan, elektronika, teknik telekomunikasi, teknik komputer, dan teknik biomedik serta sejarah dan dampak teknologi elektro bagi peradaban, peran fisika dan matematika dalam teknologi elektro, dan pentingnya kreativitas dan integritas bagi sarjana teknologi elektro.

The Introduction to Electrical Technology course discusses the basics of electrical technology which includes introductory material to power system engineering, control system engineering, electronics, telecommunications engineering, computer engineering, and biomedical engineering as well as the history and impact of electrical technology on civilization, the role of physics and mathematics in technology electrical engineering, and the importance of creativity and integrity for electrical engineering graduates.

Capaian Pembelajaran Lulusan (CPL) Yang Dibebankan Mata Kuliah / Program Learning Outcomes Charged to The Course

1. (CPL-02) Mampu mengkaji dan memanfaatkan ilmu pengetahuan dan teknologi dalam rangka mengaplikasikannya pada bidang Teknik Telekomunikasi, serta mampu mengambil keputusan secara tepat dari hasil kerja sendiri maupun kerja kelompok dalam bentuk laporan tugas akhir atau bentuk kegiatan pembelajaran lain yang luarannya setara dengan tugas akhir melalui pemikiran logis, kritis, sistematis dan inovatif.
(PLO-02) Be able to study and utilize science and technology in order to apply it to the field (study program expertise), and able to make appropriate decisions from the results of their own work or group work in the form of a final project report or other forms of learning activities whose output is equivalent to a final project through logical, critical, systematic, and innovative thinking.*
2. (CPL-08) Mampu mengetahui dan mengaplikasi metode dan keahlian sesuai perkembangan terkini di bidang ilmu pengetahuan dan teknologi untuk

menyelesaikan permasalahan di bidang Teknik Telekomunikasi dengan mengedepankan nilai-nilai universal.

(PLO-08) Able to know and apply methods and expertise according to the latest developments in the field of science and technology to solve problems in the field of Telecommunication Engineering by prioritizing universal values.

3. (CPL-09) Mampu berkomunikasi secara efektif baik dalam bentuk tulisan maupun lisan.

(PLO-09) Able to communicate effectively in oral and written manners.

Capaian Pembelajaran Mata Kuliah / Course Learning Outcomes

1. Mahasiswa memahami materi pengantar Teknik Sistem Tenaga, Teknik Sistem Pengaturan, Elektronika, Teknik Telekomunikasi, Teknik Komputer, dan Teknik Biomedik / *Students understand the introductory material for Power Systems Engineering, Regulatory System Engineering, Electronics, Telecommunications Engineering, Computer Engineering, and Biomedical Engineering*
2. Mahasiswa memahami sejarah dan timeline teknologi elektro / *Students understand the history and timeline of electrical technology*
3. Mahasiswa memahami dasar fenomena listrik dan magnet / *Students understand the basic phenomena of electricity and magnetism*
4. Mahasiswa memahami peran fisika dan matematika dalam teknologi elektro / *Students understand the role of physics and mathematics in electrical technology*
5. Mahasiswa memahami dampak teknologi elektro terhadap perkembangan peradaban / *Students understand the impact of electrical technology on the development of civilization*
6. Mahasiswa memahami pentingnya kreativitas bagi sarjana teknologi elektro dalam menghadapi perkembangan teknologi / *Students understand the importance of creativity for electrical engineering graduates in dealing with technological developments*
7. Mahasiswa memahami pentingnya integritas bagi sarjana teknologi elektro / *Students understand the importance of integrity for electrical engineering graduates*

Pokok Bahasan / Contents

1. Pengantar teknik sistem tenaga / *Introduction to power system engineering*
2. Pengantar teknik sistem pengaturan / *Introduction to the control system technique*
3. Pengantar elektronika / *Introduction to electronics*
4. Pengantar teknik telekomunikasi / *Introduction to telecommunications engineering*
5. Pengantar teknik komputer / *Introduction to computer engineering*
6. Pengantar teknik biomedika / *Introduction to biomedical engineering*
7. Sejarah/timeline teknologi elektro (Volta, Ohm, Kelvin, Faraday, Biot Savart, Laplace, Ampere, Maxwell, dan seterusnya) Dasar fenomena listrik dan magnet (elektron, arus listrik, listrik magnet, baterai, dst) / *History/timeline of electrical technology (Volta, Ohm, Kelvin, Faraday, Biot Savart, Laplace, Ampere, Maxwell,*

and so on) Basic electrical and magnetic phenomena (electrons, electric current, magnetic electricity, batteries, etc.)

8. Fisika dan matematika dalam teknologi elektro (fenomena fisika dari elektro, pemodelan matematika untuk sinyal dan sistem dalam teknologi elektro) / *Physics and mathematics in electrical technology (physical phenomena from electrical engineering, mathematical modeling for signals and systems in electrical technology)*
9. Dampak teknologi elektro terhadap perkembangan peradaban (transportasi, dsb) / *The impact of electro technology on the development of civilization (transportation, etc.)*
10. Kreativitas bagi sarjana teknologi elektro dalam menghadapi perkembangan teknologi (memiliki penguasaan dasar yang kuat) / *Creativity for electrical engineering graduates in dealing with technological developments (having strong basic mastery)*
11. Kode etik dan integritas bagi sarjana teknologi elektro (pengakuan terhadap hasil karya orang lain, upaya mandiri dalam menyelesaikan permasalahan, dst) / *Code of ethics and integrity for electrical engineering graduates (recognition of other people's work, independent efforts to solve problems, etc.)*

Prasyarat / Pre-requisite

Pustaka / Reference

1. Anthonie Meijers, Philosophy of Technology and Engineering
2. Sciences, Elsevier, 2009. Clive Maxfield dkk, Electrical Engineering, Elsevier, 2008.
3. Don Johnson, J. D. Wise, Fundamentals of Electrical Engineering, University Press of Florida, 2009.
4. Charles Gross, Thaddeus Roppel, Fundamentals of Electrical Engineering, Taylor and Francis, 2012.
5. Stan Gibilisco, Teach Yourself Electricity and Electronics, ed. 4, McGraw-Hil, 2006