



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

**INSTITUT TEKNOLOGI SEPULUH NOPEMBER (ITS)**  
**FACULTY OF INTELLIGENT ELECTRICAL & INFORMATICS TECHNOLOGY**  
**DEPARTMENT OF ELECTRICAL ENGINEERING**  
**Bachelor Degree Program in Electrical Engineering**

<b>1</b>	<b>Nama Mata Kuliah / Course Name</b> : Pengantar Teknologi Elektro dan Informatika Cerdas / <i>Introduction to Intelligence Electrical and Informatics</i>
<b>2</b>	<b>Kode Mata Kuliah / Course Code</b> : EE234101
<b>3</b>	<b>Kredit / Credits</b> : 2 SKS
<b>4</b>	<b>Semester / Semester</b> : 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, teknik biomedik serta sejarah dan dampak teknologi elektro bagi peradaban. Di matakuliah ini juga dibahas trend dan potensi perkembangan keilmuan Teknik Elektro khususnya pada periode lima tahun kedepan. / *The course 'Introduction to Electrical Technology' covers the fundamentals of electrical technology, including an introduction to power systems engineering, control systems engineering, electronics, telecommunications engineering, computer engineering, biomedical engineering, as well as the history and impact of electrical technology on civilization. This course also discusses the trends and potential developments in the field of Electrical Engineering, particularly in the next five years.*

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

CPL 1 Mampu menunjukkan sikap dan karakter yang mencerminkan: ketakwaan kepada Tuhan Yang Maha Esa, etika dan integritas, berbudi pekerti luhur, peka dan peduli terhadap masalah sosial dan lingkungan, menghargai perbedaan budaya dan kemajemukan, menjunjung tinggi penegakan hukum mendahulukan kepentingan bangsa dan masyarakat luas, melalui kreatifitas dan inovasi, eksekusi, kepemimpinan yang kuat, sinergi, dan potensi lain yang dimiliki untuk mencapai hasil yang maksimal / *Being able to demonstrate attitudes and characteristics that reflect: devotion to the One Almighty God, ethics and*

*integrity, noble virtues, sensitivity and care towards social and environmental issues, appreciation of cultural diversity and inclusivity, upholding the rule of law with a priority on the interests of the nation and the wider community, through creativity and innovation, excellence, strong leadership, synergy, and other potentials possessed to achieve maximum results.*

CPL 8 Mampu bekerja secara efektif lintas disiplin dan budaya dengan menunjukkan sifat kepemimpinan, dan mampu mendefinisikan tujuan, rencana kerja, dan capaian / *Able to work effectively across disciplines and cultures by demonstrating leadership qualities and the ability to define goals, work plans, and achievements.*

CPL 9 Mampu berkomunikasi secara efektif baik dalam bentuk tulisan maupun lisan / *Able to effective communication, both in written and oral forms.*

#### **Capaian Pembelajaran Mata Kuliah / Course Learning Outcomes**

1. Mampu menjelaskan Sejarah ilmu Teknik Elektro. / *Able to explain the history of the field of Electrical Engineering.*
2. Mampu menjelaskan Rumpun Ilmu Teknik Elektro (IEEE s/d ACM) / *Able to describe the Branches of Electrical Engineering (from IEEE to ACM).*
3. Mampu menjelaskan Kebutuhan kompetensi setiap rumpun Teknik Elektro / *Able to explain the competency requirements for each branch of Electrical Engineering.*
4. Mampu menjelaskan Trend Teknologi setiap rumpun keilmuan Teknik Elektro / *Able to explaining the Technology Trends in each branch of Electrical Engineering*

#### **Pokok Bahasan / Contents**

1. Sejarah ilmu Teknik Elektro / *History of Electrical Engineering*
2. Rumpun Ilmu Teknik Elektro (IEEE s/d ACM) / *Branches of Electrical Engineering (from IEEE to ACM)*
3. Kebutuhan kompetensi setiap rumpun / *Competency requirements for each branch*
4. Besaran Listrik dan ilustrasi nya : R, L, C, Daya, energy, cos phi, frekuensi / *Electrical Quantities and their Illustrations: R, L, C, Power, Energy, Cosine Phi, Frequency*
5. Komponen elektronika / *Electronic Components*
6. Sejarah ilmu pengobatan dan Teknik biomedik / *History of Medical Science and Biomedical Engineering*
7. Ruang lingkup Teknik biomedik / *Scope of Biomedical Engineering*
8. Sejarah Komputer / *History of Computers*
9. Bagian – bagian computer. Diagram Von Neuman: ADC, teknologi computer populer / *Computer Components. Von Neumann Diagram: ADC, Popular Computer Technologies*
10. Konsep dasar control: open loop dan close loop / *Basic Control Concepts: Open Loop and Closed Loop*
11. Trend Teknologi: / *Technology Trends:*
12. Teknik Biomedik : contoh telemedicine, Assisted technology for health / *Biomedical Engineering: Examples such as Telemedicine, Assisted Technology for Health*
13. Trend teknologi dibidang computer / *Computer Technology Trends*
14. Telkom 4.0 / *Telecommunications 4.0*

15. Trend Sistem tenaga listrik : Renewable energy dan Smartgrid / *Trends in Electrical Power Systems: Renewable Energy and Smart Grid*
16. Kontrol pada kendaraan listrik dan Autonomous Vehicle / *Control in Electric Vehicles and Autonomous Vehicles*

**Prasyarat / Pre-requisite**

**Pustaka / Reference**

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