

## **ELMEZ**

## **Electromagnetics**

To appreciate the need for a description and analysis of electromagnetic fields to electronics and the extent to which an understanding of these is needed beyond the use of current and voltage in circuits and other electronic systems. To formalize in vector notation the description of electric and magnetic fields and to have a physical insight into the use of Gauss's Law and Faraday's Law for analyzing electronic devices. Electrostatics, magnetostatics and electromagnetic dynamics including plane electromagnetic waves and Maxwell's equations.

1. Basic laws and concepts of electrostatics. Capacitance.
2. Special techniques for electrostatic problems
3. Steady currents
4. Calculation of DC circuits.
5. Static magnetic field laws and concepts
6. Magnetic field energy. Inductance
7. Voltages induced by changing magnetic fields. Faraday's law.
8. Maxwell's equations. Wave equations.
9. Alternating currents. Phasors.
10. Calculation of AC circuits.
11. Voltage and current variations along transmission lines.
12. Plane wave propagation.

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Electromagnetic fields and Waves  
Fields and waves in communication electronics

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