

Typical Outline:

1. **Introduction to Electromagnetics**
 - Basic concepts of electromagnetism
 - Historical context and significance in engineering
2. **Maxwell's Equations**
 - Derivation and physical interpretation of Maxwell's equations
 - Applications in engineering contexts
3. **Electromagnetic Waves**
 - Wave propagation in various media
 - Boundary conditions, reflection, and transmission
4. **Transmission Lines**
 - Characteristics and behaviors of transmission lines
 - Impedance matching and signal integrity
5. **Antenna Theory**
 - Types of antennas and their applications
 - Understanding radiation patterns and antenna gain
6. **Electromagnetic Compatibility (EMC)**
 - Principles of EMC and managing interference
 - Design considerations for ensuring EMC
7. **Scattering and Diffraction**
 - Scattering theory and its applications
 - Analysis of diffraction of electromagnetic waves
8. **Computational Electromagnetics**
 - Numerical methods for solving electromagnetic problems
 - Techniques such as the finite element method (FEM) and finite difference time domain (FDTD)
9. **Applications in RF and Microwave Engineering**
 - Design and analysis of RF circuits and systems
 - Overview of microwave devices and technologies
10. **Case Studies and Practical Applications**
 - Examination of real-world engineering problems and solutions
 - Discussion of emerging technologies in electromagnetics