

Table of Contents

1. **Introduction to Applied Electromagnetics**
 - Fundamental concepts
 - Electric and magnetic fields
 - Engineering applications
2. **Mathematical Foundations**
 - Vector calculus
 - Differential operators
 - Maxwell's equations
3. **QuickField Fundamentals**
 - Overview of QuickField
 - Model creation
 - Material properties
 - Boundary conditions
 - Post-processing and visualization
4. **MATLAB for Electromagnetic Analysis**
 - Numerical computation
 - Data visualization
 - Programming for electromagnetic problems
 - Automation of simulations
5. **Electrostatics**
 - Electric potential
 - Electric field distribution
 - Capacitance
 - Practical examples
6. **Magnetostatics**
 - Magnetic circuits
 - Permanent magnets
 - Solenoids
 - Inductance calculations
7. **Time-Varying Electromagnetic Fields**
 - Electromagnetic induction
 - Eddy currents
 - AC magnetic fields
8. **Engineering Applications**
 - Transformers
 - Electric machines
 - Electromagnetic actuators
 - Magnetic shielding
9. **Model Validation and Numerical Accuracy**
 - Analytical versus numerical solutions
 - Error analysis
 - Simulation verification
10. **Case Studies and Design Projects**
 - Guided examples
 - Engineering design problems
 - QuickField and MATLAB projects