## PROFORMA INVOICE FOR ELECTROMAGNETIC WAVE THEORY

# Electromagnetic Wave Theory

JIN AU KONG

#### About the book:

This textbook of 1016 pages and 8 chapters can be divided into three parts. The first 300 pages are written for an introductory undergraduate course, where fundamentals of electromagnetics can be taught without relying on complex vectors, complex variables, or curvilinear coordinates. Chapter 3, and parts of 1, 4, and 5 are designed for introductory graduate courses, where time-harmonic fields and wave concepts are studied. Chapters 6, 7, and 8 contain material for advanced graduate courses. The various topics in the book can be taught independently. The problem and solution sections provide useful exercises and applications.

#### About the author:

J. A. Kong is the President of The Electromagnetics Academy, and a Professor at the Massachusetts Institute of Technology, Cambridge, Massachusetts, USA. His area of interest is in electromagnetic wave theory and applications. He has published over 30 books, and 600 journal articles, book chapters, and conference papers. He is the Chief Editor of the book series on Progress In Electromagnetics Research (PIER), the Editor-in-Chief of the Journal of Electromagnetic Waves and Applications, and the Editor of the Wiley book series on Remote Sensing.

- Chapter 1. Fundamentals: Maxwell's Theory, Electromagnetic Waves, Force, Power, and Enegry, Hertzian Waves, Constitutive Relations, Boundary Conditions, Reflection and Guidance.
- Chapter 2. Transmission lines: Transmission Line Theory, Time-Domain Transmission Line Theory, Sinusoidal Steady State Transmission Lines, Lumped Element Transmission Lines, Transmission Line Modeling.
- Chapter 3. Media: Time-Harmonic Fields, Bianisotropic Media *kDB* System for Waves in Media.
- Chapter 4. Reflection and Guidance: Reflection and Transmission, Wave Guidance, Resonance.
- Chapter 5. Radiation: Cerenkov Radiation, Green's Function, Hertzian Dipoles, Linear Dipole Arrays, Linear Antennas, Biconical Antennas, Dipole Antennas in Layered Media.
- Chapter 6. Theorems of Waves and Media: Equivalence Principle, Reaction and Reciprocity, Quasi-Static Limits, Geometrical Optics Limits, Paraxial Limit, Quantization of Electromagnetic Waves.
- Chapter 7. Scattering: Scattering by Spheres, Scattering by a Conducting Cylinder, Scattering by Periodic Rough Surfaces, Scattering by Periodic Media, Scattering by Random Media, Effective Permittivity for a Volume Scattering Medium.
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