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A unique textbook for both entry- and advanced-level graduate courseworkTheory and Computation of Electromagnetic Fields doubles as a textbook for both an entry-level graduate course on electromagnetics and an advanced-level graduate course on computational electromagnetics. It presents the fundamental concepts in a systematic manner so that students can advance from the first course to the second with little difficulty.The book consists of two parts. Part I covers the standard basic electromagnetic theory in a different manner than most texts; the contents cover both fundamental theories (such as vector analysis, Maxwell's equations and boundary

conditions, and transmission line theory) and advanced topics (such as wave transformation, addition theorems, and fields in layered media) in order to benefit students at all levels. Part II covers major computational methods for numerical analysis of electromagnetic fields for engineering applications. These methods include the finite difference method (and the finite difference time-domain method in particular), the finite element method, and the integral-equation-based moment method.Additional benefits of Theory and Computation of Electromagnetic Fields include:. Maxwell's equations as the starting point for the treatment of every subject. Added coverage of fast algorithms for solving integral equations and hybrid techniques for combining different numerical methods to seek more efficient solutions to complicated electromagnetic problems. Material designed for classroom teaching and self-learning in two semesters, and tested over fifteen years at the University of Illinois. Homework problems in every chapter to test and reinforce understanding of course material. Accompanying Instructor's GuideTheory and Computation of Electromagnetic Fields serves as a textbook for entry- and advanced-level graduate electrical engineering students. It is also an ideal reference for professional engineers who wish to brush up on their analysis and computation skills.