ECE 8833: Advanced Topics in Analytical Electromagnetics

New Grad Course for Fall 07

Course	Title	Cr Hrs	Instructor	Days	Time	Location
ECE-8833	Advanced Topics in Analytical EM	3	Greg Durgin	T Th	9:35 am – 10:55am	TBD

ECE 8833 Advanced Topics in Analytical Electromagnetics

This class provides an in-depth treatment of several common analytical techniques for framing and solving real-world problems in EM wave propagation. Upon completion of the course, the student will have a high degree of confidence and competence in discussing the fundamental mechanisms of scattering, diffraction, and stochastic propagation with the world's top EM researchers. The final project will be a student-chosen topic involving an application of analytical electromagnetics to real-world wireless, radar, or optical problems.

Tentative Course Topics

Review of Maxwell's Equations
Helmholtz Wave Equation
Geometrical Optics Solutions
Ray Tracing Algorithms
Physical Theory of Diffraction (PTD)
Knife-Edge Diffraction Theory
Sommerfeld Half-Plane Diffraction
Geometrical Theory of Diffraction (GTD)
Unified Theory of Diffraction (UTD)
Rough Surface Scattering Theory
Perturbation Theory for Rough Surfaces
Plane Wave Scattering by a PEC Sphere
Space-Time Propagation Characterization
First-Order Wave Fading Statistics
Second-Order Wave Fading Statistics
Theory of Multipath Shape Factors
Student Project Presentations
Selected Topics (time permitting)

Prerequisites: Suggested prerequisites are graduate standing and some background in graduate-level electromagnetics (ECE 6350 or equivalent).

contact Prof. Durgin (durgin@ece.gatech.edu)
for further questions about this course