**Course Topics**

**EEE 641: Advanced Electromagnetic Field Theory**

**Prerequisites:** EEE 541 or equivalent Graduate level E&M, (445 microwaves, 443 antennas or equivalent recommended.)

**Catalog Course Description:** Cylindrical wave functions, waveguides, and resonators; spherical wave functions and resonators; scattering from planar, cylindrical, and spherical surfaces; Green’s functions.

**Course Topics:**

Rectangular waveguides and Partially-filled waveguides

Loss properties of the various modes in rectangular waveguide

Striplines and Microstrips including Couplers

QuasiTEM modes, Surface wave-like behavior

Spectral domain method

Ridged waveguides

Cylindrical coordinates waveguides and cavities

Cylindrical coordinates, Dielectric waveguides and resonators

Excitation of the lowest order TE mode (Green function)

Dielectric-covered conducting rod

Spherical transmission lines and cavities

Scattering by planar surfaces

Scattering by circular cylinders

Scattering by conducting wedge

Spherical waves and Scattering by conducting sphere

Green’s functions and the scalar Helmholtz equation