Undergraduate Courses

0301-473 - Electromagnetic Field I:
Study of electrostatic, magnetostatic, and quasi-static fields. Topics: review of vector algebra, vector calculus and orthogonal coordinate systems (cartesian, cylindrical, and spherical coordinates), electrostatic fields (Coulomb's law, Gauss's law, the electrical potential, conductors and dielectrics in static electric fields, polarization, electric flux density and dielectric constant, boundary conditions, capacitance, electrostatic energy forces), solution of electro- static problems Poisson's and Laplace's equations, methods of images, steady electric currents, conduction current density and resistance, static magnetic fields

0301-474 - Electromagnetic Field II
Study of propagation, reflection and transmissions of electromagnetic waves in unbounded regions and in guiding structures. Topics: time varying fields, Maxwell's equations, wave equations, uniform plane waves in conductive regions, polarization, the Poynting theorem and power, reflection and transmission at normal incidence from plane boundaries (multiple dielectric interfaces), oblique incidence at plane dielectric boundaries, two-conductor transmission lines, TE and TM waves in rectangular waveguides (propagation dispersion characteristics).

Graduate Courses

0301-710 - Advanced Electromagnetic Theory:
The primary objective is to provide the mathematical and physical fundamentals necessary for a systematic analysis of electromagnetic field problems. Topics include potential representations, scalar and vector Green's functions, Green's theorem, reciprocity, duality, equivalence principle, image theorem, and radiation from apertures, scattering, integral equation solutions, perturbation and numerical methods. (Pre-requisite 0301-474)

0301-717 - Microwave Circuit Design:
The primary objective is to study the fundamentals of microwave engineering with emphasis on microwave network analysis and circuit design. Topics include microwave transmission lines such as wave- guides, coax, microstrip and stripline, microwave circuit theory such as S- matrix, ABCD matrices, and even odd mode analysis, analysis and design of passive circuits and components, matching networks, micro- wave resonators and filters. (Pre-requisite 0301-474)

0301-729 - Antenna Theory & Design:
The primary objective is to study the fundamental principles of antenna theory applied to the analysis and design of antenna elements and arrays including synthesis techniques and matching techniques. Topics include antenna parameters, linear antennas, array theory, wire antennas, microstrip antennas, self and mutual impedances, equivalence principle, Huygen's principle, aperture antennas, traveling wave antennas, reflector antennas (Pre-requisite 0301-474)
**0301-816 – Design and Characterization of Microwave Systems:**
The primary objective is the design and experimental illustration of the fundamentals of microwave circuits and antennas. Projects will involve the design, construction and characterization a microwave system to satisfy a set of specified design criteria. Microwave measurement techniques will involve the use of network analyzers, and spectrum analyzers in conjunction with the probe station. Simulated results will be obtained using some popular commercial EM software for the design of microwave circuits and antennas. (Pre-requisite 0301-717)