**Course Topics**

**EEE 535: Electron Transport in Nanostructures**

**Prerequisites:** Engineering MENG, MS, MSE, PhD and MCS students OR Science & Engr Of Materials PhD students.

**Catalog Course Description:** Nanostructure physics and applications. 2-D electron systems, quantum wires and dots, ballistic transport, quantum interference, and single-electron tunneling.

**Course Topics:**

Motivation for the study of nanostructure devices

Realization of nanostructure devices

Density of states of low-dimensional systems

Shubnikov-de Haas effect and one-dimensional subbands

Quantum point contact and conductance quantization

Landauer formula

Quantum Hall effect

Ballistic waveguides

Interference in nanostructures

Aharonov-Bohm effect

Weak localization

Conductance fluctuations

Single barrier tunneling

Resonant tunneling

Coulomb blockade and single-electron tunneling

Nanotubes and Bucky balls

Graphene

Molecular electronics