EEE 535, Electronic Transport in Nanostructures, Spring 2010

Time and Place of Lectures: 9:00-10:15am TuTh, MCL 139

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Course Website: http://chaos1.la.asu.edu/~yclai/EEE535.html

Office Hours: 2:00-3:00pm TuTh and by appointment, GWC610

Prerequisites

Elementary quantum mechanics, basic solid-state physics (e.g., band diagrams, Fermi level, electron gas and conduction in metals, phonons, etc.), basic semiconductor physics and device (e.g., EEE 436 or equivalent).

Text


Reference S. Datta, Quantum Transport: Atom to Transistor (Cambridge University Press, 2005).

Objective and Topics

The objective of this course is an understanding of electronic transport in mesoscopic and nanoscale systems, and applications. Basic topics to be covered include two-dimensional electron gas (2-DEG), Landauer-Büttiker formalism for conductance, transmission function, S-matrix, and Green’s functions. Applications include quantum Hall effect, conductance fluctuations, and electronic transport in graphene.

Student responsibilities

1. Attending classes;
2. Reading textbook;
3. Completing and turning in homework assignments in time (about 6 times - 30%).
4. One midterm exam (35%).
5. Final project (35%).