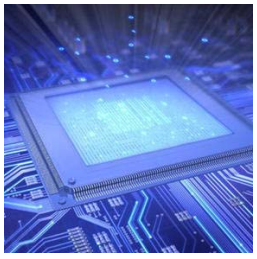
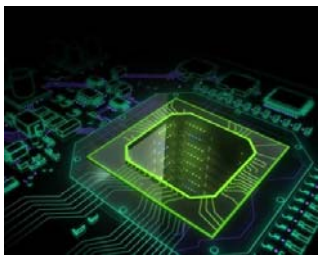
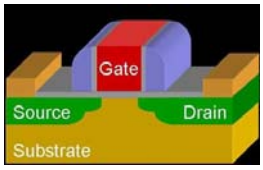
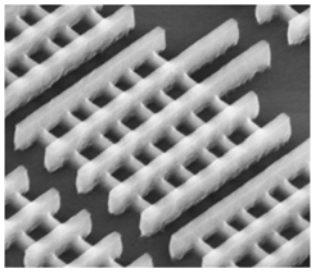
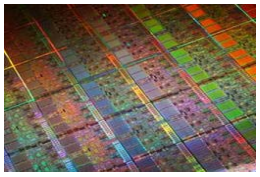
ECE 3150: Microelectronics

ECE 3150: Microelectronics

Instructor: Farhan Rana
Office: PH323
Email: fr37@cornell.edu

Syllabus:
This is a comprehensive undergraduate level course on microelectronics. Topics covered include
Basic semiconductor physics
Electrons and holes in semiconductors
Electrical transport in semiconductors
PN junctions and diodes
Photodiodes and Solar Cells
MOS capacitors
MOS field effect transistors
Bipolar junction transistors
Large signal and small signal models of electronic devices
Single stage amplifiers, multistage amplifiers, differential amplifiers
Analog circuit analysis and design
High-frequency models of devices and high-frequency circuit analysis
Digital logic and MOS logic devices,
Complimentary MOS (or CMOS) logic gates
Fundamental trade-offs in high speed analog and digital circuit design

Course Website and Homeworks

• All course documents, including:

- Lecture notes
- Homeworks and solutions
- Exam solutions
- Extra course related material
- Labs

will appear on the course website:

https://courses.cit.cornell.edu/ece315/

Homeworks

• Homeworks will be due on Thursdays at 7:00 PM in course drop box in Phillips Hall

• New homeworks and old homework solutions will appear on the course website by Thursday night

• Homework 1 will be due next Thursday and will be available on the course website by tomorrow night

Course Grading and Textbooks

• Course grading will be done as follows:

- Homeworks and Labs (35%)
- Midterm (25%)
- Final Exam (35%)
- Instructor discretion (5%)

• No in-class quizzes, no pop-quizzes, no clickers,

• Midterm and the Final exam will both be comprehensive

Textbooks

• There are no required textbooks. Highly recommended textbooks are:

- Microelectronics: An Integrated Approach
  by Howe and Sodini (out of Print)
- Microelectronic Devices and Circuits
  by Clifton Fonstad (out of print)

Course Recitation Sections

There will be recitation sections on MW 7:30-9:00 PM in PH219 every week

Goals: Homeworks, discussions, problem solving, etc

Course Labs

There will be labs on MTWF 2:30-4:30 PM in PH237

There will be 4 labs total in the semester (Final lab will be an open ended design project)

Make sure you are signed up for one lab slot

Lab reports/writeups will be due the week following the lab

Goals: Characterize devices, build and test circuits

Labs are mandatory!

Course Staff

PhD TA: Robin Ying (Head TA)
rcy22@cornell.edu

PhD TA: Shimin Huang
sh2378@cornell.edu

MEng TA: Mihir Marathe
mmm389@cornell.edu

MEng TA: Adarsh Jayakumar
aj373@cornell.edu

TA office hours and locations: PH 429

Tuesdays: 4:30-6:00 PM
Thursdays 4:30-6:00 PM