Course Syllabus: Beyond-CMOS Computing

Course Information

Special Topics in Circuits and Systems: Beyond-CMOS Computing
EECT 7v88.501
Spring 2017
Tuesday & Thursday: 7:00pm-8:15pm, FO 1.202

Professor Contact Information

Prof. Joseph S. Friedman
Office Hours: Thursday 3pm-4pm
ECSN 4.614
joseph.friedman@utdallas.edu
(972) 883-2191
www.utdallas.edu/~joseph.friedman/eect7v88sp17.html

Course Pre-requisites, Co-requisites, and/or Other Restrictions

This is an interdisciplinary course with no prerequisites. It is helpful to have some background in device physics, circuit design, and digital logic.

Course Description

This course covers the integration of emerging technologies in novel computing systems to replace CMOS as scaling approaches its fundamental limits. Relevant devices include various spintronic devices (e.g., magnetic tunnel junctions), carbon nanotubes, graphene, memristors, and multi-gate FETs. The course concentrates on innovative proposals to interconnect and cascade these devices in circuits that perform computational functions – primarily Boolean logic, as well as majority, threshold, stateful, and neuromorphic functions.

Student Learning Objectives/Outcomes

- Ability to analyze the applicability of a novel device for computing
- Ability to analyze the effectiveness of an unconventional computing system
- Ability to provide input toward the device/circuit co-design of computing systems based on novel devices

Required Textbooks and Materials

There is no textbook for this course. Course materials primarily include course notes and published research papers.
Assignments & Academic Calendar

Quizzes: Frequent quizzes on the topics covered in class and assigned readings.
Midterm Presentation(s) (group): One or two presentations (depending on total class enrollment) of a previously proposed beyond-CMOS computing system based on published research papers.
Final Project (group): Circuit efficiency analysis and design of a previously proposed beyond-CMOS computing system. This original research will be presented to an open audience and submitted to a research journal.

Grading Policy

Quizzes – 40%
Midterm Presentation(s) – 20%
Final Project – 30%
Participation – 10%

Course & Instructor Policies

When collaborating with others on joint assignments, you should always mention with whom you worked. Keep in mind that the goal of these assignments is to teach the material at a deeper level, and it is therefore expected that you understand and can explain all the work that you submit.

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

“As a Comet, I pledge honesty, integrity, and service in all that I do.”

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University’s policies and procedures segment of the course syllabus.
Please go to http://go.utdallas.edu/syllabus-policies for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.