EE-612:

Nanoscale Transistors

Fall 2006

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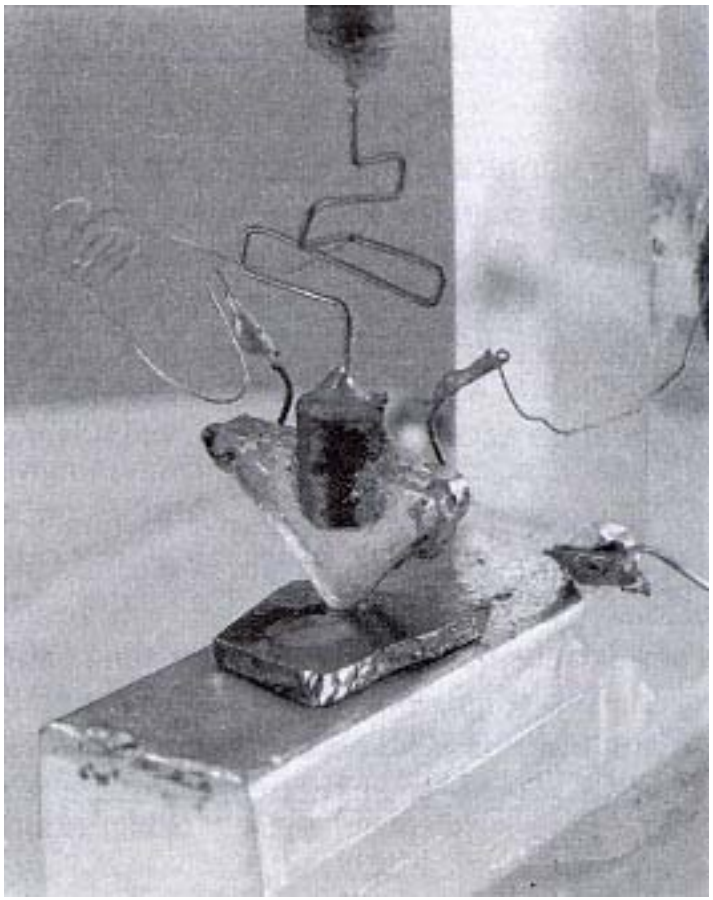
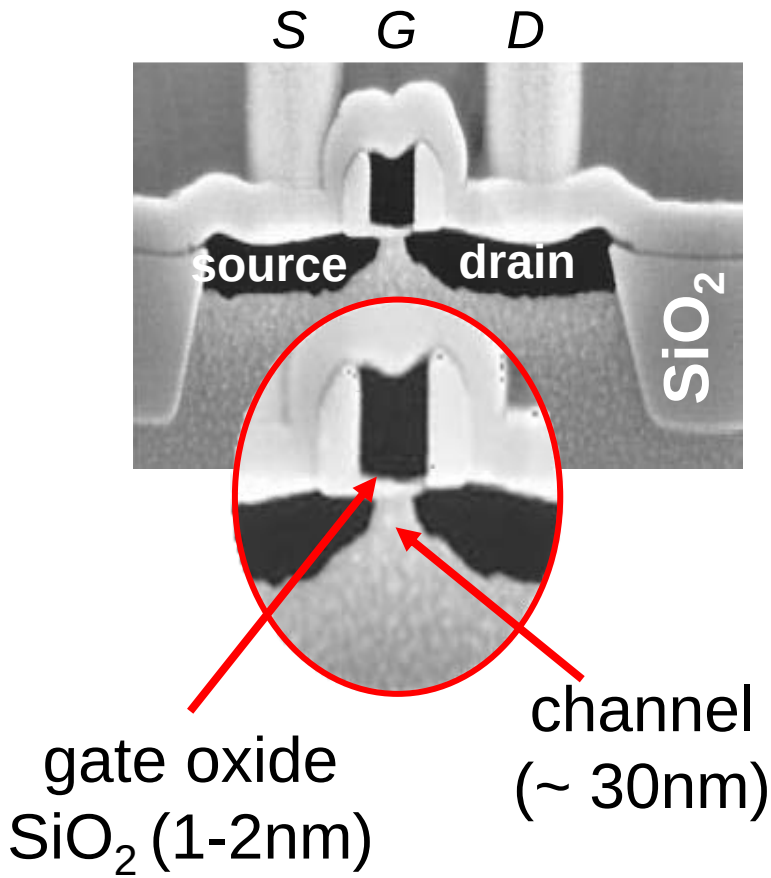
evolution of silicon technology

Bell Labs, 1947





course outcomes

After taking this course, students should:

- *Understand* nanoscale MOSFET device physics
- Appreciate how device performance affects circuits and systems
- Appreciate device scaling challenges
- Be acquainted with new material and device approaches

course prerequisites

» Introductory level understanding of semiconductor physics and devices as well as basic electronic circuits.

(EE255 and EE305/606 at Purdue)

(basic MOS physics, devices, and CMOS circuits will be briefly reviewed)

course outline

Part 1: ***MOSFET fundamentals***

5 weeks including 1 exam

Part 2: ***Short channel MOSFETs and CMOS Circuits***

5 weeks including 1 exam

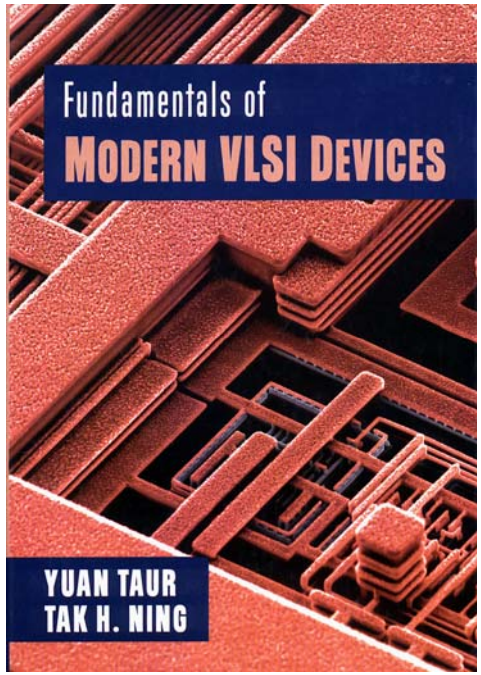
Part 3: ***Beyond the bulk silicon MOSFET***

5 weeks

course text

Fundamentals of Modern VLSI Devices

Yuan Taur and Tak Ning



supplemented with class notes

Cambridge Univ. Press, 1998

www.cup.cam.ac.uk/

course grading

Exam 1: 25%

-MOSFET fundamentals

Exam 2: 25%

-short channel MOSFETs, circuits and systems

Homework: 25%

Final: 25%

some suggestions

1) Do the reading ***before*** class (and after)

2) Monitor *IEEE Trans. Electron Devices* and *Electron Device Letters* (and ask questions)

3) Attend relevant departmental / Discovery Park seminars

4) Monitor the course homepage for announcements, handouts, etc. (http://cobweb.ecn.purdue.edu/~ee612)

5) Use www.nanoHUB.org *as a course supplement*

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for additional information, refer to the course syllabus (available on the class homepage)

Good luck in EE-612!

feel free to contact me at lundstro@purdue.edu