

Lecture 0

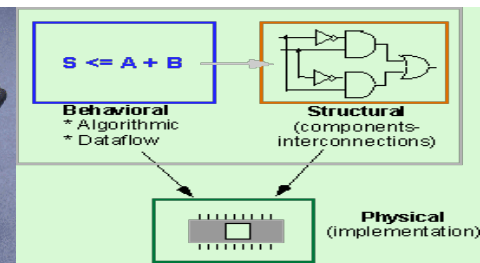
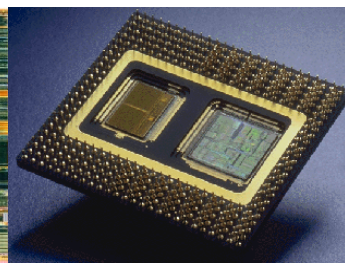
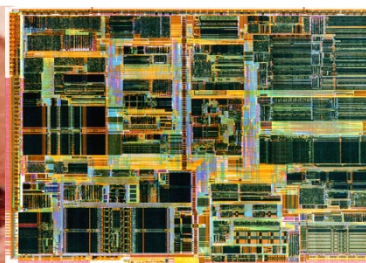
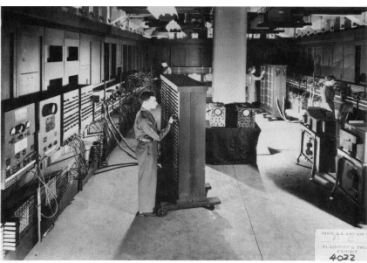
Course Organization & Introduction

Bryan Ackland

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Course Organization

- Course instructor:

Prof. Bryan Ackland

Office: Burchard 211

Email: backland@stevens.edu

Phone: (201) 216-8096

- Course web site:

http://personal.stevens.edu/~backland/Courses/Course471_Spring_18.htm

- Will use Canvas for Announcements and Gradebook only

Course Organization

- Course schedule:

Tuesday 5:00 pm – 5:50 pm McLean 218B

Friday 3:00 pm – 5:30 pm McLean 218B

January 17 – May 3

- Office Hours:

Wednesday 9:30 am – 11:30 am

Thursday 10:00 am – 12:00 noon

Other times by appointment (or just drop by)

Grading & Exam Info

- Grading Information

- Attendance (5%)
- Midterm examination (30%)
- Homework (20%)
- Project (15%)
- Final examination (30%)

Up to 2 grade points will be given to students who participate in class

- Exam times :

Midterm: Friday, March 2 @ 3:00 pm

Final: *to be announced*

- Students will be able to use lecture notes and Hu textbook during exams

Homeworks & Project

- Students are allowed to discuss assignments and collaborate on best approach to solve problems.
- Once discussion has taken place, each student must individually prepare his/her own assignment submission
- Is it OK to:
 - ask a fellow student for help in understanding how to attack a problem? **YES**
 - get together with a group of 2-3 colleagues and share ideas on how to approach problems? **YES**
 - copy another student's answers? **NO**
 - work with another student(s) to prepare a group solution which each submit independently? **NO**

Textbook & References

Textbook:

- *Modern Semiconductor Devices for Integrated Circuits*, Chenming Hu, Publisher: Prentice Hall, ISBN: 0-13-608525-3, 2010.

Recommended references:

(1) *Semiconductor Physics and Devices*, 4th edition, D. Neaman, McGraw Hill, ISBN 978-0-07-352958-5, 2012.

(2) *CMOS VLSI Design: A Circuits and Systems Perspective*, 4th Edition, N. Weste and D. Harris, Publisher: Addison Wesley, ISBN: 0-321-54774-8, 2010

Course Objectives & Outline

Objectives:

Please visit the web site for detailed course objectives

Outlines:

- Energy Band Model of Electrons & Holes
- Transport – Drift & Diffusion
- Generation & Recombination
- Analysis & Properties of PN Junction
- Optoelectronic Devices
- MOS Capacitor & Transistor
- CMOS Circuits & Logic
- CMOS Fabrication
- CMOS DC & Transient Response
- CMOS Power Dissipation

Pre-requisite Knowledge

The course assumes a knowledge of:

- Basic electronic concepts such as voltage, current, power & charge
- Basic circuit components such as voltage sources, current sources, resistors and capacitors
- Ohms law
- Current-voltage-charge relationship of simple linear capacitors
- Effect of placing simple circuit components in series and in parallel

Reference

These lectures notes are based on the following sources:

- [1] C. Hu, Modern Semiconductor Devices for Integrated Circuits, Prentice Hall, ISBN: 0-13-608525-3, 2010.
- [2] S. Tewksbury, Transport Processes class notes
- [3] D. Neaman, Semiconductor Physics and Devices, 4th edition, McGraw Hill, ISBN 978-0-07-352958-5, 2012.
- [4] N. Weste and D. Harris, CMOS VLSI Design: A Circuits and Systems Perspective, 4th Edition, Addison Wesley, ISBN: 0-321-54774-8, 2010
- [5] J. M. Rabaey, A. Chandrakasan, B. Nikolic, Digital integrated circuits- a design perspective, 2nd edition, Prentice Hall.