

COURSE DESCRIPTION

Department and Course Number: CSCI 521

Course Title: Computer Systems Engineering

Current Catalog Description : Analysis of computer system components and manufacturing economics, and how they influence design goals, direct architectural development, create hardware/software issues and modify implementation concepts, as well as system and circuit packaging.

Total Credits: 3 hours

Coordinator: P. Tobin Maginnis, Associate Professor of Computer and Information Science.

Textbook: Dally and Poulton, *Digital Systems Engineering*, Cambridge University Press, 1998.

Other required materials: Study guides and miscellaneous class handouts.

References:

1. http://cva.stanford.edu/dig_sys_engr/
2. Hall, McCall, & Hall, *High-Speed Digital System Design: A Handbook of Interconnect Theory and Design Practices*, Wiley-Interscience, 2000.

Course Goals: To provide juniors, seniors, and graduate students the conceptual tools to analyze computer systems as a series of components and interconnects, each with tradeoffs that change over time and implementation.

Prerequisites by Topic:

1. Familiarity with general programming concepts.
2. Familiarity with general purpose high-level language such as C or Java.
3. Familiarity with operating system services and programming.
4. Familiarity with general networking issues.

Major Topics Covered in the Course:

1. Introduction to digital systems engineering (4 hours)
2. Digital system packaging (4 hours)
3. Analysis of wires as a transmission media (3 hours)
4. Sub-system circuit effects on overall circuit behavior (2 hours)
5. Intra-system power distribution (2 hours)
6. Controlling noise in a digital system (2 hours)
7. Signaling conventions and techniques (3 hours)
8. Timing conventions and techniques (2 hours)
9. Synchronization issues (2 hours)
10. Signaling, transmitter, receiver, & timing circuits (6 hours)
11. Bus design and examples - PCI, SCSI, VME (6 hours)
12. Design considerations for next generation technologies (3 hours)
13. Tests (5 hours)

Laboratory projects : None

Estimate of ABET/CAC Category Content:

	CORE	ADVANCED		CORE	ADVANCED
Data Structures	_____	_____	Computer Organization and Architecture	_____	3 _____
Algorithms	_____	_____	Concepts of Programming Languages	_____	_____
Software Design	_____	_____		_____	_____

Oral and Written Communications:

Not a significant focus of this course.

Social and Ethical Issues:

Not a significant focus of this course.

Theoretical Content (Foundations):

Not a significant focus of this course.

Problem Analysis

Not a significant focus of this course.

Solution Design:

Not a significant focus of this course.