ECE 209 Syllabus

Course: ECE 209

Credit Hours: 3

Course Title: Computer Systems Programming

Course Description:

This course continues the introduction to computing systems by focusing on programming. In particular, students will learn more about the C programming language, how its features can be implemented using a processor s instruction set, and how to use data structures in C to write programs to solve complex problems.

Prerequisite(s): ECE 109 (C- or better)

Textbook(s) and/or other required material:

Yale N. Patt, Sanjay J. Patel
Introduction to Computing Systems: From Bits and Gates to C and Beyond, 2nd edition
McGraw-Hill, 2004, ISBN 0-07-246750-9

Stephen Prata
C Primer Plus, 5th edition
Sams, 2005, ISBN 0-672-32696-5

CodeLab online programming assignments: www.turingscraft.com

Course objectives. By the end of this course, the student should be able to (use demonstrative verbs):

Convert the following C language elements to LC-3 assembly language: functions, pointers, arrays, structs.
Demonstrate the use of C compilers and debugging tools.
Implement the following data structures in C: array, list, tree, hash table.
Define, implement, and use an abstract data type.
Analyze an algorithm to determine its execution time.
Design and implement a C program that performs a specified task.

Topics covered:

Intro and review of LC-3 and C basics
C programming tools: compiler and debugger
Functions and recursion
C programming tools: makefiles, std C library
Pointers
Arrays, strings
Pointer arrays, multi-dimensional arrays
C structs
Linked lists

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Dynamic memory allocation
Intro to algorithm analysis
Abstract data types
Elementary sorting algorithms
Sequential searching algorithms
Hash tables

Class/laboratory schedule (sessions per week and duration of each session):

Two lectures per week, 75 mins each
One problem session per week (approx.), 60-75 mins

Contribution of course to meeting the requirements of Criterion 5 - other:

N/A

Contribution of course to meeting the requirements of Criterion 5 - math and basic sciences:

N/A

Contribution of course to meeting the requirements of Criterion 5 - engineering topics:

3 hours

Contribution of course to meeting the requirements of Criterion 5 - general education:

N/A

Relationship of this course to program learning outcomes:

Learning Outcome	Level of Instruction	Related Course Content
Outcome A	Major	computer programming, design of algorithms, analysis of algorithms
Outcome B	N/A	
Outcome C	Intermediate	design of algorithms, computer programming
Outcome D	N/A	
Outcome E	Major	create computer program to solve a given problem
Outcome F	N/A	
Outcome G	N/A	
Outcome H	N/A	

Relationship of this course to program learning outcomes:

Learning Outcome	Level of Instruction	Related Course Content
Outcome I	N/A	
Outcome J	N/A	
Outcome K	Major	computer programming, C programming

Person who last prepared this description and date of preparation:

- Raubenheimer, Carol Dianne (cdrauben) - Jan 15th, 2010 (12:54pm)