EE 2372 --- Software Design I
Spring 2014

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Texts: C How To Program
by Paul Deitel and Harvey Deitel (7th Edition)
GNU/Linux Application Programming
by M. Tim Jones (2nd Edition)
Linux Pocket Guide
by Daniel J. Barrett (2nd Edition)

Optional Reference Text:
The C Programming Language by Brian Kernighan and Dennis Ritchie

Course Description: An introduction to software design with a structured computer language that focuses on the construction of programs consisting of multiple functions residing in multiple files. Covers program creation and top-down-design, basic elements and operations, modular program construction, and the use of programming tools such as makefiles. Introduces object oriented programming techniques.

Prerequisite: EE 1305 with a grade of “C” or better.

Class Hours: Tuesdays and Thursdays 10:30AM to 11:50AM, Psych. Bldg Rm. 308

Office Hours: Tuesdays and Thursdays 1:30PM to 3:00PM, Eng. Annex Rm. A-340

Course Outline:
Week 1: Introduction
Weeks 1-2: GNU/Linux software development environment
Weeks 2-3: C language programming constructs: variables, algebraic expressions, simple I/O
Week 4: C language programming constructs: decision statements and iterative control statements
Week 4: Exam 1
Weeks 5-6: Structured software design: the procedural programming paradigm
Week 6: C standard library
Weeks 7-8: Fundamental data structures: arrays and structures
Week 9: Fundamental data structures: strings and string processing
Weeks 9-10: Software development process (specification \rightarrow validation)
Week 10: Exam 2
Weeks 11-12: Fundamental algorithms
Week 13: Fundamental data structures: pointers and linked-lists
Weeks 14-15: Structured software design: the object-oriented programming paradigm
Finals Week: Exam 3

**Grading:**
Class Participation/Quizzes 15%
Assignments 40%
Exam 1 15%
Exam 2 15%
Exam 3 (during Finals week) 15%

**Learning Objectives:** [correlation to ACM curriculum standards in square brackets, bold means complete coverage]

1. Become a proficient user of the Linux software development environment and GNU software development tool-chain [CE-SWE6]
   a. Linux software development environment
   b. GNU software development tools – gcc, gdb, make, gprof, gcov
   c. version control tools – subversion
2. Understand high-level language programming constructs [CE-PRF2]
   a. variables
   b. algebraic and logical expressions (including operator set)
   c. simple I/O
   d. decision statements
   e. iterative control statements
3. Understand and follow structured software design strategies [CE-PRF1 and CE-SWE3]
   a. programming paradigms: procedural/modular, object-oriented
   b. design for reuse using the procedural/modular paradigm
   c. utilizing standard libraries, focus on C standard library
   d. design for reuse using the object-oriented paradigm
4. Understand and utilize fundamental data structures [CE-PRF4]
   a. arrays
   b. structures
   c. strings and string processing
   d. pointers and linked lists
   e. storage allocation: static, stack and heap
5. Understand the software development process [CE-SWE1, CE-SWE2, and CE-SWE4]
   a. software life cycle
   b. software requirements analysis, and formal specification
   c. software validation process
6. Understand and utilize fundamental algorithms [CE-PRF3 and CE-PRF5]
   a. the role of algorithms
   b. classes of algorithms
   c. recursion
**Academic Dishonesty:**

As an entity of The University of Texas at El Paso, the Department of Electrical and Computer Engineering is committed to the development of its students and to the promotion of personal integrity and self responsibility. The assumption that a student’s work is a fair representation of the student’s ability to perform forms the basis for departmental and institutional quality. All students within the Department are expected to observe appropriate standards of conduct. Acts of scholastic dishonesty such as cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in the whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student, or the attempt to commit such acts will not be tolerated. Any case involving academic dishonesty will be referred to the Office of the Dean of Students. The Dean will assign a Student Judicial Affairs Coordinator who will investigate the charge and alert the student as to its disposition. Consequences of academic dishonesty may be as severe as dismissal from the University. See the Office of the Dean of Students’ homepage (Office of Student Life) at [http://studentaffairs.utep.edu/dos](http://studentaffairs.utep.edu/dos) for more information.

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