

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 → 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:

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If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to cass@utep.edu, or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at www.sa.utep.edu/cass. *CASS' Staff are the only individuals who can validate and if need be, authorize accommodations for students with disabilities.*