

CSC 251 – The C Programming Language and UNIX

California State University Dominguez Hills
Department of Computer Science and Technology
Fall 2016

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|-------------------|---------------------------|---------------------|----------------------------------|
| Instructor | Malcolm McCullough | E-Mail | mmccullough@csudh.edu |
| Classroom | NSM B208 | Class Time | MW 16:00-17:15 |
| Office | SAC-1115 or SCC-800 (TTh) | Office Hours | MW:11:00-13:00 & TTh:15:00-16:00 |

COURSE DESCRIPTION:

This course is an introduction to programming in the C language and its use in systems programming in the UNIX operating system.

PRE-REQUISITE: CSC 121 with grade “C” or better and Consent of Instructor.

TEXTBOOKS



[Recommended]: C: How to Program Edition: 7th, by Deitel and Dietel, Prentice Hall, ISBN-13: 978-0136123569



[Required]: Programming in C UNIX System Calls and Subroutines using C by A. D. Marshall (<http://www.cs.cf.ac.uk/Dave/C/CE.html>)

COURSE GOALS: This course provides students with an introduction to basic concepts and fundamentals of the C Programming Language and the UNIX Operating System. The goals and objectives for students taking this course are as follows:

- Understand the role of C in the field of computing.
- Understand the interrelationship of C and Unix.
- Become fluent in C programming including.
- Learn how to use GNU's C compiler gcc and programming tools such as splint
- Compound data types such as structs and unions.
- Dynamically allocated structures (including cleanup).
- Binary and bit-wise manipulations.
- Making system call requests of the OS.
- Develop the habit of thorough testing and become comfortable in using debugging tools including gdb, splint, etc..
- Learn and regularly use a version control system.
- Become acquainted with the Unix tool philosophy and some common tools.
- Be able to write a Unix tool.
- Be able to compose Unix tools into shell scripts

COURSE OUTCOMES:

Upon the end of this course, the student should:

- Have a more in-depth understanding of computer hardware and operating systems;
- Be able to programming in the C programming language;
- Be comfortable using UNIX operating system;
- Know how to use common C and GNU/UNIX development tools;
- Be able to write moderate difficult C programs utilizing common UNIX/POSIX system calls.

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AMERICANS WITH DISABILITIES ACT

CSUDH adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with temporary and permanent disabilities. If you have a disability that may adversely affect your work in this class, I encourage you to register with Disabled Student Services (DSS) and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. NOTE: no accommodation can be made until you register with the DSS. For information call (310) 243-3660 or to use the Telecommunications Device for the Deaf, call (310) 243-2028 or goto: <http://www4.csudh.edu/dss/>

COMPUTER INFORMATION LITERACY EXPECTATIONS

It is expected that students will:

1. Use Microsoft Word for word processing unless otherwise approved by the instructor,
2. Be familiar with using email as a communication tool and check your official campus email account at least every other day;
3. Be able to access websites and online course materials which may require Flash and other plug-ins;
4. Use the library databases to find articles, journals, books, databases and other materials;
5. Be able to create an effective PowerPoint presentation;
6. Be able to record audio (ideally video) to share with the instructor via the web; and
7. Have regular access to a computer and internet access for the term of this course.

ACADEMIC INTEGRITY

Academic integrity is of central importance in this and every other course at CSUDH. You are obliged to consult the appropriate sections of the University Catalog and obey all rules and regulations imposed by the University relevant to its lawful missions, processes, and functions. **All work turned in by a student for a grade must be the students' own work.** Plagiarism and cheating (e.g. stealing or copying the work of others and turning it in as your own) will not be tolerated, and will be dealt with according to University policy. The consequences for being caught plagiarizing or cheating range from a minimum of a zero grade for the work you plagiarized or cheated on, to being dropped from the course.

BEHAVIORAL STANDARDS

Behavior that persistently or grossly interferes with classroom activities is considered disruptive behavior and may be subject to disciplinary action. Such behavior inhibits other students' ability to learn and an instructor's ability to teach. The instructor may require a student responsible for disruptive behavior to leave class pending discussion and resolution of the problem and may also report a disruptive student to the Student Affairs Office (WH A-410, 310-243-3784) for disciplinary action.

COURSE POLICIES:

- Deliverables (Class Assignments, Projects) submitted late are not accepted without obtaining instructors permission prior to due date.
- Deliverables (Class Assignment, Projects) not submitted before the end of the final class will earn 0%.
- Any exceptional, non-academic circumstances need to be discussed with the instructor as soon as they arise, prior to the due date of the deliverable. At the time of the discussion, NO make-up work will be assigned. The instructor reserves the right not to award credit for deliverables that are incomplete. Partial credit is awarded at the instructor's discretion, and only for work that merits such an award. Assignments that are incomplete or incongruous with the specifications may be returned to the student.

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EXAMS: There will be three exams. The first exams will be given during the 5th week, the second exam will be given during the 10th week and the final exam will be given on the date posted in the final examination schedule printed in the campus Class Schedule. The exams will be closed book/notes and include material from the book and lectures. Students are responsible for the any and all materials that will be presented in lecture and textbook. No makeup or early exams will be administered; unless there are serious, unforeseen, and unavoidable circumstances and the student notifies the instructor as soon as possible.

PROGRAMMING PROJECTS AND HOMEWORK ASSIGNMENTS:

There will be many programming/homework assignments. They will be announced in class and must be submitted to the instructor at the beginning of class on the date due. The goal of the programming assignments is to produce a correct and working program. Your submitted code must compile, run, and produce correct output. It also must be formatted correctly and contain documentation (comments). Once complete you will need to email the source code and run time listing, as plain text, as an attachment, to the instructor. Make sure to include a comment header with your name, course name, assignment number, date, and program description on each assignment. You may seek help with syntax errors or engage in general discussions with others concerning the concepts, but giving or receiving source code is considered cheating. For non-programming assignments, hand-written is acceptable as long as it is illegible and clear enough for the instructor to read. All assignments must include in the upper left hand corner, the course name, assignment name/number, and name of student. All assignments/projects must be handed to the instructor in at the beginning of class on the date due (no late work). The computer-print out homework is preferable, but hand-written is also acceptable if writing is legible.

GRADES:

The following grading scale will be used:

| Score | Grade | Score | Grade |
|--------|-------|-------|-------|
| 91-100 | A | 90 | A- |
| 89 | B+ | 81-88 | B |
| 80 | B- | 79 | C+ |
| 71-78 | C | 70 | C- |
| 69 | D+ | 64-69 | D |
| 0-63 | F | | |

GRADING:

The weighting of the coursework is listed below:

Exam One

20%

Exam Two

20%

Final Exam

20%

Assignments/Quizzes

40%

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TOPIC OUTLINE (Will be conducted according the following. However, the schedule of the topics schedule or timetable will vary)

Tentative Course Schedule

| Week # | Topic | | |
|---------|--|--|-------------|
| | | <i>Reading Assignment</i> | <i>Labs</i> |
| Week 1 | UNIX and the History of The C | Course Lecture Notes | TBA |
| Week 2 | C Programming Basics and Extended Introduction | Course Lecture Notes | TBA |
| Week 3 | Arrays and Functions | Course Lecture Notes | TBA |
| Week 4 | Program Structure and the C Preprocessor | Course Lecture Notes | TBA |
| Week 5 | Exam One | Course Lecture Notes | |
| Week 6 | The C Preprocessor and scoping & Operators and Expressions | Course Lecture Notes | TBA |
| Week 7 | Type System & Structures and Pointers | Course Lecture Notes Course Lecture Notes | TBA |
| Week 8 | Dynamic Data Structures, Arrays, and Pointers again | Course Lecture Notes Course Lecture Notes | TBA |
| Week 9 | Dynamic Arrays, Pointers and Pointer Arithmetic | Course Lecture Notes Course Lecture Notes | TBA |
| Week 10 | Exam Two | Course Lecture Notes | |
| Week 11 | Function Pointers C Standard Library & Characters and Strings | Course Lecture Notes | TBA |
| Week 12 | Memory Handling and IO C Standard Library Input and Output | Course Lecture Notes | TBA |
| Week 13 | Formatting Output / Asynchronous Events and Signals / Signals and Signal Handlers | Course Lecture Notes Course Lecture Notes | TBA |
| Week 14 | The UNIX File System / File Descriptors | Course Lecture Notes | TBA |
| Week 15 | Network Programming Introduction / Process Creation and Termination / Process Control (System Calls) | Course Lecture Notes | <i>TBA</i> |
| Week 16 | Final Exams Week | The Final Exam: 8-12 | |