

CSE 220 Programming for Computer Engineering

Syllabus and Course Information

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Catalog Description

Introduces procedural and object-oriented programming languages (C/C++) and Linux/Unix software development environment. Prerequisites: A grade of C or better in CSE120/EE120 Digital Design Fundamentals and a grade of C or better in CSE205 Concepts of Computer Science and Data Structures. Three (3) credit hours. Lecture/No lab.

Expanded Course Description

This is a required course for the B.S.E. in the Computer Systems Engineering program. The C and C++ programming languages are used extensively in industrial computer engineering and a proper understanding of these languages is essential for a graduate in computer systems engineering. Furthermore, the material learned in this course will be required in several of your future CSE courses (most specifically in CSE325 Embedded Microprocessor System, CSE310 Data Structures and Algorithms, CSE430 Operating Systems, and CSE423/424 Systems Capstone Project I and II) where the instructors will assume you can write complete, functional programs in C and C++. Furthermore, The GNU/Linux and Unix operating systems are used extensively by professional engineers and scientists so at the least, gaining a rudimentary understanding of this operating system is an important part of your undergraduate education.

Course Objectives

1. To be able to effectively use the GNU/Linux and Unix operating systems at a basic level:
 - Log into a console window and use basic Unix shell commands.
 - Create, delete, and move files using shell commands.
 - Understand file and directory permissions and use the chmod command to set permissions.
 - Write and use relatively simple shell scripts.
 - Use I/O redirection and pipes.
 - Use process management commands to start, pause, and kill jobs. Move jobs between foreground and background.

- Use the tar, gzip, and bzip2 program; to create file archives.
 - Edit a C/C++ program using a GNU/Linux text editor.
 - Use the GNU tool chain to compile, execute, and debug a C/C++ program
 - Use make and makefiles to automate software builds.
2. To develop an intermediate understanding of the C programming language:
- Use various data types including the fundamental data types, structs, 1D- and 2D-arrays, and pointers.
 - Master flow-of-control constructs: while/for loops, if statements, switch statements, nested loops, and nested if statements.
 - Write programs using multiple functions and multiple source code files.
 - Understand local, global, and multi-source code file scope rules.
 - Understand and use the static and extern reserved words.
 - Understand the difference between declaration and definition of variables and functions.
 - Master dynamic memory allocation and pointer variable usage.
 - Effectively use structs.
 - Master text and binary file I/O.
3. To develop an intermediate understanding of the C++ programming language:
- Understand differences and similarities among C, C++, and Java.
 - Use functions and classes from the C++ Standard Library.
 - Design and code a program using proper object-oriented constructs.
 - Master text and binary file I/O using streams and manipulators.
 - Effectively use dynamic memory allocation, including proper use of destructors.
 - Write multi-class programs involving multiple objects.
 - Write methods, and properly use pass-by-value and pass-by-reference parameter passing techniques.
 - Write classes using single inheritance.
 - Understand polymorphism and how and when to use it.
 - Write generic code using functions and class templates.
 - Understand multithreading programs.

Course Reference Materials & Resources

- Y. Chen, W.T. Tsai, Introduction to Programming Languages: Programming in C, C++, Scheme, Prolog, C#, and SOA, Kendall Hunt Publishing, 5th edition (2017).
- Linux and UNIX Programming Tools, S. Sarwar and K. Al-Saqabi, Addison Wesley 2002.
- C How to Program, 7th Edition, P. Deitel and H. Deitel, Prentice-Hall, 2009.
- C++ How to Program, 7th Edition, P. Deitel and H. Deitel, Prentice-Hall, 2009

Assessment and Grading

Your performance will be assessed by assignments, programming projects, quizzes, a Mid-Term Exam and a Final Exam. Their weights are:

Assignments and Projects	40%
Weekly Quiz / Exercises	15%
Mid-Term	20%
Final Exam	25%
Total	100%

The final letter grade is decided according to the percentage points obtained as follows:

A-, A, A+	90-92, 93-95, 96-100%
B-, B, B+	80-82, 83-85, 86-89%
C, C+	70-75, 76-79%
D	60-69%
E	less than 60%

The grade of "I" (incomplete) can be given ONLY when a student, who is doing otherwise acceptable work (passing grade), is unable to complete a part of work (e.g., the final exam) because of documented illness or other conditions beyond the student's control. In the latter case, the student must discuss with the instructor and complete an application form from the department before the part of work is due or as soon as the circumstances are known. Please see ASU grading policies at: <http://students.asu.edu/grades-grading-policies>

Extra Credit and Alternative Activity

Missing a graded activity will be given zero credit. In-class exercises and quizzes may not be made up. One additional quiz will be arranged to override one missing or poor quiz score.

No extra credit-activities will be given to any individual. Extra credit-activities may be given to the entire class. An alternative to the assignment and exam may be arranged if a student misses the activity and the absence is caused by documented illness or personal emergency that made the completion/attending impossible. A written explanation (including supporting documentation) must be submitted to the instructor before the part of work is due or as soon as the circumstances are known.

Grading Appeals

Any inquires or appeals on grades of homework, projects, or tests must be done in writing by completing the "Grade Inquiry Form" within a week from the day the assignment was returned or comments were published on-line. State the problem and the rationale for any change in grade in your appeal.

Statement on Accommodations

The Disability Resource Center (480-965-1234; Matthews Center; email: disability-q@asu.edu) is the central location for students requiring accommodation. Any student requiring accommodation must contact and register with the Center before any accommodation requests can be granted by the instructor. If you require accommodation, please contact the Center as soon as possible so the instructor can work with you to ensure your success.

Academic Integrity and Honor Code

You are encouraged to cooperate in study group on learning the course materials. However, you may not cooperate on preparing the individual assignments. Anything that you turn in must be your own work: You must write up your own solution with your own understanding. If you use an idea that is found in a book or from other sources, or that was developed by someone else or jointly with some group, make sure you acknowledge the source and/or the names of the persons in the write-up for each problem. When you help your peers, you should never show your work to them. All assignment questions must be asked in the course discussion board. Asking assignment questions or making your assignment available in the public websites before the assignment due will be considered cheating. All individual tests must be done independently. Working together during tests is not permitted.

The instructor and the TA will **CAREFULLY** check any possible proliferation or plagiarism by comparing among the student submissions, previous student submissions, and the publications in the public Web sites. We will use the document/program comparison tools like MOSS (Measure Of Software Similarity: <http://moss.stanford.edu/>) to check all assignments and tests that you submitted for grading.

The Ira A. Fulton Schools of Engineering expect all students to adhere to ASU's policy on Academic Dishonesty. These policies can be found in the Code of Student Conduct:

http://www.asu.edu/studentaffairs/studentlife/judicial/academic_integrity.htm

ALL cases of cheating or plagiarism will be handed to the Dean's office. Penalties include a failing grade in the class, a note on your official transcript that shows you were punished for cheating, suspension, expulsion and revocation of already awarded degrees.

Fulton Schools of Engineering Honor Code (<http://engineering.asu.edu/integrity/honor-code/>)

1. Seek out, acquaint myself with, and obey the instructor's rules concerning the materials I am allowed to use and the types of collaboration in which I am permitted to engage in each of my courses.
2. Help my fellow engineering students to succeed both academically and professionally, while both following the instructor's guidelines on collaboration and encouraging my classmates to behave ethically.
3. Ensure that all of my individual work products reflect my own abilities and not those of someone else. I will never copy the work of others or give others the opportunity to copy mine.
4. Contribute a fair share of work to all teamwork in which I participate, and acknowledge the contributions of others. I will accept responsibility for the integrity of all work submitted by my team.
5. Use only aids authorized by the instructor during all examinations, quizzes, projects, assignments and other evaluations.
6. Provide aid to, or receive aid from other students only as permitted by the instructor.

7. Give full credit to others for their words and ideas, whether directly quoted or paraphrased, using proper citation practices in all of my work, including text, figures and computer code, and all materials obtained from the Internet.
8. Never act dishonestly including lying, cheating, stealing, or attempting to corrupt the academic enterprise in any way.
9. Ensure that all data I record or report are objective, true, accurate and properly documented.
10. Treat all students, faculty and staff with respect, courtesy and dignity, the way I would like to be treated myself.
11. Recognize that it is how I act when no one else is watching that defines my true character.
12. Act at all times with integrity, as the true professional that I am to become.

Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at <http://sexualviolenceprevention.asu.edu/faqs/students>.