

Foundations of Computer Science (COT 3002)

Catalog description: Builds programming skills with an emphasis on disciplined program design and coding. Introduction to object-based programming concepts including class design and implementation. Programming in C++. Must be taken with COT3002L.

Textbook: Problem Solving with C++, Savitch, Addison – Wesley

Suggested Reference Books (optional):

C++ How to Program, 5th Edition, Deitel, Prentice Hall

The Complete Reference C++, 4th edition, McGraw-Hill, 2003

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Objectives:

- Develop skills in program design
- Develop understanding of object-oriented programming concepts including class, object, and method
- Develop ability to code in C++ using classes, objects, and methods
- Develop skill in using arrays and strings for data manipulation
- Develop an understanding of recursion as a program design method
- Develop an understanding of basic sorting algorithms
- Develop an understanding of the use of pointers to construct dynamic data structures like lists

Prerequisite: COP 2220 (or equivalent) with a “C” or better.

Topics:

1. C++ I/O, simple classes (private & public) and types
2. Control Structures
3. Value-returning functions, classes & members
4. Program design
5. Iteration
6. Variable scope
7. Documentation standards.
8. Reference parameters.
9. Class design and implementation. Bottom-up program design.
10. Arrays and vectors
11. Recursion
12. Sorting
13. Pointers, linked lists, dynamic memory allocation (new).

In compliance with the Americans with Disabilities Act (A.D.A.) – Students who require special accommodations due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) located in Boca in the Library, Room 175, (297-3880) or in Davie MOD I (236-1222), and follow all OSD procedures.

Grading Policy:

Programs 20%, Two Exams 25% each, and Final exam 30%

Penalty for Late Submission of Assignments: Programming and other homework assignments will be due at the beginning of class. Assignments submitted after this time will be subject to a penalty of 10 points for the first day, or any part of the first day, and 2 points per additional day late. There will also be a final submission deadline for each program after which the assignment will no longer be accepted.

Attendance Policy: When and whether you attend class is up to you. However, you are responsible for all of the material presented in class. Missed exams will only be excused by documented evidence, verifying that the student was unable to attend class that day due to causes beyond their control.

Grading of Programs: Grading of programming assignments will reflect three factors, weighted as shown.

(50%) ***Correctness*** -- does the program run correctly.

(25%) ***Style*** -- does the code adhere to class documentation standards? Is the code indented properly? Are the variable names mnemonic? Are there pre and post conditions for each function? Adequate comments?

(25%) ***Design*** -- is the program adequately decomposed (i.e., are the functions and procedures small enough to be comprehensible)? Are the class and structure definitions well chosen? Has the student made good use of existing classes and libraries.

Make no mistake: If you hand in a program that works, but that does not adhere to class style standards and is poorly designed, that program can receive a failing grade. Conversely, hand in a program that is well documented, well designed, compiles, but still has a few bugs, that program can receive a passing grade. All programs must be written in C++.

Cheating and Abuse of Computing Privileges:

Students are required to adhere to the policy on academic irregularities contained in the FAU student handbook. In addition, collaboration among students in solving programming and homework assignments shall be avoided. It is okay to ask another student for advice when stuck on a program design, debugging, etc. But if I receive programs or homework assignments that are substantially equivalent, I will not hesitate to punish all involved parties to the fullest extent, up to and including assignment of a failing grade for the course. All such incidents are reported to the Registrar's Office and noted on the student transcript. A second academic irregularity can lead to dismissal from the University.

In addition, the University and the computer science department maintain policies regarding proper behavior on its computer systems. Failure to adhere to these policies can result in loss of computer privileges, and possible legal action.