CS 7B - Section 3477

Computer Science II

TR, 2-5:05,

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This syllabus is the alpha version of an open source platform.

Course Description: This second course in computer science introduces more advanced topics in programming. Students will use modularity to develop solutions for larger-scale programming problems. Recursion, file processing, and object-oriented programming are implemented. This course will be taught using the C++ programming language.
Prerequisite: CS 007A with a minimum grade of C and MATH 012 (precalculus) with a minimum grade of C.
Note: A minimum grade of C is required in this course to progress to CS 9.
Credit Hours: 5

Texts: *Starting Out with C++: From Control Structures through Objects* (7th ed). ISBN: 0132576253, by Tony Gaddis (Addison-Wesley, 2012) and *Theory and Problems of Fundamentals of Computing with C++* ISBN: 0-07-030868-3, by John R. Hubbard in the Schaum's Outlines Series. **Course Objectives:**

At the completion of this course, students will be able to:

1. Develop skills in the design and development of computer software continuing to utilize an object-oriented language, packages, modules and libraries.
2. Demonstrate an understanding of and use techniques of inheritance and polymorphism.
3. Select appropriate data structures from the Standard Template Library such as vectors, linked lists, stacks and queues in the design computer programs to solve complex problems from math and science.
4. Create classes which implement dynamic memory allocation techniques appropriate to the design of computer programs.
5. Implement advanced file reading and writing methods.

Grade Distribution:

Projects	50%
Midterms	25%
Final Exam	25%

Letter Grade Distribution:

≥ 90.00	A	70.00 - 79.99	C
80.00 - 89.99	B	60.00 - 69.99	D
.	.	≤ 59.99	F

Course Policies:

- **Homework**
  - Homework will be assigned regularly but there is no one available to read your work on a regular basis, so bring your questions to class and they will be resolved.
- **Calculators and Computers**
  - Computer algebra systems are encouraged, and may even be required for some assignments. Generally, however, use a CAS only as a confirmation of what you can or cannot do with pencil and paper.
  - You will need scientific calculator for some exams, but graphing calculators and calculators with CAS are not allowed.
- **Grades**
  - Grades in the **C** range represent performance that **meets minimal expectations**; Grades in the **B** range represent performance that is **substantially better** than the expectations; Grades in the **A** range represent work that is **excellent**.
- **Attendance and Absences**
  - Attendance is expected and will be noted. If you're not there, you missed it.
  - Students are responsible for all missed work, regardless of the reason for absence. It is also the absentee's responsibility to get all missing notes or materials.

Academic Honesty Policy

In addition to skills and knowledge, College of the Desert aims to teach students appropriate ethical and professional standards of conduct. The college catalog specifies that students are expected to "Integrate universally accepted values such as honesty, responsibility, respect, fairness, courage and compassion into judgments and decision-making." and that, "Students are expected to act in an honest and trustworthy manner. Work performed on examinations or other forms of evaluation must represent an individual's own work, knowledge and experience of the subject matter. Students are expected to follow the classroom rules established by each instructor." Any attempt to deceive a faculty member or to help another student to do so will be considered a violation of this standard.

Tentative Course Outline:

Week	Content
Week 1	• FCCPP: §7.1-7.5: Abstract Data Types • Procedural Abstraction, Function Templates, Data Abstraction, Friend Functions, Overloading Operators
Week 2	• FCCPP: §7.6-7.9: Abstract Data Types • Class Invariants, Constructors and Destructors, The Four Automatic Member Functions, Abstract Data Types
Week 3	• FCCPP: Chapter 8: Pointers • §8.1-8.4: Pointers, the Dereference Operator, Pointer Operations, The Reference Operator
Week 4	• FCCPP: Chapter 8: Pointers • §8.5-8.7: Null Pointer, Dynamic Arrays, The `This` Pointer
Week 5	• §Problems and Projects
Week 6	• FCCPP: Chapter 9: Lists • §9.1-9.3 Linked Structure, C++ `Structs`, Linked Applications of the Stack ADT
Week 7	• FCCPP: Chapter 9: Lists • §9.4-9.6 Iterators, A List ADT, A `List` Class
Week 8	• Review for Midterm • Midterm Exam #1
Week 9	• FCCPP: Chapter 10: Standard Container Classes • §10.1-10.4: Containers, Templates, Standard C++ Container Classes and their Operations, The Standard C++ Stack Class
Week 10	• FCCPP: Chapter 10: Standard Container Classes • §10.5-10.7: The Standard C++ Queue Class, The Standard C++ Vector Class, The Standard C++ List Class
Week 11	• FCCPP: Chapter 10: Standard Container Classes and Reiview • §10.8: Generic Algorithms
Week 12	• Midterm #2 • FCCPP: Chapter 11: Recursion. • : §11.1-11.2: Introduction, The Basis for A Recursive Definition
Week 13	• FCCPP: Chapter 11: Recursion. • : §11.3-11.7: The Factorial Function, Activation Frames, Fibonacci Numbers, Euclidean Algorithm, Binary Search
Week 14	• FCCPP: Chapter 11: Recursion. • : §11.8-11.10: Towers of Hanoi, Mutual Recursion, Backus-Naur Form
Week 15	• Review
Week 16	• Final Exam.