

CIS 136 – Advanced Programming using C++

Cedar Crest College

Spring 2006, CIS 136 70, Th 7:00-9:30, Curtis 104

Instructor

Norman Lippincott, Asst. Professor
Dept. of Mathematical and Information Sciences
Curtis Hall, Room 105
610-606-4666 ext. 3697 (home phone available upon request)
nlippinc@cedarcrest.edu
<http://nlippincott.org/>

Office Hours

Tuesday: 11-12:30
Wednesday: 2-4
Thursday: 11-12:30, 5-7
Saturday: 8-9

Course Description

A continuation of CIS 135, this course examines programming techniques and C++ language features used to solve larger, more complex problems. Topics include advanced string processing, object-oriented programming, templates, an introduction to data structures, and the C++ Standard Template Library.

Prerequisites

CIS 135 – Introductory Programming in C++

Textbook

Hennefeld, Baker, and Burchard; *Using C++, An Introduction to Programming*, 2nd ed., Brooks/Cole, 2003.
ISBN: 0-534-39146-X. (Textbook is recommended, but not required.)

Course Objectives

- Understand string processing concepts, be able to perform common string manipulation operations, and distinguish between different string representations.
- Understand and implement composite data types and non-linear data structures, and perform common operations on them.
- Understand recursion, be able to implement recursive algorithms, and understand situations where recursion may or may not be appropriate.
- To be able to independently implement a programming project of moderate size and complexity.

Assessment

The final grade for the course will be based on the following assessment items:

- Programming Assignments (6): 40%
- Tests (2): 35%
- Final Project: 20%
- Class Participation: 5%

A final average is calculated according to the weights above and are rounded to the nearest full percent. The final grade is assigned according to the following scale:

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|-------------|-------------|-------------|
| ● 93-100: A | ● 80-82: B- | ● 67-69: D+ |
| ● 90-92: A- | ● 77-79: C+ | ● 60-66: D |
| ● 87-89: B+ | ● 73-76: C | ● 0-59: F |
| ● 83-86: B | ● 70-72: C- | |

Programming Assignments

Assignments will consist of one or more problems for which you will need to devise a solution and implement that solution as a C++ program. Programs should be well documented using comments, and code should be indented to enhance readability. Comments should be included throughout the program to clearly describe all algorithm steps. Further, each function, parameter, class, member, and variable (except minor ones such as those used for loop control) are to be fully documented.

Completion of assignments will require the use of a C++ compiler. There are several good compilers available, and any compiler that is compliant with the 1998 ANSI/ISO C++ Standard may be used. (See your instructor's web site, under C++ Resources, for a good, free C++ compiler that you can download.)

A tentative assignment schedule will be posted in a password-protected area of your instructor's web site.

Tests

Tests will be written and will consist of problems and short answer questions. Usage of the computer will not be allowed during tests. On test dates, the second half of the class period will be allocated for the test. The textbook and notes may be used during the tests for reference.

Final Project

The final project will be a project chosen by the student and approved by the instructor. It will incorporate several techniques learned in CIS 135 and CIS 136. The project should be of moderate size and complexity. Possibilities for projects will be discussed in class.

Class Participation

Students who are active and attentive members of the class, and who contribute to the class from time to time, will receive 5 points for class participation. Students who fall short of this expectation will receive fewer points, commensurate with their level of participation. Also, students who do not abide by *Classroom Protocol* guidelines will receive a reduced class participation grade.

Policies

Attendance

Regular attendance is an important factor contributing to the student's success in the class. Although much of the material covered in class comes from the textbook, some course content comes from the instructor's notes or other resources, and may be delivered only in lecture form. The student is responsible for all material covered in class, and should arrange to get notes from another student in the event of absence from class. The instructor's notes are not available for perusal by the students.

Your instructor keeps an attendance record for the class, however this record does not directly affect the student's grade. If a student has excessive absence and is not showing responsibility for the course material, a report of concern will be issued to the Advising Center.

If the student is absent on the day of a test, arrangements for a makeup must be made in advance of the test. Failure to do so will result in a grade of zero for the test.

Due Dates and Late Work

Your instructor will announce the date and time that each assignment is due. This information will also appear on your instructor's web site. Note that, for some classes, assignment due dates might not correspond to class meeting dates.

By turning in assignments on time your work will be graded and returned in a timely manner (usually within one week), and with comments as appropriate.

Late work will be accepted up to two weeks past the due date and will be subject to any or all of the following:

- A penalty of 20% of the total possible score will be assessed (unless otherwise noted under assessment details).
- The assignment may be graded without comment.
- The assignment will be graded and returned at the instructor's convenience, possibly as late as the end of the semester.

Any work that is not turned in within two weeks of the due date will receive a grade of zero.

Honor Philosophy

The *Cedar Crest College Student Guide* includes the following under *Honor Philosophy, Community Standards for Academic Conduct, Academic Integrity*:

Academic integrity and ethics remain steadfast, withstanding technological change. Cedar Crest College academic standards therefore apply to all academic work, including, but not limited to, handwritten or computer-generated documents, video or audio recordings, and telecommunications.

All Cedar Crest students shall:

- Only submit work which is his/her own.
- Adhere to the rules of acknowledging outside sources, as defined by the instructor, never plagiarizing or misrepresenting intellectual property.
- Neither seek nor receive aid from another student, converse with one another when inappropriate,

nor use materials not authorized by the instructor.

- Follow the instructions of the professor in any academic situation or environment, including taking of examinations, the following of laboratory procedures, the preparation of papers, and the proper and respectful use of sharing of College facilities and resources, including library and computing resources.
- Abide by the Cedar Crest Computer Use Policy.
- If a student perceives a violation of the Academic Standards, he/she will go to their instructor.
- If you are unable to resolve the problem with the instructor, you should go to the chair of the department. If you need further assistance after consultation with the instructor and the chair, you should see the Provost.

Unless specifically designated by the instructor, assignments for this course are individual assignments, not group projects. It is reasonable and appropriate for students to discuss an assignment outside of class, but the actual assignment work is to be one's own. It is not appropriate to collaborate on assignments, nor is it appropriate to copy another student's assignment, alter its appearance, and present it as one's own individual work. Such behavior is plagiarism and a violation of the Honor Philosophy, and will result in a grade of zero for the assignment. A second offense will result in a grade of F for the course.

Class Cancellations

College-wide class cancellations are announced on the regular media outlets and on the college inclement weather hotline (610-606-4629). In the rare event your instructor must cancel an individual class, every effort will be made to notify students via e-mail of the class cancellation. You instructor collects contact information at the start of the semester for this purpose. Please be advised that advance notice of an individual class cancellation is not always possible.

When a class is canceled, whether college-wide or individual, the following contingencies are in effect:

- If class is canceled on a day that a test is scheduled, the test will be given at the next class meeting.
- If the class meeting immediately preceding a scheduled test date is canceled, the test will be postponed by one class meeting.
- If an assignment is due at the beginning of a class meeting, and that class is canceled, check your instructor's web site for information on when the assignment is due.

Students with Disabilities

Students with documented disabilities who may need academic accommodations should discuss these needs with their professors during the first two weeks of class. Students with disabilities who wish to request accommodations should contact the Advising Center.

Release of Confidential Information

In order to remain in compliance with the Family Educational Rights and Privacy Act (FERPA), the following policies will be in effect with regard to the release of information related to the student's academic record (i.e. grades):

- Your instructor may personally discuss such information with you, and may do so via telephone.
- Your instructor will not leave such information on an answering machine or voice mail system.

- Your instructor will not release such information to any third parties (such as a parent or spouse) without the student's written consent. If you wish to make such arrangements, please contact the Advising Center.
- Your instructor will reply to requests for such information via e-mail only to e-mail addresses within the cedarcrest.edu domain. Replies to addresses hosted at other domains will be denied.
- Your instructor will post final grades on Campus Web as soon as final grades are calculated. This is the earliest method by which this information becomes available.
- You may provide your instructor with a self-addressed stamped envelope for return of materials at the end of the semester. However, the student must personally deliver the envelope to the instructor. Envelopes delivered via other means will not be used.

Extra Credit

Your instructor may, at his option, offer the class an extra credit assignment, based on the overall need of the class. How such an assignment affects the grade will be determined if and when the extra credit assignment is offered. Individual requests for extra credit will not be granted.

Incomplete Grades

The College Catalog includes the following policy with regard to incomplete grades:

A temporary grade of incomplete (I) is given only to a student who is doing passing work in a course but who, for reasons beyond the student's control, is not able to complete a major assignment or examination by the deadline for submitting grades.

The Provost's Office has further clarified this policy to faculty in the following statement:

Note, in particular, the phrase "beyond the student's control", which indicates an event such as an accident, injury, or catastrophic personal situation that prevents the student from completing a single assignment or examination at the very end of the semester; a student's failure to complete past or current work resulting from neglect or poor time management is not an appropriate justification for an incomplete grade. Note also that a student who is currently failing a course should not be given an incomplete.

Classroom Protocol

The Cedar Crest College Student Guide includes the following under Honor Philosophy, Community Standards for Academic Conduct, Classroom Protocol:

Appropriate classroom behavior is implicit in the Cedar Crest Honor Code. Such behavior is defined and guided by complete protection for the rights of all students and faculty to a courteous, respectful classroom environment. That environment is free from distractions such as late arrivals, early departures, inappropriate conversations, and any other behavior that might disrupt instruction and/or compromise students' access to their Cedar Crest College education.

Class Visitors

Anyone not registered for the course who wishes to sit in as a visitor must obtain permission from the instructor in advance. Class visitors are to adhere to the same classroom protocol as is expected from registered members of the class. For classes held in a computer classroom, visitors will not be permitted to use the computers in the

classroom.

Computer Classrooms

When a class is held in a computer classroom, the computers in the room are to be used for class-related activities only. Using the computers for Web browsing, instant messaging, gaming, or other non-class-related activities is prohibited.

Specifically, students are to follow these guidelines during class:

- Students should not have any instant messaging programs open during class. Being signed on to an instant messaging program with an away message active is considered a violation of this policy.
- Students should not have any e-mail program open during class.
- Students should not have any web browser open, except for activities specifically authorized by the instructor.

Any student violating this policy will be subject to the following penalties:

- First offense: student will be given a verbal warning.
- Second offense: student will receive a 0 for her class participation grade for the semester.

Course Schedule

The following is a tentative schedule for the course, and may be adjusted as necessary throughout the semester.

Dates	Topic	Reading (Textbook Chapters)
1/19	Strings and Characters	6, 16
1/26, 2/2, 2/9	Structured Types and Classes Object Oriented Programming	17, 18, 19
2/16, 2/23	Inheritance and Polymorphism	27
2/23	Test 1	
3/2, 3/16	Vectors, Maps, and Lists	13
3/23	Stacks and Queues	24
3/30	Templates	21
4/6, 4/13	Recursion	25
4/20	Test 2	
4/20, 4/27	Pointers and Linked Lists	22, 23