

CS251 Data Structures – Fall 2011
Course Syllabus

INSTRUCTOR:

John Bonomo
163 Hoyt Phone: 7287

TEXT:

Data Structures and Problem Solving using Java, Weiss (3rd edition)
C++ for Java Programmers, Budd (3rd edition)

POINT VALUES:

Exams:	Midterm-1 (around Oct. 7)	10%
	Midterm-2 (around Nov. 11)	10%
	Final (8:00, Dec. 16)	15%
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		35%
Homeworks	6-8 assignments	35%
Projects	4-5	30%

OBJECTIVE:

This course is designed to complete your transformation from computer programmers to computer scientists. In CS 251 we start to look “under the hood” of various data structures (some old ones, some new) and investigate how they can be implemented. After taking this course, writing programs that simply work will no longer satisfactory - your programs should now work as efficiently as possible, making use of these data structures and of various algorithmic techniques that are to be covered during this semester. We will also use this course as an opportunity to learn a new programming language – C++ – and compare and contrast it with Java. This will serve as a foundation for a more rigorous study of programming languages in CS 411 (Language Design and Implementation).

Finally, it is hoped that this course will stimulate an interest in the more theoretical and aesthetic side of computer science.

GOALS:

- learn the C++ programming language
- learn the mathematical tools necessary to perform algorithm analysis
- learn the mechanics and the uses of basic data structures such as stacks, queues, lists, hash tables, priority queues, graphs
- learn various types of algorithmic solutions to problems such as divide and conquer, backtracking

COURSE OUTLINE: (tentative)

SUBJECT	READING	TIME
Basics of C++	Chaps. 1, 2, 10, 12 (Budd)	1 week
Classes in C++, Operator Overloading	Chaps. 5, 7 (Budd)	1 week
Pointers and Dynamic Classes	Chaps. 3, 4, 5, 8 (Budd)	2 weeks
EXAM 1		
Stacks, Queues and Lists	Chaps 16, 17 (Weiss)	1 week
Polymorphism and Templates	Chaps. 6, 9 (Budd)	1 week
Algorithm Analysis	Chap 5 (Weiss)	1 week
Using Recursion	Chap 7 (Weiss)	2 weeks
EXAM 2		
Sorting	Chap 8 (Weiss)	1 week
Trees	Chaps 18, 19, 22 (Weiss)	2 weeks
Hash Tables	Chap 20 (Weiss)	1 week
Graphs	Chap 14 (Weiss)	time remaining

INSTRUCTOR INFORMATION AND POLICIES

INSTRUCTOR:

John Bonomo
Office: 163 Hoyt

Phone: 7287
Email: bonomojp@westminster.edu

OFFICE HOURS (FALL 11):

MWF	10:30-11:30
MW	2:00-4:00

Feel free to stop by my office at times other than my office hours; if I am free, I will be more than happy to answer any questions; if not, we can arrange for a time to meet. REMEMBER: My door is ALWAYS “open”, even if it happens to be closed.

Here are some reasons to come to my office:

1. You're confused about or need clarification on what was discussed in class.
2. To discuss the grading of an assignment.
3. You're lost as to how to start an assignment (after having thought about it for awhile)
4. You need help debugging a program.
5. After working on a homework problem, you're not sure how to solve it.
6. You're looking for additional projects/work to supplement what is covered in the course.

ATTENDANCE:

I do not take attendance in this class. Students are responsible for any material missed due to an absence. Quizzes given during a student's absence may not be taken later.

ACCESSIBILITY STATEMENT:

Westminster College actively strives for the full inclusion of all our students. Students with disabilities who require access solutions for environmental or curricular barriers should contact Corey Shaw, Director of Disability Resources, located in 209 Thompson-Clark Hall. phone: 724-946-7192 e-mail: shawcj@westminster.edu

WRITTEN HOMEWORK:

All written homework must be done neatly, which means (among other things) the following:

1. It should be handed in on standard 8 1/2 by 11 paper (not ripped out of a notebook) and stapled.
2. Your solutions should appear in the order that the problems are listed on the homework.
3. There should be ample room on the page for each problem (ideally, one problem per page) and nothing should be crossed out.

Failure to meet these standards may result in points taken off the homework. The ideal way to meet these requirements is to solve all the problems on scratch paper and then rewrite them on appropriate paper.

EXTRA CREDIT: I do not assign any extra credit assignments in my classes.

GRADE CUTOFFS:

GRADE	RANGE
A	93-100
A-	90-92
B+	87-89
B	83-86
B-	80-82
etc	

ASSIGNMENT AND GRADING POLICIES:

1. All programs which are to be sent to me electronically are due **30 MINUTES** before class time on the due date. You should expect me to copy all files from the public, common directory to my private directories before class starts.

All other assignments are to be handed in at the **BEGINNING** of class on the day that they are due.

2. Lateness penalties:

- 10% off per day, first 2 days (Sun and Mon count as separate days for any assignment that can be e-mailed or electronically copied; otherwise they count as one day)
- 100% off after that

IMPORTANT EXCEPTION: All due dates which fall on the class day before an exam are absolute – there will be no late assignments accepted for them.

3. I will take up to 5% off any assignment which is sloppy enough that it makes it difficult to read.
4. Program Grading Criteria:

ERROR TYPE	DESCRIPTION	POINTS OFF	COMMENTS
Obvious	Errors which the simplest of tests would detect	3–5 pts	Max for any one error is 10% of assignment
Subtle	Errors which only extensive testing would detect	2–3 pts	
Efficiency	Problem or sub-problem solved in a grossly inefficient way	2–5 pts	
Cosmetic	Bad output format, prompts, documentation, indentation, etc	1-2 pts	Max for all errors of this type is 10% of assignment
Compile Time	Program does not compile	25% off	Program will also be graded with respect to other criteria.

NOTE: Just because a program works correctly does NOT guarantee that it will receive a perfect score – other factors such as readability, documentation, user-friendliness and efficiency are also important.

ACADEMIC INTEGRITY:

From the Westminster College Undergraduate Catalog:

Central to the purpose and pursuit of any academic community is academic integrity. All members of the Westminster Community, including students, faculty, staff and administrators, are expected to maintain the highest standard of honesty and integrity, in keeping with the philosophy and mission of the College.

All students are expected to adhere to these guidelines, and to have read and understand the list of violations found (among other places) in the course catalog – this list covers the areas of Cheating, Misconduct, Plagiarism and Providing False Information. The following guidelines may help in determine what is considered acceptable in this class.

Individual Assignments : Unless explicitly stated, students are encouraged to group together to discuss assignments. We expect all students involved in the group to contribute to the discussions. However, all work handed in must be written in the individual students own words. Clearly, copying a solution from another text or another student verbatim or with small changes is not “writing in your own words.” Not nearly as obvious a problem is the following: if you find that the only way you can type in a program or write a homework solution or lab report or proof is to have someone sitting next to you doing the same work, you are probably not “writing in your own words.” You should be able, after discussing an assignment with others, to go off and produce the solution on your own.

Group Assignments : All of the participants should do their full share of the work. You should discuss problems together and reach conclusions together. It is a form of dishonesty for a student who has not attended class, read the assignment, or thought about the problem on their own to try to use the ideas developed by the group or claim credit for work to which one has not contributed. It is also a form of dishonesty to encourage or allow such practices on the part of others. Each group should work on their own, not discussing their work with other groups.

Using Tutors or help from someone not enrolled in the course : We acknowledge that often tutors are used to help students with assignments. For your long term benefit, we strongly encourage you not to leave the tutor with a completed assignment. We suggest that you seek help when necessary and produce (or reproduce) the assignment on your own.

Written Assignments : All written assignments for this course will be submitted to [turnitin.com](https://www.turnitin.com), an on-line plagiarism detection system. In the case of suspected academic dishonesty, all originality reports generated by [turnitin.com](https://www.turnitin.com) will be presented and discussed with students prior to any actions taken.

PENALTIES FOR ACADEMIC DISHONESTY:

All incidents of academic dishonesty will be reported to the Academic Dean in accordance with the Westminster’s Academic Integrity Policy. In addition, the following actions will occur:

First Offense : a zero will be given on the assignment, quiz or exam in which the dishonesty took place

Second Offense : the student will receive an F for the course.