Instructor:
Dr. David Shaffer  
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D2L: I post labs, projects, homeworks, announcements and other useful information on D2L. It is your responsibility to check it daily for updates.

Prerequisite: CS 152, co-requisite MTH 241


Description: A course on the use, implementation and analysis of data structures and algorithms. Data structures to be studied include balanced search trees, hash tables, priority queues and disjoint sets. Advanced sorting algorithms and recursive techniques are also studied, along with mathematical techniques for algorithm analysis. Students will also be introduced to a second programming language.

Outcomes: Upon successful completion of this course you will be able to use the C++ programming language to
- organize and execute a non-trivial software development project using object-oriented development techniques
- properly structure a C++ program
- use and implement “generic” (C++ template classes) types
- use a subset of the Standard Template Library to aid in software development
- make use of refactoring techniques to modify existing code
- plan and implement unit tests
- perform rudimentary algorithm analysis through detailed operation counting
- perform empirical analysis of algorithms
- implement the bag, linked list, stack, queue, priority queue and tree data structures
- apply the bag, linked list, stack, queue, priority queue and tree data structures to problems
- analyze algorithms to estimate asymptotic running time
- Implement balanced search trees, hash tables, priority queues and disjoint sets

Grading:
Final letter grades are assigned based on the percentage of the available points that you receive. The grading scale is fixed. **I do not curve.** The grading scale is as follows (percentage points are always “rounded” up so an 89.1 is an A-, for example):

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<tr>
<th>Letter</th>
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<tbody>
<tr>
<td>A</td>
<td>[92,100]</td>
<td>A-</td>
<td>(90,92)</td>
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<tr>
<td>B+</td>
<td>(88,90)</td>
<td>B</td>
<td>(82,88)</td>
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<tr>
<td>B-</td>
<td>(80,82)</td>
<td>C+</td>
<td>(78,80)</td>
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<tr>
<td>C</td>
<td>(70,78)</td>
<td>D</td>
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<td>F</td>
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**Attendance:** You are expected to attend all classes. Attendance will not constitute part of your grad but failure to attend will result in no credit for missed assignments, tests, quizzes etc. Additionally, failure to attend will probably result in poorer performance on exams. **I do not provide class notes to students who miss class, excused or unexcused.**

**General notes on turned-in work:**
All work will be submitted on D2L. Emailed or printed assignments will not be accepted (it’s too easy for me to lose track these!). Late homework and labs (not exams or quizzes) will be accepted, **with a one point deduction per 24 hours late**, up to the time I provide a solution or return the graded items (at which point they will no longer be accepted). All labs and homeworks must be submitted before our scheduled final exam period.

**Homework and lab assignments:**
These assignments are given in order to help clarify material. They are normally smaller than projects and cooperation between classmates is encouraged **so long as each student is mastering the material!** Lab and homework point values vary based on the level of difficulty.

**Projects:**
There will be several projects throughout the semester. Projects are graded based on completeness and quality of work. It is your responsibility to thoroughly test your solutions to the problems. Project point values vary depending on the project complexity. Work on projects must be entirely your own unless otherwise specified.

**In-class exams:**
In-class exams (one or two, at my discretion) will be given throughout the semester worth approximately 150 points each. There will be a comprehensive final exam worth approximately 200 points.

**Quizzes:**
Quizzes may be given at any time throughout the semester. They will be worth 10 to 15 points each. Make sure you follow lectures and complete homework and reading assignments to help you prepare for quizzes.

**Academic policies:**
Labs should be nearly entirely your own work but discussions with classmates is certainly permitted and even encouraged. **Projects, quizzes and exams must be your individual work and no cooperation or consultation of outside resources, except as specified in the project description, is permitted. In addition you must make all reasonable efforts to ensure that your work is not accessible to your classmates.** If you are stuck on a project you may certainly ask me for help.

Any violation of these policies will result in a zero on the assignment for all students involved. Such violations will also be reported to the University administration.

**Disabilities and special needs:** I will make any necessary, reasonable accommodations for students with disabilities. **If you have a disability which requires accommodations, it is your responsibility to indicate to me that you have a disability and to discuss with me what special needs you might have regarding this class. In addition to notifying me, if you have a disability which requires class accommodations, you must make it known to Westminster College’s student affairs office so that they can send me the proper paperwork.**