CS 368-1: Learning a New Programming Language

C++ for Java Programmers

Course Information:
This is a 1-credit course graded on a CR (credit) / N (no credit) basis. This means that letter grades will not be assigned. A CR grade will give you credit towards a degree but will not contribute to your grade point average calculation. An N grade does not award any credit.

Prerequisites: CS302 or consent of instructor.

Time and Place: Wednesday 12:05pm at room CS1221

Instructor: Okan Akalin
- okan@cs.wisc.edu
- 4388 CS
- office hours:
  - Wednesdays 1:30 – 2:30 pm
  - Fridays 11 am – noon
  - and by appointment

TA: Mohit Verma
- mohit93@cs.wisc.edu
- office and lab hours to be determined

Course websites:
http://pages.cs.wisc.edu/~cs368-1
http://learnuw.wisc.edu
http://piazza.com/wisc/fall2015/cs3681

Evaluation

- Attendance: make sure to sign the attendance sheet at each lecture
- Assignments: 5 programming assignments and 1 homework assignment

Students meeting both of the following requirements will receive 1 credit (i.e., a grade of CR) for the course:

1. attendance at at least 12 of the 15 lectures
2. a cumulative score of 70% or better on the assignments

If a student misses more than 3 lectures, then for each lecture missed (beyond 3), the cumulative score on the assignments required to earn credit for the class is increased by 5 points. For example, if a student attends 10 of the 15 lectures, credit will be given if the cumulative score on the assignments is 80% or better.
In some cases, religious observances or other events conflict with scheduled class activities. In such situations students can be given an alternative means of meeting the academic requirement. Students must notify the instructor of any such conflicts, with the specific dates, not later than Friday, 18 September 2015. Requests for disability accommodation should be made within the same time period or else at the time the disability occurs, whichever is later.

**Textbook**

There are two options for a suggested/recommended text:

- *C++ Primer* (5th ed) by Lippman, Lajoie, & Moo, 2013 (available in electronic format at a significantly reduced price)

Neither text is required (C++ info can also be found on-line). If you'd like a text book, either choice is fine: If you are planning on taking another course that uses C++ (like CS 564), the C++ Primer is recommended (as it is a more comprehensive C++ reference). If you want a simpler text that focuses on the differences between C++ and Java, consider the C++ for Java Programmers text.
## Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics</th>
<th>Read</th>
<th>Other</th>
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</table>
| 1    | (9/2) | course information, history, high-level differences, pros of C++, simple C++ program | *CJP: Ch. 0*  
*CJP: Ch. 1 (p. 1 - 10)*  
*CP: Ch. 1 (2.1, 2.2)*  
*CP: Ch. 2 (2.1, 2.2, 2.6)* | course information handout, example: Simple C++ Program |
| 2    | (9/9) | constants, enumerations, structures, arrays                           | *CJP: Ch. 1, Ch. 2 (2.1, 2.2)*  
*CP: Ch. 2 (2.1, 2.2, 2.6), Ch. 3 (3.3, 3.5.1, 3.5.2, 3.6)* | example: cardExample.cpp                    |
| 3    | (9/16)| vectors, parameter passing, pointer basics                            | *CJP: Ch. 2 (2.2, 2.3), Ch. 3*  
*CP: Ch. 2 (2.3 - 2.5), Ch. 6 (6.1, not 6.1.3, 6.2, not 6.2.6, 6.3, 6.4, 6.5.1)* | handouts: Variables, References, Pointers; pointerBasics.cpp |
| 4    | (9/23)| pointers to structs/classes, arrays, dynamic allocation, pointer caveats | *CJP: Ch. 3 (continued)*  
*CP: Ch. 3 (3.5.3), Ch. 6 (6.6)* | handout: Pointers; P1 due: Friday, 9/25 |
| 5    | (9/30)| abstract memory model, reference variables, passing params to and return values from functions | *CJP: Ch. 3 (continued)*  
*CP: Ch.6 (6.1-6.3)* | handout: C++ Abstract Memory Model / Parameter Passing |
| 6    | (10/7)| .h and .cpp files, defining classes, multi-file compilation         | *CJP: Ch. 4*  
*CP: Ch. 7* | handout: Multi-file Compilation, IntList Example |
| 7    | (10/14)| makefiles, constructor, member initialization                       | Makefiles Overview (see link in menu),  
*CJP: Ch. 4 (continued)*  
*CP: Ch. 7 (continued)* | Hw due: Monday, 10/12; handout: Defining Classes |
<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
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<th>Read</th>
<th>Other</th>
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<tbody>
<tr>
<td>10/21</td>
<td>8</td>
<td>&quot;Big Three&quot; (copy constructor, copy assignment, destructor)</td>
<td>Unix utilities (see gdb and valgrind tutorial links in menu), <em>CJP</em> Ch. 4 (continued), <em>CP</em> Ch. 7 (continued), Ch. 13 (13.1)</td>
<td>Try using gdb (for practice) and valgrind (to fix the memory leaks) on the <code>IntList</code> example code</td>
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<tr>
<td>10/28</td>
<td>9</td>
<td>operatorX syntax and use, member vs. non-member options (assignment and arithmetic operators)</td>
<td><em>CJP</em> Ch. 5, <em>CP</em> Ch. 14 (14.1, 14.3, 14.4)</td>
<td>P2 due: Monday, 10/26; handouts: <a href="#">Operator Overloading</a>, <a href="#">Polynomial Example</a></td>
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<tr>
<td>11/4</td>
<td>10</td>
<td>explicit, member / non-member function pairs</td>
<td><em>CJP</em> Ch. 5 (continued), <em>CP</em> Ch. 14 (continued), Ch. 7 (7.5.4)</td>
<td>handout: <a href="#">More Operator Overloading</a></td>
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<tr>
<td>11/11</td>
<td>11</td>
<td>overloading &lt;&lt;, friend, overloading relational operators, console I/O, overloading &gt;&gt;</td>
<td><em>CJP</em> Ch. 5 (continued), Ch. 9, <em>CP</em> Ch. 7 (7.2.1), Ch. 14 (14.2)</td>
<td>handout: <a href="#">Overloading I/O Operators</a>, P3 due: Thursday, 11/12</td>
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<td>11/18</td>
<td>12</td>
<td>overloading ++ and --, condition states, string class, C strings</td>
<td><em>CJP</em> Ch. 9 (continued), <em>CP</em> Ch. 14 (14.6), Ch. 8 (8.1), Ch. 3 (3.2, 3.5.4, 3.5.5)</td>
<td>handout: <a href="#">Overloading ++ and --, Conditions States, and Strings</a></td>
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<td>11/25</td>
<td>13</td>
<td>file I/O, manipulators, C I/O</td>
<td><em>CJP</em> Ch. 9 (continued), <em>CP</em> Ch. 8 (8.2), Ch. 17 (17.5)</td>
<td>handout: <a href="#">I/O</a>; P4 due: Friday, 11/27</td>
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<td>12/2</td>
<td>14</td>
<td>templated functions and classes, more template features, containers</td>
<td><em>CJP</em> Ch. 7, Ch. 10, <em>CP</em> Ch. 16, Ch. 9</td>
<td>handout: <a href="#">Templates</a></td>
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<td>12/9</td>
<td>15</td>
<td>iterators, generic algorithms, function objects</td>
<td><em>CJP</em> Ch. 10 (continued), <em>CP</em> Ch. 11, Ch. 10, Ch. 14 (14.8)</td>
<td>handout: <a href="#">STL overview</a>; P5 due: Friday, 12/11</td>
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