CS 3005: Programming in C++

Fall 2018 Syllabus

Course Description

For students pursuing degrees in Computer Science and Computer and Information Technologies, or any student with a strong interest in computer programming. Covers syntax and semantics of the C++ programming language through completion of hands-on projects. The student must already be fluent in some other programming language.

Prerequisites

CS 1410 (Grade C- or higher)

Course fees

Course fee: $25, used to assist in maintaining CIT infrastructure.

Disability Statement

If you suspect or are aware that you have a disability that may affect your success in the course you are strongly encouraged to contact the Disability Resource Center (DRC) located in the North Plaza Building. The disability will be evaluated and eligible students will receive assistance in obtaining reasonable accommodations. Phone # 435-652-7516.

Sections

1. MWF 8:00 - 8:50 am in Smith 116
   Final exam Dec ?? at ??:?? - ??:?? ??

Instructor

Curtis Larsen

Objectives

The student learning outcomes for this course are:

- Construct computer programs in C++, using functions, classes and STL elements.
- Construct computer programs using stack, heap and static memory.
- Construct computer programs in a statically typed language.
- Construct and use unit tests.
- Use version control to manage code.
- Use memory checking and debugging tools.
- Create programs with more complexity than in previous course work.

The following C++ language constructs will be covered:

- C++ syntax
- Typed variables and values
- Pointers and references
- Dynamic, stack and static memory
- C++ functions
- C++ classes
- Polymorphism
- Namespaces
- Making a class robust
- const, in all its flavors
- Template functions and classes
- Standard template library (STL)
- Recursion
Resources

Textbook

There is no required text for the course. However, reference sources for C++, the STL and C will be very helpful.

1. Online References [C++ Reference, C++ Tutorial]

Other Resources

- Install g++
- Linux: Create, Compile, Link, Run Simple Program (3:23)
- Linux: Create, Compile, Link, Run Multiple File Program (9:45)

Computer Labs

You may use the computers and software in the Smith Computer Center. Some lab assistants may be able to help with assignments and pass off homework assignments for introductory courses.

Course Web Site

Assignment submissions and grades will be managed in the Canvas System.

Assignments and Exams

Reading

While there is no required text book. Students are expected to find and read relevant references and example programs.

Drills

A series of exercises will be required. These will be small, but plentiful exercises completed in the Code Grinder system. The intention of these exercises is to ensure that students have multiple experiences with each of the elements of the C++ programming language. Access these drills via Canvas. Drills will be due most days before class begins.

Assignments

A series of programming assignments will be required. These assignments are due on the date and time listed in the schedule, or as stated by the instructor during class. It cannot be over emphasized that it is important to start early and get all of your assignments done before their due dates. Programs that do not run correctly will receive no credit.

Parts of some programming assignments will be completed inside Code Grinder. Parts or all of most assignments will be completed inside a development environment such as the GNU tool chain. All non-Code Grinder assignment submissions will require compatibility with g++, the 2011 C++ standard and a Makefile submission.

Some students will use other development environments such as XCode, Visual Studio or C-Lion. Submissions will still require the GNU tool chain.

The source code for programming assignments will be submitted to the Canvas assignment page.
Participation

You will be required to give positive contributions to class discussions.

Exams

There will be a midterm and a final. Test tasks will be extensions of homework assignments and small new programs. Be sure to understand your assignments and keep backups of all your work.

Grading

Letter grades will be assigned based on the percentage of total possible points attained. The point totals will be approximately: drills 20, assignments 120, participation 20, midterm exam 100 and final exam 200. The following chart will be used for letter grades.

<table>
<thead>
<tr>
<th>Minimum Percentage</th>
<th>Letter Grade</th>
<th>Minimum Percentage</th>
<th>Letter Grade</th>
<th>Minimum Percentage</th>
<th>Letter Grade</th>
<th>Minimum Percentage</th>
<th>Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>94</td>
<td>A</td>
<td>84</td>
<td>B</td>
<td>74</td>
<td>C</td>
<td>64</td>
<td>D</td>
</tr>
<tr>
<td>90</td>
<td>A-</td>
<td>80</td>
<td>B-</td>
<td>70</td>
<td>C-</td>
<td>60</td>
<td>D-</td>
</tr>
<tr>
<td>87</td>
<td>B+</td>
<td>77</td>
<td>C+</td>
<td>67</td>
<td>D+</td>
<td>0</td>
<td>F</td>
</tr>
</tbody>
</table>

Course Policies

Attendance

Students are responsible for material covered and announcements made in class. School-related absences may be made up only if prior arrangements are made. The class schedule presented is approximate. The instructor reserves the right to modify the schedule according to class needs. Changes will be announced in class and posted to the website. Exams and quizzes cannot be made up unless arrangements are made prior to the scheduled time.

Time Commitment

Courses should require about 45 hours of work per credit hour of class. This class will require about 135 hours of work on the part of the student to achieve a passing grade, which is approximately 9 hours per week. If you do not have the time to spend on this course, you should probably rethink your schedule.

Late Policy

Each assignment has two due dates. The earliest due date is the required date. The second date is the absolute latest date to submit the assignment. Late work will not be accepted after the second date.

Collaboration

Limited collaboration with other students in the course is permitted. Students may seek help learning concepts and developing programming skills from whatever sources they have available, and are encouraged to do so. Collaboration on assignments, however, must be confined to course instructors, lab assistants, and other students in the course. Students are free to discuss strategies for solving programming assignments with each other, but this must not extend to the level of programming code. Each student must code his/her own solution to each assignment. See the section on cheating.

Cheating

Cheating will not be tolerated, and will result in a failing grade for the students involved as well as possible disciplinary action from the college. Cheating includes, but is not limited to, turning in homework assignments that are not the student’s own work. It is okay to seek help from others and from reference materials, but only if you learn the material. As a general rule, if you cannot delete your assignment, start over, and re-create it successfully without further help, then your homework is not considered your own work.

You are encouraged to work in groups while studying for tests, discussing class lectures, discussing algorithms for homework solutions, and helping each other identify errors in your homework solutions. If you are unsure if collaboration is appropriate, contact the instructor. Also, note exactly what you did. If your
actions are determined to be inappropriate, the response will be much more favorable if you are honest and complete in your disclosure.

Where collaboration is permitted, each student must still create and type in his/her own solution. Any kind of copying and pasting is not okay. If you need help understanding concepts, get it from the instructor or fellow classmates, but never copy another’s code or written work, either electronically or visually. The line between collaborating and cheating is generally one of language: talking about solutions in English or other natural languages is usually okay, while discussions that take place in programming languages are usually not okay. It is a good idea to wait at least 30 minutes after any discussion to start your independent write-up. This will help you commit what you have learned to long-term memory as well as help to avoid crossing the line to cheating.

**College Policies**

Additional college policies, calendars, and statements are available online at [http://new.dixie.edu/reg/syllabus/](http://new.dixie.edu/reg/syllabus/).