SYLLABUS
CS 202 Programming Systems
Summer 2015

Prerequisite:	**CS163 Data structures** *This means you should have experience writing complete programs in C++ using classes, pointers, dynamic memory and have experience writing programs developing data structures such as Linear Linked Lists, Circular Linked Lists, Doubly Linked Lists, Arrays of Linked Lists, Linked Lists of Arrays, Trees, and Graphs.*

Instructor:	**Karla Steinbrugge Fant,**
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Office:	**Fab 120-19**
Office hours:	**Wednesdays 4-4:50 in FAB 120-19,** **Except NO office hours on July 1st 9**
Text:	C++ Primer Plus, Stephen Prata Thinking in Java, Bruce Eckel
Lab Manual:	**Required.** Purchase from the PSU Book Store
Lecture Notes:	Lecture notes and power point slides are on D2L
PSU ID:	Bring your PSU ID card (preferably your "proximity" card) to all lectures and labs; it will be used for attendance purposes.
Handouts:	All handouts, due dates, and assignments can be retrieved from D2L
Disabilities:	If you have a disability and are in need of academic accommodations, please notify the instructor immediately to arrange needed support. This includes any accommodations required for taking examinations.

Hardware:	CS Linux (linux.cs.pdx.edu).
Compiler:	C++ language implemented by the **g++** compiler.
	All work this term will be done on CS linux ***For assignments use linux.cs.pdx.edu*** ***For labs use quizor2.cs.pdx.edu***
	Allowed editors: vi, vim, emacs ***Do not use Dev Cpp, Visual Studio or xcode*** ***No IDEs are allowed when working in C++***
	Use of gdb with each C++ assignment is expected.

Course Description:

Students will become familiar with the language and operating system environment used in most upper division courses in the Computer Science major curriculum. Use of the file system, operating system calls, and shell-level programming; low-level debugging of high-level programs. Programming exercises will include applications of data structures and memory management techniques.

Class Expectations:

1. **Attending lectures is required to pass the class.**
    a. Arrive within the first 10 minutes to count as attending.
    b. Your PSU proximity card will be used for attendance purposes.
    c. In-class quizzes may also be used in class to record attendance.
    d. It is expected that students will stay for the entire class period, until excused. This applies to class lectures and lab sessions.

2. **Attending labs is required to pass the class**
    a. **PSU ID's** are scanned at the **beginning** and **end** of labs.
    b. One lab may be missed without making it up
    c. It is expected that students will program, write algorithms, and design test plans for the entire duration of the lab. If lab work is completed prior to the end of the lab period, practice questions may be assigned by the lab assistants. Be prepared to stay the entire lab period.
3. **If you miss more than one lab, it needs to be made up within a 1-2 week period.**
    a. Authorization to attend one of the alternate lab sessions is required by contacting karlaf@pdx.edu
4. **Pre-lab exercises** must be brought to the labs already completed.
    a. The prelabs are required as part of your attendance.
    b. They are Pass/No-Pass.
5. **Programs are due on Fridays uploaded to D2L by 7pm.**
6. **Late programs will be accepted by Wednesday at 7pm, of the following week** (except that the last program cannot be turned in late)
7. **Every** program must be completed to get a grade on an assignment.
8. Design writeups for most programs are uploaded the week prior. Be careful to not plagiarize. Doing so will result in a zero on an assignment and a failure in the class.

Proficiency Demonstrations:

- Every student in CS202 must show proficiency in programming in C++ and data structures, using linux with either vi, vim, or emacs, and gdb
- Demonstrating syntax proficiency is Pass/No Pass.
- Demonstrations will occur twice a term.
- If a student receives a non-passing score on the proficiency demos, they may meet with the instructor to discuss their performance. A proficiency demo taken during the middle of the term may be retaken within one week to receive a passing score with approval by the instructor. A passing score is required to pass CS202. There are no re-tests available for the final proficiency demo.

Goals:

The primary goal in CS202 is to prepare students for programming in the upper division 3xx and 4xx level classes. To achieve this goal, CS202 focuses on three areas: object oriented programming, advanced C++, and an overview of how Java relates to what we have learned in C++.

The majority of the term will be spent introducing students to object-oriented programming while learning advanced C++ syntax. Students will understand the difference between procedural abstraction and object oriented solutions. Students will spend the term designing and programming with inheritance hierarchies, with the goal of solving problems efficiently: producing high quality, robust, maintainable as well as efficient object oriented solutions. This will provide students with the chance to experience object oriented design and programming. Programming assignments will focus on advanced data structures while at the same time accomplishing these other goals. Students will learn about C++'s function overloading, operator overloading, copy constructors, and be introduced to inheritance.

Java skills developed include writing two programs using advanced data structures in Java with strict requirements to follow OOP guidelines – all data members private, no friendly access, and complete implementation of functions required to handle issues of deep versus shallow copies and compares. Students learn the relationship between the two languages and the similarity of Java's references to pointers.

Then, the rest of the term compares Java to C++, where we will work through example projects in both languages.

Computing Environment:

The **CS linux** systems using the g++ compiler **must** be used for all assignments. *Login remotely using ssh, putty, or terminal programs to www.cs.pdx.edu. Dev Cpp, or Visual C++ are not acceptable.* This is even the case if your PC has linux installed.

- Each student needs a CS account (which can be received from FAB 88 or contacting the tutors (tutors@cs.pdx.edu)
- Lab work is done using **quizor2.cs.pdx.edu.**
  - The lab system is only available for the term in which you take the class and all materials will be deleted at the end of the term.
- Individual programs are to be done on **linux.cs.pdx.edu**.

Lab Sessions:

The labs are where we reinforce the materials learned in lecture. It is where concepts will be practiced prior to applying them to your larger individual programming assignments. *Work on the labs is required and it is expected that all students will perform the lab work each week.*

- Every student in CS202 is enrolled in both a lecture and a lab session.
- **Bring your lab manual** (from the PSU Book Store) to each lab session
- **Also bring your PSU Picture ID** (preferably the PSU Proximity card); it will be scanned when your prelab is examined and again when the lab is completed.
- **Expect the lab assistants** to initial and date the completion of a lab in your lab manual.
- **Attendance to the labs is required to pass CS202**
- **If you miss more than one lab, it needs to be made up within a 1-2 week period.** Arrange with the instructor to attend one of the alternate lab sessions.

- Some lab sessions will be held in classrooms without computers. Therefore, it is important to either bring a laptop, netbook, or tablet to the lab session or notify your instructor 24 hours in advance that a school computer is needed.
- Make sure to fully charge your computer –electrical outlets may not be available
- No food or drink while labs are in session
- No use of the internet for web surfing, social media, or email during lab time. With the exception of D2L, karlaf's website, and the use of putty, ssh, or terminal to work remotely with the CS systems. *Any violation will result in an immediate No Pass for that particular lab session.*

Written Designs to your Programming Assignments:

- Each program has a written design writeup that you will be turning in prior to the programming assignment
- **Every written design must be completed** to pass CS202.
- **They must consist of a minimum of 600 words** and may include drawings
- The writeup should cover the major design considerations: what classes you are using, how they are related to other classes (using, containing, hierarchical); it should discuss how the methods provided minimize the use of getters. It should be clear in the design what functions will be needed in each class and how they will be used by the other classes in your design. UML diagrams are highly encouraged.

- All designs must be your own work and may not be copied from the web or other students. Be careful to not plagiarize. Doing so will result in a zero on an assignment and a failure in the class.

Programming Assignments:

- Course requirements consist of five programming assignments in C++ and Java. The programming assignments provide experience building correct implementations of object oriented situations.
- **All 5 assignments must be submitted and a passing score received on each to pass CS202**
- 20% of each program's grade is based on the program style and comments.
    - Each file must have your name and header comments describing the purpose of the code within the file.
    - The file header comments should be a paragraph, at a minimum
    - Each function must have header comments describing the purpose of the function and arguments. No exceptions!
    - Make sure that each function that has a non-void return type returns a value through each possible path
    - Always use the returned value when calling a function

- It is expected that each program will have multiple files (.h and .cpp files for C++) and have their name and header comments in each file. Never place function implementations in a .h file and never #include a .cpp file!

- 20% of each program's grade is based on the documentation provided with the assignment. **Each programming assignment must include the following writeups:**
    1. A minimum 400 word written document analyzing your design and discussing how effective the classes that you created were. Discuss the validity of your approach and analyze it in terms of object oriented programming. **Think in terms of analyzing your solution!** This means discussing the efficiency of the approach as well as the efficiency of the resulting code.
    2. A minimum 400 word written discussion of how debuggers (gdb, xxgdb, ddd, etc.) assisted in the development. This write up must describe experiences with the debugger, how it assisted code development, or how it could be used to enhance the programming experience.

- **Programs are due on Fridays uploaded to D2L by 7pm.**

- **LATE assignments will be accepted the following week no later than Wednesday at 7pm, for 5% off** (the last assignment cannot be turned in late)**.** Assignments may **not** be turned in later than the late due date**.** ***There are no exceptions. Turn in what you have after one week late.***

- Each student is expected **to submit only original work**. Software and passwords must be kept **confidential**. Any person who violates these will receive a **grade of zero on an assignment which will result in an F** for the course and a letter will be sent to the head of the CS Department. Identical programs will be treated as copying even with cosmetic changes.

Term Paper:

- Each student will be required to submit a typed term paper. The paper must **explore how well your programs have met our objectives to become object oriented programmers! Discuss how the designs or your assignments met the criteria set out for OOP, and how they can be improved.**
- The paper must be a minimum length of 4 pages and a maximum of 7 pages (double spaced, 12 point font) of text. This does not include the cover sheet, table of contents or reference pages.
- If you have tables or sample code, they MUST be attached as exhibits and should not be part of the 4-7 page count.
- Your term paper should be done using **Word** or plain text. You may submit a pdf if other word processors are used.

Exams:

- Quizzes combined are 25% of your grade
- The Final Exam is 40% of your grade
- **In emergency situations, makeup exams can be proctored through the testing services center and cost students a fee ($10).** To make arrangements with the testing center you must first get authorization from your teacher, then set up an appointment with the testing center, which then is followed by communicating the date/time of the exam to your teacher so that they can get the testing center an exam. *Do not assume that the testing center will be available to be used (except in emergency situations).*

- **It is against department policy to give final exams early (no exceptions!). Exams will all be closed book, closed notes.**

Administrative and Grading Policies

Demonstrate Proficiency in C++ - Midterm Demo - Final Demo	Pass/No Pass	At PSU or by Proctor (must pass both demos)
Lab Participation - Prelabs - Lab Code Submitted	Pass/No Pass	Pre-labs and Lab code (1 lab may be missed without a makeup)
Individual Assignments - Term Paper - 5 Written Designs - 5 Programming Projects	35%	Submit to D2L Dropbox (All designs, programs, and papers must be submitted and each receive a passing score)
Quizzes	25%	At PSU or by Proctor (On average, must receive 65% to pass CS202)
Comprehensive Final Exam	40%	At PSU or by Proctor ***** Must receive a Passing score of 65% to pass the class *****

- For C or better in this class, you must receiving a PASS on all of the Pass/No pass components of this class (see the chart above)

- All 5 programs, design write-ups, term paper, averaged quizzes **and final** must receive passing scores to pass the class.

- Failure to turn assignments on-time or within the allowed late period will result in a zero for that assignment. Assignments will not be accepted after 1 week late. ***There are no exceptions.*** Assignments will not be accepted after the last day of class.

- **GRADING** will be done near 90% (A-, A), 80% (B-, B, B+), 65% (C). A No pass on the proficiency demos or a failure to turn in an assignment will result in a non-passing grade (F, D-, D, D+). However, exact break points for grades will depend upon the overall class results. For P/NP grade option, a "pass" grade requires an overall class grade of at least a C.

- **No Basis for a Grade** – A no basis for a grade in this class only applies when a student has not turned in any work, not taken any exams, and have not participated on D2L. If you have complications and cannot finish the class, make sure to drop or withdraw. *Otherwise you will get a grade in the class.*

- **INCOMPLETES** will be given only when a minimal amount of work remains to be completed, only for a valid reason and only for a fixed time period. Do not expect an incomplete in this class.

CHEATING: Each student is expected to submit only original work. **Any person who violates these requirements will receive a grade of zero for an assignment which based on the above grade requirements will result in an F for the course.** A letter will be sent to the head of the CS Department.

Students will receive a zero on an assignment if any of these activities take place:

1. Student provides proficiency demo questions to other students
2. Student provide proficiency demo solutions to other students
3. Student solicits (asks for) proficiency demo questions and/or solutions from other students
4. Student accepts an assignment and/or program from another student
5. Student supplies an assignment and/or program to another student
6. Student posts the assignment and/or program on the web, social networking site, or D2L discussions
7. Student shares their password with another student at PSU giving that student access to their assignments and/or programs
8. Students work together on assignments and turn in the same and/or similar assignments.
9. Student turns in work that was obtained from other sources such as the web, friends, tutors or TA's.
10. Student leaves work available for others to copy from
11. Student attempts to purchase programs from others (in person or electronically).

The work you submit must be your own. It is not acceptable to hand in assignments in which substantial amounts of the material was done by someone else. You must be especially careful that in the process of discussing problems with other students that they do not inadvertently end up using your work. In such an event, all students involved will receive a zero on that assignment.

Be careful when seeking help from others. You should seek help from (a) instructor, (b) TA's, and (c) Tutors. We are here to work with you – either in person or remotely. But, beyond this be careful. Do not to share your code with others! ***Never*** **post your code in the D2L discussions, the web, or social networking sites.** ***Never*** **give your assignments to any other PSU students, regardless of their situation.** ***Never*** **email your code to anyone except your instructor. Performing any of these actions will result in a ZERO grade on that assignment.**

Try to Exceed my Expectations!