UNIVERSITY OF CALIFORNIA, MERCED

BERKELEY · DAVIS · IRVINE · LOS ANGELES · MERCED · RIVERSIDE · SAN DIEGO · SAN FRANCISCO

SANTA BARBARA · SANTA CRUZ

CSE165: Introduction to Object-Oriented Programming Syllabus

Semester	Fall 2020
Instructor	Dr. Angelo Kyrilov (akyrilov@ucmerced.edu)
Teaching Assistants	Abhilasha Dave (adave4@ucmerced.edu) Shubham Rohal (srohal@ucmerced.edu)
Designation	Introduction to Object-Oriented Programming
Catalog Description	This course covers object-oriented programming concepts, such as classes, objects, methods, interfaces, inheritance, encapsulation, and polymorphism. While the goal of the course is to teach students how these concepts can be implemented in C++, significant emphasis is put on object-oriented modeling and design techniques
Textbook	No prescribed textbook. All course materials distributed during class.
Course Objectives & Learning Outcomes	At the end of the course, students will be able to: • create programs in Linux using the gcc compiler and makefiles; • learn about cross-platform development; • apply standards and principles to write truly readable code; • write clean programs without memory leaks; • test and debug programs; • learn the fundamentals of input and output using C functions and the C++ templated classes; • develop the needed objects and data structures to solve a given computation problem; • understand and demonstrate the concepts of object-oriented design, polymorphism, interface, inheritance, and templates; and • apply object-oriented design in the development of implementation projects

Program Learning Outcomes

Students who complete this course will posses:

- Ability to apply knowledge of computing and mathematics appropriate to the discipline;
- ability to analyze a problem and identify the computing requirements appropriate for its solution;
- ability to design, implement and evaluate a computer-based system, process, component or program to meet desired needs;
- ability to apply mathematical foundations, algorithmic principles and computer science theory to the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.

Prerequisites

CSE 100

Course Policies

Due to the Project-Based Learning nature of the course, students are expected to have access to a laptop computer at all times in order to complete practical exercises and work through course materials, both in and out of class.
Students are expected to attend all lectures. Synchronous attendance is preferred since students will be able to interact with the instructor in real time. Accommodations for asynchronous attendance will be made, by providing a video recordings of each lecture.
In addition, students are also expected to attend weekly laboratory exercises to put concepts covered in classes into practice, with the help of a Teaching Assistant.

Course Outline

Week 0: Aug 26 - Aug 30

- *No labs this week due to start of semester*
- Introduction to the course

Week 1: Aug 31 - Sep 6

- Setting up the development environment
- Linux command-line
- The C++ language

Week 2: Sep 7 - Sep 13

- *No lecture on Monday, Sep 7 due to Labor Day*
- More C++

Week 3: Sep 14 - Sep 20

- Introduction to OpenGL
- Building simple graphical apps in 2D

Course Outline

Week 4: Sep 21 - Sep 27

- Data abstraction
- Encapsulation

Week 5: Sep 28 - Oct 4

- Initialization of objects
- Copy constructors

Week 6: Oct 5 - Oct 11

- Pointers and references
- Dynamic object creation

Week 7: Oct 12 - Oct 18

- *No labs this week due to midterm*
- Midterm preparation
- Midterm (details TBD due to remote instruction)

Week 8: Oct 19 - Oct 25

- Function overloading
- Default parameters
- Operator overloading

Week 9: Oct 26 - Nov 1

- Code reuse
- Composition
- Inheritance

Week 10: Nov 2 - Nov 8

- Polymorphism
- Virtual functions

Week 11: Nov 9 - Nov 15

- *No lecture on Wednesday, Nov 11 due to Veterans Day*
- Introduction to backend development in C++

Week 12: Nov 16 - Nov 22

- Creating RESTful APIs

Week 13: Nov 23 - Nov 29

- *No lecture on Wednesday, Nov 25 due to Thanksgiving*
- *No labs this week due to Thanksgiving*
- Hash tables

Week 14: Nov 30 - Dec 6

- Putting it all together
- Creating online multiplayer games or multi-user apps

Course Outline

Week 15: Dec 7 - Dec 11

- *No labs this week due to end of semester*
- Review of material
- Preparation for final
- Final projects due

Academic Integrity Policy

Academic integrity is the foundation of an academic community. Academic integrity applies to research as well as undergraduate and graduate coursework. Academic misconduct includes, but is not limited to cheating, fabrication, plagiarism, altering graded examinations for additional credit, having another person take an examination for you, or facilitating academic dishonesty or as further specified in this policy or other campus regulations.

Cheating is the unauthorized use of information in any academic exercise, or another attempt to obtain credit for work or a more positive academic evaluation of work through deception or dishonesty. Cheating includes, but is not limited to: copying from others during an examination; sharing answers for a take-home examination without permission; using notes without permission during an examination; using notes stored on an electronic device without permission during an examination; using an electronic device to obtain information during an exam without permission; taking an examination for another student; asking or allowing another person to take an examination for you; tampering with an examination after it has been corrected, then returning it for more credit than deserved; submitting substantial portions of the same academic work for credit in more than one course without consulting the second instructor; preparing answers or writing notes in a blue book before an examination; falsifying laboratory, or other research, data or using another persons data without proper attribution; allowing others to do the research and writing of an assigned paper (for example, using a commercial term paper service or downloading a paper from the internet); and working with another person on a project that is specified as an individual project.

Plagiarism refers to the use of anothers ideas or words without proper attribution or credit. This includes, but is not limited to: copying from the writings or works of others into one's academic assignment without attribution, or submitting such work as if it were one's own; using the views, opinions, or insights of another without acknowledgment; or paraphrasing the ideas of another without proper attribution. Credit must be given: for every direct quotation; when work is paraphrased or summarized, in whole or in part (even if only brief passages), in your own words; and for information which is not common knowledge. The requirement to give credit applies to published sources, information obtained from electronic searches, and unpublished sources.

Collusion is when any student knowingly or intentionally helps another student to perform any of the above acts of cheating or plagiarism. Students who collude are subject to discipline for academic dishonesty. No distinction is made between those who cheat or plagiarize and those who willingly facilitate cheating or plagiarism.

Cheating vs. Collaboration: Collaboration is a very good thing. On the other hand, cheating is considered a very serious offense. Please don't do it! Concern about cheating creates an unpleasant environment for everyone. If you cheat, you risk losing your position as a student in the college. The school's policy on cheating is to report any cases to the university judicial office. What follows afterward is not fun. So how do you draw the line between collaboration and cheating? Here's a reasonable set of ground rules. Failure to understand and follow these rules will constitute cheating and will be dealt with as per university guidelines.

Simpson's Rule: This rule says that you are free to meet with a fellow student(s) and discuss assignments with them. Writing on a board or shared piece of paper is acceptable during the meeting; however, you should not take any written (electronic or otherwise) record away from the meeting. This applies when the assignment is supposed to be an individual effort or whenever two teams discuss common problems they are each encountering (inter-group collaboration). After the meeting, engage in a half-hour of mind-numbing activity (like watching an episode of the Simpsons), before starting to work on the assignment. This will assure that you can reconstruct what you learned from the meeting, by yourself, using your brain.

Freedom of Information Rule: To assure that all collaboration is on the level, you must always write the name(s) of your collaborators on your assignment.

Computer Science Department Academic Honesty Policy

As stated in the campus-wide Academic Honesty Policy (AHP), "academic integrity is the foundation of an academic community". Accordingly, the CSE faculty takes this matter very seriously and has embraced a zero tolerance on this matter. The process described in the following establishes the minimum consequences for violations of the AHP in CSE courses, but repercussions may be more severe for egregious violations. The Computer Science Department Policy on Academic Honesty ("CSE Policy" from now onwards), does not substitute the AHP but rather specifies how it will be implemented when students enrolled in classes offered by the Computer Science and Engineering (CSE) department are found in violation of the AHP. In particular, the CSE Policy defines how the CSE faculty implements the "Instructor-Led Process" described in AHP 802.00.A. This policy and the associated processes have been developed in collaboration with the Office of Student Conduct and the School of Engineering and is jointly implemented by the CSE Faculty, the School of Engineering, and the Office of Student Conduct. The CSE Policy becomes effective starting from the Fall 2019 term.

Preamble

Computer science education relies on a variety of methods to assess students' preparation and learning. The term "assignment" shall be interpreted as any method or process resulting in a grade or contributing to the final grade for a class. Accordingly, the term "assignment" used in the following includes, but is not limited to: homeworks, quizzes, in-class exams, take-home exams, programming assignments, software projects, and presentations.

Shared Responsibility

Maintaining an environment where academic integrity is valued and enforced requires commitments by both instructors and students. Instructors will specify what type of collaboration is allowed or disallowed for a given assignment, and students should strictly follow the provided guidelines. When in doubt, students should contact the instructor and ask for clarification.

First Infraction

If it is determined that a student has cheated, plagiarized, or otherwise violated the AHP, the student will receive a 0 (or equivalent grade) for the assignment. As per the AHP, violations will be reported to the Dean of the School of Engineering and the Office of Student Conduct for review of possible violations of the Code of Student Conduct.

Additional Infractions

The School of Engineering keeps a record of all infractions reported by its faculty. If upon receiving a notification it is determined that the student has one or more prior violations of the AHP, the School will inform the instructor who reported the new violation. The additional violation will immediately lead to a failing grade (F) for the course. The student will be informed in writing and will not be allowed to withdraw from the class. According to CSE Policy, students should note that even the first infraction in a class may lead to a failing grade if after reporting it is determined that the student had been previously sanctioned for one or more infractions in other classes. Students will have the right to appeal the instructor's decision as per AHP 802.00.A.

Class/Laboratory Schedule

Lectures: Monday/Wednesday 10:30 am - 11:45 am, remote instruction only

Labs: See your lab section in your schedule, remote instruction only

Important Dates

Midterm Examination - Wednesday Oct 14, 10:30 am - 11:45 am, Details TBD

Final Examination - Friday Dec 18, 3:00 pm - 6:00 am, Details TBD

Grading Policies

There will be no curved grading of any kind in this class.
There will be no extensions given for work not turned in on time.
Course grades will be calculated as follows:

Lab assignments	30%
Midterm (exam/project)	30%
Final (exam/project)	40%