

Syllabus

CSCI 202: Object-Oriented Programming

Course Information

Instructor:	Jerad DeVries
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Phone:	1-715-394-8275
Office:	SWEN 3032; Virtual office (use Firefox): see link in canvas.
Office Hours:	MWF 2pm - 2:50, Tu 1pm - 2:50 (online only), or by appointment
Course:	CSCI 202-E1: Object-Oriented Programming
Term:	Spring 2024
Mode of Delivery:	Online
Credits:	3

Course Description

Continuation of CSCI 201. Programming course emphasizing the methodology of programming from an object-oriented perspective and software development principles. Topics include: data structure fundamentals; exception handling; abstraction and encapsulation; inheritance and polymorphism; pointer and reference variables; memory management, operator overloading, concurrent programming; various important algorithms; and file processing techniques.

Prerequisites

Prerequisite for taking this course is having completed CSCI 201 with a grade of C- or better.

Learning Outcomes

Computer Science Learning Outcomes

- Applies an appropriate formal process (or formal language) to write a solution to a given problem and to evaluate the validity and effectiveness of a given written solution.
- Solves multipart problems by performing appropriate analysis and complex calculations.
- Understands and effectively utilizes both high- and low-level programming concepts and languages.

University Learning Outcomes

- Students will clearly express themselves to achieve a purpose
- Students will articulate important questions, theories, and creative processes
- Students will analyze information to answer specific questions

Course Objectives

Upon successful completion of this course, a student will be able to analyze and solve complex problems using:

- Object-oriented aspects in Java and C++
- Several standard data structures
- Inheritance and Polymorphism
- Exceptions in Java and C++
- Basic concurrent programming in Java
- File processing
- Pointers and memory management in C++
- Generic programming using C++ templates

Experiential learning

Students will engage in experiential learning by working on programming exercises on the computer which includes completing labs and doing programming assignments in their homeworks. Students will reflect on their completed work by either comparing their solutions to the instructor's solutions and/or reviewing instructor feedback and asking the instructor any questions they may have about their work.

Course Material









Textbooks

There are no required textbooks for this course. The following is a list of suggested textbooks:


- Introduction to Java™ Programming and Data Structures, Comprehensive Version (12th edition)
Author: Y. Daniel Liang
ISBN-13: 978-0136520238
- The C++ Programming Language (4th edition)
Author: Bjarne Stroustrup
ISBN-13: 978-0321958327

Software

- Operating System:
 - Recommended: GNU/Linux (suggested distros: Debian, Trisquel) **or**

- Microsoft Windows 10 or higher **or**
- MacOS
- Web Browser:
 - Firefox web browser (download <http://www.mozilla.org/en-US/firefox/new/> 
(<http://www.mozilla.org/en-US/firefox/new/>)
- Java IDE:
 - IntelliJ IDEA Community Edition (download: <http://www.jetbrains.com/idea/download> 
(<http://www.jetbrains.com/idea/download>)
 - Make sure to download the Community Edition, not the Ultimate Edition.
- Java Development Kit:
 - Liberica Full JDK (this includes JavaFX) either version 20 or version 17.
 - This can be downloaded in IntelliJ (this is the preferred option). Make sure you download version 20 and not version 21. Alternatively you may download version 17 at the following link: <https://bell-sw.com/pages/downloads/#/java-17-current> 
(<https://bell-sw.com/pages/downloads/#/java-17-current>)
 - Make sure to download the Full JDK and not the Standard JDK.
- C++ development tools:
 - (These are provided on the GNU/Linux server. Instructions on how to download these for your own computer will be given in class)
 - GNU Emacs (download: <https://www.gnu.org/software/emacs/download.html> 
(<https://www.gnu.org/software/emacs/download.html>)
 - GNU C++ compiler (g++) (C++11 or later)
 - GNU Debugger (gdb)
- Tools for communicating with the course GNU/Linux server:
 - **If you are using GNU/Linux or MacOS**
 - FileZilla client (download: <http://filezilla-project.org/download.php?type=client> 
(<http://filezilla-project.org/download.php?type=client>)
 - openSSH client (using the ssh command)
 - **If you are using Microsoft Windows**
 - WinSCP (download: <http://winscp.net/eng/download.php> 
(<http://winscp.net/eng/download.php>) **or**
 - FileZilla client (download: <http://filezilla-project.org/download.php?type=client> 
(<http://filezilla-project.org/download.php?type=client>)
 - Putty (download: <http://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html> 
(<http://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html>)

Canvas

To access this course on Canvas (<https://www.uwsuper.edu/learn/index.cfm> 
(<https://www.uwsuper.edu/learn/index.cfm>), students need access to the Internet and a supported

Web browser. You log in to Canvas with the same user name and password as your campus email address. Once logged in to Canvas, you will see the course listed on the Dashboard; click on the title to enter the course.

Course server (GNU/Linux server)

For C++ development students can either install and run the software on their own personal computer, or they can use the software set up on the GNU/Linux server. Each student will be set up with an account on the server. More instructions will be given in class on how to access and use the server.

Assessment and Grading

Course Grade

Each student will receive a calculated grade. A student's final grade at the end of the course will not be worse than their final calculated grade. A student may receive a better final grade than their final calculated grade. This is determined by the instructor based on how the class does overall and how the student does individually.

Categories and

Weights for

Calculated

Grade

Category	Weight
Discussions	5%
Labs	8%
Homeworks	37%
Midterm Exam	25%
Final Exam	25%

Grading Scale for

Calculated Grade

Letter Grade	Percent Range
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S+	Above 100%
S	[97%, 100%]
A	[93%, 97%)
A-	[89%, 93%)
B+	[85%, 89%)
B	[82%, 85%)
B-	[78%, 82%)
C+	[74%, 78%)
C	[71%, 74%)
C-	[67%, 71%)
D+	[63%, 67%)
D	[60%, 63%)
D-	[56%, 60%)
F	Below 56%

The official gradebook will be posted in Canvas.

A letter grade higher than an A will be mapped to an A on your official record.

Course Policies and Procedures

Communication Policy

Your UW-Superior email account is the official form of contact between you and your instructor.

Please check your UW-Superior email account daily.

Assignments will be posted in canvas. It is expected that students check Canvas daily and are aware when a new assignment is posted an when it is due.

Homeworks and Labs

Homework and lab assignments will be posted in Canvas. It is expected that students check Canvas daily and are aware when a new assignment is posted and when it is due. The distinction between labs and homeworks in this course is as follows: labs are lower stake assignments that are weighted less heavily than homeworks (see the "Categories and Weights for Calculated Grade" table above), and written instructor feedback will be given for graded homeworks but not for labs. If a student would like feedback on a graded lab, they are encouraged to meet with the

instructor outside of class. Homework and lab questions should be brought to your instructor.

Late homeworks will be accepted up to two days late with a 5% reduction in score. After that students will NOT be allowed to turn in late work unless arrangements have been made with the instructor. Group work for labs (but not for homeworks and exams) is allowed. However, after a joint design of the task the students are required to separate and repeat this work individually without referring to the designed prototype. It is expected that all assignments submitted for grading are noticeably different.

Discussions


Each week (except for weeks with exams and when otherwise specified) there will be a discussion question/prompt in canvas. To receive credit for the discussion assignment, a student must successfully make a post (or posts) in canvas answering the question/prompt before it is due.

Exams

Exams are to be done strictly individually. Students are not allowed to use online help, nor are students allowed help from other people, nor are students allowed to discuss the exam questions with anyone. If a student believes there is a mistake on an exam, then the student is to contact the instructor about this. Interpretation of exam questions must be done by the student taking the exam.

If a student is going to miss an exam, arrangements to take the exam **MUST** be made with the instructor prior to the absence. If the student does NOT communicate and make arrangements prior to the absence, the student will NOT be allowed to make-up the missed exam.

Office hours

Office hours will be available to students in both in-person and virtual formats (see course information near the top of the syllabus for days and times). In-person office hours will be held in SWEN 3032. Virtual office hours will be held at the office hours link given in canvas. To access the site for virtual office hours you will need an internet connection and the [Firefox](https://www.mozilla.org/en-US/firefox/new/)  [\(https://www.mozilla.org/en-US/firefox/new/\)](https://www.mozilla.org/en-US/firefox/new/) web browser (note, web browsers other than Firefox will likely not work with the site, so please only use Firefox). When connecting to the site for the first time, your web browser may complain about the site not being secure, which is perfectly fine. This site is not actually a security risk. Please tell your web browser to proceed.

Policy on Artificial Intelligence

You are not allowed to use artificial intelligence on any of your assignments in this course (this includes exams). Using artificial intelligence in this course is considered **academic misconduct** and is strictly prohibited. The work you turn in must be your own original work.

Diversity and Inclusion at UW-Superior

Diversity and inclusion is integral to the educational mission of the University of Wisconsin-Superior. As a community we commit to recognize, include and value inherent worth and dignity of each person; foster tolerance, sensitivity, understanding, mutual respect, and justice among its members; and encourages each individual to strive to reach their own potential. The institution recognizes these experiences are crucial for developing the requisite skills to thrive as a member of a pluralistic society and as a responsible global citizen.

In pursuit of its goal of inclusive excellence, the University actively seeks to attract students, faculty, and staff from diverse backgrounds and life experiences, including but are not limited to: race, ethnicity, sex, gender identity, gender expression, sexual orientation, age, socio-economic background, cognitive ability, physical ability, religion and spirituality, value system, national origin, immigration or refugee status, veteran status, and political beliefs.

The University believes that diversity among its members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life. The University of Wisconsin-Superior views, evaluates, and treats all person in any University related activity or circumstance in which they may be involved, solely as individuals.

For more information about Equity, Diversity and Inclusion and/or to report bias, discrimination or harassment, please email edi@uwsuper.edu (<mailto:edi@uwsuper.edu>) or call 715-394-8015.

Policies and Practices to Help Your Learning and Growth

The University of Wisconsin-Superior is dedicated to a safe, supportive and nondiscriminatory learning environment. It is the responsibility of all undergraduate and graduate students to familiarize themselves with University policies regarding special accommodations, academic misconduct, religious beliefs accommodation, discrimination and absence for University-sponsored events.

Please review the Student Information provided in Canvas.

This includes policies and information related to:

- **Student characteristics**, including policies and services related to those who are active military/veterans, those who are pregnant or expecting new family members, and students

seeking services for differing abilities and accommodations student services, and others.

- **Academic integrity**, including information on plagiarism and steps that an instructor can take.
- **Campus policies**, including how to sign up for Safe Alerts, information on course evaluations, process for submitting a formal grievance regarding academics and/or discrimination, and others.

Other Course Policies, Procedures and Comments

- The instructor retains the right to make any and all deletions, additions and changes to the requirements or structure of the course and its materials as deemed necessary by the instructor.
- Representing someone else's work as your own without referencing or permitting another student to do so with your work is **academic misconduct** and is strictly prohibited in this course.

Tentative Course Schedule

Week	Topics	Day		Assignments and Notes
1	Review of class design in Java; Basics of Object-Oriented Programming	W	Jan 24	Week 1 Discussion assigned
		Th	Jan 25	Lab1 assigned
		F	Jan 26	Week 1 Discussion due
2	Continue Basics of Object-Oriented Programming	M	Jan 29	Week 2 Discussion assigneed
		W	Jan 31	
		Th	Feb 1	Lab1 due; Hw1 assigned
		F	Feb 2	Week 2 Discussion due
3	Inheritance and Polymorphism in Java; Drawing in JavaFX; Abstract classes (and Abstract Data Types)	M	Feb 5	Week 3 Discussion assigned
		W	Feb 7	

		Th	Feb 8	Hw1 due; Lab2 assigned; Hw2 assigned
		F	Feb 9	Week 3 Discussion due
4	Some more on Inheritance and Polymorphism in Java; Casting objects; Interfaces; Deep comparison and deep copying in Java	M	Feb 12	Week 4 Discussion assigned
		W	Feb 14	
		Th	Feb 15	Lab2 due; Hw2 due; Hw3 Part 1 assigned
		F	Feb 16	Week 4 Discussion due
5	Deep comparison and deep copying in Java continued; Concurrent programming	M	Feb 19	Week 5 Discussion assigned
		W	Feb 21	
		Th	Feb 22	No new assignment
		F	Feb 23	Week 5 Discussion due
6	Finish concurrent programming; Exception handling; Files and Streams in Java; Additional topics if time permits (such as recursion topics not covered in CSCI 201)	M	Feb 26	No Week 6 Discussion
		W	Feb 28	
		Th	Feb 29	Hw3 Part 2 assigned
		F	Mar 1	
7	Midterm Exam; C++ Basics	M	Mar 4	Review for Midterm Exam
		W	Mar 6	

		Th	Mar 7	Hw3 Parts 1 & 2 due; No Lab3; Lab4 assigned; Hw4 assigned
		F	Mar 8	Midterm Exam
Spring Break				
8	C++ Basics continued; Basics of C++ classes	M	Mar 18	Week 8 Discussion assigned
		W	Mar 20	
		Th	Mar 21	Hw4 due; Lab4 due; Lab5 assigned
		F	Mar 22	Week 8 Discussion due
9	Basics of C++ classes continued; Statically allocated arrays; C++ string and C-style strings	M	Mar 25	Week 9 Discussion assigned
		W	Mar 27	
		Th	Mar 28	Lab5 due; Hw5 assigned
		F	Mar 29	No class
10	More on C++ classes; Pointers; Arrays as pointers; Dynamically allocated data; Debugging	M	Apr 1	Week 9 Discussion due Week 10 Discussion assigned
		W	Apr 3	
		Th	Apr 4	Hw5 due; Lab6 assigned
		F	Apr 5	

11	Dynamically allocated arrays; Memory management; C++ templates; Linked Lists	M	Apr 8	Week 10 Discussion due; Week 11 Discussion assigned
		W	Apr 10	
		Th	Apr 11	Lab6 due; Lab7 assigned
		F	Apr 12	Week 11 Discussion due
12	Linked Lists continued; Abstract Data Types; Stacks and Queues; Trees; Algorithms for searching trees	M	Apr 15	Week 12 Discussion assigned
		W	Apr 17	
		Th	Apr 18	Lab7 due; Hw6 assigned
		F	Apr 19	Week 12 Discussion due
13	Exception handling in C++; Operator Overloading; Copying and Moving in C++	M	Apr 22	Week 13 Discussion assigned
		W	Apr 24	
		Th	Apr 25	Continue working on Hw6
		F	Apr 26	Week 13 Discussion due
14	Copying and Moving in C++ continued; Inheritance in C++; Virtual and pure virtual functions; Multiple inheritance; The diamond inheritance problem and solving it with virtual inheritance	M	Apr 29	Week 14 Discussion assigned
		W	May 1	
		Th	May 2	Hw6 due; Hw7 assigned

		F	May 3	Week 14 Discussion due
15	The diamond inheritance problem and solving it with virtual inheritance continued; Casting in C++; Vectors; Additional topics if time permits (such as the Standard Template Library, Template specializations, etc.); Review for Final Exam	M	May 6	Week 15 Discussion assigned
		W	May 8	
		Th	May 9	Continue working on Hw7
		F	May 10	Week 15 Discussion due
16	Final Exam Week	M	May 13	Hw7 due
		Th	May 16	Final Exam
17		Th	May 23	Final grades given