CPSC 421 Object-Oriented Programming Spring 2026

Section 010 Tuesday and Thursday 2:00 - 3:15 pm Arts & Sciences (CAS) 136

Instructor: Dr. Michael L. Collard
Homepage: mlcollard.net
Email: collard@uakron.edu
Office: Arts & Sciences (CAS) 228
Mailbox: Arts & Sciences (CAS) 221
Phone: (330) 972-7191
Office Hours: Available on the instructor's homepage. Other times are by appointment.

Course Description The design and development of software systems, covering abstraction, encapsulation, class inheritance, polymorphism, modeling, physical design, and architecture to build reliable and maintainable systems.

The course primarily uses C++ but may include principal features in other popular languages.

Learning Objectives Students who complete the course can:

- Describe how classes and other user-defined types support abstraction
- Apply encapsulation to hide implementation details
- Create classes to represent both concrete and abstract entities
- Explain subtype and implementation inheritance and appropriate uses
- Explain dynamic dispatch through virtual functions
- Demonstrate the ability to use functional abstractions (e.g., lambda expressions) with generic algorithms and reactive frameworks
- Create design models to represent existing systems
- Explain the principles of good design
- Apply principles of good cohesion and coupling to program design
- Compare design pattern solutions

Prerequisites Minimum C- in CPSC 210 CS II **Credits** 3

Textbook
A Tour of C++ 3rd Editon by Bjarne Stroustrup, Addison-Wesley Professional, 2023, ISBN: 9780136823544

Grading

Exercises	10%
Projects	40%
Midterm	25%
Final	25%
	100%

A	≥ 93%	C	≥ 73%
A-	≥ 90%	C-	≥ 70%
B+	≥ 87%	D+	≥ 67%
B	≥ 83%	D	≥ 63%
B-	≥ 80%	D-	≥ 60%
C+	≥ 77%	F	

Exercises Exercises are an essential part of understanding the material in the course. Exercises occur in almost every class period and are 10% of the overall score. They include crosswords, forms, and coding. In general, they are due the next day after the class period. Access to a laptop during class will allow you to complete some coding exercises in class. You are expected to finish all parts of an exercise, so the grading of exercises is strict.

Projects At least 5 projects are assigned and collectively are 40% of the overall score. Projects include both implementation in source code and design using modeling languages such as UML. Grades for the projects are based on correctness, readability, style, quality, and the application of concepts taught in the course.

The projects involve extensive programming. Successful completion of the projects requires consistent and iterative work. This means starting the projects immediately and working on them throughout the assignment. Waiting until the last minute will lead to unavailable support, subpar work, and lower grades.

Midterm The Midterm Exam is 25% of the overall score. It occurs after the 8th week of the semester, with the specific date announced at least one week before.

Final Exam The Final Exam is in the regular classroom on the day/time determined by the University and is worth 25% of your overall score. Consult your schedule in "My Akron" for the exact day/time.

General Policies Attendance during class meeting times is required. Since class meetings start with general announcements, arriving in the classroom by the beginning of class is necessary to gain the full benefit.

The course involves exercises often conducted during class. Full credit requires attendance.

Class instruction uses various presentation methods, including instructor notes, interactive web pages, and writing on the board. The instructor may also enter examples and discuss them during class. Attendance is necessary for a complete understanding of the material.

Any source code created for this course must be committed to a GitHub Classroom Git repository. The code must appear in the proper repository for credit.

Late assignments require a valid excuse so that work can be graded and returned promptly. It is up to the student to make up any missed material. Make-ups of any work for this class are given only with an excused absence or a documented, valid emergency. I encourage you to contact me if an emergency arises.

Only students whose names are on the University's official 15-day class list can attend class. For specific dates and policies regarding course withdrawal, consult university information.

Academic Honesty All submitted work (exercises, projects, and tests) must be your own. Submission of work that is even partly not yours results in a report to the *Office of Student Conduct and Community Standards*.

AI Policy AI tools (such as ChatGPT) are powerful tools that can be used to aid in the learning process. Students should look to their instructors for guidance on the fair and ethical use of AI tools for this course. The inappropriate or unethical use of such technologies will violate the Code of Student Conduct as cheating, plagiarism, fabrication, unauthorized collaboration, misrepresentation, and/or gaining an unfair advantage. The Code of Student Conduct is a University rule that provides the framework for the student conduct process at the University of Akron and defines student misconduct and the process that the University will use to address student misconduct reported to the Department of Student Conduct and Community Standards. Students at the University of Akron are responsible to know and abide by the Code of Student Conduct and all University rules, regulations, and policies.

In this course, students are welcome to use whatever AI tools might help them, however they like,

as much as they want. Students must know and abide by The University of Akron Code of Student Conduct.

The use of AI tools in software development is one of the first impactful utilization of this technology. However, these tools' output may often be incomplete, lack the necessary quality, or even fail in some instances. For instance, the code generated may not compile or may use non-existent features. It is the student's responsibility to compile and meticulously test the resulting code. This course emphasizes the process of software development rather than the actual act of writing the code.

Classroom Environment & Respect This class, as well as The University of Akron community, prohibits unlawful discrimination and harassment—including sexual harassment—on the basis of race, color, religion, sex/gender, sexual orientation, gender identity or expression, age, national origin, ethnicity, disability, pregnancy, parental or foster parent status, nursing status, military status, genetic information, or veteran status. Protected-class–based harassment is not tolerated and is investigated under university policy. More details can be found at the EEO/AA Office.

Special Notice Any student who feels she/he may need an accommodation based on the impact of a disability should contact the Office of Accessibility at 330-972-7928. The office is at 105 Simmons Hall.

The University of Akron is committed to providing an environment free of all forms of discrimination, including sexual violence and sexual harassment. This includes instances of attempted and/or completed sexual assault, domestic and dating violence, gender-based stalking, and sexual harassment. Additional information, resources, support and the University of Akron protocols for responding to sexual violence are available at uakron.edu/Title-IX.