

# CPSC 421 Object-Oriented Programming (OOP) Spring 2023

Section 020 14266 Tuesday and Thursday 2:00 pm - 3:15 pm Arts & Sciences (CAS) 134

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**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 3460:210 CS II **Credits** 3

## Textbook

*A Tour of C++* by Bjarne Stroustrup, Addison-Wesley Professional, June 2018, ISBN: 9780134998053

<b>Grading</b>	Exercises	10%	A	≥ 93%	C	≥ 73%
	Projects	40%	A-	≥ 90%	C-	≥ 70%
	Midterm	25%	B+	≥ 87%	D+	≥ 67%
	Final	25%	B	≥ 83%	D	≥ 63%
		100%	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 during class. You are expected to finish all parts of an exercise, so the grading of exercises is strict.

**Projects** At least 4 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. Project grades include correctness, readability, programming style, quality of design, and application of the concepts presented in the course.

The projects involve extensive programming. Successful completion of the projects requires consistent and iterative work. This means starting on the projects immediately and working on them throughout the assignment period. Waiting until the last minute will lead to poor work, lack of support, and poor 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 May 4, 2:30 - 4:30 pm and is worth 25% of your overall score.

**General Policies** Class instruction uses a variety of sources, including web sources and the instructor's notes. During class, examples may be entered by the instructor and discussed.

Any source code created for this course is committed to a Git repository created through GitHub Classroom. For credit, the source code must appear in the proper repository.

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

Students whose names are not on the University's official 15-day class list are not permitted to participate in the class. Consult University information for specific dates and policies regarding the withdrawal policy.

**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*.

**COVID-19 Policies** The COVID-19 pandemic is still present and serious. Before entering class, you should have completed your daily health assessment. You should not come to class if you fail your health check or feel ill. At that time, I also ask you notify me that you will be absent. When campus policies require masks to be worn indoors, all students are required to wear a mask during in-person classes. While you are in class on campus, you are required to: always cough or sneeze into your elbow or a tissue and adhere to other public safety protocols and directives for your specific classroom/lab/studio. Students who do not follow these health and safety requirements will be instructed to leave class immediately. Students who violate this protocol will need to leave the classroom and MAY be marked absent. Repeated violations of these health-saving protocols may lead to sanctions under the Student Code of Conduct up to and including suspension or expulsion. Current guidelines can be found at: [uakron.edu/return-to-campus](https://uakron.edu/return-to-campus).

**Diversity Policy** This class, as well as the broader University of Akron community, respects diversity and strives for equity and inclusion of all students. Diversity includes how we as individuals identify along the lines of race, color, religion, sex, sexual orientation, gender identity or expression, age, national or ethnic origin, citizenship status, disability, status as a parent during pregnancy and immediately after the birth of a child, status as a parent of a young child, status as a foster parent, military status, genetic information, or status as a veteran. Inclusion and respect for diversity make the classroom and the larger community stronger and foster dialogue and democratic decision-making. As part of ensuring this class is a safe space for all students, please avoid use of negative stereotypes and insensitive or hateful statements toward groups of people.

Please respect your classmates' pronouns. Each of us is responsible for creating a safer, more inclusive environment. If you feel there is something I can do to make the classroom more inclusive, please let me know in person, via email, or by placing an anonymous note in my mailbox. For support services on campus, go to [www.uakron.edu/ie/lgbtq](http://www.uakron.edu/ie/lgbtq) or [www.uakron.edu/zipassist](http://www.uakron.edu/zipassist).

**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](http://uakron.edu/Title-IX)