

PURDUE UNIVERSITY

CS18000 – Problem Solving and Object-Oriented Programming

Fall 2024

Optional Text:

Start Concurrent: An Introduction to Problem Solving in Java with a Focus on Concurrency

By Barry Wittman, Aditya Mathur, and Tim Korb

Purdue University Press – 2014

ISBN-13: 978-1626710092

Online version: <http://start-concurrent.github.io/>

Note: The course slides are based on this book.

Prerequisites:

MA 16100, 16300, 16500, 16700 or other approved math courses (may be taken concurrently)

Course Outcomes:

A student who successfully fulfills the course requirements will understand:

- How to solve problems through analysis and algorithm design
- How to implement algorithms in a high-level programming language
- How to use data types and strings, selection, repetition, arrays, methods and classes, inheritance, exceptions, polymorphism, and recursion
- How to implement simple graphical user interfaces
- How to perform file I/O
- How to debug programs

Class Attendance:

You are expected to attend class and lab.

But, you should stay home if you feel ill. You should inform your Head TA of any illness or situation that will affect the submission of an assignment or the ability to take an exam. Only your Head TA can excuse a student from a course requirement or responsibility.

When conflicts can be anticipated, such as for many University-sponsored activities and religious observations, you should inform your Head TA of the situation as far in advance as possible.

For an unanticipated or emergency conflict, when advance notification to your Head TA is not possible, you should contact your Head TA as soon as possible by email. When the student is unable to make direct contact with the Head TA and is unable to leave word with the instructor's department because of circumstances beyond the student's control, and in cases of bereavement, quarantine, or isolation, the student or the student's representative should contact the Office of

the Dean of Students via email or phone at 765-494-1747. Our course Brightspace includes a link on Attendance and Grief Absence policies under the University Policies menu.

Preparation for Class:

You should read the slides and relevant material in your selected course text before class. Additionally, you are expected to check your email, Brightspace, and Ed Discussion regularly.

Tentative Lecture Schedule:

Topic	Concept
01	Introduction to Computer Science and Programming
02	Primitive Types and Strings
03	Selection
04	Repetition
05	Methods and Classes
06	Arrays
07	File I/O and Exception Handling
08	Interfaces and Inheritance
09	Concurrency Software Engineering: Working As A Team
10	Network I/O and Simple GUIs
11	Complex GUIs
12	Polymorphism, Dynamic Data Structures
13	Dynamic Data Structures
14	Recursion

Quizzes:

For quizzes we will use iClicker Cloud. You should get the iClicker Student app for your phone. Log in to iClicker Cloud using your Purdue Career Account login and password. Sign in through the campus portal "Purdue University West Lafayette/Indianapolis" and search for your section of CS 18000. Click the "Add This Course" button.

We will give two in-class quizzes each day:

2 points for the correct answer

1 point for an incorrect answer

0 points for not taking the quiz

Each day's lecture attendance is comprised of 2 questions and will be listed on Brightspace under Qnn where nn is the number of that day's class (such as Q01, Q02, etc.). The lowest 4 quiz scores will be excused. This can account for any personal excuses, sickness, or reasons you may need from being absent from lecture as we know unforeseen circumstances can come up which may prevent you from attending lecture.

During class students will be given 2 minutes to answer the iClicker Cloud question. Please be sure to input your answer during this time frame.

If an error prevents you from submitting your answer during these 2 minutes, you will need to present a time-stamped screenshot of your error or reason preventing you from doing so to your Head TA **at the end of the same class session. Emailing us after class is not a valid option.**

You can expect to see your quiz score updated on Brightspace by the end of the lecture day. Please check your grades frequently and immediately notify your Head TA if there are discrepancies. It is your responsibility to verify these grades are correct and to notify the Head TA within a timely manner (~1 week) of these being posted.

Missed quizzes cannot be made up. However, you may ask your Head TA to make you exempt from a day's quizzes if you have to miss class due to serious illness, broken leg, or some other situation beyond your control. You may also ask your Head TA for extensions on homework and project deadlines. Again, these will only be granted in the case of some significant situation beyond your control.

Homework:

A homework assignment will be released every lab. The homework will be due a week later at the start of lab. It will consist of a programming assignment and will be submitted to Vocareum through Brightspace.

Other important notes on homework:

- A homework assignment may be turned in late at a penalty of 10% per day late.
- If you feel you have a valid reason for not having your work done on time, then send your Head TA an email message before the assignment is due.
- Do not wait until the last minute.
- Down time and crashes of the computer network are not valid excuses for late or missed assignments.
- No credit will be given for programs that do not compile.

Projects:

Five projects will be released throughout the semester – four individual and one team project. For team projects, you may collaborate with only your teammates.

Other important notes on projects:

- Do not wait until the last minute.
- Down time and crashes of the computer network are not valid excuses for late or missed assignments.
- No credit will be given for programs that do not compile.

Examinations:

Midterm Exam 1 will be 8-10 pm, Monday, September 30.

Midterm Exam 2 will be 8-10 pm, Monday, October 28.

Questions and Answers:

Questions of general interest should be posted on Ed Discussion. Answers will be posted as soon as possible. Questions involving code or specific implementation details should be directed to a staff member, instead of a classmate. Answers will be sent to you directly. If you need to contact a specific TA or instructor, you may contact them via private message on Ed Discussion, via email, or by visiting during their office hours.

Grade Breakdown for CS 18000 Fall 2024

5% Class Quizzes

10% Homeworks

10% Individual Projects

Project 1: 2.5%

Project 2: 2.5%

Project 3: 2.5%

Project 4: 2.5%

15% Team Project

20% Midterm Exam 1

20% Midterm Exam 2

20% Final Exam

Incompletes:

A grade of incomplete (I) will be given only in unusual circumstances. To receive an “I” grade, a request must be submitted prior to the Sunday of the last week of classes and approved by the instructor. The request must describe the circumstances, along with a proposed timeline for completing the course work. Submitting a request does not ensure that an incomplete grade will be granted. If granted, you will be required to fill out and sign an “Incomplete Contract” form that will be turned in with the course grades. Any requests made after the course is completed will not be considered for an incomplete grade.

Makeup Policy:

Homework, projects, and exams cannot be made up unless there is an excused absence. Excused absences are given only for university-approved reasons. These include serious illness, family

emergencies, and official university commitments. In all cases, some form of evidence or documentation must be provided. If the absence is planned (band trips, course field trips, etc.), you must inform your instructor ahead of time.

Makeup Examination Policy:

Makeup exams will be given only in the most extreme circumstances and require certification for such circumstances, for example, a medical doctor's statement certifying that the student is unable to attend the scheduled exam. Any travel (including interview trips), load from work or from other classes, failed alarm clocks, or simply not being able to make it to the exam will not be grounds for a make-up. If you have any recurring medical problems that may unexpectedly prevent you from making it to class or exams, please obtain a doctor's statement certifying your circumstance.

Regrades:

Problems regarding grading of homework, projects, and exams must be resolved within **two weeks** after the grade has been published on Brightspace. You should contact your Head TA. It is your responsibility to obtain the graded work on time. **Grades will not be modified after the two-week period.**

Academic Integrity:

In CS 18000 this semester you will have 13 homeworks which will account for only 10% of your grade. Each homework is less than 1% of your grade. You will have four individual projects that also account for only 10% of your grade. Each project is only 2.5% of your grade. That means that the point value of any homework or project is quite small. We want you to use the homeworks and individual projects as a way to take what you have been taught in class and lab and be able to put it into practice in a program that you write. The most important thing is that you learn from these programs.

We suggest that the best way to learn is to write the program yourself. However, it is acceptable in CS 18000 for you to collaborate with one or more other students. You may talk about what you are doing and even create lines of code together that each of you turn in. Also, it is acceptable for you to use ChatGPT (or any other Generative AI tool). The best way to use ChatGPT is to ask it to teach you something such as "How do I use a switch statement?", "How do I write a text file?", or "How do I implement the ActionListener interface?" If in the course of using ChatGPT, you get some lines of code that you use in your program, that is allowed.

The critical thing is that in each program you submit, you **MUST** understand every line of code and know exactly what each statement does. The reason is that we are going to have two Midterm Exams and a Final Exam in CS 18000. On those exams you may be asked to write some code that is similar to or even nearly identical to what you have submitted for your homeworks or projects. So, you will need to make sure that you understand every statement that you submit so that you can do that yourself on an exam.

NOTE 1: You may not collaborate with other teams or use ChatGPT on the Team Project. The Team Project must be your own work.

NOTE 2: Most of the classes that you take at Purdue University will NOT allow you to collaborate with other students and will NOT allow you to use ChatGPT or any other Generative AI tools. Make sure that you know the rules for each class that you are taking.

Nondiscrimination Statement:

Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life.

Accessibility:

Purdue University strives to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let any of the course coordinators know so that we can discuss options. You are also encouraged to contact the Disability Resource Center at: drc@purdue.edu or by phone: 765-494-1247.

Mental Health Statement:

- If you find yourself beginning to feel some stress, anxiety, and/or feeling slightly overwhelmed, try [WellTrack](#), Sign in and find information and tools at your fingertips, available to you at any time.
- If you need support and information about options and resources, please see the [Office of the Dean of Students](#), for drop-in hours (M-F, 8am-5pm).
- If you are struggling and need mental health services, Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help and to speak with a clinician, contact Counseling and Psychological Services (CAPS) at (765)494-6995 or by going to CAPS' office on the second floor of the Purdue University Student Health Center (PUSH). For urgent situations after hours, on weekends and holidays, call (765)494-6995 to speak with a clinician. Please see the [CAPS website](#) for further information.

Emergency Preparation:

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Relevant changes to this course will be posted onto the course website or can be obtained by contacting the instructors or TAs via email or phone. You are expected to read your @purdue.edu email on a frequent basis.

Netiquette:

Your instructor and fellow students wish to foster a safe online learning environment. All opinions and experiences, no matter how different or controversial they may be perceived, must be respected in the tolerant spirit of academic discourse. You are encouraged to comment, question, or critique an idea, but you are not to attack an individual. Our differences, some of which are outlined in the University's nondiscrimination statement above, will add richness to

this learning experience. Please consider that sarcasm and humor can be misconstrued in online interactions and generate unintended disruptions. Working as a community of learners, we can build a polite and respectful course ambience. Please read the Netiquette rules for this course:

- Do not dominate any discussion. Give other students the opportunity to join in the discussion.
- Do not use offensive language. Present ideas appropriately.
- Be cautious in using Internet language. For example, do not capitalize all letters since this suggests shouting.
- Avoid using vernacular and/or slang language. This could possibly lead to misinterpretation.
- Keep an “open-mind” and be willing to express even your minority opinion.
- Think and edit before you push the “Send” button.
- Do not hesitate to ask for feedback.

Violent Behavior Policy:

Purdue University is committed to providing a safe and secure campus environment for members of the university community. Purdue strives to create an educational environment for students and a work environment for employees that promote educational and career goals. Violent Behavior impedes such goals. Therefore, Violent Behavior is prohibited in or on any University Facility or while participating in any university activity. See our course Brightspace under University Policies for a link to the full Violent Behavior Policy.

Diversity & Inclusion Statement:

In our discussions, structured and unstructured, we will explore a variety of challenging issues, which can help us enhance our understanding of different experiences and perspectives. This can be challenging, but in overcoming these challenges we find the greatest rewards. While we will design guidelines as a group, everyone should remember the following points:

- We are all in the process of learning about others and their experiences. Please speak with us, anonymously if needed, if something has made you uncomfortable.
- Intention and impact are not always aligned, and we should respect the impact something may have on someone even if it was not the speaker’s intention.
- We all come to the class with a variety of experiences and a range of expertise. We should respect these in others while critically examining them in ourselves.

Basic Needs Security:

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. There is no appointment needed and Student Support Services is available to serve students from 8:00 – 5:00, Monday through Friday.

Course Evaluation:

During the last two weeks of the semester, you will be provided with an opportunity to give feedback on this course and your instructor. Purdue uses an online course evaluation system. You will receive an official email from evaluation administrators with a link to the online evaluation site. You will have up to 10 days to complete this evaluation. Your participation is an

integral part of this course, and your feedback is vital to improving education at Purdue University. We strongly urge you to participate in the evaluation system.

Modifications:

This syllabus may be modified at any time.