Carnegie Mellon HeinzCollege

95712 Object Oriented Programming in JAVA

Fall 2024

Course Information	Course Number: 95712 Course Title: Object Oriented Programming in JAVA Semester and Year: Fall 2024 Units: 12.0
	<table><tr><td>Section</td><td>Lecture</td><td>Lab</td><td>Location</td></tr><tr><td>B</td><td>Mon: 05:00PM 06:20PM</td><td>Wed: 05:00PM 06:20PM</td><td>HBH A301</td></tr><tr><td>D</td><td>Mon: 06:30PM 07:50PM</td><td>Wed: 06:30PM 07:50PM</td><td>HBH 1002</td></tr></table> Instructor: Dr. Sakir Yucel Email: syucel@andrew.cmu.edu Please visit the course home page on Canvas to see instructor's and TAs' office hours schedule.
Prerequisites (if applicable)	None
Description	This course is an in-depth look at the popular programming language Java. It is not intended for first time programmers. Basic syntax and program structure, classes, composition, inheritance and polymorphism are examined. The Java collection classes are studied in some detail, as is the set of I/O classes. Additional topics include exception handling, building GUIs with JavaFX, and multi-threading. Throughout the second half of the course, a series of homework problems develops a non-toy application, illustrating by example how larger object-oriented programs are organized.
Course Materials (if applicable)	**Course Web Sites** In this course, we will use the Canvas to post lecture notes and related documents and to receive assignments electronically from students. To access Canvas, go to https://canvas.cmu.edu/ Supplemental Reference Textbooks: • Cay S. Horstmann, "Core Java, Volume 1 - Fundamentals," 12th Edition • Horstmann & Cornell, "Core Java, Volume 2 – Advanced Features," 12th Edition Online Texts: • The Java Tutorial http://docs.oracle.com/javase/tutorial/

	Downloads • Download Java 21. If your computer has not JDK, please go to https://www.oracle.com/java/technologies/ and download/install JDK. • Download Eclipse from www.eclipse.org. • Go to textbook webpage at https://horstmann.com/corejava/index.html and download code for 12th edition. There might be additional downloads later during the semester.
Evaluation Method	

Activities: Count	Scoring	Points	%
Prereq test: 1	15 points	15	3.75
Self-assessment: 14	2 points each	28	7.00
Homework: 3	37.5 points each	75	18.75
Lab assignments: 9	Top 8 considered for 10 points each	80	20.00
Class quizzes: 10	Top 8 considered for 10 points each	80	20.00
Midterm exams: 3	Top 2 considered for 35 points each	70	17.50
Final exam: 1	52 points	52	13.00
Total		400	100.00

Learning/Course Objectives	1. Use a Java IDE as well as command line to test code snippets and author professional programs. 2. Learn Java language basics, including types, operators and program control. 3. Develop problem solving skills through practice and understanding of the divide-and-conquer and top-down approaches. 4. Form and manipulate collections of data (such as lists, dictionaries, tuples). 5. Learn the principles of object oriented programming in Java with the use of classes, inheritance, polymorphism, interfaces, containers and design patterns - with the goal of understanding code reuse and building scalable programs. 6. Be exposed to the SDLC (software development lifecycle) to understand how software applications are authored in industry. This includes basic UML usage and design concepts.
Grading Scale	A+: 100% A: 93-99% A-: 90-92% B+: 87-89% B: 83-86% B-: 80-82% C+: 77-79% C: 73-76% C-: 70-72%

Course Policies & Expectations	Activities: A typical week in this course will have several activities spread through the week, as listed below: 1. Videos & Self-assessments: There is a significant part of course-content provided in the form of videos that you must watch before coming to the class each week. This will help us spend the class-time more effectively on Q&A, code-review, and labwork. You are expected to complete the weekly self-assessment. You will get two attempts for self-assessments. The higher of the two scores will be considered for grading. This must be completed each week before Sunday midnight. 2. Class Quiz (CQ): There are 10 short multiple-choice quizzes through the semester. Top 8 scores will be considered for your final grade. 3. Lab assignments: There are 9 lab-exercises through the semester. Each lab-exercise is a short programming problem related to a topic discussed in the previous class. For lab assignments, you will submit a Java program before the end of the lab. Top 8 scores will be considered for your final grade. You can discuss general subjects about the lab problem with me, TAs or your classmates during the lab time, but you cannot discuss implementation level details. Unless specified otherwise, you will need to submit your lab-solution within the class time to be graded on full score. In case of any delay in submission beyond this, you may submit within the extended time specified on Canvas for 75% of the score, provided your submission is complete and correct. 4. Homework: There are 3 homework assignments. Top 2 scores will be considered for your final grade. 5. Mid-Terms: There are 3 mid-term exams during the semester comprising questions and programming test. Top 2 will be considered for your final grade. The mid-term format will be similar to the Labs except that you cannot consult with anyone. 6. Final Exam: The format of final exam is similar to mid-term exams but may be longer, and is mandatory. **No late submission for exams, quizzes and prereq test.** Others 7. Class Attendance: Labs, quizzes, and exams require your presence in the class. If you miss any lab / quiz / exam, it will be adjusted as the lowest score. No makeup lab / quiz / exam will be accepted unless there is an emergency, in which case a documented evidence may be required. Job interviews do not count as an emergency. You need to be present in-person in class to take the quizzes, labs, and exams. Attempts to take them from outside the class without instructor's written permission will be considered as integrity violation and will be dealt with as per university policies. 8. Grade Disputes: Grade disputes, if any, must be reported to the TA or the instructor within one week after grade distribution.

Plagiarism & Cheating Notice	### Academic Dishonesty, Cheating and Plagiarism Students are subject to Carnegie Mellon University's policies on academic integrity. You are responsible for being familiar with the university standard for academic honesty and plagiarism. Please see the CMU Student Handbook for information. In our course, there is no group assignment, and all work is individual. All your submissions must be your work. For our course, cheating means "submitting, without proper attribution, any computer code that is directly traceable to the computer code written by another person." Copying from any source without citation, sharing your work with other students, or copying from other students will be considered as cheating and plagiarism and will be addressed according to the university policies at http://www.cmu.edu/academic-integrity/. In general, you can use any code from the textbook and lecture notes. Other than the code you may take from textbook and lecture notes, all code you submit must be written by you. You are welcome to use generative AI tools (ChatGPT, DALL-E, etc.) in this class for certain deliverables as stated below. Although you can use them in your learning and in getting help while working on your deliverables, you cannot copy generated code from those tools and submit as your own. When working on your course deliverables, always keep in mind the following statement from CMU academic integrity policy at https://www.cmu.edu/policies/student-and-student-life/academic-integrity.html: "In any manner of presentation, it is the responsibility of each student to produce [their] own original academic work." If you are in doubt on whether to use a material in your assignment or how to use it, please consult me first. For self-assessments: You may collaborate with classmates on understanding the subjects. You may use lecture, online and AI resources. For class quizzes: No collaboration is allowed. Do not use any resource while taking the quizzes. Do not try to run the supplied code in the quizzes. For labs: While you can seek help from your classmates in labs for clarifications and debugging, you cannot copy their code and submit as your own. You may use lecture, online and AI resources. For homework assignments: You may discuss homework problems with classmates, after you have made a serious effort in trying the homework on your own. You can use ideas from the literature (with proper citation). You may use lecture, online and AI resources.

| | For exams: No collaboration is allowed. You may use lecture, online and AI resources.

To deter and detect plagiarism, tools are used in this class. |
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| **Course Policies & Expectations** | ## Course Etiquette
I expect all the students to observe polite conduct in the classroom. Specifically, please pay attention to the following:
- No cell phone use during the class
- No random comings and goings
- Stay awake
- No recording of the classroom activities
- If you are in doubt about proper course etiquette, contact me in person or via email

Policy Regarding Students Using English as a Foreign Language
Assignments in this course are graded with reference to evidence of the acquisition of concepts, presentation format, and accuracy of information. Having done business in countries that use languages other than English, we understand that the use of an unfamiliar language can result in unusual word choices or grammatical errors that are not critical to the overall understanding of the information. Therefore, we will take into account your need to function in a language that may be unfamiliar to you. We will provide feedback as appropriate if we feel that language or grammar you have used in assignments would be best if it were configured in a different way. |
| **Accommodations for Students with Disabilities** | Our community values diversity and seeks to promote meaningful access to educational opportunities for all students. CMU and your instructors are committed to your success and to supporting Section 504 of the Rehabilitation Act of 1973 as amended and the Americans with Disabilities Act (1990). This means that in general no individual who is otherwise qualified shall be excluded from participation in, be denied benefits of, or be subjected to discrimination under any program or activity, solely by reason of having a disability.

If you have a disability and have an accommodations letter from the Disability Resources office, I encourage you to discuss your accommodations and needs with me as early in the semester as possible. I will work with you to ensure that accommodations are provided as appropriate. If you suspect that you may have a disability and would benefit from accommodations but are not yet registered with the Office of Disability Resources, I encourage you to contact them at access@andrew.cmu.edu |
| **Classroom Expectations Related to COVID-19** | In order to attend class meetings in person, all students are expected to abide by all behaviors indicated in A Tartan's Responsibility, including any timely updates based on the current conditions.

In terms of specific classroom expectations, whenever the requirement to wear a facial covering is in effect on campus, students are expected to wear a facial covering throughout class. If you do not comply, you will be referred to the Office |

	of Community Standards and Integrity for follow up, which could include student conduct action.
Take Care of Yourself	Do your best to maintain a healthy lifestyle this semester by eating well, exercising, avoiding drugs and alcohol, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress. All of us benefit from support during times of struggle. You are not alone. There are many helpful resources available on campus and an important part of the college experience is learning how to ask for help. Asking for support sooner rather than later is often helpful. If you or anyone you know experiences any academic stress, difficult life events, or feelings like anxiety or depression, we strongly encourage you to seek support. Counseling and Psychological Services (CaPS) is here to help: call 412-268-2922 and visit their website at http://www.cmu.edu/counseling/. Consider reaching out to a friend, faculty or family member you trust for help getting connected to the support that can help.

Course Schedule / Topical Outline: (Subject to change as needed)

Week	Dates	Topic	Sunday	Monday	Wednesday	Homework Due Dates
Week 1	Aug 26, 28	Intro	Videos + SA1	Intro	Lab setup and practice	
Week 2	Sep 2, 4	Data Types*	Videos + SA2	NO CLASS Labor Day	Prereq test	
Week 3	Sep 9, 11	Data types, program flow*	Videos + SA3	CQ1	Lab 1	
Week 4	Sep 16, 18	Classes and objects*	Videos + SA4	CQ2	Lab 2	
Week 5	Sep 23, 25	Inheritance*	Videos + SA5	CQ3	Exam 1	HW1 Due Sep 29
Week 6	Sep 30, Oct 2	Encapsulation*	Videos + SA6	CQ4	Lab 3	
Week 7	Oct 7, 9	Polymorphism*	Videos + SA7	CQ5	Lab 4	

Fall Break	Oct 14-18	NA	NA	NA	NA	
Week 8	Oct 21, 23	Java FX	Videos + SA8	CQ6	Lab 5	
Week 9	Oct 28, Oct 30	Collections (Indexed)*	Videos + SA9		Exam 2	
Week 10	Nov 4, 6	Collections (Hashed)*	Videos + SA10	CQ7-Collections	Lab 6 (Indexed)	HW2 Due Nov 10
Week 11	Nov 11, 13	Exceptions* + IO	Videos + SA11	CQ8-Exceptions	Lab 7 (Hashed)	
Week 12	Nov 18	Exam		Exam 3	NO CLASS Thanksgiving	
Week 13	Nov 25, 27	Multithreading*	Videos + SA12/13	CQ-Multithreading	Lab 8	HW3 Due Dec 1
Week 14	Dec 2, 4	Reflection	Videos + SA14	CQ10	Lab 9 (Multithreading)	

*included in final exam

For final exam data, refer to https://www.heinz.cmu.edu/current-students/final-exam