CSE205 Object Oriented Programming and Data Structures

Syllabus Disclaimer

The syllabus is a statement of intent and serves as an implicit agreement between the instructor and the student. Every effort will be made to avoid changing the course policies or schedule but the possibility exists that unforeseen events will make syllabus changes necessary. Please remember to check your ASU email and the course site often.

Catalog Description

Problem solving by programming with an object-oriented programming language. Introduces data structures. Overview of computer science topics. Prerequisites: CSE 110 with C or better. Credit is allowed for only ACO 102 or CSE 205 or CST 2003.

Online Course

This is an online course. There are no face-to-face meetings.

Course Time Commitment

This three-credit course requires approximately 135 hours of work. Please expect to spend around 18 hours each week preparing for and actively participating in this course.

Course Overview

This course is essentially a continuation of *CSE110 Principles of Programming with Java* (students who successfully completed *CSE100 Principles of Programming with C++* may also enroll in CSE205). In CSE205, we continue our study of computer programming in an OO programming language by examining advanced OO programming techniques. CSE205 also introduces students to the study of data structures and algorithms which are the foundation of computer programming and computing.

Course Textbook

Java for Everyone, 2nd Edition (Cay Horstmann).

Learning Objectives

There are several areas of emphasis and at the end of the course students shall be able to:

1. Software Design
   - Employ proper object oriented design techniques to identify classes and objects and define the relationships among them.
   - Read simple UML (Unified Modeling Language) class diagrams to represent OO designs and implement the design in Java.
2. Concepts of Data Structures
   - Write programs using basic predefined data structures such as ArrayList.
   - Write programs to implement data structures such as linked lists, queues, stacks and trees.
   - Identify the appropriate data structures to use in a program to solve a problem.
3. Object Oriented Language Constructs
   - Write programs using text files as input and output.
   - Design and implement GUI (graphical user interfaces) programs.
   - Write a complete Java application using OO concepts such as inheritance, interfaces, polymorphism, and abstract classes.
   - Write programs that perform exception handling.
4. Introduction to Algorithmic Complexity Theory

- Derive and explain the efficiency of sorting algorithms, e.g., selection sort, bubble sort, merge sort, quick sort, and heap sort.
- Derive and explain the efficiency of searching algorithms, e.g., linear search and binary search.
- Explain the differences between various complexity classes such as O(1), O(n), O(n^2), and O(n *lg* n).

Major Topics

1. Object Oriented Software Development
   - Objects, classes, inheritance, abstract classes, interfaces, and polymorphism.
   - GUI-based programming.

2. Introduction to Data Structures
   - Primitive arrays and the ArrayList class.
   - Linked lists.
   - Stacks.
   - Queues.
   - Trees.
   - Binary search trees.

3. Introduction to Computer Algorithms
   - Recursion.
   - Searching.
   - Sorting.
   - Algorithmic complexity theory and Big O notation.

4. Input/Output Streams and Exception Processing
   - Errors, exceptions, and exception handling.
   - Text file input/output stream classes.

Assessment

Various methods will be used to assess the student's mastery of the learning objectives.

Homework Assignments

There will be four homework assignments involving shortanswer and codewriting exercises that are designed to help students learn the material discussed in the textbook and the video lectures.

Shortanswer solutions to homework assignments must be typed using either a text editor or word processor and submitted to the CSE205 website homework assignment link as a PDF or as instructed in the homework instructions. **In no case will an emailed assignment be accepted for grading.** A solution that is submitted in a file format other than PDF or as mentioned in the homework instructions (e.g., a Word document) will be graded with a 25% penalty if the TA can open the submitted file. If the TA cannot open the submitted file for grading, then the student will be assigned a score of zero. Newer versions of Microsoft Word will export documents in PDF format. If you use Openoffice or Libreoffice, you can export a document in PDF format using the **File Export as PDF** menu item. Otherwise, there are freeware programs that you may download and install which will convert a file into PDF format. One such Windowsbased program is named CutePDF; Google it.

Each homework assignment will be worth 25 points so there will be a total of 100 homework assignment points to be earned. **At the end of the course, a homework assignment percentage, denoted hw in the course percentage formula below, will be calculated as the sum of the points you earned on the four**

homework assignments divided by 87.5 with the percentage not to exceed 100%. That is, in essence, you can miss earning up to 12.5 homework points without it affecting your grade.
Note: not all of these exercises will be graded, i.e., random ones will be selected for grading.

Programming Projects

There will be four programming projects that will involve writing a complete Java program. These programming projects are designed to help you learn the material discussed in the textbook and the video lectures.

For the programming projects you will be required to submit your source code files in a compressed ZIP archive to the CSE205 programming project submission link. In no case will an emailed project be accepted for grading. A solution that is submitted in a file format other than as a ZIP archive will be graded with a 25% penalty if the TA can open the submitted file. If the TA cannot open the submitted file for grading, then the student will be assigned a score of zero.

Each programming project will be worth 25 points so there will be a total of 100 project points to be earned. **At the end of the course, a programming project percentage, denoted proj in the course percentage formula below, will be calculated as the sum of the points you earned on the four programming projects divided by 87.5 with the percentage not to exceed 100%. That is, in essence, you can miss earning up to 12.5 project points without it affecting your grade.**

Examinations

There will be two examinations: a midterm exam during the Week 4 and a final exam at the end of the final week of the course. The exam completion deadlines are listed in the course schedule. The exams will be administered using a remote proctoring service named RPNow.

Note: There is no fee and reservation for the RPNow. You only need to setup the RPNow software on your system and the setup instructions will be available on blackboard before the exams.

Assignment, Project, and Exam Deadlines

Assignment, project, and exam deadlines are based on Arizona Mountain Standard Time. Due to the compressed time course schedule, it is important for the student to complete the assignments, projects, and exams by the deadlines to avoid falling behind. That said, there will be a 24 hour late penalty period where the assignment or project may still be submitted for penalty points. The deduction will be 25% of the assignment or project points. In no case will an assignment or project be accepted for grading if it is not submitted within the 24 hour late penalty period.

Exams must be completed by the exam deadline with no exception. If you miss the deadline for completing the exam you will earn a score of zero on the exam.

Please follow the appropriate University policies to request an accommodation for religious practices or to accommodate a missed assignment due to University-sanctioned activities.

Final Letter Grade Assignments

At the end of the course a *course percentage* will be calculated using this formula:

$$Course\% = (hw \times 30\%) + (proj \times 30\%) + (midterm \times 20\%) + (final \times 20\%)$$

where *hw* is your homework assignment percentage as described above; *proj* is your programming project percentage as described above; *midterm* is your score on the midterm exam, and *final* is your score on the final exam. The assignment of letter grades is based on this table:

Grade	*Course%*
A	[87.5%, 100%]
B	[75%, 87.5%)
C	[62.5%, 75%)
D	[50%, 62.5%)
E	Below 50%

Grading Policy

Grades reflect your performance on assignments, projects, and exams and adherence to deadlines. Graded assignments and projects will be available within a week of the due date via the Gradebook. Graded exams will be available within four days following the last day to write the exam.

Grade Appeals

If you have a question about the grading of an assignment or exam, first discuss the matter with the TA. We all mistakes and if he or she made an honest mistake in the grading of an assignment, project, or exam then he or she will correct it. After discussing the matter with the TA, you still feel that the assignment, project, or exam was erroneously graded, then bring the matter to the attention of the instructor who will be the final arbiter.

After letter grades are submitted at the end of the course, if you wish to dispute the assigned grade, then address the situation with the instructor. If the dispute is not resolved with the instructor, the student may appeal to the department chair per the University Policy for Student Appeal Procedures on Grades.

Student Success

Online courses can require more commitment and diligence than an in-person course. To ensure success, the student should:

- Check the course website daily.
- Read the course announcements.
- Read and respond to course email messages as needed.
- Complete assignments by the specified deadline.
- Communicate regularly with your instructor and TA.
- Create a study and assignment schedule to stay on track.
- Start working on the homework assignments and programming projects as early as you can; they will require significant time to complete.

Communicating With the Instructor

This course uses Piazza for questions about the course, course policies, the lectures, the homework assignments, and the programming projects. Prior to posting a question, please check the syllabus, announcements, and existing posts. If you do not find an answer, post your question. You are encouraged to respond to the questions of your classmates.

Email questions of a personal nature to your instructor or Grader. You can expect a response within 2 business days.

Key Sections from the Piazza User Agreement

This course uses a product called Piazza. Recently the company has added a **Piazza Careers** service. This is something that you can choose to add to your Piazza account, but is not required for this class. Please read these two key user privacy sections from the Piazza Terms of Use before opting into the service.

Under FERPA:

If you choose to opt-in to Piazza Careers, you consent to the release of information you added to your user profile, which may include education records, to companies that participate in Piazza Careers. These companies will have access to selected information in your user profile.

The Service is not a part of or endorsed by the School. If you create a class, you represent and warrant that the School associated with or created for such class is valid and that you are validly affiliated with the School.

Under Proprietary Rights

The Service may include advertisements, which may be targeted to the User Content or information on the Service, queries made through the Service, or other information. The types and extent of advertising on the Service are subject to change. In consideration for Piazza granting you access to and use of the Service, you agree that Piazza and its third party providers and partners may place such advertising on the Service. You may have the opportunity to opt-out of advertising. We do not give your User Content or information to advertisers without your consent. Piazza Careers is a program where users can learn about and connect with companies to explore job opportunities. Participation in Piazza Careers is wholly optional and you may opt-out of the program at any time.

The entire terms of use can be found at the following link.

https://piazza.com/legal/ terms

Opting Out of Piazza Careers:

If you have already signed up for Piazza Careers and wish to opt out:

1. Log into Piazza and go to your "Settings" icon (next to your name in the upper right)
2. Under "Career Opportunities are not currently relevant to me" - select "Turn Off Piazza Careers"

If you need assistance, please contact the ASU Helpesk via the HELP tab in Blackboard.

Email and Internet

ASU email is an official means of communication among students, faculty, and staff. Students are expected to read and act upon email in a timely fashion. Students bear the responsibility of missed messages and should check their ASU-assigned email regularly.

All instructor correspondence will be sent to your ASU email account.

Drop and Add Dates/Withdrawals

This course adheres to a compressed schedule and may be part of a sequenced program, therefore, there is a limited timeline to drop or add the course. Consult with your advisor and notify your instructor to add or drop this course. If you are considering a withdrawal, review the following ASU policies:Withdrawal from Classes, Medical/Compassionate Withdrawal, and a Grade of Incomplete.

Student Conduct and Academic Integrity

ASU expects and requires its students to act with honesty, integrity, and respect. Required behavior standards are listed in the Student Code of and Student Disciplinary Procedures, Computer, Internet, and

Electronic Communications policy, ASU Student Academic Integrity Policy, and outlined by the Office of Student Rights & Responsibilities. Anyone in violation of these policies is subject to sanctions.
Students are entitled to receive instruction free from interference by other members of the class. An instructor may withdraw a student from the course when the student's behavior disrupts the educational process per Instructor Withdrawal of a Student for Disruptive Classroom Behavior.
Appropriate online behavior (also knows as *netiquette*) is defined by the instructor and includes keeping course discussion posts focused on the assigned topics. Students must maintain a cordial atmosphere and use tact in expressing differences of opinion. Inappropriate discussion board posts may be deleted by the instructor.
The Office of Student Rights and Responsibilities accepts incident reports from students, faculty, staff, or other persons who believe that a student or a student organization may have violated the Student Code of Conduct.

Prohibition of Commercial Note Taking Services
In accordance with ACD 304-06 Commercial Note Taking Services, written permission must be secured from the official instructor of the class in order to sell the instructor's oral communication in the form of notes. Notes must have the notetaker's name as well as the instructor's name, the course number, and the date.

Course Evaluation
Students are expected to complete the course evaluation. The feedback provides valuable information to the instructor and the college and is used to improve student learning. Students are notified when the online evaluation form is available.

Accessibility Statement
In compliance with the Rehabilitation Act of 1973, Section 504, and the Americans with Disabilities Act as amended (ADAAA) of 2008, professional disability specialists and support staff at the Disability Resource Center (DRC) facilitate a comprehensive range of academic support services and accommodations for qualified students with disabilities.

Qualified students with disabilities may be eligible to receive academic support services and accommodations. Eligibility is based on qualifying disability documentation and assessment of individual need. Students who believe they have a current and essential need for disability accommodations are responsible for requesting accommodations and providing qualifying documentation to the DRC. Every effort is made to provide reasonable accommodations for qualified students with disabilities.
Qualified students who wish to request an accommodation for a disability should contact the DRC by going to https://eoss.asu.edu/drc, calling (480) 965-1234 or emailing DRC@asu.edu. To speak with a specific office, please use the following information:

Tempe Campus 480-965-1234 (Voice)	**Polytechnic Campus** 480-727-1165 (Voice)
West Campus University Center Building (UCB), Room 130 602-543-8145 (Voice)	**Downtown Phoenix Campus and ASU Online** University Center Building, Suite 160 602-496-4321 (Voice)

Computer Requirements

This course requires a computer with Internet access and the following:

- A web browser (Chrome, Internet Explorer, Mozilla Firefox, or Safari)
- Adobe Acrobat Reader (free)
- Adobe Flash Player (free)
- Speakers
- Java SE Development Kit 7
- A text editor or Java Integrated Development Environment
- Webcam for proctoring software in exams

In completing the programming projects you may use any text editor or Java IDE you wish. I recommend NetBeans 7.4. The Eclipse IDE for Java Developers is another free and open-source Java IDE.

Technical Support

This course uses Blackboard to deliver content. It can be accessed through MyASU at http://my.asu.edu or the Blackboard home page at https://myasucourses.asu.edu
To monitor the status of campus networks and services, visit the System Health Portal at http://syshealth.asu.edu/.
To contact the help desk call toll-free at 1-855-278-5080.