CSC205AB Object Oriented Programming and Data Structures
Syllabus – Spring 2024 - Online

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Office Hours:

Class Format and Time

Title	Section	Format	Credit Hours
CSC205AB	16743	Online	4

Description:
Covers Object-Oriented design and programming; elementary data structures; arrays; lists; stacks; queues; binary trees; recursion; searching and sorting algorithms.   **Prerequisites:** CSC110 or permission of instructor.

MCCCD Official Course Competencies

1. Describe how modern Software Engineering techniques are used in program development. (I)
2. Implement programs that use Object-Oriented Programming techniques: classes, aggregate classes, inheritance, interfaces, abstract classes, and polymorphism. (II)
3. Write applications that handle run-time errors by using Exception Handling techniques. (II, III)
4. Write programs using basic data structures such as arrays, ArrayLists, and Vectors. (II, IV)
5. Implement linked lists, stacks, and queues using Object- Oriented techniques. (II, IV)
6. Implement Binary Search Trees and use recursive methods as part of the implementation. (II, IV, V)
7. Analyze and compare the efficiency of different searching and sorting algorithms, including algorithms that are implemented recursively. (V)
8. Write applications that read and write text and Object files. (II, VI)
9. Discuss social and ethical issues related to Computer Science. (VII)

MCCCD Official Course Outline

I. Applying Modern Software Engineering Principles
  A. Software Life Cycle Model
  B. Pre- and post-conditions of an algorithm
  C. Generating test cases
  D. Design UML (Unified Modeling Language) diagrams
       and use them to implement Object Oriented Programs

II. Using Object Oriented Programming constructs
  A. Classes and subclasses
  B. Aggregate classes
  C. Inheritance
  D. Polymorphism
  E. Interfaces and abstract classes

III. Applying Exception Handling techniques
  A. Signal existence of runtime error

  B. Handle runtime error without program termination
IV. Introducing Data Structures
  A. Arrays
  B. Simple data structures such as ArrayLists/Vectors
  C. Linked Lists
  D. Stacks
  E. Queues
  F. Binary Trees
V. Understanding algorithms
  A. Recursion
  B. Searching
  C. Sorting
  D. Efficiency of Algorithms using BigO notation
VI. Using Input/Output mechanisms
  A. Console Input/Output
  B. Reading and Writing text files
  C. Serialization
VII. Understanding other issues related to Computer Science
  A. Social and/or ethical issues

Course Format

The course format for this class is online (On Your Time Online). For all sections, coursework must be completed according to deadlines. Students are required to have access to a computer or mobile device, Internet access, webcam, and printer unless otherwise specified.

Time Commitment

This online course is a 4-credit course and requires the student to learn and complete assignments completely online. If it were to be conducted in a face-to -face classroom, it would be scheduled to meet for 53 clock hours, and students would be expected to commit to at least 100 additional hours (153 hours total). Thus, you are responsible for devoting a considerable amount of time to prepare for this class. Your preparation time should be devoted to reading textbooks, reviewing PowerPoint, completing computer assignments, taking online quizzes, typing in programming examples from the textbook, and writing discussion posts. It is difficult to be successful in this class if you have not completed your assigned reading and homework. If you are not prepared to dedicate at least 153 hours to this course—whether offered in a 5-week, 8-week, or 16-week format—you should seriously reconsider your enrollment.

Textbooks:

(Required)   zyBook: CSC 205AB: Object Oriented Programming and Data Structures. The text will be accessed directly through Canvas. See the instructions on Canvas

(Recommended)   Java Foundations, 4th edition, ISBN: 9780134296876, Author: Lewis, DePasquale, Chase (Any edition is fine)

Hardware and Software Required:

1. Java JDK (Java Development Kit). This is needed to compile and run Java programs. Instructions on downloading and installing JDK are on the Canvas course site. There is a video link on canvas on downloading and installing the JDK on a Windows machine. If you have a Mac you already have JDK in it. Install the JDK as soon as possible. The JDK consists of a programmer tool and does NOT show up as an application in the Windows Start/Programs menu, not in the Mac OS Application folder. Note: Your computer probably has a version of JRE(Java Runtime Environment). JRE is not the same as JDK. You must download JDK.

2. Any Integrated Development Environment (IDE) for Java. NetBeans will be used for instruction. Eclipse, IntelliJ, VSCode are also acceptable. Install and download instructions for NetBeans are on the canvas course site.

3. Replit Account for Collaboration. Replit is an online IDE that we will use on occasion to write code together. It is free to use. There will be an activity in Module 1 that helps you set up an account.

Assignment Types and percentage of the grade:

Demo's/Activities/Discussions/Quizzes: (20% of your grade). There will be video work, homework, discussions and Quizzes throughout the course.

Demos: Code written together in class or via a video. You will need to follow along and write the code as well. During the Demo, I will ask questions that you will need to answer as part of the assignment and in some Demo's, you will need to ask additional questions.

Activities: Activities reinforce concepts and may require written analysis as well as programming. These are small follow up assignments to the Demo's

Discussions: General discussions on topics related to this course, including Ethics

Quizzes: Quizzes are designed to reward you for reading the chapter and working to understand the conceptual material.

zyBooks Participation Problems and zyBooks Challenge Activities: (5% of your grade). zyBooks Participation and Challenge Problems will also be completed on zyBooks. It is important that you only access these problems through Canvas so your grades are recorded. There are unlimited attempts allowed for each of these assignments. They will NOT be accepted late, however.

Programming Assignments and zyBooks Programming Labs: (40% of your grade). Programming Assignments and Hardware Labs will be posted on Canvas. They will be graded according to the Programming Assignment Guidelines and the Rubric provided. These guidelines will detail rules for writing your program, formatting requirements and submission requirements (how you send your code to me).

Exams: (35% of your grade). There will be three exams during the semester, worth a total of 35% (10%, 10%, 15%). Each will be given using Lockdown Browser software. You are expected to take the test at the scheduled time. If an emergency arises that is **beyond your control**, you must contact me **on or before** the day of a test to arrange for a make-up test. Make-up tests are possible only in special circumstances, at the instructor's discretion. All make-ups, if granted, must be **completed** before the exams are returned to the class. Failure to adhere to this policy may result in a grade of zero for the test missed. You are only allowed **one** make-up test per semester.

Office Hours: I will be online from 9:30 a.m. - 9:50 a.m. (Zoom) on Tuesdays and Thursdays. Please feel free to drop in at any time. For meetings outside of those hours, please schedule an appointment using your school Google Calendar. I am very flexible on times we meet, including over the weekend. My only request is that if you make an appointment, please be sure to not miss it.

Mandatory Check-In Meetings: You will be required to meet with me for at least one mandatory check-in meetings during the semester. One will be after exam 1 as an opportunity to discuss your academic performance, offer insightful feedback, and address any other related issues during this time. You will need to schedule your virtual or in person meeting using the Google Calendar in your student account. It can be at any time I am shown as available on the calendar.

The other two can be any time during the semester. It could be to work together on an assignment or to discuss topics in the class.

ATTENDANCE POLICY

Attendance for this class will follow the rules for Online Courses.

Administrative Regulation 2.3.2
Online course attendance requires that students actively participate in the course as listed below.
1. Submitting an academic assignment (assignment required in the course, regardless of whether it is graded or not), paper, or project.
2. Taking an exam, quiz, or an interactive tutorial required by the course.
3. Attending an online or in-person study group (where there is assigned attendance/participation as part of the course).
4. Initiating contact with a faculty member to ask a question about the academic subject studied in the course.
If you miss three due dates in a row or you fail to submit more than three demo's (interactive tutorial), then it may warrant withdrawal from the course. Simply logging into Canvas will NOT count as attendance.
NOTE: <u>You must log in to the Canvas course and complete at least one assignment or connect with me through email within the first four days of the start of the course or you will be withdrawn from the course as a 'no show'.</u>

Due Dates: Due dates for each programming assignment (Programs, zyBooks Programming Labs) are on Canvas. Assignments turned in within 2 days of the due date will be penalized 10%. Assignments turned in within 2 weeks of the due date will be penalized 50%. Submissions turned in later than two weeks late or after the final exam will not be accepted.

Quizzes/HW and zyBooks Participation and Challenge Problems due dates are also on Canvas and will NOT be accepted late.

Lockdown **Browser:** The exams will be taken using Lockdown Browser. Lockdown Browser is free to download, but is not available on a Chromebook. Lockdown Browser also requires that you have a webcam and microphone. See the Lockdown Browser folder in Canvas for additional details.

Speaking of Ethics… I encourage students to help each other as needed and to get help from our Tutors often. But please make sure you write your own code on all programming assignments for this class. You will have to write similar code on all of the tests, so it is important that you have worked through the code. Students handing in code they did not write will have their grade for the course lowered 10% depending on the complexity of the assignment. Students handing in code downloaded from sites such as CourseHero or any AI generated code will be given an immediate "F" for the class.

Grading:

Point Allocation		Grading Scale	
40%	Programming Assignments	A	90% - 100%
20%	Demo's/Activities/Discussions/Quizzes	B	80% - 89%
35%	Exams	C	70% - 79%
5%	zyBooks Participation and Challenge Activities	D	60% - 69%
		F	0% - 59%

Withdrawals

Students seeking to withdraw should first meet with a Financial Aid advisor to discuss the impact on current and future financial aid awards. Students who do not complete 67% of their attempted courses, or fall below a 2.0 GPA, may be ineligible for future financial aid. Additionally, students who choose to withdraw from this course may have to return financial aid funds to the college. Please, meet with a Financial Aid advisor and provide documentation of your meeting before requesting to be withdrawn.

There are two kinds of withdrawal: student initiated withdrawal and instructor initiated withdrawal.

Student-initiated: Students may self-withdraw at my.maricopa.edu until Sunday, March 5th with a guaranteed grade of W.

Instructor-initiated: A student may be withdrawn from the course if
- a student stops participating after Week 4.
- a student is more than 1 week late in completing a module with no contact.
- a student accumulates 2 assignments, 4 activities, 2 quizzes of missed work or an amount of work in any combination equivalent to:
  - o 5% of the course before the 45th day of the semester,
  - o 10% of the course before midterm, or
  - o 15% of the full course
- Withdrawal requests will not be honored within the last two weeks of the course period. Exceptions may be made for excused absences. During the last two weeks, W grades may still be assigned if missed assignments accumulate.
- A withdraw (W) grade will not be changed to an F grade, nor will an F grade be changed to a W. Scores reflect specific levels of credit and completion.
- Incomplete (I) grades require a contract, are only allowed in limited circumstances, and will only be granted if more than 90% of all course material was complete and on time.
- I will not withdraw any student after taking the final exam

Schedule – Note, this does not include assignments and due dates. Those will be on Canvas.

Date	In Class Lesson	Reading before next class zyBook
Module 0 1/29	Introductions Syllabus, Course Overview	
Module 1 Week 1	Review	Review Chapters 1 thru 4
Module 2 Week 2	Arrays and Strings User-Defined Methods Enums	Chapter 5 and 6
Module 3 Week 3	Objects and Classes	Chapter 7
Module 4 Week 4	Memory Management and Input/Output	Chapter 8 and 9
Module 5 Week 5 Test 1	Inheritance, Polymorphism and Interfaces	Chapter 10
Module 6 Week 6	Inheritance, Polymorphism and Interfaces	Chapter 10
Module 7 & 8 Week 7	Exceptions Java FX	Chapter 11 and 12
Module 9 Week 8	Recursion Introduction to Data Structures and Algorithms	Chapter 13 and 14
Module 10 Week 9 Test 2	Searching and Algorithm Analysis Sorting Algorithms	Chapter 15 and 16
Module 11 Week 10	Collections and Generics	Chapter 17 and 18
Module 12 Week 11	Lists, Stacks and Queues	Chapter 18
Module 12 & 13 Week 12	List, Stacks and Queues Trees	Chapter 18 and 19
Module 13 Week 13	Trees	Chapter 19
Week 14	Catchup and Test 3	

Disclaimer: Students are responsible for the information contained in this syllabus. The information in this syllabus is subject to change based on the discretion of the instructor.