

College of Engineering
California State University, Long Beach

CECS 274
Course Syllabus
Section #: 01/02

** The instructor reserves the right to make changes to the grading criteria, assignments and course outline to best serve the needs of the class.*

Administrator Information

Instructor's Name: Prof. Song	E-Mail Address: gina.song@csulb.edu
Office Number: ECS 525	Office Hour: TR 1:30pm-2:00pm by appointment
Class Term: Fall 2019	Class Location: VEC-418, ECS-412
Class Meeting Times: Lecture TTR 11:00 am – 11:50 am, Lab 12:00 pm – 1:15 pm	

Course Description

Prerequisite: CECS 174 with a grade of "C" or better.

Disciplined methods of design, coding and testing using the Java programming language. Data abstraction, object-oriented design. Introduction to data structures (linked lists, stacks, queues and trees.) Recursion. Sorting and searching. Letter grade only (A-F). (Lecture 2 hours, laboratory 3 hours). Same course as CECS 274H. Not open for credit to students with credit in CECS 274H.

Course Objectives

- Apply prerequisite of programming concepts to develop code in Java; language syntax
- Program Object Oriented Java code. Understand OOP concepts of class, constructor, attribute, method, access modifiers (public/private), public interface, static vs. instance, overloading, inheritance, containment (has-a relationship), polymorphism.
- Exception handling with try / catch / throw
- Javadoc basics for API documentation
- Understand the execution of recursive functions; design and write code for simple recursive functions (i.e., 20 lines of code).
- Design an Abstract Data Type (ADT), convert it to a Java class and then implement and use the class in a program of moderate complexity.
- Implement searching (linear, binary tree) and sorting (selection, bubble, merge) algorithms
- Analyze various implementations; calculate memory requirements for data structures.
- Use O-notation to describe the performance of simple blocks of code (i.e., 10 - 20 lines of code).
- Design a Linked List, Stack, Queue and Hash Map ADT and then implement them as a Java class using an array, a singly linked list, and a doubly linked list.
- Expand knowledge of coding, testing, debugging, and Eclipse IDE tool.

Textbook

We use a mandatory interactive online book “Object Oriented Programming and Data Structures” published by zyBooks.

- Sign in or create an account at **learn.zybooks.com**
- Enter zyBook code “CSULBCECS274SongFall2019”
- Subscribe

A subscription will last until the end of the semester.

Programming Environment

This course uses Java SE JDK version 12 programming language and Eclipse IDE. Free versions are available for Mac, Windows and Linux platforms.

Internet Resources

Being able to search, find and retrieve information on the Internet is a prerequisite for this class. Answers for almost every question you will ask regarding Java programming are out there somewhere on the internet. It is expected that students should be able to answer simple questions on their own by searching for the answers on the web. Students should be able and willing to do supplemental research on the Internet when they need to find additional code examples or answer simple “how to” questions. Copying code found on the Internet is not solving the problem and will be treated as cheating and plagiarism.

Students must spend time to practice and program every week.

About this course

This course compresses Java language and Data Structures to one class and many students found it difficult. You must allocate significant time every week to learn the concepts, solve exercises, and practice coding implementations. Without such commitment your chances of success is slim. Class and lab participation is mandatory. Lab time is provided to solve lab activities focusing on subject of prior lectures. Read the assigned sections and practice prior to each lecture. Lectures will not cover every topic in the book - the time will be used for reviewing and explaining important or difficult concepts. Students will be called upon during lectures to participate in answering questions, comment on discussion topics and even to review and troubleshoot code. Please refrain from wearing head/earphones, sunglasses, hats that may interfere while in class / lab.

Take the time to solve interactive materials and exercises presented in your book.

Quizzes will focus on the core material and they are given to encourage you to take the time to truly understand the concepts and how to apply them.

While collaboration is encouraged during the lab, projects are to be solved on your own. If your project is substantially the same as someone else's, then both of you will receive a failing grade. Be prepared to explain how your project works.

Attendance - You are expected to be present during the lecture and lab.

Homework - Participation and Challenge Activities are your homework.

In the readings column, all chapter and section numbers are from zyBooks. You should make an effort to read those chapters/sections and do your mandatory practice problems before every class meeting. I will allow you to take additional time up until **Saturday at 11:59pm of the same week**.

Lab work – zyLab assignments will be assigned to you in the lab, and they shall be worked on and completed whenever possible during the mandatory lab time. If you are not able to finish them during the lab, **only then** you may take additional time up until **Saturday 11:59pm of the same week**. Late submission beyond that extension will not be accepted.

Course Schedule*

Week	Date	Lecture Topic	Readings (ZyBooks)	Note	Homework
1	27-Aug	CECS274 class overview			
1	29-Aug	Java basic	1 8.9 scanner		1.1 ~
2	3-Sep	Java basic cont.	2.2-2.10 4.1 constant data "final" 4.2 common Math. methods. 4.3 integer div/modulo, 4.4 typecast (int) 4.5 binary, 4.6 character 4.7 Strings 4.9 numeric data types 4.10 random 5.1-5.7, 5.11-5.12		2.2-2.10 4.1-4.5, 4.7 5.1-5.7, 5.11-5.12
2	5-Sep	Java basic cont.	6.2-6.3 while, 6.4-6.7 for, for each 6.8 nested 6.10 break, 6.11 do while 6.12 variable scope		6.1-6.6 6.8-6.12
3	10-Sep	Java basic cont. + methods	2.11 calling methods 3.4 method basics 3.5 return 9.13 static fields/methods 5.13 String comparison 5.14 String operations 5.15 Character Ops 5.16 more Strings		2.11 3.4-3.5 9.13 5.13-5.16
3	12-Sep	OOP	3.1, 3.2 defining a class 3.3 main 8.3, 9.3 constructor overload 9.5 ADT/encapsulation	Quiz 1	3.1-3.3 8.3, 8.7 9.5
4	17-Sep	OOP cont.	2.12 constructing objects 2.13 accessors and mutators 3.8 this 3.9 java doc for classes 8.4 methods & errors 8.10 java doc methods 9.2 constructor		2.12-2.13 3.8-3.9 8.4, 8.10 9.2

4	19-Sep	OOP cont.	8.8 parameter error checking 9.1 mutators, accessors 9.14 packages		8.8 9.1 9.14
5	24-Sep	OOP cont.	8.7 overloading 9.4 objects and references 9.6 primitive and ref types 10 inheritance		8.7 9.4, 9.6 10.1-10.3
5	26-Sep	OOP cont.	10.4 object class 10.5 polymorphism 10.7 is vs has relationship		10.4 10.5 10.7
6	1-Oct	Arrays	7 Arrays 7.9 2D- Arrays 7.10 for each arrays 8.5 array as parameters	Quiz 2	7.1-7.5 7.9-7.10
6	3-Oct	Arrays / ArrayList	9.7 wrapper classes 9.8-9.11 Arraylist 10.6 Arraylist as object 25.18 ADT array based list		9.7-9.11 10.6 25.18
7	8-Oct	Exception	17 Exception		17.1-17.3
7	10-Oct	Midterm review			
8	15-Oct	Midterm			
8	17-Oct	Recursion	18.1-18.2 Recursion 18.5 Recursive methods 18.6 Recursive math 23.7 Recursive definitions 23.8 Recursive algorithms		18.1-18.2 18.5-18.6 23.7-23.8
9	22-Oct	Computational complexity	20.3, 23.5 Big-O notation 20.4, 23.6 Algorithm analysis 22.6 Algorithm efficiency 23.3 Constant time operations		20.3-20.4 22.6 23.3, 23.5
9	24-Oct	Sort	20.6, 24.2 Selection sort 34.1 Bubble sort	Quiz 3	20.6, 24.2 34.1
10	29-Oct	Sort cont.	20.9, 24.6 Merge sort		20.9 24.6
10	31-Oct	Search	20.1, 23.1 Searching algorithms		20.1 23.1
11	5-Nov	Search cont.	20.2, 23.2 Binary Search		20.2 23.2
11	7-Nov	Linked List	19.2 Linked List 22.1 Data structures 22.4 ADT 25.2 Singly linked list	Quiz 4	19.2 22.1 22.4 25.2
12	12-Nov	Linked List cont.	25.3 Singly linked list insert 25.4 Singly linked list remove		25.3 25.4
12	14-Nov	Linked List cont.	25.5 Singly linked list 25.6-25.8 Doubly linked list 25.9 Traversal		25.5-25.9
13	19-Nov	Stack	25.13 Stack ADT 25.14 Stacks	Quiz 5	25.13 25.14
13	21-Nov	Queue	25.15 Queue ADT 25.16 Queue 22.5 Applications of ADT		25.15 25.16 22.5
14	26-Nov	Hash Table	26.1 Hash table 26.2 Chaining 26.3 Linear probing		26.1-26.3
14	28-Nov	Thanksgiving break			

15	3-Dec	Hash Map	Hash Map		
15	5-Dec	Final review			
16	10-Dec	No class			
16	12-Dec	Final Exam 10:15am-12:15pm			

Course Evaluation Criteria

Your final grade is calculated by adding

- **5%** weight for each of the 5 quizzes (25% total)
- **20%** weight for midterm exam
- **25%** weight for final exam
- **15%** weight for lab work (zyLabs)
- **15%** zyBooks Participation / Challenge activities(recommend) (homework)
- Grades for all activities will be on a curve - the highest score is treated as 100%.
- Attendance is mandatory for both lecture and lab.

NOTE: You must be physically present in the classroom to receive any credit for a quiz or exam. You may not use any aid during a quiz or exam. Unless specifically stated, all quizzes and exams are closed book, closed notes, no computer, no tablet and no phone use allowed.

General School Guidelines

University Withdrawal Policy (This statement was provided by the Psychology Department).

It is the student's responsibility to withdraw from classes. Instructors have no obligation to withdraw students who do not attend courses, and may choose not to do so.

Attendance: Please read the CSULB attendance policy carefully. It can be found at:
http://www.csulb.edu/divisions/aa/grad_undergrad/senate/documents/policy/2001/01/

Due Dates: Check the class schedule carefully for assignment dates.

Make-up policy: If you miss graded assignments because you are absent and the absence falls under the conditions for an excused absence, I will work with you to make up the work at my discretion. Be prepared to show documentation.

Accommodation: It is the student's responsibility to notify me in advance of the need for accommodation of a disability.

Cheating and Plagiarism: All work that you turn in is assumed to be original unless your source material is documented appropriately. Using the ideas or words of another person, even a peer, or a web site, as if it were your own, is plagiarism. Cheating and plagiarism are serious academic offenses. Students should read the section on cheating and plagiarism in the CSULB catalog.

Furthermore, students should be aware that faculty members have a range of academic actions available to them in cases of cheating and plagiarism from arranging a conference, to failing a student on that particular work, to failing a student in a course, to referring the case to judicial affairs. *The official CSULB Policy on Cheating and Plagiarism can be found here:*

http://web.csulb.edu/divisions/aa/catalog/current/academic_information/cheating_plagiarism.html

ADA accommodations: Students with a disability or medical restriction who are requesting a classroom accommodation should contact the Disabled Student Services at 562-985-5401 or visit Brotman Hall, Suite 270 during 8AM-5PM weekday hours. Disabled Student Services will work with the student to identify a reasonable accommodation in partnership with appropriate academic offices and medical providers. We encourage students to reach out to DSS as soon as possible.

Beachboard: This course will be set up on CSULB's BeachBoard. You will need to have a CSULB e-mail account to use BeachBoard. Announcements and messages from me to the class will be posted on BeachBoard. If you do not check your CSULB e-mail account regularly, but use another account instead, please set your CSULB account so that it will forward messages to your other account. It is your responsibility to check the Beachboard.