



**KENNESAW STATE
UNIVERSITY**

SYLLABUS

COLLEGE OF COMPUTING AND SOFTWARE ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE

CS 3305/04: DATA STRUCTURE

ACADEMIC TERM: SPRING 2020

Course Information

Class meeting time: T/R 2:00pm – 3:15pm

Modality and Location: J-251

Instructor Information

Name: Selena He

Email: she4@kennesaw.edu

Office Location: J338

Office phone: 470-578-6039

Office Hours: T, H 11:00am – 2:00pm

Preferred method of communication: email

Course Description

Catalog Description:

This course introduces data structures, specification, application, and implementation. The case studies will illustrate how data structures are used in computing applications. The emphasis of the course is on linear and some nonlinear data structures and object-oriented principles. Topics include abstract data types, stacks, queues, lists, binary search trees, priority queues, recursion, algorithm efficiency, trees, heaps, hash tables, and analysis of search and sort algorithms and their performance for implementation and manipulation. The programming language to be used in this course is any standard high-level object-oriented programming language such as C++, Java, and Ada.

This course will use C++ as the implementation language. [CodeLite](#) will be the supported development environment and [gnu compiler](#) will be the required compiler. This compiler is native to Linux and there are versions available for Windows and Macs.

Prerequisites: (MATH2345 or CSE2300) and ((CSE1322 and CSE1322L each with a “B” or better), or (MTRE2610 with a “B” or better, or CPE3000 with a “B” or better))

Co-rerequisites: CS3305L

Credit Hours: 3-0-3

Course Materials

Course Website: <http://ksuweb.kennesaw.edu/~she4/2020Spring/cs3305>

Required Texts:

Data Structures and Other Objects Using C++ 4th Edition
Michael Main and Walter Savitch
Addison Wesley
ISBN#: 978-0-13-212948-0

Technology requirements: This course will use C++ as the implementation language. [CodeLite](#) will be the supported development environment and [gnu compiler](#) will be the required compiler. This compiler is native to Linux and there are versions available for Windows and Macs.

References:

C++ for Java programmers

- <http://pages.cs.wisc.edu/~cs368-2/CppTutorial/>
- <http://www.cprogramming.com/java/c-and-c++-for-java-programmers.html>
- <http://www.horstmann.com/ccj2/ccjapp3.html>
- http://cs.brown.edu/courses/cs123/docs/java_to_cpp.shtml

C++ for C# programmers

- <http://www.bobtaoindustries.com/Content/Devs/CsToCppASomewhatShortGuide.pdf>
- <https://msdn.microsoft.com/en-us/library/yyaad03b%28v=vs.90%29.aspx>
- https://en.wikibooks.org/wiki/C%2B%2B_Programming/Programming_Languages/Comparisons/C_Sharp

Learning Outcomes

After successful completion of this course, a student will be able to:

1. Apply single dimensional, multidimensional arrays, and dynamic arrays to store and access data
2. Learn specifications and presentation of commonly used data structures
3. Learn advanced search and sort algorithms and their performance issues
4. Analyze the time complexity and space complexity of algorithms
5. Apply the covered data structure in problem solving and application development

Course Requirements and Assignments

Homework, quizzes, and exams will be given numerical scores. These scores will be averaged at the end of the semester using the following weighting:

Assignment	Points, percentage or measurement
Midterm 1	20%
Midterm 2	20%
Comprehensive final	25%

Homework	15%
Quizzes	15%
Attendance	5%

Homework Submission: Copying or paraphrasing codes from other sources or other students will be considered a violation of the Student Code of Conduct. Due dates for homework assignments will be specified on the homework themselves. **No late submission is accepted.**

Evaluation and Grading Policies

All assignments will be given numerical scores and collected through Desire2Learn. Letter grades will be determined by ranking the numerical averages of all students in the class. Cut-off points for grades will depend on the performance of the class as a whole; however, they will be no higher than 90 (A), 80 (B), 70 (C), and 60 (D).

Grading Scale:	
A	90% - 100%
B	89% - 80%
C	79% - 70%
D	69% - 60%
F	59% or below

I will round up grades if they are > or = .5 or above, for example, an 89.6 is an A, but 79.2 is a C.

Course Policies

Feedback in a Timely Manner: The instructor will ONLY reply to e-mails that are sent using D2L email system. Please allow your instructor 24-48 hours before replying back to your email.

Attendance Policy: Regular attendance is expected; please notify me in advance if you will be unable to attend because of business travel or other valid reason. If a student misses 2 or more than 2 classes, the student's final grade may be decreased.

Homework Submission: Copying or paraphrasing codes from other sources or other students will be considered a violation of the Student Code of Conduct. Due dates for homework assignments will be specified on the homework themselves. **No late submission is accepted.**

Quiz/Exam Policy: Three quizzes and three exams will be given throughout the semester. In most cases, quizzes will be administered during the first 20 minutes of class. Students who are late to class on a day when a quiz is administered will not be given extra time to complete the quiz. Makeup quizzes/exams **WILL NOT** be given.

Electronic Devices and Classroom Behavior Policy: In order to minimize the level of distraction, all beepers and cellular phones must be on quiet mode during class meeting times. Students who wish to use a computer/PDA for note taking need prior approval of the instructor since key clicks and other

noises can distract other students. Recording of lectures by any method requires prior approval of the instructor. Students using a laptop in class should not check their email, browse the web, or in other way detract from the focus of the class.

Students are reminded to conduct themselves in accordance with the Student Code of Conduct ([KSU Student Code of Conduct, Section III](#)), as published in the Undergraduate and Graduate Catalogs. Every KSU student is responsible for upholding the provision. Students who are in violation of KSU policy will be asked to leave the classroom and may be subject to disciplinary action by the University.

Tutoring: The College of Computing and Software Engineering offers some tutoring services for certain courses. If this applies to your course, you may want to include this resource for your students. Tutoring info can be found here: <http://ccse.kennesaw.edu/ccselabs/ccse-tutoring.php>.

Faculty Conversations:

In preparation for the conversations with CS faculty about the research process/method, students must complete assigned background reading. There will be articles or book chapters assigned per class. In addition to the assigned articles or chapters, students should review the background information on the professor.

Withdrawal Policy

The last day to withdraw without academic penalty is **February 26, 2020**. Ceasing to attend class or oral notice thereof DOES NOT constitute official withdrawal from the course. Students who simply stop attending classes without officially withdrawing usually are assigned failing grades. Students wishing to withdraw after the scheduled change period (add/drop) must obtain and complete a withdrawal form from the Academic Services Department in the Registrar's Office.

Student Course Evaluation

A standard questionnaire (described below) will be administered during the last two weeks of the semester in all classes. Additional questions developed by the college or instructor(s) may be included as well. It is important that each student provide meaningful feedback to the instructor(s) so that changes can be made in the course to continually improve its effectiveness. We value student feedback about the course, our teaching styles, and course materials, so as to improve our teaching and your learning. At a minimum, the following two questions will be asked: 1) Identify the aspects of the course that most contributed to your learning (include examples of specific materials, exercises and/or the faculty member's approach to teaching and mentoring), and 2) Identify the aspects of the course, if any, that might be improved (include examples of specific materials, exercises and/or the faculty member's approach to teaching and mentoring).

Acquiring Final Grades

In an effort to better utilize our technology resources, Kennesaw State University has instituted the reporting of end of term grades by phone. This is in addition to the web version of grades, which has been in effect for several terms. Students may call 770-420-4315 and select Option Number 4 to secure their end of term grades. With this new development, printed grade reports will not be mailed at the end of the term. Students needing verification of grades or enrollment should request either an official transcript or enrollment verification through the Office of the Registrar.

Academic Integrity

Every KSU student is responsible for upholding all provisions of the Student Code of Conduct, as published in the Undergraduate and Graduate Catalogs. The Code of Conduct includes the following:

- Section II of the Student Code of Conduct addresses the University's policy on academic honesty, including provisions regarding plagiarism and cheating, unauthorized access to University materials, misrepresentation/falsification of University records or academic work, malicious removal, retention, or

destruction of library materials, malicious/intentional misuse of computer facilities and/or services, and misuse of student identification cards. Incidents of alleged academic misconduct will be handled through the established procedures of the University Judiciary Program, which includes either an “informal” resolution by a faculty member, resulting in a grade adjustment, or a formal hearing procedure, which may subject a student to the Code of Conduct’s minimum one semester suspension requirement.

- Students involved in off-campus activities shall not act in a disorderly or disruptive fashion, nor shall they conduct any dangerous activity.
- Students involved in off-campus activities shall not take, damage or destroy or attempt to take, damage or destroy property of another.

Frequently students will be provided with “take-home” exams or exercises. It is the student’s responsibility to ensure they fully understand to what extent they may collaborate or discuss content with other students. No exam work may be performed with the assistance of others or outside material unless specifically instructed as permissible. If an exam or assignment is designated “no outside assistance” this includes, but is not limited to, peers, books, publications, the Internet and the WWW. If a student is instructed to provide citations for sources, proper use of citation support is expected.

Additional information can be found at the following locations:

- <http://www.apa.org/journals/webref.html>
- <http://bailiwick.lib.uiowa.edu/journalism/cite.html>
- <http://www.indiana.edu/~wts/wts/plagiarism.html>
- <http://www.virtualsalt.com/antiplag.htm>

Department or College Policies

Students are expected to be aware that the Computer Science department has certain policies in place that govern practices within the department including:

1. “B” or better grade is required for CS 1321/L and CSE 1322/L and their equivalent transfers. All courses used toward any undergraduate degree in the computer science must be completed with an assessed performance grade of “C” or better. This means that all prerequisite courses from the CS Department must have been completed with a “C” or better in order for a student to enter the next course in a sequence.
2. All requests for course overloads must be made through the College advising office and with the approval of the Program coordinator and department chair. The instructor of any course is not permitted to authorize course overloads.
3. All requests for prerequisite bypasses must be made through the College advising office and with the approval of the Program coordinator and department chair. The instructor of any course is not permitted to authorize course overwrites.
4. All students are encouraged to register their current choice of major using the department major change process. Students who are not recorded under their intended major may find that they may be limited from registering for courses they require to complete their intended program of study.

Institutional Policies

Please visit each of the following links for Institutional policies.

Federal, BOR, & KSU Course Syllabus Policies:

https://curriculum.kennesaw.edu/resources/federal_bor_ksu_student_policies.php

Student Resources:

https://curriculum.kennesaw.edu/resources/ksu_student_resources_for_course_syllabus.php

Academic Integrity Statement:

<https://scai.kennesaw.edu/codes.php>

KSU Student Resources

This link contains information on help and resources available to students:

https://curriculum.kennesaw.edu/resources/ksu_student_resources_for_course_syllabus.php

Course Schedule

Course Topics and Outline

- Introduction to C++
- Linear data structures & STL
- Trees
- Graphs
- Maps/hash tables
- Sorting algorithms

Final Exam: 04/28/2020 1:00pm – 3:00pm

Week	Lecture Topic	Lab Topic	Reference
1	HelloWorld, Algorithm Efficiency	Set up the programming environment	Ch 1
2	OOP in C++	Create objects in C++	Ch 2
3	Container	Bag class modification	Ch 3
4	Dynamic bag	Dynamic bag improvements	Ch 4
5	Linked-List	Linked-List lab	Ch 5
6	Bag with Linked-List	Bag with Linked-List lab	Ch 5
7	Review, test 1		
8	Bag with template	Bag with template lab	Ch 6
9	Stack and Queue	Deque lab	Ch 7 & 8
10	Recursion	Recursion lab	Ch 9
10	BinaryTree	BinaryTree lab	Ch 10

11	Review, test 2		
12	Binary Search Tree	Write and test programs with binary search trees	Ch 10
13	Heaps and BTrees	Write and test programs with Heap	Ch 11
14	Hashing and Sorting	Write and test programs with Hash table	Ch 12 & 13
15	Graphs	Write and test programs with DFS/BFS	Ch 15
16	Final Exam		As per Semester Schedule

Disclaimer

The course syllabus provides a general plan for the course. Deviations may be necessary.