University of South Carolina
College of Engineering and Computing

CSCE 350: Data Structures and Algorithms
Spring 2023
Section H01: TR 10:05 am - 11:20 am   Location: 300MN B112

Vignesh Narayanan, Ph.D.	Course Website: https://blackboard.sc.edu
Assistant Professor, AIISC,	Teaching Assistant: N/A
Computer Science and Engineering	Office Hours:
Email: vignar@sc.edu	TR 2:00 pm – 3:00 pm, or by appointment

Tentative Course Syllabus

ACADEMIC BULLETIN DESCRIPTION:
Techniques for representing and processing information, including the use of lists, trees, and graphs; analysis of algorithms; sorting, searching, and hashing techniques.

GOALS AND LEARNING OUTCOMES:
The student will be able to

1. Describe formal analysis measures.

2. Describe the relevance of abstraction to problem-solving.

3. Analyze and use lists, trees, and graphs.

4. Apply common algorithm design techniques: brute force, decrease & conquer, divide & conquer, transform & conquer, dynamic programming, and the greedy technique.

5. Analyze algorithms.

6. Use appropriate data structures.

PREREQUISITES:
CSCE 240; MATH 174 or MATH 374 or MATH 574.
Pre-requisite by topics:

• Introductory programming and data structures

• Discrete mathematics

• Use of simple data structures (queues, stacks, lists, trees)

• C/C++ programming

COURSE TEXTBOOK AND REFERENCES:

1. Levitin, Anany. Introduction to the Design and Analysis of Algorithms. 3rd Edition. Addison-Wesley, 2012. (Required)

2. Cormen, H. Thomas, Leiserson, E. Charles, Rivest, L. Ronald, and Stien Clifford. Introduction to Algorithms. 3rd Edition. MIT Press, 2009. (Reference book)

All course materials comply with copyright/fair use policies.

GRADING SYSTEM:

All grades will be posted on Blackboard. You are strongly encouraged to check you scores in Blackboard regularly. Your overall final course letter grade will be determined by your grades on the following assessments.

Your final grade is based on the total points you have earned over the semester. The percentage scores are translated to letter grades as follows: A = [90% − 100%], B+ = [86% − 89%], B = [80% − 85%], C+ = [76% − 79%], C = [70% − 75%], D+ = [66% − 69%], D = [60% − 65%], F = [0% − 59%]

Homework Assignments (~ 5)	25%
Programming Assignments (~ 4)	20%
Quizzes(~ 5)	5%
Midterm Exams (~ 2)	30%
Final Exam	20%
Bonus Points* (Optional)	$\sim 20\%$

IMPORTANT NOTE REGARDING GRADE APPEALS:

Grade appeals for any assessment must be requested (either in writing or via email to me) within one (1) week of my posting the grade to Blackboard.

COVERED TOPICS:

- Structured programming, stacks, queues, lists

- Determining the Running Time of Programs, Order of Magnitude Analysis

- Brute force

- Divide-and-Conquer

- Dynamic Programming

- Transform-and-Conquer

- The Greedy Technique

- Decrease-and-Conquer

- Graphs

- Reviews and exams

- Invited talks (TBA) based on available time

COURSE COMMUNICATION:

The lecture notes and homework/programming assignments will be posted on the Blackboard, and solutions to the assignments, quizzes, and exams will be posted on the Blackboard. Announcements of this course will also be posted in Blackboard whenever necessary.

I will be communicating with you regarding grades and assignments. If you need to get in touch with me, the best method is via email (vignar@sc.edu). Generally, I will reply to emails within 24 hours and will provide feedback on assignments within 72 hours. You may also post questions pertaining to the course on the Blackboard Discussion Board. These questions will be answered within 24 hours. If you are having trouble with this course or its material, you should contact me via email to discuss the issues. If there is any other information I think is important, I will send it to your email address you have in Blackboard. It is your responsibility to ensure that your email account works properly to receive email.

COURSE ASSIGNMENTS:
All course deadlines are listed in Eastern Time Zone.

Homework assignments: A due date will accompany each homework assignment. The due time of the homework assignments will be at the beginning of the class. Homework assignments should be submitted through Blackboard.

Programming assignments: A due time will accompany each programming assignment. Each programming assignments may have different weight when it is counted into your final grade. Code should be written in C or C++ and should be tested in the departmental Linux computers. You need to turn in your code to Blackboard.

Quizzes: Quizzes will be held in class and announced the lecture before. Quizzes are closed-book, but open-notes either printed or handwritten.

Exams: Midterm exams and the final exam are closed-book and closed-notes, except for a single-side letter-size cheat sheet for each midterm and a double-side one for the final exam.

LATE SUBMISSION POLICY:
Make-up quizzes/ midterm-exams/ final exam are not allowed except excusable absences (see policy) with appropriate documentation and advanced notice. Please refer to Attendance Policy below for details.

   Late submissions of the homework/programming assignments will be accepted ONLY if BOTH of the following requirements are met:

• You must contact me in advance of the required assignment to make arrangement for its completion.

• You must complete the assignments within the week following its due date.

However, late submissions will be subject to the following penalty except excusable absences: 10% will be deducted from your grade for the first day late, and an additional 5% will be deducted on each subsequent day.

   ONE-TIME waiver of late submission penalty: you are granted for a ONE-TIME waiver of late submission penalty - you will not be penalized if you submit your assignment in three days after due date. Please notify me in advance when you use this waiver.

ATTENDANCE POLICY:
You are expected to attend class lectures and **participate in class discussions**. Success in this course is dependent on your active participation throughout the course. Class attendance is required as claimed in University policy. If you are absent, you are responsible for learning material covered in class. If you have an excused absence, you will be permitted to make up coursework or complete an equivalent assignment agreed upon with me. To arrange excuses for absences that can be anticipated at the start of the term, you should:

• Submit a written request (email is acceptable) stating the dates of the anticipated absence no later than the end of the second week of the course.

• Explain the reason for absence. Documentations are required. Please consult the policy for additional information.

• Include any request for make-up work.

   To arrange excuses for absences that cannot be anticipated at the start of the term, (e.g. legal proceedings or illness), you should, at the first opportunity, submit in a written request stating:

• The date of absence

- The reason for absence. Documentations are required. Please consult the policy for additional information.

- Any request for make-up work as soon as reasonably possible after you become aware of the need to be absent.

Lecture presentations assume that you have read the assigned material before coming to class and are prepared to ask questions during class. **If you do not ask questions, then I will assume that you understand the material**. If there is a topic you do not understand, it is your responsibility to seek clarification from me during lectures or during office hours, or from other students.

REQUEST FOR ACCOMMODATIONS:
Student Disability Resource Center (SDRC) empowers students to manage challenges and limitations imposed by disabilities. Students with disabilities are encouraged to contact me to discuss the logistics of any accommodations needed to fulfill course requirements (within the first week of the semester). In order to receive reasonable accommodations from me, you must be registered with the Student Disability Resource Center (1705 College Street, Close-Hipp, Suite 102, Columbia, SC 29208, 803-777-6142). Any student with a documented disability should contact the SDRC to make arrangements for appropriate accommodations.

ACADEMIC INTEGRITY:
The faculty takes violations of the University Honor Code seriously. Students are encouraged to review the Honor Code and to understand the consequences of any action that is proven to be a violation of the code.

You are expected to practice the highest possible standards of academic integrity. Any deviation from this expectation will result in a minimum academic penalty of your failing the assignment. In addition, an honor code violation will be subject to the sanctions described in the USC Community Handbook and Policy Guide. Violations of the University Honor Code include, but are not limited to, improper citation of sources, using another student's work, and any other form of academic misrepresentation. For more information, please see the University Honor Code.

In reference to this course, students are expected to do their own work when assignments and exams require individual work. For example, students are encouraged to discuss with peers while working on assignments and projects, but they may not copy the work of others, either manually or electronically, under these conditions. Further, students who allow their work to be copied by others risk violation of the University Honor Code. Below are some websites for you to visit to learn more about University policies:

- Carolinian Creed

- Academic Responsibility

- Office of Student Conduct and Academic Integrity

- Information Security Policy and Standards

HEALTH AND SAFETY:
Students are expected to comply with all university health and safety guidelines including those about COVID-19. For current COVID-19 guidelines, visit Guidelines.