CS 2413 – Data Structures – Spring 2021

Syllabus

Instructor: Dr. Sridhar Radhakrishnan, sridhar@ou.edu

Office Location: DEH 325 (All meetings will be via Zoom)
Office Hours: 2:00 P.M to 3:30 P.M (Monday and Wednesday) held via Zoom with the link below.
https://oklahoma.zoom.us/j/92522962598?pwd=K2dMd21EL2JLbXlPY1BIeVVOc2RvQT09&from=addon

Class Time: 3:30 PM to 4:45 PM (MW) (All class meetings will be via Zoom)
https://oklahoma.zoom.us/j/94836113285?pwd=NVpDQS9Vam9tM2FZK3Rydm02bUsxQT09&from=addon;

As this is a Zoom class, please note that the instructor may request you to turn your microphone and camera on. Please let the instructor know if you do not have accesses to a microphone or camera or you are in an environment where you cannot use them. You need to treat this Zoom class as if you are attending an in-person class. Zoom etiquette to be followed for this class:

- Keep the microphone and video camera off. Turn them on when you need to use them for class.
- You need to use your real name for the zoom session.
- Dress as if you are attending an in-person class.
- Use the Chat box to communicate and do not use abusive or inappropriate language.
- All video sessions will be recorded and hence use appropriate language when communicating.
- Ensure that the room where you are attending the class from is quiet and well-lit.

Teaching Assistants:

- Sudhindra Gopal. sudhi@ou.edu (2:00-3:00 PM on Tuesday and Thursday)

  Zoom Link:
  https://oklahoma.zoom.us/j/96348004153?pwd=ZHFQM0M3UE5Nblc0MENUcVh0bmNCdz09
- Aditya Narasimhan. adinaras@ou.edu (1:00-2:00 PM on Monday and Wednesday)

  Zoom Link:
  https://oklahoma.zoom.us/j/98423807989?pwd=aWJvaUZ0VDFHVW9OQis0V3NqSlFZQT09

Course Pre/Co-requisite: CS 2334 and (CS 2813 or MATH 2513 as a corequisite)

Textbook: Radhakrishnan, S., Wise L., and Sekharan, N. 2013. *Data Structures Featuring C++: A Programmer's Perspective (Links to an external site.)* This textbook is available on Amazon.

Course Requirements: Students are required to take two exams and a final. There will be no makeup exams except in cases of emergencies. Failure to take the final exam will result in an automatic F as the overall course grade. There will be set of six programming projects that each student should individually complete and all programming projects must be written in C/C++ and will be specified. There will be a number of pop quizzes. These quizzes will be during class time. The quizzes will be on canvas and released just before the actual quiz time and will be closed in about 10-15 mins. Exactly 20% of the lowest scoring quizzes will be dropped. If a quiz is not taken, then you will receive an

automatic zero on the quiz. If there is a legitimate and documented reason (for example, health), then that quiz will not be considered when evaluating the quiz grades. The course letter grade will be assigned based on the overall percentage: >= 90 (A), >=80 and < 90 (B), >=70 and < 80 (C), >=60 and < 70 (D), and <60 (F). The allocation of percentages is given below:

	Percentages
Pop Quizzes	10%
Exam 1	15%
Exam 2	15%
Final	25%
Programming Projects	35%

ABET Outcomes of Instruction in CS 2413:

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.

Persons with Disability or Special Accommodation or Accommodation for any reason:

Please advise/inform your instructor of any of your special needs if you are an individual with disability. Also, please advise/inform your instructor of any special accommodation that you need, and all such matters will be addressed after conversations with relevant experts. It is important that you reach out to your instructor in a timely manner to address all matters relating to the need for accommodation. We will follow the makeup policies as provided in [See Faculty Handbook 4.7, 4.9, 4.10, and 4. 11]

Programming Projects:

Projects have to be coded in C/C++. You will use the Google Cloud Computing environment. We will provide instructions to install the compute image that we have created for this course. We will use ANSI C/C++ and hence if your program compiles on any g++ compiler then you are set to go.

1. You will also use the gradescope facility to submit the source program.
2. For every 24 hours late, you will be deducted 10% of the grade of the programming project. Any project that is more than 5 days late will not be evaluated.
3. A programming project that does not meet the specifications will receive an automatic deduction of 50% of the grade.
4. You are better off submitting a working project on the fifth day rather than the one that does not work on the day it is due.
5. Programs have to be documented clearly. Programs that lack or are weak in documentation will receive a deduction of up to 30% of the grade. Follow the documentation methods that were used in programs presented in your data structures book.
6. You will demo your project to the grader during the grader assigned special office hours **if the grader so wishes**. Graders are not responsible for debugging your programs.

7. The specification for the projects presented by the instructor may not contain all the details of implementation. It is your responsibility to understand the specifications thoroughly. Please ensure that all relevant questions regarding the project are asked during class time.
8. **Copying programs or consulting others for coding is strictly prohibited and will be treated as plagiarism. Additionally, copying programs from the Internet is also strictly prohibited. All projects are individual projects and hence you are required to work on your own without any help from others.**
9. Apart from the above general policies for evaluating, each programming project will also have a set of specifications that should be met.

Programming Tools:

All the programming projects should be carried out through the Google Cloud Platform (GCP).

1. Each student will be given a $50 coupon for the platform.
2. The platform is built on an Ubuntu operating system.
3. The projects should be written using Eclipse Integrated Development Environment.
4. Eclipse also provides tools to debug the programs in case of a syntax or a semantic error.
5. Eclipse also will be equipped with the profiling tools to measure,
   a. The time taken to run the program, and its sub-routines.
   b. Check if there are any leaks in the memory, or the memory usage by your program.
6. To access the Ubuntu user interface, an external software called VNC viewer should be installed on the host desktop.
7. The $50 coupon allows you use the instance for approximately 1500 hours with the configuration mentioned in the setup documentation.
8. The individual will be responsible for any charges beyond the $50.00 Care must be taken to stop the instance when not in use.

Tentative Course Schedule

Date	Topics	Projects
January 25, 2021	C++ Programming	Project 1 Assigned
January 27, 2021	C++Programming	
February 1, 2021	Chapter 1 Introduction (Object-Oriented Programming)	
February 3, 2021	Chapter 1 Introduction (Object-Oriented Programming)	
February 8, 2021	Chapter 2 Algorithms and Recursion	
February 10, 2021	Chapter 2 Algorithms and Recursion	Project 1 Due; Project 2 Assigned
February 15, 2021	Chapter 3 Arrays, Strings, and Vectors	
February 17, 2021	Chapter 3 Arrays, Strings, and Vectors	
February 22, 2021	Chapter 3 Arrays, Strings, and Vectors	
February 24, 2021	Chapter 4 Linked Lists	
March 1, 2021	Chapter 4 Linked Lists	Project 2 Due; Project 3 Assigned
March 3, 2021	Chapter 5 Stacks and Queues	
March 8, 2021	Chapter 5 Stacks and Queues	
March 10, 2021	**Exam – 1**	
March 15, 2021	Chapter 6 Single Dimensional Binary Trees	
March 17, 2021	Chapter 6 Single Dimensional Binary Trees	Project 3 Due; Project 4 Assigned
March 22, 2021	Chapter 6 Single Dimensional Binary Trees	
March 24, 2021	Chapter 7 Self-Modifying Search Trees	
March 29, 2021	Chapter 7 Self-Modifying Search Trees	
March 31, 2021	Chapter 7 Self-Modifying Search Trees Chapter 8 Priority Search Trees	
April 5, 2021	Chapter 8 Priority Search Trees	Project 4 Due; Project 5 Assigned
April 7, 2021	**Exam – 2**	
April 12, 2021	Chapter 9 Sorting	
April 14, 2021	Chapter 9 Sorting	
April 19, 2021	Chapter 9 Sorting Chapter 10 Hashing	
April 21, 2021	Chapter 10 Hashing	Project 5 Due; Project 6 Assigned
April 26, 2021	Chapter 11 Graphs	
April 29, 2021	Chapter 11 Graphs	
May 3, 2021	Chapter 11 Graphs	
May 5, 2021	Review for the Final Examination	Project 6 Due
May 13, 2021	**Final Examination; 8:00 AM – 10:00 AM (Thursday)**	

Make-up Policy

In this section, you should clearly state a make-up policy that is in agreement with the relevant statements in the Faculty Handbook. [See Faculty Handbook 4.7, 4.9, 4.10, and 4. 11]

Absences

In this section, you should clearly state an attendance policy that is in agreement with the relevant statements in the Faculty Handbook. [See Faculty Handbook 4.19]

University Policies

Academic Integrity: *There is not specific language for the Academic Integrity policy to be included in the syllabus. It is good to become familiar with the policy and describe it in your own words.*
[See http://integrity.ou.edu/faculty_guide.html]

Cheating is strictly prohibited at the University of Oklahoma, because it devalues the degree you are working hard to get. As a member of the OU community it is your responsibility to protect your educational investment by knowing and following the rules. For specific definitions on what constitutes cheating, review the Student's Guide to Academic Integrity at http://integrity.ou.edu/students_guide.html. To be successful in this class, all work on exams and quizzes must be yours and yours alone. You may not receive outside help. On examinations and quizzes, you will never be permitted to use your notes, textbooks, calculators, or any other study aids. Should you see someone else engaging in this behavior, I encourage you to report it to myself or directly to the Office of Academic Integrity Programs. That student is devaluing not only their degree, but yours, too. Be aware that it is my professional obligation to report academic misconduct, which I will not hesitate to do. Sanctions for academic misconduct can include expulsion from the University and an F in this course, so don't cheat. It's simply not worth it.

Religious Observance: It is the policy of the University to excuse the absences of students that result from religious observances and to reschedule examinations and additional required classwork that may fall on religious holidays, without penalty.
[See Faculty Handbook 3.15.2]

Reasonable Accommodation Policy: *There is not specific language for the Reasonable Accommodation policy to be included in the syllabus. It is good to become familiar with the policy and describe it in your own words. Including the link to Disability Resources Center is encourage, http://www.ou.edu/drc/home.html.* [See Faculty Handbook 5.4]

Students requiring academic accommodation should contact the Disability Resource Center for assistance at (405) 325-3852 or TDD: (405) 325-4173. For more information please see the Disability Resource Center website http://www.ou.edu/drc/home.html Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact me personally as soon as possible so we can discuss accommodations necessary to ensure full participation and facilitate your educational opportunities.

Title IX Resources and Reporting Requirement: For any concerns regarding gender-based discrimination, sexual harassment, sexual assault, dating/domestic violence, or stalking, the University offers a variety of resources. To learn more or to report an incident, please contact the Sexual Misconduct Office at 405/325-2215 (8 to 5, M-F) or smo@ou.edu. Incidents can also be reported confidentially to OU Advocates at 405/615-0013 (phones are answered 24 hours a day, 7 days a week). Also, please be advised that a professor/GA/TA is required to report instances of

sexual harassment, sexual assault, or discrimination to the Sexual Misconduct Office. Inquiries regarding non-discrimination policies may be directed to: Bobby J. Mason, University Equal Opportunity Officer and Title IX Coordinator at 405/325-3546 or bjm@ou.edu. For more information, visit http://www.ou.edu/eoo.html.

Adjustments for Pregnancy/Childbirth Related Issues: Should you need modifications or adjustments to your course requirements because of documented pregnancy-related or childbirth-related issues, please contact your professor or the Disability Resource Center at 405/325-3852 as soon as possible. Also, see http://www.ou.edu/eoo/faqs/pregnancy-faqs.html for answers to commonly asked questions.

Final Exam Preparation Period: Pre-finals week will be defined as the seven calendar days before the first day of finals. Faculty may cover new course material throughout this week. For specific provisions of the policy please refer to OU's Final Exam Preparation Period policy (https://apps.hr.ou.edu/FacultyHandbook#4.10).

Emergency Protocol: During an emergency, there are official university procedures that will maximize your safety.

Severe Weather: If you receive an OU Alert to seek refuge or hear a tornado siren that signals severe weather *1. LOOK* for severe weather refuge location maps located inside most OU buildings near the entrances *2. SEEK* refuge inside a building. Do not leave one building to seek shelter in another building that you deem safer. If outside, get into the nearest building. *3. GO* to the building's severe weather refuge location. If you do not know where that is, go to the lowest level possible and seek refuge in an innermost room. Avoid outside doors and windows. *4.* GET IN, GET DOWN, COVER UP. 5. *WAIT* for official notice to resume normal activities.
Link to Severe Weather Refuge Areas , Severe Weather Preparedness - Video

Armed Subject/Campus Intruder: If you receive an OU Alert to shelter-in-place due to an active shooter or armed intruder situation or you hear what you perceive to be gunshots:
1. GET OUT: If you believe you can get out of the area WITHOUT encountering the armed individual, move quickly towards the nearest building exit, move away from the building, and call 911. *2. HIDE OUT*: If you cannot flee, move to an area that can be locked or barricaded, turn off lights, silence devices, spread out, and formulate a plan of attack if the shooter enters the room. *3. TAKE OUT*: As a last resort fight to defend yourself.
For more information, visit http://www.ou.edu/emergencypreparedness.html
Shots Fired on Campus Procedure - Video

Fire Alarm/General Emergency: If you receive an OU Alert that there is danger inside or near the building, or the fire alarm inside the building activates: *1. LEAVE* the building. Do not use the elevators. *2. KNOW* at least two building exits *3. ASSIST* those that may need help *4. PROCEED* to the emergency assembly area *5 ONCE safely outside, NOTIFY first responders of anyone that may still be inside building due to mobility issues. 6. WAIT* for official notice before attempting to re-enter the building.*OU Fire Safety on Campus*