DATA STRUCTURES AND ALGORITHMS
CSCE 3110.021 – SUMMER 2019

Instructor: Dr. Mark A. Thompson, Sr.
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E-mail Address: Mark.Thompson2@unt.edu
Class Location/Time: NTDP B142, MoWe 11:30 AM – 2:20 PM
Office Hours: MoWe 2:30 – 3:30 PM or by appointment

Every attempt will be made to answer e-mails within 24 hours. Please include CSCE 3110.021 in the subject line.


Prerequisites: CSCE 2100 Computing Foundations I and CSCE 2110 Computing Foundations II. You need to know how to write and compile C++ code on your own, and basic knowledge of elementary data structures.

Canvas This course will use the Canvas learning management system (LMS) to distribute course materials, communicate and collaborate online, post grades, and submit assignments. You are responsible for checking the Canvas course site regularly for class work and announcements.

COURSE DESCRIPTION
This course is intended to emphasize the understanding of non-linear data structures and elementary graph algorithms. We will cover both theoretical analysis and experimentation. Lectures will emphasize theoretical aspects, whereas assignments will cover both theory and programming aspects.

COURSE OUTCOMES
Course outcomes are measurable achievements to be accomplished by the completion of a course. These outcomes are evaluated as part of our ABET accreditation process.

1. Understand time complexity of algorithms.
2. Be able to solve recurrence relations.
3. Understand and be able to analyze the performance of data structures for searching, including balanced trees, hash tables, and priority queues.
4. Apply graphs in the context of data structures, including different representations, and analyze the usage of different data structures in the implementation of elementary graph algorithms including depth-first search, breadth-first search, topological ordering, Prim's algorithm, and Kruskal's algorithm.
5. Be able to code the above-listed algorithms
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TOPICS
1. Time and Space Analysis (Asymptotic Notation)
2. Recursion and Recurrence Relations
3. Review of Basic Data Structures (Lists, Stacks, Queues, etc.)
4. Tree-Based Data Structure, including Heaps, BSTs, Union/Find Data Structures, and AVL Trees
5. Hashing
6. Data Structures for Storing Graphs, Elementary Graph Algorithms (Breadth-First Search, Depth-First Search) and their Applications
7. Algorithms for Solving Minimum Spanning Tree Problem (Prim’s and Kruskal’s) and their Implementations

ADA STATEMENT
The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking reasonable accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with a reasonable accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request reasonable accommodations at any time, however, ODA notices of reasonable accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of reasonable accommodation for every semester and must meet with each faculty member prior to implementation in each class. Students are strongly encouraged to deliver letters of reasonable accommodation during faculty office hours or by appointment. Faculty members have the authority to ask students to discuss such letters during their designated office hours to protect the privacy of the student. For additional information see the Office of Disability Accommodation website at http://www.unt.edu/oda. You may also contact them by phone at 940.565.4323.

ACCEPTABLE STUDENT BEHAVIOR
Student behavior that interferes with an instructor’s ability to conduct a class or other students’ opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student’s conduct violated the Code of Student Conduct. The university’s expectations for student conduct apply to all instructional forums, including university and electronic classroom, labs, discussion groups, field trips, etc. The Code of Student Conduct can be found at http://deanofstudents.unt.edu.
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GRADING POLICY

Your course grade will be a weighted average according to the following:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance/Participation/In-Class</td>
<td>10.0%</td>
</tr>
<tr>
<td>Homework</td>
<td>25.0%</td>
</tr>
<tr>
<td>Programming Assignments</td>
<td>25.0%</td>
</tr>
<tr>
<td>Midterm</td>
<td>20.0%</td>
</tr>
<tr>
<td>Comprehensive Final Exam</td>
<td>20.0%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Grades will be posted on Canvas throughout the semester to provide an ongoing assessment of student progress, though final assessment will be measured using the weighted average above. Once a grade is assigned on Canvas, students have one (1) week to dispute the grade. The proper channel for grade disputes is to first go to the original grader (either the TA or IA) in an attempt to resolve the issue. If, however, a resolution cannot be reached between the student and the grader, the student shall then go to the instructor who will have the final say on the grade.

Attendance/Participation: Attendance/Participation/In-Class grades will be based on attendance, contribution to in-class discussions, and in-class assignments. Disruptive behavior and absences deemed excessive will result in a lower attendance/participation grade.

Homework: Homework will be assigned based on material from the lectures and textbook. These assignments are meant for you to become familiar with the course material and this practice will aid you in mastering the concepts on the programming assignments and exams. No late homework will be accepted, so please make sure that you complete and submit all homework assignments on time.

Programming Assignments: There will be approximately three or four programming assignments assigned during the summer session. Programming assignments will be completed solely by the individual outside of class, though some in-class time may be dedicated to answering questions about or working on the programming assignments. Programming assignments will be accepted up to 24 hours late and be assessed a 30% grade reduction penalty. Programming assignments submitted more than 24 hours late will not be accepted and receive a grade of “0”. Partial credit will be given for programs that compile, but are not complete. Starting early on programming assignments is strongly encouraged as students typically have great difficulty in completing their programming assignments in one night the day before they are due. Instructions for submitting programming assignments will be made available for each project.

Midterm Exam: There will be a midterm examination given in this course. The date of this exam will be posted on Canvas and announced in class at least one week prior to the date of the exam. A make-up exam will be given at the discretion of the instructor when a student misses an exam with an excused absence. Unexcused absences on the date of an exam may result in a grade of “0” for the missed exam, so every effort should be made to attend class on the day of a scheduled exam.

Final Exam: There will be a final exam on Friday, July 5, 2019, at the same time and location of our regularly scheduled lecture. All students are expected to take the final exam during the scheduled time period.
ATTENDANCE POLICY

Class attendance is regarded as an obligation as well as a privilege, especially as some of the homework and laboratory assignments require specific software or hardware that is provided by the instructor on a particular date. All students are therefore expected to attend each class meeting. A student who misses class is still responsible to find out what was discussed and to learn the material that was covered and obtain the homework that was assigned on the missed day. The instructor is not responsible for re-teaching material missed by a student who did not attend class. Therefore, each student is accountable for and will be evaluated on all material covered in this course, regardless of attendance. Excessive student absences may have a negative impact on a student’s comprehension and learning and result in a lower grade than expected. If there are extenuating circumstances, please notify your instructor so that you can work together to ensure your success in learning the material.

ACADEMIC DISHONESTY

This course follows UNT’s policy for Student Academic Integrity that can be found at https://policy.unt.edu/policy/06-003 as well as the Cheating Policy for the Department of Computer Science and Engineering (posted on Canvas). Specifically, the first instance of a student found to have violated the academic integrity (i.e., cheating) policy will result in a grade of “F” for the course and have a report filed into the Academic Integrity Database, which may include additional sanctions.

Individual assignments must be the sole work of the individual student. For individual assignments, you should not work with other students on a shared solution or acquire a solution from the Internet. If you are having trouble with an assignment, please consult with your instructor or TA. Failure to adhere to these strict standards may be cause for disciplinary action even leading to expulsion from the University.

In case the above description and in-class discussion of appropriate and inappropriate collaboration do not answer all of your questions, please meet with your instructor and look at the university Student Rights and Responsibilities web page.

STUDENT RESPONSIBILITY

Students are responsible for submitting the correct assignments (i.e., uploading the proper files) for each applicable assignment submission on Canvas. In certain cases, when an assignment is verified to be completed on time, but either was submitted to an incorrect assignment location (e.g., submitting Homework 4 to Homework 5 location on Canvas) or a wrong assignment was submitted instead, the assignment may be assessed a 30% reduction penalty if the due date has passed. If you have any questions or concerns about your submission, please work with your instructor or TA/IA to ensure the correct file(s) is/are submitted.

Please note that verification of completion time must be on our CSE machines, so it may be in your best interest to download any submitted work to your directory on our CSE machines.
SYLLABUS REVISIONS
This syllabus may be modified as the course progresses should the instructor deem it necessary. Notice of changes to the syllabus shall be made through Canvas and/or class announcement.

TENTATIVE CLASS SCHEDULE (subject to change):

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Material Covered</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5/13 — 5/17</td>
<td>Intro, Chaps 1 &amp; 2</td>
<td>HW1</td>
</tr>
<tr>
<td>2</td>
<td>5/20 — 5/24</td>
<td>Chaps 2 &amp; 3</td>
<td>HW2, PROG1</td>
</tr>
<tr>
<td>3</td>
<td>5/27 — 5/31</td>
<td>Chaps 3 &amp; 4</td>
<td>HW3</td>
</tr>
<tr>
<td>4</td>
<td>6/3 — 6/7</td>
<td>Chaps 4 &amp; 5</td>
<td>Midterm, PROG2</td>
</tr>
<tr>
<td>5</td>
<td>6/10 — 6/14</td>
<td>Chap 6</td>
<td>HW4</td>
</tr>
<tr>
<td>6</td>
<td>6/17 — 6/21</td>
<td>Chaps 7 &amp; 8</td>
<td>HW5, PROG3</td>
</tr>
<tr>
<td>7</td>
<td>6/24 — 6/28</td>
<td>Chaps 8 &amp; 9</td>
<td>HW6</td>
</tr>
<tr>
<td>8</td>
<td>7/1 — 7/5</td>
<td>Chap 9, Review</td>
<td>Final Exam, PROG4</td>
</tr>
</tbody>
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IMPORTANT DATES

May 13    First Class Day
May 27    Memorial Day (university closed)
Jun 13    Last day to drop a course with a grade of W for courses a student is not passing
Jul 3     Last class day
Jul 4     Independence Day (university closed)
Jul 5     Final Examination