DATA STRUCTURES AND ALGORITHMS  
CSCE 3110.001 – FALL 2017

Instructor: Dr. Mark A. Thompson, Sr.  
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E-mail Address: Mark.Thompson2@unt.edu  
Class Location/Time: NTDP B155, TuTh 2:30 – 3:50 PM  
Office Hours: MoWe 10:30 – 11:30 AM  
TuTh 1:30 – 2:30 PM  or by appointment  
Every attempt will be made to answer e-mails within 24 hours. Please include CSCE 3110.001 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.  
Blackboard: This course will use Blackboard, a web-based course management system, to distribute course materials, communicate and collaborate online, post grades and submit assignments. You are responsible for checking the Blackboard 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.
GRADING POLICY

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

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance/Participation</td>
<td>6.0%</td>
</tr>
<tr>
<td>Homework</td>
<td>20.0%</td>
</tr>
<tr>
<td>Programming Assignments</td>
<td>24.0%</td>
</tr>
<tr>
<td>Midterm 1</td>
<td>15.0%</td>
</tr>
<tr>
<td>Midterm 2</td>
<td>15.0%</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 Blackboard 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 Blackboard, students have two (2) weeks 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 grades will be based on attendance and engagement in in-class activities using iClicker Cloud. Students are expected to attend class, register with iClicker Cloud, and bring a device (e.g., smartphone, tablet, laptop computer, etc.) for polling responses in this course. Details about iClicker Cloud will be provided separately.

**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 programming assignments assigned during the semester. Programming assignments will be completed 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 Exams:** There will be two midterm examinations given in this course. The dates of these exams will be posted on Blackboard and announced in class at least one week prior to the date of the exams. 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 comprehensive final exam on Tuesday, December 12, 2017, from 1:30 PM to 3:30 PM. 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. 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.

Points will be allocated towards the attendance/participation grade based on both attendance and engagement in several in-class activities using iClicker Cloud given throughout the semester. Details about iClicker Cloud will be provided in a separate document. There will be no make-up for missed polling questions, whether for an excused or unexcused absence, so it is in your best interest to make every attempt to attend each and every lecture section. 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 the Department of Computer Science and Engineering Cheating Policy. Specifically, students caught cheating or plagiarizing will receive a “0” for that particular assignment or exam for the first incident and may have a report filed into the Academic Integrity Database according to https://policy.unt.edu/policy/06-003. A second instance of cheating in this class will result in a grade of “F” for the course and follow the procedures for multiple violations of academic dishonesty, which may include additional sanctions.

All work, including homework, programming assignments, and exams, should be the sole work of the individual student. You should not work with other students on shared program solutions or use program solutions found on the Internet. Specifically, you should never copy someone else’s solution or code, and never let a classmate examine your code. A sophisticated program will be used to compare your work to the work of all other students (including students in past classes). If you are having trouble with an assignment, please consult with your instructor, TAs, IAs, or Peer Mentors.

Misuse of iClicker Cloud, such as submitting answers for someone not in attendance in class, will be considered a violation of proper student conduct and will be treated as cheating.

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 Blackboard. In certain cases, when an assignment is submitted on time, but to an incorrect assignment location (e.g., submitting HW 04 to HW 05 location on Blackboard), 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, TA, IA, or Peer Mentor to ensure the correct file(s) is/are submitted.
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 Blackboard 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>8/28 — 9/1</td>
<td>Intro, Chapter 1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>9/4 — 9/8</td>
<td>Chapters 1 &amp; 2</td>
<td>HW 1</td>
</tr>
<tr>
<td>3</td>
<td>9/11 — 9/15</td>
<td>Chapter 2</td>
<td>HW 2</td>
</tr>
<tr>
<td>4</td>
<td>9/18 — 9/22</td>
<td>Chapter 3</td>
<td>Prog 1</td>
</tr>
<tr>
<td>5</td>
<td>9/25 — 9/29</td>
<td>Chapter 3, Review</td>
<td><strong>Exam 1</strong></td>
</tr>
<tr>
<td>6</td>
<td>10/2 — 10/6</td>
<td>Chapter 4</td>
<td>HW 3</td>
</tr>
<tr>
<td>7</td>
<td>10/9 — 10/13</td>
<td>Chapters 4 &amp; 5</td>
<td>HW 4</td>
</tr>
<tr>
<td>8</td>
<td>10/16 — 10/20</td>
<td>Chapter 5</td>
<td>HW 5</td>
</tr>
<tr>
<td>9</td>
<td>10/23 — 10/27</td>
<td>Chapter 6</td>
<td>Prog 2</td>
</tr>
<tr>
<td>10</td>
<td>10/30 — 11/3</td>
<td>Chapter 6, Review</td>
<td><strong>Exam 2</strong></td>
</tr>
<tr>
<td>11</td>
<td>11/6 — 11/10</td>
<td>Chapter 7</td>
<td>HW 6</td>
</tr>
<tr>
<td>12</td>
<td>11/13 — 11/17</td>
<td>Chapters 7 &amp; 8</td>
<td>HW 7</td>
</tr>
<tr>
<td>13</td>
<td>11/20 — 11/24</td>
<td>Chapters 8 &amp; 9</td>
<td>HW 8</td>
</tr>
<tr>
<td>14</td>
<td>11/27 — 12/1</td>
<td>Chapter 9</td>
<td>Prog 3</td>
</tr>
<tr>
<td>15</td>
<td>12/4 — 12/8</td>
<td>TBD, Review</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>12/12 Tue</td>
<td>Final Exam</td>
<td></td>
</tr>
</tbody>
</table>

1:30 — 3:30

IMPORTANT DATES
Aug 28 First Class Day
Sep 4 Labor Day (university closed)
Oct 6 Last day to drop a course with a grade of W for courses a student is not passing.
Nov 6 Last day to drop a course with written consent of instructor.
Nov 23 – 24 Thanksgiving Break (no classes)
Dec 7 Last Class Day
Dec 12 Final Exam