CSCI 3110: Algorithm and Data Structures
Summer 2019

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Office Hours:
Monday, Tuesday, Wednesday & Thursday: 2:00 – 3:30
Other times by appointment

Course Information:

Requirement textbook:

Course webpage: http://www.cs.mtsu.edu/~zdong/3110

Covered concepts: Most chapters in the textbook will be covered in an appropriate sequence – not necessarily in the sequential order. Other supplemental material deemed necessary by the instructor will be provided and covered in assignments and exams. Major topics include
- C++, such as inheritance, polymorphism, and class/function template;
- Data structures such as trees, hashing table, and heap;
- Various algorithms such as graph, and sorting;
- Algorithm Design Techniques such as greedy algorithm, and dynamic programming;
- Algorithm analysis

Learning outcomes: Upon successful completion of this course, a student will be able to
- write object-oriented programs using advanced techniques such as inheritance, polymorphism, dynamic binding, and generic programming.
- design and implement various sorting algorithms such as selection, bubble, insertion, merge, quick, and heap sorts
- design and implement more complicated structures such as priority queue, heap, balanced search trees, hashing table, and graphs as classes (including search, insert, delete, and traverse elements)
- use “Big-O” analysis to critique algorithms
- produce effective and efficient programs to solve complex practical problems by choosing the most appropriate data structures and algorithm design techniques, and then use appropriate design, debugging, and testing techniques
- recognize the need for, and can program in a consistent and well accepted coding style
Course Assignments

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>10%</td>
</tr>
<tr>
<td>Projects</td>
<td>30% (The worst one will be dropped)</td>
</tr>
<tr>
<td>Midterm Exams (2)</td>
<td>40% (20% each)</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Grading scale

Letter grades will be determined using a standard percentage point evaluation as outlined below.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90% - 100%</td>
</tr>
<tr>
<td>B+</td>
<td>85% - 89%</td>
</tr>
<tr>
<td>B</td>
<td>80% - 84%</td>
</tr>
<tr>
<td>C+</td>
<td>75% - 79%</td>
</tr>
<tr>
<td>C</td>
<td>70% - 74%</td>
</tr>
<tr>
<td>D+</td>
<td>65% - 69%</td>
</tr>
<tr>
<td>D</td>
<td>60% - 64%</td>
</tr>
<tr>
<td>F</td>
<td>0% - 59%</td>
</tr>
</tbody>
</table>

Your final grades will be calculated based on the above tables with the following exceptions:

- The project grade cannot raise the test grade more than two levels. For example, if your test grade is C, then the highest final letter grade you can get is B (i.e. C --> C+ --> B).
- Your final grade will be **below** C if one of the following occurs
  - the exam average is a F
  - the final exam score is a F
  - the project average is a F
  - a grade of zero on two or more projects

Project

Programming projects are designed for solving problems assigned without direct teacher supervision. You will go to the lab at your own convenience and solve the assigned problem at your own pace.

Programs are graded based upon design, correctness, documentation, style, efficiency, elegance, and adherence to requirements. You must design, write, implement, and debug your own programs. You may discuss with others high level details of program design and implementation. However, following situations are not allowed and will be treated as cheating:

- Show to or acquire from other students any materials related with assignments such as source code and documentation, no matter with intention or not, no matter in which form these materials are presented.
- Help or seeking help from other students to debug programs. However, you may get help from lab assistant or instructor.
- Copy, or refer to source code from internet, other students' homework or other source (excludes textbook or materials provided by instructor), no matter with citation or not. All source code must be original.
FREE TUTORING!

Learn how to study, get help with understanding difficult course material, receive better test grades, or simply improve your grade point average. Take advantage of our FREE tutoring that is available to you as an MTSU student. Tutoring is available in study skills and learning strategies, and over 180 courses including biology, history, computer information systems, physics, math, psychology, chemistry, economics, recording industry, and many more. The central location for tutoring is the Tutoring Spot, located in Walker Library. Tutoring is also conducted at various other campus sites. For available tutoring opportunities, visit http://mtsu.edu/studentsuccess/tutoring.php#on. For questions, call the Tutoring Spot at 615-904-8014.

Class Policies

Cell Phone: Please silence all cell phones and beepers. If the lecture is interrupted by a cell phone or beeper, the student will answer a question later in the class.

Attendance: Attendance is expected and absences do not excuse one from class responsibilities. If for some unavoidable reason you must miss class, obtain class notes, handouts, and assignments from another class member or course webpage. Students can earn up to 2 bonus points if they are "active" enough, i.e. asking and answering questions in the class.

Exams: Examinations must be taken at the published times. No make-up exams will be offered unless there is an unavoidable extenuating circumstance (at the discretion of the instructor).

Grade: It is guaranteed that you will get at least 20% points for any homework or project you submit. Each homework/project has ONE deadline only. No submission will be accepted after the deadline.

Final Exam: Students can opt out the final exam if he or she gets 70% or above on EVERY homework, project, and exam. His or her final grades will be the letter grade provided by instructor based on the performance on submitted work.

Zero Tolerance of Academic Misconduct: The class has a zero tolerance policy of academic misconduct. Academic misconduct includes cheating, plagiarizing, research misconduct, misrepresenting one’s work, and inappropriately collaborating. This applies to any work students turn in for evaluation or course credit. Definitions can be found at: http://www.mtsu.edu/~csdept/Academics/academicIntegrity.htm. If a student is found responsible for committing an act of academic misconduct, he/she will get F on this course and will be reported to the university. If you are working on a lab machine, make sure your work is stored under your personal account so that other students cannot access it.

General Policy:

- Each student is responsible for checking for updates/modifications/etc. on the class web page http://www.cs.mtsu.edu/~zdong/3110 frequently.
- Each student is responsible for checking class email regularly.
- Each student is responsible for checking class calendar regularly.
- Emails from non-mtsu account will not be replied if the instructor thinks the reply may leak student personal information such as name, or grade.
University Policies

*Lottery Scholarship:* Do you have a lottery scholarship? To retain the Tennessee Education Lottery Scholarship eligibility, you must earn a cumulative TELS GPA of 2.75 after 24 and 48 attempted hours and a cumulative TELS GPA of 3.0 thereafter. A grade of C, D, F, FA, or I in this class may negatively impact TELS eligibility.

If you drop this class, withdraw, or if you stop attending this class you may lose eligibility for your lottery scholarship, and you will not be able to regain eligibility at a later time.

For additional Lottery rules, please refer to your Lottery Statement of Understanding form (http://www.mtsu.edu/financial-aid/forms/LOTFEV.pdf) or contact your MT One Stop Enrollment Coordinator (http://www.mtsu.edu/one-stop/counselor.php).

*Academic Misconduct:* It is expected that all work for this class (including exams, homework and open labs) is your own. The university policy for academic misconduct will be followed. Academic misconduct includes the following behaviors:

- Plagiarism. The adoption or reproduction of ideas, words, statements, images, or works of another person as one's own without proper acknowledgement.
- Cheating. Using or attempting to use unauthorized materials, information, or study aids in any academic exercise. The term academic exercise includes all forms of work submitted for credit or hours.
- Fabrication. Unauthorized falsification or invention of any information or citation in an academic exercise.
- Facilitation. Helping or attempting to help another to violate a provision of the institution code of academic misconduct.

For more information, please refer to the following links: http://www.mtsu.edu/~csdept/Academics/academicIntegrity.htm

*Unofficial Withdrawals:* Federal regulations require that students who cease class attendance but do not officially withdraw from the University must be reported so that future financial aid will cease and/or the student will be required to return funds. Therefore, during the term I will be required to complete a roster indicating those students who have stopped attending class without officially withdrawing. Faculty members are not required to check attendance each day; however, you may use project submission deadlines, exams, quizzes, advising appointments, or other methods I choose may be used to determine unofficial withdraws.

*Student with Disabilities:* Students with documented disabilities are entitled to reasonable accommodations if needed. If you believe you need accommodations, please see me and the Office of Disabled Student Services (898-2783). No accommodations will be made unless verified by the Office of Disabled Student Services. For more information about the office, please check their website: http://www.mtsu.edu/dssemail/.

This syllabus represents a general plan for the course and deviations from this plan may be necessary during the duration of the course. I reserve the right to modify course policies, the course calendar, assignment point values, and due dates.