CSCE 411: Design and Analysis of Algorithms — Syllabus

Fall 2016

Instructors:

Graduate Teaching Fellow
Edward Talmage
Office: HRBB 410A
Office Hours (subject to change):
  Monday and Tuesday, 2-3:30PM,
  or by appointment
Email: etalmage [at] tamu [dot] edu

Mentor
Dr. Jennifer Welch
Office: HRBB 425G
Office Hours: Tuesday 10-11:30 AM and
  Thursday, 2-3:30 PM
Email: welch [at] cse [dot] tamu [dot] edu

Teaching Assistant: Xing Zhao (zhaoxing623 [at] tamu [dot] edu); Office hours: HRBB 408, Monday and Wednesday, 9:3-11:30 AM

Schedule:    Monday, Wednesday, Friday, 11:30-12:20, HRBB 113

Prerequisite Courses:   (From the catalog) Grade of C or better in CSCE 221 and CSCE 222/ECEN 222; junior or senior classification or approval of instructor.


Course Goals:  By the end of this course, you should be able to

• Describe and use standard algorithms and techniques
• Design algorithms to solve specific problems
• Analyze algorithms’ running times and space complexity
• Prove impossibility results for lower bounds on running time and space complexity
• Clearly and articulately state proofs and intuitions for algorithms
• Analyze existing data structures
• Choose an appropriate data structure for a problem and give a pseudocode implementation
• Prove a problem is NP-complete using reduction and understand the implications
• Understand the notion of undecidability, know that some problems are undecidable and the implications thereof.
Grading: Problem sets will have a variety of algorithmic design and analysis questions, and will be proof-focused. There will be unannounced quizzes in class for a small portion of your grade. These are primarily to help me evaluate your progress in understanding the material. We will have two midterms and one final. These will be in the style of the problem sets, but shorter, so that they can be completed in one sitting. Exams and quizzes may not be made up without prior written permission from the instructor.

Late assignments will lose 10%, plus 10% for every 24 hours that pass after the due date. If we discuss the assignment in class, or I provide solutions, no further late submissions will be accepted.

It is assumed that you will attend every class and participate in discussion. Questions are encouraged, especially if you do not understand something. Frequent and consistent unexcused absences will result in lost participation points. See http://student-rules.tamu.edu/rule07 for a list of reasons absences will be excused. For all other absences, contact the instructor to ask for permission.

Assignments 25%
Quizzes 10%
Midterm 1 20%
Midterm 2 20%
Final 20%
Participation 5%
Total 100%

Letter grades will be assigned per 10% interval: [90%,100%) = A, [80%,90%) = B, etc. I reserve the right to curve grades up for any assignment or for the course.

Cooperation Cooperation on assignments is allowed, as long as all submitted work is your own. As a rule of thumb, never show your final writeup to someone else, or look at someone else’s. You may share scratchwork or demonstrate concepts on a whiteboard, but final answers need to be written by each student independently. If you discuss a problem in depth or work with someone else, credit them at the beginning of your solution. If you look up material related to the assignment anywhere other than the textbook, cite that source at the beginning of your solution. The point of assignments is to give you time in the material to think deeply, use the material we cover, and understand its implications.

Cooperation of any sort on quizzes and tests is strictly disallowed, and is a violation of the Aggie Honor Code.

Honesty “An Aggie does not lie, cheat, or steal, or tolerate those who do.”

Academic dishonesty of any form, as defined by the University, will be prosecuted through the University’s proscribed channels. Don’t copy final work on assignments, anything on exams, or ideas you don’t understand from anyone or any source. Any assignment, quiz, or test which is determined to include cheating will receive a grade of 0. Cases of cheating are also punishable by up to an F* grade on your transcript and/or expulsion from the university.

More information at aggiehonor.tamu.edu

Disabilities If you need accommodations for any form of disability documented with the University, please talk to me as soon as possible so that I can provide such accommodations.

Americans with Disabilities Act (ADA) Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit http://disability.tamu.edu
## Tentative Schedule

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<td>Chap. 1-2</td>
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<td>Week 2</td>
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<td>Chap. 3</td>
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<td>Week 3</td>
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<td>Chap. 10,12</td>
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<td>Week 4</td>
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<td>Chap. 13,18,21</td>
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<td>Week 5</td>
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<td>Chap. 15</td>
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<td>Week 6</td>
<td>Dynamic Programming II and Review</td>
<td>Chap. 15</td>
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<td>Week 7</td>
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<td>Week 8</td>
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<td>Week 9</td>
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<td>Week 12</td>
<td>NP-Completeness I</td>
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<td>Week 13</td>
<td>NP-Completeness II</td>
<td>Chap. 34</td>
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<td>Week 14</td>
<td>Approximation Algorithms &amp; Undecidability</td>
<td>Chap. 35</td>
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<td>Week 15</td>
<td>Undecidability</td>
<td>Other</td>
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<td><strong>Final Exam</strong></td>
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