Course title and number: Analysis of Algorithms: CSCE 411-501
Term (e.g., Fall 200X): Fall 2014
Meeting times and location: MWF 1:50-2:40, Civil Engineering 219

Course Description and Prerequisites
Study of computer algorithms for numeric and non-numeric problems; design paradigms; analysis of time and space requirements of algorithms; correctness of algorithms; NP-completeness and undecidability of problems.
Prerequisites: CSCE 221, CSCE 222, and CSCE 315

Learning Outcomes
At the end of the semester, you should:
• be familiar with fundamental algorithms and algorithmic techniques;
• given a particular application, be able to decide which algorithm among a set of possible choices is best;
• be able to prove correctness and analyze the running time and space complexity of a given algorithm;
• be able to design efficient algorithms for new situations using the techniques learned;
• be able to 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.

Instructor Information
Name: J. Michael Moore
Telephone number: 845-5475
Email address: jmichael@cse.tamu.edu
Office hours: MWF 11:30 am – 12:20 pm, MW 1:50-2:40 pm, by appointment
Office location: HRBB 325

Textbook and/or Resource Material

Grading Policies
All assignments will be announced in class and posted on the course web page. If you cannot turn in an assignment on time, discuss the situation in advance with the instructor.

Grading breakdown
• weekly quizzes 10% -- Almost every week, there will be a short (about 10 minutes) quiz on the current material. Your top 10 quiz grades will count toward your semester grade.
• homeworks 30% -- Homework will consist of written problems and programming assignments. More information is here.
• exams 50% -- Two in-class midterms, worth 15% each, and a cumulative final exam, worth 20%, will be given.
• **culture reports 10%** -- This component is to round out your classwork. Write three short reports on aspects of computer science and engineering that relate to algorithms. More details are available on course website.

**Late Policy**

An assignment turned in late will lose 10% of the maximum possible points for each 24 hours that it is late. Once solutions have been posted/distributed/discussed, the assignment will not be accepted. [http://student-rules.tamu.edu/rule07](http://student-rules.tamu.edu/rule07)

**Course Grades**

Course grades will be assigned according to this scale:

<table>
<thead>
<tr>
<th>% total points</th>
<th>90-100</th>
<th>80-89</th>
<th>70-79</th>
<th>60-69</th>
<th>&lt; 60</th>
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<tbody>
<tr>
<td>letter grade</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>F</td>
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**Course Topics, Calendar of Activities, Major Assignment Dates**

The course will cover the following topics. The relevant chapters of the textbook are indicated.

<table>
<thead>
<tr>
<th>week of</th>
<th>topic</th>
<th>chapter</th>
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<tbody>
<tr>
<td>9/1</td>
<td>introduction and review</td>
<td>Chs 1-3</td>
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<tr>
<td>9/8, 9/15</td>
<td>divide and conquer algorithms</td>
<td>Chs 4, 30 and 33</td>
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<tr>
<td>9/22, 9/29</td>
<td>transformations</td>
<td>Chs 18, 28-30</td>
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<tr>
<td>10/6</td>
<td>dynamic programming</td>
<td>Chs 15 and 25</td>
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<td>10/13</td>
<td>amortized analysis</td>
<td>Chs 17 and 21</td>
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<tr>
<td>10/20</td>
<td>greedy algorithms</td>
<td>Chs 16, 23 and 24</td>
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<td>10/27</td>
<td>maximum flow</td>
<td>Ch 26</td>
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<tr>
<td>11/3</td>
<td>linear programming</td>
<td>Ch 29</td>
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<tr>
<td>11/10</td>
<td>randomized algorithms</td>
<td>Ch 5</td>
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<td>11/18</td>
<td>lower bounds</td>
<td>Ch 8.1</td>
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<tr>
<td>11/25, 12/1</td>
<td>NP-completeness and approximation</td>
<td>Chs 34 and 35</td>
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<tr>
<td>12/8</td>
<td>undecidability</td>
<td>other sources</td>
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**Americans with Disabilities Act (ADA)**

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, in Cain Hall, Room B118, or call 845-1637. For additional information visit [http://disability.tamu.edu](http://disability.tamu.edu)

**Academic Integrity**

The Aggie Honor Code states "An Aggie does not lie, cheat or steal or tolerate those who do". More
information on academic integrity, plagiarism, etc. is available at the Aggie Honor System Office web site [http://aggiehonor.tamu.edu](http://aggiehonor.tamu.edu), including:

- Definitions of academic misconduct, which includes plagiarism
- List of sanctions that can be applied if academic misconduct is found.

Please review this material.

For the assignments in this class, discussion of concepts with others is encouraged, but all assignments must be done on your own, unless otherwise instructed. If you use any source other than the text, reference it/him/her, whether it be a person, a book, a solution set, a web page or whatever. You MUST write up the solutions in your own words. Copying is strictly forbidden. Every assignment must be turned in with this cover sheet, which lists all sources you used.