CS 255: Algorithms and Discrete Structures
Spring 2011

Lecture: T/R 8:00 – 9:15 (P 267)  Lab: W 8:00 – 9:50 (P 115)
Web: www.cs.uwec.edu/~ernste/cs255
D2L
Instructor: Elizabeth Ernst  Office: P 134
Email: ernste@uwec.edu  Phone: 836-2804
Office Hours: M 8:30 – 9:30 & T/R 9:15 – 10:30

Prerequisites: CS 245; MATH 114 (or concurrent)

Text: *Foundations of Algorithms* Neapolitan & Naimipour
*Mathematical Structures for Computer Science* Gersting

Software: Java, Eclipse

Content: Discussion of algorithm design, problem-solving methods, and application of discrete mathematics to computing. Algorithm topics include divide-and-conquer, dynamic programming, and backtracking. Discrete structure topics include logic, proof, sets, relations, graphs, and complexity theory.

Grading:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
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<tbody>
<tr>
<td>Labs</td>
<td>120 points</td>
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<tr>
<td>Assignments</td>
<td>100 points</td>
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<tr>
<td>Quizzes</td>
<td>120 points</td>
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<tr>
<td>Final Exam</td>
<td>60 points</td>
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<td>Total</td>
<td>400 points</td>
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Assignments: All assignments are due at the *beginning* of the class period on the due date specified. Late assignments will not be accepted unless prior approval is granted. See Late-Policy.

Quizzes: Plan to have a quiz *every Thursday* (occasionally we will skip one). Make-up quizzes will not be given unless approval is granted *prior* to the class period. See Late-Policy.

Labs: Labs will be checked off during the lab period on the day they are due. You may seek help during the lab period, however, it is strongly recommended that you begin working on the lab prior to the lab time. Many labs require more work than can be completed in lab. Late labs will *not* be accepted.

Late-Policy: Assignments & quizzes turned in after the due date will be assigned a late penalty of 10% a day no matter the reason.

Attendance: Attendance and participation in lectures is expected. Students are responsible for all material assigned and discussed in class.

Policies: *Academic Dishonesty / Misconduct:* The work you turn in should be your own. Discussion of concepts is encouraged; however, you should have a full understanding of all work you submit as your own. Copying of other’s work is prohibited. Violation of this policy will result in no credit for the work in question.

*Special Accommodations for Students:* Any student who has a disability and is in need special accommodations, please contact me at the beginning of the semester.
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Topics

1/25 – 2/1
Formal Logic

Mathematical Structures: Sec 1.1 – 1.4, 1.6,

Labs: Logic

2/3
Circuit Minimization

Mathematical Structures: Sec 7.2 – 7.3

Labs: Quine McCluskey

2/8 – 2/15
Proof Techniques

Mathematical Structures: Sec 2.1 – 2.2

Lab: Proofs

2/17
Recursion

Mathematical Structures: Sec 2.4

2/22 – 2/24
Computational Complexity: Sorting

Foundations of Algorithms: Ch. 1, 7

Lab: Complexity Analysis

3/1 – 3/3
Divide and Conquer

Foundations of Algorithms: Ch. 2

Lab: Closest Points

3/8 – 3/17
Dynamic Programming

Foundations of Algorithms: Ch. 3

Lab: Edit Distance

3/29
Concurrency

Lab: Concurrent Dynamic Programming

3/31 – 4/5
Sets / Greedy Algorithms

Mathematical Structures: Sec 3.1

Foundations of Algorithms: Ch. 4

Lab: Minimal Spanning Trees

4/7 – 4/12
Relations

Mathematical Structures: Sec 4.1, 4.3, 6.1

Lab: Shortest Path

4/14 – 4/19
Backtracking

Foundations of Algorithms: Ch. 5

Lab: Graph Coloring

4/21 – 4/26
Branch-and-Bound

Foundations of Algorithms: Ch. 6

Lab: Graph Coloring cont.

4/28 – 5/3
Combinatorics

Mathematical Structures: Sec 3.2 – 3.5

Lab: Combinatorics

5/5 – 5/10
P vs NP

Foundations of Algorithms: Ch. 9