CS624 (Analysis of Algorithms) – Syllabus

Nurit Haspel

Instructor: Nurit Haspel (nurit.haspel@umb.edu)

Course Description and Objectives
The design and analysis of algorithms. This is a theoretical course. No programming is involved.

• A systematic study of the methods of structuring and manipulating data in computing.

• Application programming interfaces (APIs), data abstraction, and the encapsulation of implementations, familiarity with the Java Collection Classes, Advanced techniques for program development and organization.

• The design and analysis of algorithms, including run time analysis.

• Familiarity with advanced algorithmic techniques such as divide and conquer, dynamic programming, graph algorithms and greedy algorithms.

Prerequisite
CS220 (formerly CS320) – Applied Discrete Math, or permission from the instructor.

Textbooks


Topics
• Runtime analysis and growth rate.

• Sorting – Heapsort, Quicksort, theoretical boundaries on sorting.

• Binary search trees.

• Dynamic programming.

• Greedy algorithms.

• Randomized algorithms.
• Amortized analysis.
• Graph algorithms and applications - graph traversals, flow problems.
• Introduction to complexity classes: P=NP? and approximation algorithms.
• Other topics may be covered if time permits.

Assignments and Grading
The following grading scheme is subject to change (I will do my absolute best to not change it and if I do, I’ll let you know):
• Homework Assignments – 20% of your final grade
• Two Midterms – 20% of your final grade each (40% total)
• Final exam – 40% of your final grade. You must also pass the final exam (at least with a grade of 60) to pass the course.

You must have a documented reason to schedule a makeup exam. I must know that you need a makeup exam within 2 days after the exam date.

Final Grade
Your final grade will be calculated using the following table. The minimum standard for passing the course is a percentage score of 60%. You also must pass the final exam (score at least 60% in the final exam). Keeping this in mind, your grade for the course will be calculated using the following table. Assume your final percentage score for the course is P:

<table>
<thead>
<tr>
<th>P</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 90</td>
<td>A</td>
</tr>
<tr>
<td>85</td>
<td>A-</td>
</tr>
<tr>
<td>80</td>
<td>B+</td>
</tr>
<tr>
<td>75</td>
<td>B</td>
</tr>
<tr>
<td>70</td>
<td>B-</td>
</tr>
<tr>
<td>65</td>
<td>C+</td>
</tr>
<tr>
<td>60</td>
<td>C</td>
</tr>
</tbody>
</table>

This is a graduate course, therefore the minimum passing grade is C.

Accommodations
Section 504 of the Americans with Disabilities Act of 1990 offers guidelines for curriculum modifications and adaptations for students with documented disabilities. If applicable, students may obtain adaptation recommendations from the Ross Center for Disability Services, M-1-401, (617-287-7430). The student must present these recommendations and discuss them with each professor within a reasonable period, preferably by the end of Drop/Add period.
**Student Conduct**

Students are required to adhere to the University Policy on Academic Standards and Cheating, to the University Statement on Plagiarism and the Documentation of Written Work, and to the Code of Student Conduct as delineated in the catalog of Undergraduate Programs, pp. 44-45, and 48-52. The Code is available online at:  
[www.umb.edu/student_services/student_rights/code_conduct.html](http://www.umb.edu/student_services/student_rights/code_conduct.html)

**class email**

Should I need to send the class an e-mail, I will use your umb address. Please make sure you check it regularly.

**Homepage**

The course home page is [http://www.cs.umb.edu/cs624](http://www.cs.umb.edu/cs624)