CMSC 351 : Syllabus : Spring 2008

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Teaching Assistant information and all office hours will be posted at:
http://www.cs.umd.edu/class/spring2008/cmsc351/

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Catalog Description: A systematic study of the complexity of some elementary
algorithms related to sorting, graphs and trees, and combinatorics. Algorithms
are analyzed using mathematical techniques to solve recurrences and summations.

Some Course Goals: Obtain a thorough grounding in basic algorithms and related data
structures, asymptotic bounds (eg: upper and lower), recurrences, core graph
algorithms (eg: DFS, BFS, MST), core algorithm strategies (eg: divide & conquer,
greedy), randomization, reductions, and NP-completeness.

Grading Scheme:

Exams: 84% (Three Semester Exams - 17% each, Final Exam - 33%)
The three semester exams will be held during the regular class period. The
date for the first exam will be on Monday, February 25th. The date for the
second exam will be on Wednesday, April 2nd. The date for the third
exam will be on Wednesday, April 30th. The cumulative Final Exam will be held on
Saturday May 17th, 4-6pm. If you are unable to take the Final Exam on
Saturday for religious reasons, you need to inform your instructor of this
at the start of the semester. With a properly documented medical excuse, a
make-up exam can be taken on Wednesday, February 27th during class time for
the first exam, on Friday April 4th from 2-3:15 for the second exam, on
Friday May 2nd for the third exam. For a longer medical excused exam the
grade for a missed semester exam will be calculated using the weighted
average of the other exams. If more than one semester exam is missed with
accepted excuses, the instructor will create a comprehensive exam over the
material to count in their place. Students claiming an excused absence
must apply in writing and furnish documentary support (such as from a
health care professional who treated the student) for any assertion that
the absence qualifies as an excused absence. The support should explicitly
indicate the dates and times the student was incapacitated due to illness
and provide contact information for verification. Self-documentation of
illness is not sufficient support to excuse an absence.

Homework Assignments and Project: 16%
- Homework assignments and the project are all individual efforts. You are not
allowed to discuss them with anyone other than the instructor and/or
the teaching assistants for this class. You are not to search the
Internet for solutions.
- All written homework assignments will be due at the beginning of the
class session indicated.
- Missed homework assignments, or late projects due to a valid, documented
medical reason will be handled in a manner to be determined at that time.
Again, a documented medical excuse is required, as defined above.

Note: Each semester exam and the final exam will be curved individually as/if needed.
It is not guaranteed that all exams will be curved. The final letter grade will
be based on 90% and above for an A, 80% for a B, etc. The final grade will not
need to be curved since each contributing exam grade may be.
**Academic Honesty:**

Homework and projects and exams are individual endeavors and are to be done by you. You may NOT discuss these with anyone other than the instructor or one of the teaching assistants for this class. Any students found to be turning in identical or unusually similar homework or projects, collaborating on homework or projects, or cheating on exams will be turned over to the Student Honor Council for review and a hearing. The default decision of the Council is typically to give you an XF for the course but they may go as far as suspending you from the University.

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit [http://www.studenthonorcouncil.umd.edu/whatis.html](http://www.studenthonorcouncil.umd.edu/whatis.html).

Any student eligible for and requesting reasonable academic accommodations due to a disability is requested to provide, to the instructor in office hours, a letter of accommodation from the Office of Disability Support Services (DSS) within the first two weeks of the semester.

**Topics will include (though not necessarily in strict order):**

- Review of induction and introduction to constructive induction, topics in Calculus such as integration, topics in Probability such as expected values.
- Simple dynamic programming and approximations examples (eg: via Fibonacci recursive, recursive w/table, approximation formula).
- Review and extension of asymptotics (eg: Big-O, Omega, Theta).
- Recurrences and ways to solve some basic recurrences.
- Algorithms and analyses for searching and sorting.
- Basic data structures and some related algorithms and analysis of those algorithms. Examples may come from Lists, BSTs, balanced trees (eg: AVL, heaps), heaps, and Union-Find problems.
- Algorithms and analyses for basic graph algorithms such as DFS, BFS, MST.
- Algorithm-design paradigms: examples and patterns such as greedy algorithms, Divide and Conquer algorithms, and randomized algorithms.
- Reductions and NP-Completeness and approximation algorithms.