

CMSC 351 : Syllabus : Fall 2009

Section 0201: Evan Golub (AVW 1115 - egolub@glue.umd.edu)

Teaching Assistant information and all office hours will be posted at:
<http://www.cs.umd.edu/class/fall2009/cmssc351-0201/>

Textbook (optional): Introduction to Algorithms (Second Edition) by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein. ISBN: 0-07-013151-1

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: 86% (Three Semester Exams - 17% each, Final Exam - 35%)

The three semester exams will be held during the regular class period. The date for the first exam will be on **Wednesday September 30th**. The date for the second exam will be on **Wednesday, October 28th**. The date for the third exam will be on **Monday November 23rd**. The cumulative Final Exam will be held on **Wednesday, December 16th** from 4-6pm (please see me during the first two weeks of class if this presents a conflict). With a properly documented medical excuse, a make-up exam can be taken on October 2nd for the first exam, on October 30th for the second exam, and on November 25th for the third exam. For a longer medically-excused exam the grade for a missed semester exam will be calculated using the weighted average of the other two exams. If more than one semester exam and its makeup are 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, Quizzes, and Programming Project: 14%

- Homework assignments, quizzes, 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 should 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>.

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).
- Algorithms and analyses for basic graph algorithms such as DFS, BFS.
- 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 for processing b-bit values (such as Primality).
- Algorithms and analyses for more advanced graph algorithms such as MST.
- Algorithm-design paradigms: examples and patterns such as greedy algorithms, Divide and Conquer algorithms, and randomized algorithms.
- NP-Completeness.