Computer Science 124
Mathematical Foundations of Computer Science
Fall, 2000 - Dr. Robert E. Bailey

Text: Discrete Mathematics and Its Applications, 4th ed. Kenneth H. Rosen
WebSite: http://www.mhhe.com/rosen

Course Content: This course introduces elementary mathematics necessary for the Computer Science curriculum. Topics include logic, set theory, number theory, linear algebra, abstract algebra, combinatorics, graph theory, automata, and probability theory (the discrete part of the subject).

Grading: Grades will be determined by student performance on three tests and a comprehensive final exam:

4 tests @ 150 points	600 points
1 final @ 300 points	300 points
Total	900 points

In general,

A:	810 to 900 points
B:	720 to 809 points
C:	630 to 719 points
D:	540 to 629 points
F:	Below 540 points

There is no provision for making up tests. Emergencies will be handled on an individual basis. Your final exam will include material selected form the entire course. The final exam will be given on Wednesday, Dec. 20 at 9:00 am.

Homework: The textbook homework problems will not be collected but are to benefit you. Review problems will be included in review handouts for tests. You will need to stay current with the assignments.

To do well in this course, the average student will need to study about 3 hours outside of class for every class meeting, or around 6 hours per week. Preparing and studying for tests will take additional time.

Attendance: You are expected to attend all classes since you are responsible for work covered in class. An inordinate amount of absences will be handled in accordance with school policies.

You are expected to take tests at the scheduled times. Any conflicts, problems, or emergencies will be handled on an individual basis. You must be present to take tests.

Office Hours: 8:00 - 9:30 M-F - Office 115A Seney Hall. E-mail: oxmaeb@emory.edu

Honor Code: THE HONOR CODE OF OXFORD COLLEGE APPLIES TO ALL WORK SUBMITTED FOR CREDIT POINTS TOWARD YOUR GRADE. ALL SUCH WORK WILL BE PLEDGED TO BE YOURS AND YOURS ALONE. YOU PLEDGE THAT WITH YOUR SIGNATURE.

Topics and Homework Assignments

Section 1 - Chapters One to Two - Logic and Mathematical Reasoning

8/30	Section 1.1 - Logic Page 11 - 1, 3, 5, 7, 9, 11, 12, 13, 15, 17, 21, 22, 23, 25, 29	
9/1	Section 1.2 - Propositional Equivalencies Page 19 - 1-19 (odd) Section 1.3 - Predicates and Quantifiers Page 33 - 1, 5, 9, 13, 17, 19, 21, 25, 27, 31, 33	
9/4	Labor Day Holiday	
9/6	Section 1.4 - Sets Page 45 - 1 - 23 (odd), 26 Section 1.5 - Set Operations Page 54 - 1 - 27 (odd)	Last Day to Change Classes
9/8	Section 1.6 - Functions Page 67 - 1 - 25 (odd) Section 1.7 - Sequences and Summations Page 78 - 1 - 9 (odd), 13-21 (odd)	
9/11	Section 1.8 - The Growth of Functions Page 90 - 1 - 25(odd)	
9/13	Section 2.1 - Algorithms Page 104 - 1, 5, 11 Section 2.2 - Complexity of Algorithms Page 111 - 1, 5, 8, 9, 10	

9/15	Section 2.3 - The Integers and Division Page 125 - 1 - 11 odd, 15, 19, 20, 41, 45, 46, 47- 52 Section 2.4 - Integers and Algorithms Page 135 - 1 - 15 odd, 18 - 22, 24 - 28, 32
9/18	Section 2.5 - Applications of Number Theory Page 148 - 1 - 11 odd, 21, 23, 25, 26, 38 Section 2.6 - Matrices Page 159 - 1 - 15 odd, 18 - 21, 29
9/20	Review for Test One ---- Chapters One and Two
9/22	Test One -- Chapters One and Two
9/25	Section 3.1 - Methods of Proof Page 182 - 1 - 11 odd, 23, 25, 29, 31, 63 Section 3.2 - Mathematical Induction Page 199 - 1 - 11 odd, 15, 21, 31
9/27	Section 3.3 - Recursive Definitions Page209 - 1 - 17 odd, 36 - 39, 54, 58, 59 Section 3.4 - Recursive Algorithms Page 218 - 1 - 11 odd
9/29	Section 3.5 - Program Correctness Page 224 - 1 - 7 odd

10/2	Section 4.1 - The Basics of Counting Page 242 - 1 - 33 odd, 46, 47, 48 -51 Section 4.2 - The Pigeonhole Principle Page 248 - 1 - 9 odd, 19, 23, 26, 31
10/4	Section 4.3 - Permutations and Combinations Last Day to Drop - Page 257 - 1 - 17 odd, 25, 27, 31, 34
10/6	Section 4.4 - Discrete Probability Page 265 - 1 - 17 odd, 25, 27, 31, 34
10/9	Section 4.7 - Generating Permutations and Combinations Page 300 - 1 - 5, 10, 12
10/11	Section 5.1 - Recurrence Relations Page 316 - 1 - 7 odd, 8, 13, 14, 23, 43 - 47 Section 5.3 - Divide-and-Conquer Relations Page 337 - 1 - 9 odd, 10 - 13
10/13	Section 5.5 - Inclusion-Exclusion Page 354 - 1- 17 odd
10/16	Mid-Semester Break
10/18	Review for Test Two - Chapters 3,4 and 5
10/20	Test Two - Chapters 3, 4 and 5
10/23	Section 6.1 - Relations and Their Properties Page 382 - 1 - 16, 19 Section 6.2 - *n*-ary Relations and Their Applications Page 389 - 1 - 9 odd
10/25	Section 6.3 - Representing Relations Page 395 - 1 - 9 odd, 10
10/27	Section 6.5 - Equivalence Relations Page 413 - 1 - 13 odd, 16, 23, 25, 27, 29

10/30	Section 7.1 - Introduction to Graphs Page 443 - 1 - 15 odd Section 7.2 - Graph Terminology Page 454 - 1 - 21 odd, 27, 29, 33, 35
11/1	Section 7.3 - Representing Graphs and Graph Isomorphism Page 463 - 1 - 41 odd, 57, 61, 63, 69 Section 7.4 - Connectivity Page 473 - 1 - 11 odd, 23, 24
11/3	Section 7.5 - Euler and Hamilton Paths Page 485 - 1 - 15 odd, 25, 27, 39, 43, 45, 50, 52, 58
11/6	Section 8.1 - Introduction to Trees Page 539 - 1, 3, 5, 6, 7, 11, 15, 17, 33, 35 Section 8.2 - Applications of Trees Page 546 - 1 - 7 odd
11/8	Section 8.3 - Tree Traversal Page 560 - 1 - 19 odd, 27, 28, 34
11/10	Section 8.4 Trees and Sorting Page 569 - 1, 3, 5, 7, 9, 11, 12
11/13	Review for Test Three - Chapters 6, 7 and 8
11/15	Test Three -- Chapters 6, 7, and 8
11/17	Section 9.1 - Boolean Functions Page 599 - 1, 3, 5, 11, 15, 19 Section 9.2 - Representing Boolean Functions Page 603 - 1 - 9 odd
11/20	Section 9.3 - Logic Gates Page 610 - 1 - 11 odd Section 9.4 - Minimization of Circuits Page 623 - 1 - 17 odd
11/22 11/24	Thanksgiving Break ---

11/27	Section 10.1 - Languages and Grammars Page 638 - 1 - 13 odd Section 10.2 - Finite-State Machines with Output Page 645 - 1 - 9 odd, 16, 18
11/29	Section 10.3 - Finite-State Machines with No Output Page 653 - 1, 3, 5, 9, 11, 13, 15, 17, 19, 21 Section 10.4 - Language Recognition Page 665 - 1, 3, 8, 10, 11
12/1	Section 10.5 - Turing Machines Page 673 - 1, 3, 5, 7, 9, 12, 17, 23
12/4	Review for Test Four - Chapters 9 and 10
12/6	Test Four - Chapters 9 and 10
12/8	Review for Final Exam
12/11	Last Day of Classes
12/20	Final Exam --- 9:00 to 12:00