

MA 240 Fall 2007

## SYLLABUS

August 27, 2007

Instructor: Jeffrey Horn, email: [jhorn@nmu.edu](mailto:jhorn@nmu.edu)  
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Office Hours: [http://cs.nmu.edu/~jeffhorn/daily\\_schedule.html](http://cs.nmu.edu/~jeffhorn/daily_schedule.html)

Textbook: *Discrete Mathematics and Its Applications (5th ed.)*, by Ken. H. Rosen

Classroom: New Science Facility (NSF) 1205

Meeting Times: 4:00pm M, W, F

Prerequisites: CS 120 (or equivalent programming experience), MA 103 or equivalent

NMU Bulletin Course Description: <http://cs.nmu.edu/courses/descriptions/ma240.html>

Our web page: <http://cs.nmu.edu/~jeffhorn/Classes/MA240/Fall2007>

(I will use the web page EXTENSIVELY, posting everything I can up there as soon as possible. This includes all electronic forms of handouts, assignments, solutions, sample tests, etc. Also I will post announcements, links to interesting, topic-related sites, etc. So please check our page regularly! At the very least, once a week. Also, our textbook has an associated web page which we will also use extensively, at <http://www.mhhe.com/math/advmath/rosen/r5/>. I will link to appropriate pages from ours, but I suggest you browse it on your own too! I will also use your nmu email address for notices, and our class WebCT page for grade posting.)

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### OBJECTIVES:

Learn, and become comfortable with, the range of discrete mathematical structures that are fundamental to the further study and application of computation. Acquire the conceptual tools for modeling real-world situations as abstract problems amenable to computational solution.

### TOPICS: (tentative)

LOGIC (propositional, proof by induction)

#### BOOLEAN ALGEBRA

- propositional calculus
- switching (combinational) circuits
- minimization/cannonical forms

#### RELATIONS and FUNCTIONS

- equivalence relations, partial orders

#### COMBINATORICS

- permutations
- combinations
- orderings (full, partial)

## GRAPH THEORY

trees, directed graphs, lattices  
cycles, circuits, tours, cut sets, etc.

## GRAPH ALGORITHMS

shortest paths, spanning trees,  
network flow optimization

## COMPLEXITY ANALYSIS

order notation,  $O(n)$ , etc.

## COMPUTATION MODELS

finite state machines (automata, Mealy/Moore machines)  
push-down automata

## RECURRENCE RELATIONS

modeling with difference equations

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## GRADING:

50% Homeworks. Drop the lowest TWO homework grades (only if  $>7$  HWs; otherwise drop lowest ONE homework grade)

20% Quizzes. Drop the lowest (ONE) grade, if  $> 4$  quizzes.

10% Midterm exam, comprehensive.

10% Final exam, comprehensive.

10% Instructor's discretion.

**Late Policy:** For homeworks, 5% off for each day late (counting only days that the university is open; e.g., **not** weekends or snowdays). But of course I cannot accept them after solutions are handed out! As for exams, those cannot be made up except under the most severe and extenuating emergencies! Don't take a chance if you don't have to!

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## COMPUTING FACILITIES:

We might use Maple or Mathematica for symbolic manipulation and graphing of numerical results.

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## DISABILITY SERVICES

If you have a need for disability-related accommodations or services, please inform the Coordinator of Disability Services in the Disability Services Office by: coming into the office at 2001 C. B. Hedgcock; calling 227-1700; or e-mailing [disserv@nmu.edu](mailto:disserv@nmu.edu). Reasonable and effective accommodations and services will be provided to students if requests are made in a timely manner, with appropriate documentation, in accordance with federal, state, and University guidelines.