CS 191 **INTRODUCTION TO DISCRETE MATHEMATICS I** **Fall 1993**

SYLLABUS
REVISED VERSION, 9 SEPTEMBER 1993

PREREQUISITE: The prerequisite for this course is CS 113. (And CS 191 is a prerequisite for CS 192.)

Staff:

Professor: Dr. William J. Rapaport, 214 Bell Hall, 645–3193, rapaport@cs.buffalo.edu
Office Hours: TTh 1:30 P.M.–2:30 P.M., and by appointment.

Teaching Assistants:

Mr. Daniel F. Boyd, Trailer A, 645–3774, boyd@cs.buffalo.edu
Office Hours: T 3:00 P.M.–3:50 P.M., and by appointment.

Mr. Haichen Cheng, Trailer A, 645–3774, hcheng@cs.buffalo.edu
Office Hours: T 9:00 A.M.–10:30 A.M., and by appointment.

Mr. Phil Goetz, 335 Bell Hall, 645–2193, goetz@cs.buffalo.edu
Office Hours: F 11:30 A.M.–12:30 P.M., and by appointment.

Mr. Siva Kumar, Trailer A, 645–3774, sivak-d@cs.buffalo.edu
Office Hours: F 2:30 P.M.–3:30 P.M., and by appointment.

Class Meetings:

CLASS	INSTRUCTOR	REGISTRATION NO.	DAYS	FROM	TO	LOCATION
Lecture	Rapaport	046708	MWF	1:00 P.M.	1:50 P.M.	**170 Fillmore**
Recitation A2	Kumar	313020	M	12:00 NOON	12:50 P.M.	210 Norton
Recitation A3	Boyd	120561	T	11:00 A.M.	11:50 A.M.	218 Norton
Recitation A4	Boyd	023256	W	2:00 P.M.	2:50 P.M.	351 Fillmore
Recitation A1	Goetz	331395	F	9:00 A.M.	9:50 A.M.	316 Fillmore

Text:

- Ross, Kenneth A., & Wright, Charles R. B. (1992), *Discrete Mathematics*, 3rd edition (Englewood Cliffs, NJ: Prentice–Hall); ISBN 0–13–218157–6.

What this course is about:

The purpose of the two-semester sequence in discrete mathematics is to provide the mathematical foundations and skills that you will need in your further study of computer science. The central concept is that of an algorithm. To understand an algorithm, you need to appreciate that it is a formal mathematical entity, not a program in a particular language. To design an algorithm, you need to know logic, basic arithmetic, set theory, combinatorics, graph theory, and other discrete structures. To model many real-world systems algorithmically, and to analyze certain algorithms, you need to know difference equations and probability theory. To verify that an algorithm works correctly, you need mathematical rigor and good proof techniques—in particular, induction. These are the areas covered by this course sequence.

Topics:

The topics to be covered in CS 191 will include: sets, sequences, functions, logic, relations, induction, recursion, and Boolean algebra. Some of these topics will also be covered, along with many others, in CS 192.

Attendance, Homeworks, and Exams:

You will be expected to attend all lectures and recitations, and to complete all readings and assignments on time. There will be regular homework assignments, a mid-term exam, and a final exam. Taking both the exams is a necessary condition for passing the course. No programming will be required.

All homeworks will be announced in lecture. Therefore, be sure to get a classmate's phone number,[1] so that you will not miss assignments in the unlikely event that you miss a class.

From time to time, information about homeworks, etc., will be posted to the newsgroup `sunyab.cs.191`, which you should read on a regular basis.

Important Dates:

Monday	August	30	First Lecture
Monday	September	6	Labor Day—no class
Tue., Wed., Fri., Mon.	September	7, 8, 10, 13	First meetings of Recitations
Thursday–Friday	September	16–17	Rosh Hashana—no class
Wednesday	October	20	Mid-Term Exam (probably covering Chs. 1–3.5)
Friday	October	22	*** Last day to withdraw with a grade of 'R' ***
Monday	November	22	Friday schedule followed
Tuesday	November	23	Thursday schedule followed
Wednesday–Sunday	November	24–28	Thanksgiving recess—no classes
Tue., Wed., Fri., Mon.	December	7, 8, 10, 13	Last meetings of Recitations
Monday	December	13	Last Lecture
Wednesday–Tuesday	December	15–21	Exam Week (Assume our exam is Tuesday afternoon)

Tentative Schedule:

Chapter	**Topics**	**Lecture Dates**
1	sets, sequences, functions	Aug 30 – Sep 22
2	propositional logic	Sep 24 – Oct 4
3	relations	Oct 6 – Oct 27
	review for mid-term exam	Monday, Oct 18
	**** MID-TERM EXAM ****	WEDNESDAY, OCT 20
4	induction, recursion	Nov 1 – Nov 12
10	Boolean algebra	Nov 15 – Nov 29
13	predicate logic, infinite sets	Dec 1 – Dec 8
	semester review	Dec 10 – Dec 13

[1] For instance, 1 or 2 people sitting next to you in class, whoever they are!

Keeping Up with the Reading:

1. I will expect you to have read each chapter *before* the first day of my lecture on it.
2. I strongly recommend that you *re*-read each chapter *after* my lectures on it.
3. See the handout, "How to Read (a Computer Science Text)".
4. You should try all exercises whose answers are given in the text.
5. Not all material in the text will be covered in lecture (in lecture, we shall only cover interesting or hard material, plus occasionally material that is *not* in the text), but you are responsible for *all* material in the text and lectures.

Keeping Up with the Homeworks:

1. Homework assignments will be of the "paper-and-pencil" variety, to be done at home.
2. The purposes of homeworks are:
   (a) to give you practice in applying the concepts covered in the course
   (b) to give you a chance to assess the level of your understanding
3. There will be approximately 1 HW each week.
4. Due dates will be announced in lecture when the homework is assigned. HWs will be collected at the *start* of lecture on the due date. If you try to hand yours in after they have been collected (e.g., at the end of lecture, in my mailbox, in the TAs' mailboxes, etc.), it will not be accepted. To repeat:

   NO LATE HOMEWORKS WILL BE ACCEPTED.

   This is so that the homework can be discussed in the class period when it is due.
5. Put your full name, date, and your recitation (A1, A2, A3, A4) at the **top right-hand side** of the *each* page , and secure all pages with a **staple** in the **top left-hand corner**.
6. **Note:** The lowest homework grade will be dropped; you should assume that you will fail to turn in one homework (oversleep, get stuck in traffic, etc.)—that's the one that will be dropped. If you know *now* that you will regularly be late, see me to make alternative arrangements for turning in your work. Your graded HW will be returned in recitation.
7. Just as you cannot expect to learn how to drive a car by reading about it or by watching other people do it, the same holds true for doing mathematics. Do your work on time—this is one course you simply cannot cram for at the last minute, so don't even try! I cannot stress this strongly enough. Remember that the homeworks may be fairly time-consuming, so please consider your other commitments, and plan your time accordingly.

Grading:

All graded work will receive a letter grade, 'A', 'A–', 'B+', 'B', 'B–', 'C+', 'C', 'C–', 'D+', 'D', or 'F'. Your course grade will be calculated as a weighted average of all letter grades according to the following weights:

Recitation Assignments (including attendance, homeworks, quizzes, etc.)	50%
Midterm Exam	20%
Final Exam	30%
Total	100%

Incompletes:

It is University policy that a grade of Incomplete (with a default grade) is to be given only when a small amount of work or a single exam is missed due to circumstances beyond the student's control, and that student is otherwise doing passing work. I will follow this policy. Incompletes will normally have to be made up by the end of the Spring 1994 semester. The default grade will automatically be assigned after that if the work has not been completed.

Academic Honesty:

While it is acceptable to discuss general approaches with your fellow students, the work you turn in must be your own. *If the work of two or more students appears unjustifiably similar, penalties will be assessed to all concerned.* If you have any problems doing the homeworks, consult the TAs or Prof. Rapaport.