

Math 356:01 — Fall 1998
MW4 RAB-209B
Prof. Bumby

Contacting the instructor. The most reliable way to contact me is electronic mail: the address is *bumby@math* from any machine in the *rutgers.edu* domain. Although I have courses on the Douglass and College Avenue Campuses, my office is Room 438 in Hill Center on the Busch Campus. There is an answering machine on my office phone, so you may leave a telephone message by phoning 445-0277. I will have office hours in Hill Center from 2 to 3 PM on Friday. I will also have office hours at the Math Department outpost on the second floor of the Douglass Chemistry building on Monday and Wednesday surrounding this class, say from 12:45 to 3 PM except for the time that I am in class. If these times are not convenient, do not hesitate to ask for an appointment.

The textbook. The text for the course is Kenneth H. Rosen, *Elementary Number Theory and its Applications*, Third Edition, Addison-Wesley, 1993 (ISBN 0-201-57889-1). The book is too long to be covered in one semester, but we should include some topics from every chapter. I do not expect to cover the whole book in this course. The selection of topics was made on the assumption that most students in the course are Mathematics majors (or Computer Science majors with a good background in mathematics).

Registration information. If you were not able to register for this course in the normal manner, you should expect that you will be able to register during the Add-Drop period and continue to attend class. You should also write your name at the bottom of the signup sheet that I circulate. These sheets are revised daily to reflect current attendance, so you should only need to do this once. The department processes all special requests for registration centrally. Most requests are processed from the department's Home Page on the Web, but graduate students and non-matriculated students must submit applications at the department office in Room 303 of Hill Center.

Grading information. A sufficient number of problems from the text will be assigned for homework that a grade could be based on the number of those problems completed satisfactorily, and my usual practice is to request that inadequate solutions to problems be redone. However, it is also useful to have exams to focus attention on what has been learned. The University expects a final exam to be given and has already reserved 12 – 3 PM on Tuesday, December 15 (most likely in the regular classroom) for that purpose. A midterm exam is useful to wrap up the more systematic first half of the course. The only convenient date is Wednesday, October 14. The outline on the other side of this sheet has been constructed to culminate in an exam on that date. In a small class, all measures of performance should agree. Concern about grades should not get in the way of learning the subject; you should let me know if any part of the graded work falls short of your expectation. There is an ample supply of additional projects that can supplement what was initially selected for grading. For one thing, computer projects are not a *required* part of the course, since it is not always easy to do such work when faced with a deadline. However, I am willing to cooperate with individual arrangements to use such projects as part of the work of this course.

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Homework. Here is a list giving the dates on which I expect to introduce topics in class. Some of the earlier sections are delayed since their content is less suitable for use on the midterm exam. You should begin working on the homework problems immediately after the topic is introduced. If it is not clear how to do a problem completely, you should raise your concerns at the next class. While I will be happy to see completed solutions to homework problems as soon as you have them, I expect them one week after the introduction of the topic. I will find it easier to identify and evaluate your work if problems are done on separate pages with your name and the problem number clearly displayed at the top of the page. In a few cases, a pair of related problems are grouped in the list below. These will be considered as a single problem. Similarly, if a problem has many parts, those are to be done together. If I ask you to resubmit a problem, you should include your original work on the problem, so that I can refer to correct parts while correcting flaws.

Date	section	page	problems
September 02	1.3	23	8, 10, 24
September 09	1.4	33	6, 10
	1.5	39	20, 24
September 14	1.9	70	2, 4, 16
September 16	2.1	77	2, 6
	2.2	87	2, (9&10)
September 21	2.3	97	2, 8
September 23	2.5	115	2, 8, 16
September 28	3.1	126	(4&5), (12&14), 28
September 30	3.2	133	2, 6, 8
October 05	3.3	141	2, 32
October 07	1.6	46	12, 22
	1.7	56	6, 12
October 12	1.8	61	4, 6

Notes. Problem 1.4.10 allows $n = 0$, but the parenthetical comment at the the end of the problem does not apply in that case. This causes no difficulty, since that comment is not used in setting up the induction — its only purpose is to assure you that the expression is a finite sum although it is written as an infinite one. Problems 9 and 10 in section 2.2 begin with an introductory paragraph on p. 87. In problem 1.6.12, the difficulty is that a finite expression must be obtained for every integer — negative as well as positive — so the usual approach to radix expansions of positive numbers must be modified. Also, accepting the empty sum as a representation of zero gives a representation of this form for every integer. The problems in section 1.7 should be done by developing routines that work entirely in the given base, but you should check your answer by converting to decimal. It is not necessary to include this check with your solution. The “big-O” notation in section 1.8 is an abbreviation for an inequality with an explicit constant. Although this constant does not appear in the statement of the problem, you should find a suitable constant and use it in your solution.