CSC 286/486: Computational Complexity
Course Information Handout/Syllabus
Version 1.6 (any substantially updated versions of this document will be announced as the course goes on via BB and made available on the course home page)
Fall 2016 Semester
2016/8/31 (last updated: 2016/10/3/832pm)

Location/Time: The course meets in Room CSB 632, M/W 2:00PM–3:15PM.
Instructor: Lane A. Hemaspaandra, CSB 618, csc486staff “at” cs.rochester.edu. Office hours: Wednesdays 3:15PM–4:15PM (but from 3:30PM onward I’ll stay only if there are people at my office hours, so please do arrive safely earlier 3:30PM for sure) in CSB 632 and/or (what that means is class is in 632 so of course at the end of class I’ll be in 632 and might stay there for a few minutes if students have questions, but probably will quickly more to my office, 618, so that we don’t block the next class from moving into the room) CSB 618 (but please always feel free to stop by any time without an appointment or, easiest of all, grab me right before or after one of our class sessions), through and including December 7th (but not Nov. 23rd).

TAs and Review Sessions:
Graduate TA: Georgiy Platonov, CSB 625, csc486staff “at” cs.rochester.edu. Office hours: Mondays/Wednesdays 3:15PM–3:55PM and Tuesdays 4:50PM–5:30PM, all in CSB 625 (except on Mondays and Wednesdays he may be in CSB 632 for some tiny bit of time before moving to CSB 625). (Also, please always feel free to stop by his office any time without an appointment, and if he has time he’ll see you then, or otherwise will try to make a separate later appointment with you.) Note: His Mon./Tue./Wed. office hours end on Nov. 1, but after that you can still see him along the lines of the immediately preceding parenthetical.

Review Sessions: And on Thursdays (through and including Oct. 27th), starting September 9th, Georgiy will conduct a weekly, optional Review Session at 4:50PM (lasting 50–100 minutes, most typically ending in around 75 minutes) in room CSB 632. The review sessions after that Oct. 27th session will be precisely the following ones (taught respectively by Groups A, B, and C; each session lasts 50-100 minutes): 450PM on Thurs. Nov. 3 (taught by Group A in CSB 632), 450PM on Thurs. Nov. 17 (taught by Group B in CSB 632), and 450PM on Thurs. Dec. 1 (taught by Group C in CSB 632). Students typically find these review sessions to be very valuable in staying on top of this course’s (quite demanding) material. (FYI, the above info regarding office hours and review sessions may change starting probably in late October.)

Undergraduate TA: Daniel (“Dan”) Rubery, csc486staff “at” cs.rochester.edu. Office hours: If you wish to meet with Dan for help, please use email to get in contact with him.

Address for Course-Related Email: Please use csc486staff “at” cs.rochester.edu. (This address will be automatically forked by the system to go to both me and the TAs. Please
make sure to always use it so that none of us are left out of the process of being on top of any questions and discussion. The only exception is if you are for example trying to set up a one-on-one appointment time with Georgiy or Dan, then you might want to write him directly at his just-him email address of, respectively, gplatono “at” cs.rochester.edu and drubery “at” u.rochester.edu.)

Overview: This course studies the difference between computable and uncomputable problems and between feasible and infeasible problems. Regarding the latter, what properties of a problem make it computationally simple? What properties of a problem may preclude its having efficient algorithms? How computationally hard are problems? Complete sets and low information content; P=NP?; unambiguous computation and one-way functions; reductions relating the complexity of problems; complexity classes and hierarchies.

Prerequisites: CSC 280 (prereq). You should also have taken (or know equivalently well) discrete mathematics (MTH 150), which is a prerequisite of CSC 280.

Homework Preparation/Class Participation: You may discuss and work with other CSC286/486 students on the reading, studying, and problems; the goal of the course is not to compete with each other, and, indeed, in real research, collaborative work is very common. However, it is cheating to solicit help from anyone other than your classmates—this includes using electronic forums such as wikis/newsgroups (or even mailing lists that function as electronic discussion forums) and also includes using solution sets from previous years’ CSC286/486.

More broadly speaking, it is cheating to get or use, during this course, course quiz or homework or exam materials (quizzes or their answers, homework sets or their answers, exams or their answers, etc.) from any previous offering of CSC286/CSC486. Further, when doing homework sets, you indeed may use the library and the internet to search for information and examples on techniques and so on. But you should not attempt to find/look up a solution to a given in-progress homework problem; doing so is cheating. If you by accident stumble on a web page that happens to solve an in-progress homework problem, that in itself is not cheating. But you should, immediately the moment you realize that this has happened, not read or copy the solution. The experience and skills you’ll build by working on solving problems are an important part of doing this course; this is not a course about web-searching for answers.

Also, your write-up of your homework answers (on graded homework assignments) must be your own work/words, even if you discussed the problems with others; you may in no case copy all or part of anyone else’s write-up. (A very wise way to achieve this is as follows: Even if you have discussed the problem with others, as you do your final write-up have nothing in front of you but rather write just from the knowledge/images of the solution you have in your head.)

However, regarding the previous paragraph, if you are doing your homework not as an individual but in an allowed “group,” and (see below) pretty much every homework set will be done in a very, very small close-knit group (typically two people) rather than as an individual, then you and your groupmate(s) can without limitation and without
being in violation of the course rules discuss the problems with each other, and can (and should) work jointly on the write-up and so on. In effect, it is as if you, regarding the collaboration/discussion issues above, are a single person. That is because, if you do your homework as a group, the entire group must turn in a single homework that has all the group members’ names on it; and all group members will get the same grade. (Caveat: But invoking a formal regrading request is an individual request; since during regrades grades can go down as well as up, it would be unfair to a group member for his or her grade to go down due to another member having asked for a regrade. Of course, some or all group members may, in parallel, request a regrade, if each so chooses.) Now, let us turn to what an allowed group size is. I expect each homework set to have essentially the whole class do the problem set in groups of size 2. Your group can be different on different problem sets, but on each problem set, you will do all problems with your particular group for that set. However, since there might be an odd number of students in the class, and because people may enter or leave the class in the middle of problem sets, at least initially, as a safety value, we will accept homework sets from groups of sizes 1, 2, or 3. But it is expected that everyone will be in a group of size 2 (except perhaps one group of size 3), give or take issues that arise due to people suddenly adding the class or leaving the course. In particular, if on any set we for example find that the class hasn’t turned in the set within that configuration, we’ll most likely change the rules to firmly enforce things very, very restrictively. (That is, loosely put, don’t do your set in a group of size 1 (well, except see the above for exceptional cases such as people dropping the course); and don’t do it in a group of size 3 unless you are the one such group in the class and the class is of odd size.) (Caveat: Some of the homework sets may explicitly change this “group” issue; they may require that each student in the class write up and submit the set individually—not as part of any group; if so, the set will explicitly state that; for example, the first set will likely be individual, and possibly the second set and others.) Regarding groups. the TAs and I will not coordinate or exchange information on who is in a group with whom and whether there yet is a size-3 group (if the class size is odd) or so on; rather, you as a class would be wise to handle that yourselves in some natural way (namely, have one class member be the Knower/Sharer/Enabler of Group-Membership Information; that can be organized various ways, whether by some (perhaps password protected if you are worried about privacy, say, if your email addresses are part of the form) online form/spreadsheet/whatever editable by all of you, or perhaps via the Knower sharing info on a web page, or etc.—I leave it to you to organize it well and in a way that does not exclude any of your classmates, and lets people who are unpaired easily find each other without delays). I would encourage you not to simply work with the same person each time, but rather to on different homeworks perhaps work with a different partner. I would strongly encourage the undergrads and grads not to act as if they have no connections and cannot interact, but, rather, I’d encourage you to often form groups where an undergrad and a grad are working together—both of you might learn interesting things from that (what grad school is like so far, etc.). Above all, please use your group (which will essentially always be a size-2 group) wisely—both of you utterly must understand everything in your turned-in answer, so if you understand a problem and
your groupmate does not, make sure to clearly discuss and explain the problem with your
groupmate (you yourself will better understand the answer—and at times uncover bugs it
in—from helping your partner fully understand the solution); working in groups can be far
more enjoyable and valuable that learning alone, but you utterly most not do it in a way
that blinds any group member from full participation in and understanding of the group’s
work, e.g., saying “I’ll solve and write up the first 5 problems and you solve and write up
the next 6 problems, and we’ll concatenate those writeups” is a totally improper approach;
you need to work together, helping each other, and doing the write-up truly jointly.

Homeworks must be submitted on time; late homeworks get no credit (and will not
be graded or marked up with comments; although you always can stop by the TAs’ or
my office hours to, after solutions have been gone over in class, make sure you understand
those solutions or to discuss an alternate approach). (No late homeworks means no late
homeworks; even if one of my faculty colleagues—even if he or she is the chair—tells you
that he or she thinks it will be ok to hand in late a homework assignment in this course,
even for some very good reason such as there being a research paper deadline or there
being a fellowship deadline, you nonetheless must hand in your homework on time in this
course if you wish to get credit for it; similarly, none of my faculty colleagues can excuse
you from this course’s quizzes, homeworks or exams.) Also, you must write yourself your
one-sheet notes allowed on quizzes and tests (see below). Note that the quizzes make it
counterproductive to ever be in the state of having relied so heavily on classmates that
you do not yourself fully understand everything. The TAs and I generally won’t answer
questions about homework questions that are currently in progress (my typical answer to
such questions is to point to this sentence (let us label this sentence “β1” as a convenient
reference string ), or “no comment,” or “understanding the question is part of solving the
question” or if it was asked by email simply not to reply); of course, if you have questions
about the underlying material (that a question might be related to), you can and should
use the office hours or the review sessions to ask questions about or better learn about that
material (but not to ask for answers to or explanations of in-progress homework questions).

You may bring to each class one sheet of handwritten notes (writing on both sides is
allowed; you may alternatively bring two sheets on which each has one side with handwritten
notes and one side that is totally blank), prepared yourself. You may use this sheet of notes
on a surprise quiz that class. (Separate from this is the issue of bringing in notes on the
homework problems. If you are called on to present some of the homework problems, you
may bring with you to the blackboard as many sheets as you like of your own handwritten
notes on the problems.)

Regarding class participation, even though it does not directly contribute points to
the score calculation, you are expected and required (and this will be kept in mind when
assigning your course grade): to attend class, to be prepared for class, and to participate
in class. For example, if you are called on to put up your answer to a for-home-thought
problem and it is clear you have not put in a substantial amount of time and thought, that
could lower your grade. Note that, even if you do not know a perfect answer, if you clearly
have put in careful thought (e.g., you have partial results or a clear description of what
issue is stumping you), that certainly will make a much better impression on me than if you clearly have not thought at all about it. As another example, if you have not done the assigned reading, that could lower your grade.

By the way, if you have a question in class about some of the course material, it usually is a good idea to ask it. Probably other students have exactly the same question, and you will be doing yourself, them, and the class a big favor by asking, so we all can explore whatever issue you raise!

(Some caveats: This is a course on certain material, not a course on how to design and teach a course on that same material. Thus please do not ask course-design/course-logistics questions such as “Why is there so much homework?” or “Why can’t I use my computer, my full notes, my supersmart pet dog Fido, and our textbooks during quizzes?,” and I typically won’t answer such questions—most especially not during class time. Also, audio or video recording of the class sessions is not permitted, except if you have a documented disability that would need such recording, in which case please speak to me about this. More generally, no laptops or smartphones may be opened or in use in class—except any laptop that is connected to the projector to give the day’s talk—nor may you Skype in—not even in silent view-only mode—on days you can’t attend class, nor may you have a classmate electronically record or transmit that class session for/to you. If you cannot attend, though, of course do get from a classmate (in the dream case, one that you have warned to please take notes for you due to you having to miss the class session) a detailed account of what happened in class and if some of our course slides were covered in class that day you’ll want to find out from your classmate which were, and read them, and also missing a class when something was handed back does not change your regrading window, so do pick up from the grad TA your handbacks at his next office hour or if that is beyond the regrading window or is too close to its end, try to arrange with him to get it back even earlier (perhaps you can ask him—ahead of the class you’ll miss—to give it at that class session, in a sealed envelope, to a friend in class to bring to you), as needed. Finally, regarding asking questions about the course material: Questions should not be asked by email, but rather please ask them in class, or use the fact that we have office hours or Review Session on four of the five weekdays to ask your question by showing up in person to ask at an office hour or a review session—and please also keep in mind that your 286/486 classmates are often a great resource with which to discuss the course material (let us label this sentence β2, and if you do ask questions by email, we probably will either refer you to this sentence, or will simply not reply since we expect that you know that the expected thing to do is to come into an office hour or review session or to discuss with your classmates); a corollary is that if you have a question sometime after the Thursday review session, you won’t—unless you manage to schedule an extra in-person meeting with Georgiy on Friday, but there is no guarantee that you will be able to if you try to, esp. if it is at the last minute—get an answer to

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1Even professors sometimes—more often than they would like to admit—don’t understand talks/lectures, even in their own areas! Here is a cute, relevant anecdote from Moshe Vardi’s introduction to the September 2011 issue of CACM, where he mentions asking, at a top theoretical computer science conference, how many people understood at least N% of at least N% of the papers—to get 50% of the people to say yes, he had to drop N down to 50. Understanding lectures is a nontrivial challenge, and requires a lot of focus!
it before, for example, any Monday due date/time of a homework set, so don’t leave your questions until after the Thursday review session.)

**Grading:** The overall course grades (A, A-, etc.) will not be any fixed curve, but rather will reflect the instructor’s judgment about what grade is appropriate based on performance. Each of the two midterms counts for 18% of your course average. Your quiz average counts for 25% of your course average. Your homework average counts for 39% of your course average. Note that the stress here is not on learning things the day before an exam and forgetting them the day after, but rather is on having/gaining/sustaining day-after-day and week-after-week performance, competence, and with luck mastery, as reflected in your quizzes and your homeworks. It is a 14-week course, not a 150-minute course.

If you are taking the course as 486, in computing your quiz average we will drop the 2 lowest quizzes; in computing your homework average we will drop the lowest homework. If you are taking the course as 286, in computing your quiz average we will drop the 4 lowest quizzes; in computing your homework average we will drop your two lowest homeworks.

As to grades (and what is made public and what is not), each student gets his or her own grade on each quiz, homework, and midterm (and of course I assume and expect that you will keep each given-back item/grade), and through Blackboard he or she will see some information about the overall class performance each of those items, and at the end of the course he or she will receive his or her course grade either from the registrar or from me. However, I in general do not give out grade or grade-distribution or grade-range-cutoffs info beyond that (or provide guesses of what letter grade a student is “headed toward”), though of course if a student wishes to share with some classmate his or her grades on some items or the course, that is up to him or her.

Note that, very informally put, the quiz/homework dropping in some sense covers 286 students for 4 quizzes and 2 homeworks of misses, and 486 students for 2 quizzes and 1 homework of misses. However, I would emphatically urge each of you to attend every class (except when sick) and do and hand in every homework; you will learn far more and enjoy the course far more; and that will let the drops just end up dropping whichever quizzes or homeworks you happened not to do well on, rather than ones you skipped outright.

Beyond that, in grading the course, the 286 students will have their grades assigned with consideration of the fact that they are taking the course as 286. (Thus, 286 students should not view themselves as being in competition with the 486 students—though actually no one should view him- or herself as being in competition with anyone else in the course.) All undergraduates in the course (except those who did excellently in CSC280) should speak with me immediately after the first class, so we can get a handle on exactly what your background is as it relates to the current course, and whether you are ready for this course.

We will use Blackboard to store and to share with you the grades on each item. (If we enter your grade in Blackboard incorrectly as an overly low grade, you have the same time frames as in the regrading-request information to get to us your request that we correct that within Blackboard. Thus you’ll want to frequently check Blackboard. So, except for the last 10 days, you have a 48-hour window after something is handed back in class to let us know by email to “csc486staff” of any case where we simply entered the wrong number—for this
case, we will not regrade your entire quiz/homework/exam, but rather let us know within the window by email, and include a scan of the cover page that shows the grade we wrote but didn’t correctly enter.)

This course is available for audit credit, but only with my permission, so if you want to audit this course, please do make sure to talk with me (by email or on the first day of class).

Class Attendance: Required.

Academic Honesty: On all aspects of the course, it is very important to follow appropriate norms of academic honesty and professional conduct, most importantly including those regarding plagiarism; do not plagiarize. Please see the link from the course’s main web page to the school’s site on academic honesty. And note carefully the rules about what you can and cannot do/discuss together with classmates (note the discussion at the start of the section “Homework Preparation/Class Participation” of this document) and the rules on what notes/etc. you can/cannot have during quizzes and exams.

Quizzes, Tests: No makeups (not after the fact; not before the fact). No exceptions (except for religious holidays discussed long in advance\(^1\)). As a bow to sicknesses, broken cars, varsity events, conferences, and other compelling excuses, each 486 student will have his or her 2-lowest-quizzes/1-lowest-homework dropped (but no more, even with good excuses). As a bow to sicknesses, broken cars, varsity events, conferences, and other compelling excuses, each 286 student will have his or her 4-lowest-quizzes/2-lowest-homeworks dropped (but no more, even with good excuses). The only exceptions to the above will be with a letter from a convincing (i.e., one with the authority to mandate exceptions to course policies) Dean who has read the course’s policy regarding no makeups and that dropped quizzes are given to all students in the above way to account for all reasons) and who having seen that has determined that your case is so extraordinary that he or she is mandating an exception to the policy in your case.

By the way, regarding sickness or other times you’ll be missing a class session at which a homework is being collected, let me mention that if you send in your homework set to class, in a sealed envelope, with a friend who remembers to turn it in when the homework is collected today, then your homework will be graded. Alternatively, you can do your homework and mail it to us as a pdf (e.g., computer typeset, or as a scan of your handwritten homework), to the address csc486staff “at” cs.rochester.edu, and as long as it arrives in our mailbox before the 2:00 start of class (after sending it, keep looking for a few minutes to see if you get a “bounce” error message, e.g., because you misspelled the email address

\(^2\)To be explicit: You should, no later than September 6, noon, send me an email if any of the class days fall on days where due to observance of a religious holiday you will not be able to attend; in that email, you should please let me know all such days for the entire term. If you have a religious conflict told to me by the above date, I’ll regarding the quiz/exam give you a makeup (perhaps oral or perhaps written) exam or will simply try to avoid having the exam on that day. If a homework falls due on a religious holiday, you should take that into account and make sure you nonetheless turn it in on or before the deadline; you may email your homework hand-in to “csc486staff,” no later than the deadline of course, as a pdf, if for some reason (religious holiday; illness; etc.) you cannot attend class on its due date to hand it in yourself.
or you sent a file so large the mailer bounced it—the UR faculty email system bounces any message on which the total size of the message, including all attachments, is 20MB or more), we will grade it as if you had turned it in at the class session.

The no-exceptions policy is so settled and broad that we expect you to understand it and not to ask for exceptions; and so if you email asking for an exception, we generally won’t reply to the email, but rather the answer is implicitly a “no.”

There will be many, many quizzes (very often or usually “surprise” quizzes, but actually I often so heavily signal them that often the fact that there is a surprise quiz won’t be too surprising, plus we’ll have sufficiently many that the real surprise will be days when we don’t have a quiz).

Please use only black or blue pen (no pencil allowed) on handwritten turn-ins (exams and any homeworks or take-home quizzes or exams that you do handwritten), and even in computer-generated text (such as if you do your homework answers on a computer) please don’t use the colors red or purple, as we may use those in our grading. As to in-class quizzes, ideally you’ll do those in black or blue pen, but if you truly feel that writing in pencil is far better for you than using pen, you may do your in-class quizzes in (black, number 2) pencil.

By the way, if you see in Blackboard a 0.1% as your grade on a quiz or project, what that means is the following: If you don’t submit something, we of course record a 0.0%. But if you hand something in and get a zero (or even any grade between 0 and 0.1%), we will often record it in Blackboard as a 0.1%, so that I can see that you did hand it in.

There will be two midterms. The first will be an in-class exam. The second midterm might be the same or might be an oral exam or might be a take-home exam done on your own or (most likely, at least if the class is going very well) might be a take-home project in the form of tackling and presenting a topic (some Hem-Ogi chapter that I assign your group) in groups or might be some multi-part combination of these or other elements; which it will be will be announced ahead of it. There will not be a final exam.

The first midterm and all quizzes are closed-book unless they explicitly say otherwise. The first midterm and the quizzes are also closed notes, except for the one sheet of cram-notes prepared by yourself, as discussed elsewhere. The second midterm will be closed-book, closed-notes, if an in-class exam or an oral exam, but will be open-book, open-notes, closed-people if a take-home exam.

Anyone with a documented disability for which accommodation is relevant to this course should please have the appropriate university office inform me of this and the related accommodations immediately (and should please speak privately with me after the first class so we can start on the logistics related to those accommodations).

Note that a quiz may, for example, be on material that is related to homework/class/etc. but that you have not seen before. You should not assume that the number of quizzes will be the same in the second half of the term as in the first half. On some days, we may have more than one quiz on the same day. You should not at all assume that quizzes will be mechanical playback of information. Some might be, but others may expect you to apply and/or extend and/or demonstrate creativity and insight. Somewhat
relatedly, some quizzes may be easy and some may be hard. Coming in prepared is always a good idea (and is expected). Some quizzes may be take-home exercises that ask you to do something, such as come to an office hour and demonstrate your skill in some technique.

No questions may be asked during quizzes, and none will be answered; the process breaks the flow and concentration of the class, and can be unfair as to who gets what information due to having asked or not having asked questions (even if one tells the whole class something about a problem in the middle of the exam in response to a question, such as a correction/change to a problem, some people may have already spent/wasted time on that flawed problem and some may have not, and the former group will be put at a disadvantage just due to the order they tackled the questions in). If you see on a quiz something that you’re sure makes solving the problem impossible (or equivalent to something such as resolving P versus NP that is something I wouldn’t possibly ask you on a quiz—I save your Turing-Award-level challenges for the midterms!) or makes the problem meaningless or incoherent, what you should do is that as part of your answer you should clearly explains what you have noticed, and why it seems to make the problem impossible or meaningless or incoherent. If what you notice seems to be a very minor technical typo and you are sure it is and you see the correction, you probably should note that, fix it, and the solved the fixed problem (but if the original one was really what was meant, you probably won’t get credit if you change it to a different problem; and just noticing for example a spelling error or a missed “the” doesn’t get you out of having to solve a problem).

**Regrading:** If you want some quiz/homework/midterm-that-is-an-exam regraded (if Midterm II is a group project, I’ll directly grade you on it and regrading won’t apply), you must notify the grad TA (only via the email address “csc486staff” in the domain cs.rochester.edu—not via his personal email address—since “csc486staff” sends it to him, me, and the undergrad TA) of that via email within 48 hours (Sat. and Sun. do not count against those) of it being given back, along with an emailed explanation of what you feel was graded incorrectly, and an emailed color scan (B&W is ok if you don’t have access to a color scanner) of your entire graded item (all parts of it—not just what you are asking for a regrade of). Note that the entire quiz/homework/exam that you are asking to be regraded may be regraded (not just the issue about which you are asking), and the grade may move either up or down (and moving down is a very real possibility, e.g., if I (or a TA) discover that a TA (or I) missed some errors, or just graded overgenerously relative to what the regrader thinks during the regrading. We will usually have your regraded paper back to you by the next class or the one after. If you are unhappy with the grad TA’s regrading (which might done by him, or him in consultation with me and/or the UG TA), you may within 24 hours of getting it back from the grad TA repeat the same procedure as above (except adding an explanation of why you think it is still misgraded, and including in the email’s subject field this string: “RE-REGRADING REQUEST”; again, do be aware that other parts may be regraded and your grade may move up or down).

The only exception to the above time limits and scheme is that during the last 10 calendar days before the last day of classes (i.e., from December 2 onward), anything on which you want a regrade (and there is no re-regrading option during this period) has a
single 24-calendar-hour-after-the-class-where-it-was-available-for-return time limit for being submitted for regrading (so look over things given back during the last ten days within the first 24 hours of getting them back, please).

**Texts:**

(required) Bovet and Crescenzi, Intro. to the Theory of Complexity Classes, *the online edition—NOT the earlier printed edition.*

(required) Hemaspaandra and Ogihara, The Complexity Theory Companion, Springer-Verlag. (Both the softcover and the hardcover versions of this book are equally good to use.)

(recommended) Papadimitriou, Computational Complexity, Addison-Wesley.

Places like Amazon and so on have the required Hem-Ogi and the recommended Pap texts, and the UR Bookstore (which is the Barnes and Noble at the corner of Elmwood Ave. and Mt. Hope Ave.) has then in the computer science section of its textbook department, which is located on the second floor of that store. But please do be aware, see below, that I have asked the library to put their copies on 2-hour reserve at the library for our course. Bovet–Crescenzi is kindly made available online by the authors at

http://javamm.sourceforge.net/piluc/

(use the link to "Introduction to the Theory of Complexity" to get to the pdf of the book).

Also, your own notes (whatever notes you take in class) surely will be useful to you.

**Books on Reserve:** On reserve, for this course, at Carlson Library, are quite a few books, including the above books, texts covering some or all of course’s topics, some more advanced (and less advanced) complexity books, some review books on discrete mathematics, and some just-plain-interesting books that I thought that you, as emerging computer-science researchers (and writers), might enjoy. Note that though the course is CSC286/CSC486, the library may list the books under the reserve list of one or both of those numbers.

You can usually get to the library’s list of reserve books for our course, and the status of each, through the Blackboard system (click on the “Reserves” button in our course area), or perhaps alternatively directly through the library’s own online catalog system.

**WWW Site:** You are expected, as part of taking this course, to visit the course web site

http://www.cs.rochester.edu/u/www/u/lane/=courses/=CSC486/

frequently (i.e., wise would be to peek at it relatively often each day—indeed, it makes a very good homepage for your browser!). *Be careful to make sure your browser isn’t caching and showing you an old version that you previously visited (browsers love to do that).* The web site will be the path that I will use to post homework assignments (and my quick description of what the topic of each past class was). The web site also has much other information, not just pointers at its end, but also within the day-by-day listing—both as items and as
Notes inside each of the days. (The web site’s Notes and BlackBoard’s “announcements” feature are the two main paths used for communication; there is not a hard and firm rule as to which is used for what, but the general flavor tends to be that I often put things in Notes if they are things I want to be stay on the web site or are things that are part of the initial build of a day’s web-site block, and on the other hand for quick reminders/hints that come to mind after I do the initial build of a day’s web-site block I sometimes lean toward BB announcements.)

Note that I usually don’t send a BB announcement when I add Notes to the web page. (I assume either you look at it often yourself (the Notes go up under the session-by-session blocks, in chronological order, and so it is easy to see what the most recently added Note(s) are), or that—since you are CS students and so know your way around computers way better than I do—you added to one of your browsers the existing extensions that notice/alert when the page is updated or, even better, that you use something like Follow That Page; do be careful though... after the first moment I save a changed version, it can take a minute or few for the page to stabilize, as I look at it and see if the update I merged into the main page came out ok after the merge-in and if not I quickly fix things. I very highly recommend using Follow That Page to be automatically notified of all updates to our home page. You can find the information on how to use that service described on our home page in the Navigation Information section near the page’s top; it takes just about 90 seconds to get everything totally set up and running.

Blackboard Announcements: Many day-to-day reminders/announcements (aside from those made verbally in class) will be transmitted using the Blackboard “Announcements” feature. You can see these announcements within Blackboard. By default, Blackboard will not send you these by email. But you can, by changing your settings in Blackboard, arrange for it to do so (although the UR Blackboard administrator warns you that that option is not necessarily reliable; and so you even if you have it turned on you should very frequently peek at the course’s Announcements area within Blackboard). You definitely should do so; I assume that you have, and that you thus are quickly getting all late-breaking updates!

So, how do you turn on email notification of Announcements? Here is how, thanks to the UR Blackboard Administrator:

In your main Blackboard screen, click on the caret or “V” near your name in the upper-right, then choose Settings, then choose Edit Notification Settings. Fixing your general settings won’t save you; the course ones override those in a bad way. So under Edit Individual Course Settings, select this course, and then check the Email box at the top of the email column, and then make sure to click on Submit. (If you get a big red error screen when doing this, wait a few minutes and try again at few times; Blackboard is prone to such errors but they usually go away in a few minutes when one retries.)

Fun with Numbers: Although the course is both CSC286 and CSC486, depending on which you are registered under, I’ll often just refer to it by one or the other of the numbers (or sometimes as CSC286/486 or CSC2/486).

Various Other Good Stuff on the Course Web Site, Including Advice on Pre-
**senting a Paper:** Please note the “Useful Links” section on our course homepage, which contains many items. For example, that section contains a link to excellent guides by Parberry and Parberry-Spillman on how to present a paper; these should be big help in preparing your group presentations on the second part of the course (if our second midterm will involve group-based chapter-presenting).