Instructor: Lane A. Hemaspaandra, WEG 2317.

Grad TA: Andrew (“Read”) Read-McFarland, WEG 3209. (To avoid confusion with the other course TA also named “Andrew,” in this document and in class, I’ll myself usually call him “Read.” However, he not only has nothing against “Andrew,” but indeed he actively likes it, in contexts where it won’t be confusing. So please don’t hesitate to when interacting directly with him use “Andrew,” most especially if “Andrew” (the other “Andrew” that is—see how confusing it is!) happens to not be your tutorial leader.)

Workshop Leaders: Shir Maimon and Brandon Willett.

UG TAs (aka Tutorial Leaders): Jackson Abascal, Michaela Houk, Joel Kottas, Andrew (“Andrew”) Peck, and Colin Pronovost.

Address for Course-Related Email: If you have any questions about the course, you should see a human during office hours or at weekly workshop or at your weekly tutorial; there are office hours every day, Monday through Friday (starting 1/29), and in almost every week you’ll have a tutorial on Monday or Tuesday and a workshop on Wednesday or Thursday. We will not be using email as a way of accepting questions; we will be using (only) (gasp!) face-to-face, in-person human conversations. Really. (There are some very, very limited exceptions. If a TA or workshop leader or I asked you to email him or her directly and gave you his or her email address at which to do that, then of course you may use that address for whatever purpose it was given for. For example, this syllabus mentions below issues regarding religious holidays and regarding CETL accommodations, and gives you email addresses to use regarding those.) If your questions are about course logistics, see the grad TA in person at his office hours (or by appointment if his office hours are all conflicts for you), or also he’ll be at each class session starting 1/29, although do be aware that there are no exceptions to the rules, and so you should not be requesting an exception, and also be aware of the point made later in this document that this is a Models of Computation course, not a course on designing a Models of Computation course, and so we don’t answer questions about the “why”s of the course’s design or its rules. (Most are designed to help teach a good course within the constraints of its size and its staff support; and to allow us to spend as much of our time as possible on content and on providing you support/feedback/exam-grading; and also, some rules are related to CETL-accommodation issues.)

Class Time: M/W 325PM–440PM, Morey 321.

Office Hours: There are office hours each day of the week (starting 1/29). Here are all the office hours, listed by time. (Note: Office hours exist only on days when regular classes are in session, so not during Spring Break and not after the last day of AS&E classes; so the last day of office hours this term will be Tuesday, May 1st.)

1Any substantially updated versions of this document will be announced as the course goes on via BB and made available on the course home page.
### Office Hours by Time:

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>(Who, Where)</th>
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<tbody>
<tr>
<td>Mondays</td>
<td>450PM–550PM</td>
<td>(Read, WEG 3209)</td>
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<tr>
<td>Mondays</td>
<td>450PM–550PM</td>
<td>(Lane, CSB WEG 2317)</td>
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<tr>
<td>Tuesdays</td>
<td>450PM–550PM</td>
<td>(Read, WEG 3209)</td>
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<td>Wednesdays</td>
<td>450PM–550PM</td>
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<td>Thursdays</td>
<td>1120AM–1220PM</td>
<td>(Read, WEG 3209)</td>
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<tr>
<td>Fridays</td>
<td>200PM–300PM</td>
<td>(Read, WEG 3209).</td>
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### Workshop Sessions:

There will be workshops (note: in registrar-speak and CDCS these are “recitations”). These are required. Each student must be signed up (via the registrar) for (exactly) one of the six workshop sections. You are expected to attend your workshop section every week and participate well at it. (Your first workshop will be 1/17 if you’re in a Wednesday workshop and 1/18 if you’re in a Thursday workshop; there are no workshops during Spring Break or after the end of classes; some other weeks might also be nonworkshop weeks.) Your attendance will directly affect your course grade (see the grading formula). But far more crucially, the workshops are central to the learning of the course; if you skip workshop sections, you’ll miss their value, and will most likely do far worse on the midterms than you would have done had you attended the workshops. The six workshop section section-names/times/rooms/leaders are:

1. (“early Wednesday Brandon”)  
   Wednesdays 450PM–605PM (first one: 1/17), Dewey 4162.  
   Workshop Leader: Brandon Willett.

2. (“early Wednesday Shir”)  
   Wednesdays 450PM–605PM (first one: 1/17), Hylan 306.  
   Workshop Leader: Shir Maimon.

3. (“late Wednesday”)  
   Wednesdays 615PM–730PM (first one: 1/17), Meliora 218.  
   Workshop Leader: Brandon Willett.

4. (“early Thursday”)  
   Thursdays 450PM–605PM (first one: 1/18), Meliora 209.  
   Workshop Leader: Shir Maimon.

5. (“late Thursday Brandon”)  
   Thursdays 615PM–730PM (first one: 1/18), Dewey 4162.  
   Workshop Leader: Brandon Willett.

6. (“late Thursday Shir”)  
   Thursdays 615PM–730PM (first one: 1/18), Meliora 206.  
   Workshop Leader: Shir Maimon.

If any time on or after January 17th you use an add/drop to change which workshop you are in, you are required to immediately send an email to csc280staff “at” cs.rochester.edu noting which workshop you dropped and which you added.

### Tutorial Times and Locations:

Your tutorial will likely be a group of you and one or two other students meeting weekly for half an hour with a TA. The tutorials are required, and your tutorial’s time slot for the whole term will be determined right after the first class session, based on information we’ll collect from you.

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2(a) Read’s office hours will start not at the start of classes, but rather on 1/29; however, even during that first week and a half you will have people to ask questions to at your Monday-or-Tuesday tutorial and your Wednesday-or-Thursday workshop. (b) My office hours will start 450PM Mondays, and I’ll always stay until at least fifteen minutes, and starting then I’ll stay on as long as people are there (until 550PM or perhaps longer). So to see me during my office hours, please make sure to arrive no later than 505PM. But don’t panic if you’re there at 450PM sharp and I’m not; sometimes people ask me questions right after class in our classroom and when so depending on how long that lasts I can sometimes be slightly late getting back to my office. (c) I will not have office hours on 2/5.
there. You’ll have the same time slot all term long (except perhaps in strange cases driven by add/drops/etc.). Your first tutorial will be 1/22 or 1/23. The rooms and TAs and students members of each tutorial can be found on—or via—the Tutorial Times page that is linked to from our home page.

**Overview:** “This course studies fundamental computer models and their computational limitations. Finite-state machines and pumping lemmas, the context-free languages, Turing machines, decidable and Turing-recognizable languages, undecidability.”

Well, that is the course catalog blurb. And what it means is we’ll be covering much of (though by no means everything in) Chapters 1–5 of the Sipser textbook (so we’ll learn about the regular sets, about the context-free languages, about the recursive and recursively enumerable languages, and about the machine models that capture them), and we also will be (probably lightly, depending on how time goes) introducing P, NP, and NP-completeness. (I typically put up the slides for Chapters 1–5 at or near the start of the course, but please be aware that in that slide set there are various sequences of slides we’ll skip over in class, sometimes with me pointing you to the textbook to read the particular item/issue/proof/example there—we’ll come back to this point in the next paragraph. For our brief introduction to P/NP/NP-completeness, we’ll use a different set of slides that will be made available near when we get to that material.) The pace of our coverage will be in part hinged on how things go in this particular instance of this course; I’m more interested in you understanding well what we cover (which already will be quite a lot) than in covering a zillion things so fast that no one understands them.

Also, although this is by far the most abstract material in the BS core undergraduate CS curriculum here, we’ll teach it in a very hands-on way. The weekly workshops are a key vehicle for small(ish)-group hands-on problem-solving, and your weekly tutorials will have you and usually one or two other students interacting for half an hour with one TA, so that also is a setting with an even smaller group, and in those too you will often be discussing/presenting your solutions or working on new problems given to you by your tutorial leader. And at times, even in class, we may swap into a mode when we right in class try to discover or develop a given technique, or examples related to something we’ve learned. Partly to make some time for this, and partly to allow the rest of the material to be less rushed, for some proofs, esp. ones that don’t come across clearly on transparencies and in the time crush of class, I’ll assign them to you through the readings. (The readings will be assigned via being listed on our course home page in the list of assigned readings; usually any reading assigned on a given day will be listed on the site that same day, before midnight, so please do checked the page to find the assigned reading; I will often though not always also mention in class the reading assignments.)

Indeed, following the lead of Sipser, we won’t be obsessed with proofs (and we especially won’t be focused on proof details); rather, we’ll try to give you the functional, hands-on ability to really work with these different grammars/models of computation (and for the most interesting, important proofs, will try to give you a good understanding of what is the key idea behind the proof).

**Prerequisites:** CSC 173 and MTH 150. Really. If you have not taken and passed both, you’ll need to drop the course now and come back in a later term after you have passed both of those.

**The Flow of the Course, Including a Discussion of Tutorials and Workshops and How They Fit In:** The general flow of the course will be as follows.

In a given week, there will be material presented in class, or exercises and examples done in class (by you or by me), on Monday and Wednesday. And an exercise set (usually related to those classes, though it might draw on earlier work or other things altogether) will be posted to the course web site usually on Tuesday or Wednesday (if you don’t see it before your Wednesday tutorial don’t worry; your workshop leader will bring in the set to your workshop, and the first thing on the set that you’ll do is working on
solving Part A as a group at that workshop). That set will have a Part A and a Part B, and sometimes a Part C.

In your Wednesday or Thursday workshop that week, the workshop will try to solve all the Part A problems, and if it finishes that (and also the issue of answering any questions about the course material and about the Part B problems from the previous exercise set), the workshop leader will usually have extra problems that the leader brought in for you to also work as a group on solving as practice. It is perfectly legal, and indeed is a good idea, to take notes at the workshop You will not in a workshop go over the Part B of the current week's problems, as those are what you'll be working on between then and you next tutorial. And it is totally ok, and in fact is the design plans, for you to come into the workshop not having solved the Part A questions, since basically the workshop is a group effort on solving those questions—that is where you’ll tackle the Part A problems. (However, it is not ok to come in to that workshop without having reviewed what was covered in the course, e.g., in that week’s lectures and in any readings that were due before the time of the workshop.)

Then between that workshop and your tutorial (that will be on Monday or Tuesday of the next week), you will prepare handwritten—prepared by you in your own handwriting—writeups of answers to all the Part A problems and all the Part B problems from that exercise set. (If due to an ADA-related accommodation about which I have been informed in writing CETL has granted you the right to hand in at-home exercises computer typeset, then the above “handwritten” requirement does not apply to you.)

When you go to your assigned tutorial on Monday or Tuesday, you will hand in those handwritten answers. You may hand in the original or you may hand in a photocopy. If you forgot to make a copy, you’ll have no choice to hand in the original (though you’d be smart to frantically take photos of each page with your smartphone so you retain a copy). Keeping a copy (or keeping the original and handing in a copy) is very wise, since these sets may be of use to you when studying for the midterms (and we will not be handing out answers to the exercise sets). You will not ever be getting back those hand-ins. See the “grading” section of this document for how you’ll be getting a grade at each tutorial, but, briefly put, if you are on time and your hand-in for each problem in Part A and each problem in Part B has either your personally handwritten answer or clear written description, if you could not get to an answer to that one, of precisely what proof obstacle/confusion/etc. kept you from getting to an answer (plus what progress and partial work you made up to the point where you hit that obstacle), you are likely to get a 100% on that tutorial session. (That approach is because I want these sessions insofar as possible to be supportive rather than judgmental. However, if the tutorial leaders let me know that people are gaming this system, I may well sharply change the grading for all still-to-come ones, for example, the workshop leaders might test/judge you and give a grade to you based on what skill you displayed.)

The goal of the course is not to compete with each other, and, indeed, in real research, collaborative work is very common. And as fellow learners, the class’s students can be great helps to each other. After all, the primary goal is getting to a state of better understanding of the material. For this reason, I am at least initially setting the rules on working together to be very permissive. You may discuss and work on the exercise sets together with groups (even large groups) of your classmates, as long as that work happens face-to-face, in-person. You in fact may discuss the exercises with any UR students. You may look at books to help learn the material.

The write-up you do of Parts A and B should be, even if you did your solving in a group, something that you completely understand, that is in your own handwriting, and that is insofar as possible your own write-up. My suggestion to you is to for each problem put aside all notes (such as those made while working on the problem with others or while it was being solved by you and your workshop-mates at workshop) and other material, and write up your answer. If you get stuck, re-review those notes, and try again. And so on,
until you understand the problem and how to solve it well enough that you can do it without notes. (To help with that process, you might want to have each problem answered on a separate page, so you can throw out false starts on one without losing the one before it in the process.)

However, at least initially (it might change if the TAs determine that people are taking advantage of that approach in a way that is harming the learning), that is a suggestion, not a requirement. Especially since the Part As will be done in front of you (and involving you) as a group solution at the workshops, it would be unnatural to ask you to artificially alter the solution so as to make it artificially look different. On the other hand, the solutions that the workshops get to are often done quickly and perhaps with gaps or sloppy points, and as you do your write-up for hand-in of those Part A problems, you surely will do a more careful write-up. Even for the Part Bs, we at least initially will not try to play gotcha, since we do know that people—quite legally—may have solved things together, and may both be writing up their solution from the same notes that they jointly created as they solved it.

However, it is cheating to electronically post or distribute or share your answers; it is cheating to even give your final for-turn-in write-up to any classmate. It is cheating to create an electronic forum for discussing the problems and their answers; you must do that face-to-face in-person and only with fellow UR students. It is cheating to grab answers electronically (whether from a fellow student or from the web\(^3\)) and write them with your own handwriting and hand them in. You should have solved the problems yourself, or as part of your workshop, or working with other UR students. And then you will write up, in your own handwriting, your solution, or all your partial work and then the technical or understanding roadblock that prevented a solution, and will hand it in at your tutorial.

By the way, the above even extends, to some extent, to written material. That is, sort of restating the above to capture even this: When doing exercise 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 exercise-set problem; doing so is cheating. If you by accident stumble on a web page (or textbook page) that happens to explicitly solve an in-progress exercise-set problem, that in itself is not cheating. But as mentioned above 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; again, this is not a course about web-searching for answers. So Googling/etc. to find a exercise-set answer is sooooooo not allowed; and to expand things a bit further still, looking for or getting exercise-sets answers from earlier versions of this course or courses elsewhere or textbooks or etc. is also not allowed.

At least initially, since these exercise sets are not homeworks and their answers are not graded as to correctness, at least as far as I am concerned it is not an academic honesty violation to even get help on understanding problems from UR-student tutors at the CSUG Tutoring Center. (However, under their policy regarding homeworks, and as these are not insanely far from being homeworks though they actually are pretty far from it, tutors may quite reasonable decide to decline to touch an exercise set problem, and you should respect that if they do. And I would suggest that if you go to the tutoring center because you want help on some concept/technique, you try to avoid doing the problems that are on the current exercise set—because doing that with the tutor cheats you of the chance to solve it. So, instead ask for a different similar problem from the tutor. And with the skills you learn from that, you’ll be with luck ready to tackle the problem that previously was giving you problems.)

At your tutoring session, you of course should ask about any Part B problems you did not get to an

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\(^3\)If when browsing the web by bad luck you by no fault of your own bump into a solution to one of our problems, simply stop looking at it the moment you realize that that is what it is. The goal here is for you to build the skill of solving the problem; the goal is not to test your ability to look up answers with Google.
answer to, so your session-mates or the leader can share/discuss solutions and help you understand the problem and answer. If even after that you have questions, the best places to next ask are the grad TA's daily office hours, or your workshop later that week, or a classmate, or the CSUG Tutoring Center.

I said this above, but since this is an item that can easily lead to academic honesty cases, let me repeat it for emphasis. It is cheating to solicit help for in-progress exercise sets from anyone other than UR students. And even regarding UR students, although there is the allowed “face-to-face, in-person” path mentioned above, it is cheating to use any electronic forum for discussion or work together, so you may not post or answer questions on course-related materials to newsgroups/wikis/Piazza-or-so-on/Facebook-or-Google-or-etc.-groups or to places such as Stack Overflow, or even by using email lists; remember: “face-to-face in-person.” (A borderline case is things like Skype. For now, initially, I’ll let you consider *small-scale* use—let us define that as at most 4 people participating via Skype—of Skype to be as if it was face-to-face in-person, though I really do think it is less helpful than being actually face-to-face in-person. This Skype exception does not apply to class/workshop/tutorials, where Skyping in is not allowed, see later on.)

Of course, your tutorial turn-in must be done on time, right at your tutorial. If you forget your turn-in, you’ll be getting a 20% for that tutorial (if you show up on time), not a 100%. (No lateness means no lateness; even if one of my faculty colleagues—even the chair—tells you that he or she thinks it will be ok to hand in late a turn-in 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 the work on time in this course if you wish to have a chance to get credit for that tutorial day; similarly, none of my faculty colleagues can excuse you from this course’s classes, workshops, tutorials, midterms, etc.)

Your exercise-set hand-in should have the problems in the same order as on the set, using the same numbering as on the set, and if a problem is out of our Sipser textbook, please echo back the problem number for clarity. So if on a given set the 3rd problem is to do Problem 1.46(a) of Sipser, your answer must begin “3. (SIP Problem 1.46(a)).” (Also, be careful not to write “Problem” when what you are solving is a SIP “Exercise”; SIP has both problems and exercises.)

When an exercise set has a Part C section, you will not be handing that in. Part C questions, which are usually pretty challenging, will generally be gone over either in class or at your workshop.

By the way, I try to never give out answers to in-progress exercise-set questions; so you certainly won’t get me to solve your in-progress exercise-set questions for you. And if you want clarification of what a question means, well, a big part of solving problems is understanding them and understanding what is appropriate as a solution to them. And recall that we do not answer questions via email; the course is about face-to-face interaction. But if you are so confused as to be quite lost about what a problem even means, the natural thing to do is to ask about it at the grad TA’s office hours, or your workshop, or your tutorial, or to ask a classmate (if you have left things to the very last minute, that last path may be your only path).

So, if you ask me questions via email (such as asking for answers or even clarifications on exercise-set problems), you are likely to get either no reply or the answer “no comment” (perhaps with a pointer to this document)—most likely the former. In fact, if you get no answer at all, please consider that to implicitly be the answer I just gave above. 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 workshop sessions or the tutorial sessions to ask questions about or better learn about that material. We also don’t answer emailed questions about either course content (rather, see a human during office hours) or course logistics (except if it is something broken such as “Blackboard does not have a column that by now should be up”); but course-design questions/rule-change-requests we don’t answer by email or in person, as described elsewhere) and so please consider each such email to be implicitly answered by this sentence itself, when/if I don’t reply to it. Again, as to content, note that it follows that if you have a question sometime after the last workshop-
or-office-hour you can make in a week, you likely can’t get an answer to it before the due date/time of your exercise-set hand-in (well, that actually depends on precisely which time you have).

I do expect you to use the office hours and other such availabilities to the full extent needed to do well in the course. There are office hours each M/Tu/W/Th/F, and if you are both doing poorly and not using them, then you’re in a doubly bad state: both from the poor grades, and from the fact that by not making the effort to use the office hours to learn the material you are not making the expected effort to participate and do well in the class. Of course, not every student can make all the office hours, but all of you should be able to make some of them; or if not, you can make a separate appointment with the grad TA. Also, you should plan ahead and use those hours you can make. Also, you’ll have your weekly workshop section, which is a powerful weekly 75-minute resource (that by the way comes after the week’s two class sessions yet before the Monday due date of the exercise set—so it is a key way to learn the week’s examples/techniques/etc.).

Audio or video recording of the class sessions is not permitted nor is having an open computer (laptop/tablet/PDA/phone/etc.) in class, except if you have a documented disability that would need such recording/assistance and CETL has sent me an accommodation letter on that issue.

You may not Skype in—not even in silent view-only mode—on days you can’t attend class (and this all similarly applies to workshops and tutorials), nor may you have a classmate electronically record or transmit the 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 a midterm was handed back does not change your regrading window, so do pick up from the grad TA your handbacks at his very 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, as needed.

Related to the above, you absolutely will want to have three or four students in the class with whom you’ve exchanged email addresses and phone numbers, so that if you do have to miss a class session, you can get from them a description of what was covered. (Do not ask me or the TAs to fill you in on what you missed; your three or four fellow classmates are your go-to source; of course, you’d surely similarly help them if they missed a class. It is your responsibility to yourself find out what happened during any class that you miss.)

Since the class is large, please (unless when I call on you I myself have already mentioned your name) when asking a question prefix your question with your first and last name, since that may help me to (I hope) eventually learn some/many of your names.

By the way, if you have a question about some of the course material (i.e., technical content, e.g., “Does that definition imply that no DFA can have more than one start state?”) during class, it usually is a very good idea to ask your question. 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! A caveat: This is a course on certain material, not a course on how to design and teach a course on that same material. So do not ask course-design/course-logistics questions such as “Why are there Parts A and B?” or “Why can’t I use my computer, my full notes, my supersmart pet dog Fido, and our textbook during the midterms?” I don’t answer such questions. (If you have a matter of something outright broken as to Blackboard or so on and need to inform us of that, then the address to use to report it is csc280staff “at”

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⁴Even 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!
A Interesting Twist Regarding Making Workshops Work

The philosophy of the workshop is that on most things the workshop members themselves seek and find solutions to problems—most typically, problems that they are seeing for the first time right there at the workshop. This doesn’t get to a solution as quickly as you would if the workshop leaders just gave you a solution—but it is likely to end up with you understanding the solution far, far better than if the workshop leader just tossed it his or her solution in your lap, since as we’re doing things, you will have been part of the process that arrived at the solution.

And that in general is a very good thing, and students have tended in this course to find that the workshops are a real help. However, there is a potential downside to this approach, so let me mention it, and mention a good way around it.

The worry is as follows. As a side effect of the student-led nature of workshops (itself, a very good thing), sometimes the solutions reached may not be 100% clean as the group may have had to vary and re-vary approaches to get to a good solution. And a good approach addressing that worry is that if you as workshop members are, after arriving as a group at a solution, not comfortable with the solution’s beauty or clarity or cleanness, then please, please suggest to the workshop leader right then and there that the solution seems perhaps nonoptimally clear/clean, and then the leader can (depending on time) either have the workshop members re-investigate the problem, to seek a cleaner, more beautiful solution, or (if time is tight) the leader in some cases may just jump to the cleanest solution he or she knows of. However, of those two, I think the former is the better one... and in fact, reminds me of a quote from our main course web page, namely, and this is one of my very favorite quotations in CS:

After solving a challenging problem, I solve it again from scratch, retracing only the insight of the earlier solution. I repeat this until the solution is as clear and direct as I can hope for. Then I look for a general rule for attacking similar problems, that *would* have led me to approach the given problem in the most efficient way the first time.
– Robert Floyd, 1978 Turing Award winner.

So please don’t be at all shy about urging your workshop leader to let you, like the late Prof. Floyd, seek the most lovely, insightful solution to a problem, through rethinking an initial solution. It certainly worked well for Prof. Floyd!

Grading: You course grade has the following components.

Your workshop attendance grade (which as mentioned below isn’t all about attendance; good participation at workshops can get you some bonus points in this part of your average) counts for 12% of your course grade. Your tutorial attendance grade (which also isn’t all about attendance; see below) counts for 12% of your course grade. Your class attendance grade counts for 12% of your course grade. Your midterms count for 64% of your course grade. There is no final exam.

Those grade components values are computed as follows.

Your midterm component, which counts for 64% of your course grade, is the average of your Midterm I and Midterm II grades (so each of those counts for 32% of your course grade).

The other components are a bit more complex to describe.

At each class session (except during the two midterms, and I during the course might announce some other sessions as not counting toward the class attendance calculation) you will get a 0% if you do not attend and a 100% if we record you as attending (via your being there and signing—on your line and only

\footnote{For the Spring 2018 CSC 280/480, whether the 4/30/2018 class session will be counted toward the class attendance calculation will be announced at the 4/30 class session.}
on your line—the attendance sheet; so do double-check each time, especially if you and others have the same last name, as if you sign on the wrong line, you will get a 0% even if you attended class). The average of those grades, but with the 4 lowest ones dropped if you are taking this as 280 and the 2 lowest ones dropped if you are taking this as 480, is your class attendance grade.

At each tutorial (during weeks when we have tutorials, and I during the course might—though it is not too likely—announce some other tutorials as also not counting toward the tutorial attendance calculation) you will get a 0% if you do not attend or you arrive late, and otherwise you will get a 100% if your Part A/Part B turn-in has for each question either an answer or if you did not reach one then your partial work and your explanation of what proof obstacle/confusion/etc. kept you from reaching an answer, and otherwise you will get a 20%. The average of those grades, but with the 2 lowest ones dropped if you are taking this as 280 and the 1 lowest one dropped if you are taking this as 480, is your tutorial attendance grade.

Regarding the tutorial grade computation above, you will be credited for attending a week’s tutorial only if you attend the tutorial session you are assigned to; you will not get credit for attending any of the other ones, and indeed you may not attend any of the other ones (unless, rather exceptionally and I don’t encourage them to do that, your tutorial leader or another lets you, but even in that case, that won’t give you credit for tutorial attendance for that week). There will be no exceptions to this, except regarding issues of religious holidays, discussed long in advance, see later in this document. If you miss a tutorial, you’ll have missed your chance to chat there about that exercise set, but you still will have the grad TA’s office hours as a useful resource if you have questions about the set.

Both tutorials (see above) and workshops (see below) give you a 0% if you skip or “are late.” But how strict will the tutorial leaders and workshop leaders be as to deciding whether it counts as “late” if you come in 3 seconds or 3 minutes late? I’ll leave up to those leaders how to draw the threshold as to what counts as late (but it likely will be pretty strict). However, since you are expected to be at those meetings on time, the wise thing to do, not just for grades but for the learning and out of respect for your groupmates and leader, is to be there safely and completely on time each week. Naturally, we expect you as part of attending things to stay until the earlier of when their time period ends and when the leader says it is over; except... for some or all tutorials, I may via a posting or in the rules for the Exercise Set that tutorial is on set a minimum amount of time you must spend to avoid getting a 0%; on such days, if the amount of time I specific is $N$ minutes—$N$ will never be more than 30 of course—then you will get a 0% unless you stay until min(30 minutes in, max($N$ minutes in, whenever the tutorial leader says things are done)). (During weeks that have such an $N$ specified, you and the tutorial leaders will know of $N$, but if your leader forgets and tries to push you out the door at time less than $N$ minutes in, remind the leader of the applicable $N$ and spend the time between then and $N$ minutes in in discussion of material/problems/etc.)

At each workshop (during weeks when we have workshops, and I during the course might announce some other workshops as also not counting toward the workshop attendance calculation) you will get a 0% if you do not attend or you arrive late, and if you arrive nonlate and attend then you will got a 100% for that day. The average of those grades, but with the 2 lowest ones dropped if you are taking this as 280 and the 1 lowest one dropped if you are taking this as 480, is an intermediate result on the way to your workshop attendance average. And then your workshop leader will at the end of the term be allowed to raise the grade that attendance portion yields by up to an extra (additive) 3 points, based on strong participation. So for example, if you miss 1 workshop but your workshop leader at the end of the term adds 3 points, your workshop grade would be a 103%. Yes, a 103% is above 100%, and yes, we’ll really average in the 103% when computing the weighted average of your various grade components.

Regarding the workshop grade computation above, you will be credited for attending a week’s workshop only if you attend the one workshop session you are registered for; you will not get credit for attending any
of the other five; there will be no exceptions to this (except regarding issues of religious holidays, discussed long in advance). The one exception is that for the 1/17 and 1/18 workshops, though you should try to attend the one you are registered for, you will get credit for that week as long as you attend at least one of that week’s six workshops. In all other weeks, you may if you can’t make the workshop that you are registered for attend one of the other five, and that is a good idea, but that will not (regardless of how good your reason is for not attending your own workshop) be counted as having attended that week’s workshops for the purpose of the workshop grade computation. Also, you may—for example if you are having particular problems with the current material—in a week choose to attend more than one of the workshop sessions, e.g., your “home” one and another one (perhaps given by the other workshop leader).

Not being registered for a workshop section does not mean you don’t need to attend workshops. You are required, as part of taking this course, to be registered for a workshop session. If you are not, I’ll likely have the registrar remove you from the course (though the registrar these days usually forces workshop registration in parallel with course registration, avoiding such a case in the first place); but even if I don’t catch your workshop nonregistration, the workshop nonattendance would surely severely lower your course average.

On some weeks we will simply not have workshops and tutorials. For example, if a midterm is on Monday then there likely will be no tutorials or workshops that week. We also for example might not have tutorials during the final week—or perhaps even two—of the term. Such days simply won’t generate any column that participates in the relevant items attendance averaging. Times when there will not be WSs or tutorials will be clearly announced via Blackboard or the home page, or are announced later in this document.

Your course grade will be based on the resulting weighted average, from the components. If you would like to know what letter grade you will get (though focusing on grades is the wrong thing to do; the ideal thing to focus on is to learn as much and as well as one as one can), here is the scale the course will use:

FOR CSC 280:
- A starts at 95.0%
- A- starts at 90.0%
- B+ starts at 86.6% (so, yes, 86.63% would get a B+)
- B starts at 83.3% (so, yes, 83.31% would get a B)
- B- starts at 80.0%
- C+ starts at 76.6%
- C starts at 73.3%
- C- starts at 70.0%
- D starts at 66.6%
- and lower is E.

FOR CSC 480:
- A starts at 95.0%
- A- starts at 90.0%
- B+ starts at 86.6% (so, yes, 86.63% would get a B+)
- B starts at 83.3% (so, yes, 83.31% would get a B)
- B- starts at 80.0%
- C starts at 73.3% (this is not a typo; there is no graduate grade of C+)
- and lower is E.

I will use the above 280 scale for the midterm warning reports to the Dean that (via the Dean) under-graduates get, based on the grades on all items up to spring break, but using in my calculation the dropping
of just the prorated portion of grade-drops, so 2 classes and 1 workshop and 1 tutorial. Aside from that, I do not give predictions of grades. However, you at any point are of course free to yourself use the above to do the calculation. (I mention that I will not give you a grade lower than that which the above listing specifies. Although it is extremely unlikely and I won’t comment on this ahead of time, I do leave myself the freedom to, if I think that following the above scale is not appropriately reflecting the quality of the class’s work, shift the boundary values to more generous ones; again, this is extremely unlikely and you would be exceedingly unwise to hope for or plan on it.)

Again, note that, very informally put, the and “class/tutorial/workshop-missing” rules in effect covers you for four class days and two tutorials and two workshops of misses in 280 (in each case, half of that if are taking this as 480). However, I would emphatically urge each of you to (except when sick) attend every class/tutorial/workshop; you will learn far more and enjoy the course far more; and that will let the drops for example just end up dropping whichever days you were truly sick/etc. on, rather than ones you skipped outright in the hope that you would not later get sick or have other needed misses. Do keep in mind that the stated numbers drops/misses are a bow to sicknesses, broken cars, family tragedies, sport teams, scholastic teams, and all other compelling and noncompelling excuses; you do not get more, not matter how many reasons you have or how good they are.

**Academic Honesty:** You should read and follow the school’s academic honesty rules. Violating them is a severe mistake, and will throw you into a process that you very much don’t want to get thrown into—and violating the honesty rules just plain isn’t the right way to operate. The rules from earlier in this document as to how and from whom and from where you can (and cannot) seek help/answers or work with are a very important part of the academic honesty policy of this course.

**Disability Accommodations** If you are entitled to and wish ADA-related accommodations (for example, regarding extended-time arrangements), please *immediately* contact CETL Disability Resources to both (1) confirm extended time arrangements and (2) have them send me (ideally by email) an accommodation letter (they have a “Letter to Faculty” form on their web site—https://www.rochester.edu/college/cetl/disability/current.html—to guide that process). If taking the midterms under extended time, you will take the midterms at CETL, if possible the same day the class does but timed to end only after the class has started the exam; if that is not possible, you’ll take it early the next day. (Note: CETL has moved to Taylor Hall as of January 2018.) If you are entitled to and wish the ADA-related accommodation of extended time, please also make sure to, right away after you’ve asked CETL to send me an accommodation letter and confirmed with them your extended-time arrangements, send an email to (be careful; this is a special address to use ONLY for that; only the grad TA gets those emails, and I get a cc) csc280gradta “at” cs.rochester.edu noting that you’ll be taking the midterms at CETL.

(please remember all three: (1) Confirm extended time arrangements with CETL, (2) Have CETL send me an accommodation letter, (3) [For those accommodations that mean you’ll be taking the midterms at CETL, also:] Send the above-mentioned email to csc280gradta.)

**Class Attendance:** Required.

**Missed Days as to Attendance Grades (of All Three Types) and Missed Exercise Set Hand-Ins and Missed Midterms:** No makeups. No lateness. No exceptions (except for observance of religious holidays, discussed long in advance\(^6\) or unless you have a letter from a convincing Dean (i.e., one with the authority

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\(^6\)To be explicit: You must, no later than January 29, 5PM, send an email having as its title—since we may be doing a search for exactly this subject field—*utterly exactly* (but without the quotation marks) “Religious Holiday and CSC280/480” to csc280staff “at” cs.rochester.edu if any of the class days or of your tutorial days or of workshops to which you are assigned fall on days where due to observance of a religious holiday you will not be able to attend; in that email, please let us know all such days for the entire
to mandate exceptions to course policies). Again: As a bow to sicknesses, broken cars, tragedies, and other compelling excuses, each 280 student will have their lowest four class-attendance grades, two tutorial-attendance grades, and two workshop-attendance grades dropped (but no more, even with good excuses, unless you have a letter from a convincing Dean as mentioned above; this dropping rule builds in and covers all sicknesses, disasters, and so on; we do not make exceptions, so do not ask for an exception). For 480 students, the same holds except the number of drops are respectively not 4, 2, and 2, but 2, 1, and 1.

There will no final. Note that missing a midterm means you got a 0% on 32% of the course’s grade, and so if it is the first midterm you’d need to withdraw (you’d be from that alone only a whisker above an E), and if it is the second you likely will fail the course. (In fairness to those student who would have liked and benefited from more preparation time but knew the rules and so showed up and did their best, I do not give incompletes to people who miss the second midterm.)

People sometimes email requests for extensions or to be excused from attendances/deadlines/exams/etc., and sometimes think that not getting a reply means they have permission. To avoid such confusion... let me state the implicit reply to all such email requests right now: no extensions, no excuses... and this reply is so fixed that you won’t get a reply... both because the reply is preset and because, as mentioned earlier, in this course, students will not be using email for questions about the course; if you have questions, you should see a human during an office hour (or tutorial or workshop).

The midterms are closed-book unless they explicitly say otherwise. The midterms are also closed notes, except that you may prepare and use one 8.5-by-11 sheet (writing on both sides is allowed; you may alternatively bring two 8.5-by-11 sheets on which each has one side with handwritten notes and one side that is totally blank) of handwritten cram-notes hand-prepared by yourself. (If taking the midterm at CETL, typically they will have you photocopy your above-mentioned cram-notes before starting the midterm and you may have the photocopy (but not the original) out during the midterm; the photocopy will be turned in with the midterm (but not counted at all in the grading, and there is no promise it will be returned); the original will remain in your possession, so you can use it for future purposes.)

As to the midterms, 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 midterm in (black, number 2) pencil (but if it is a smudgy, erased-and-overwritten mess you’ll likely get no points). In no case may you use any color other than blue or black.

No questions may be asked during the midterms, and none will be answered; the process breaks the flow and concentration of the class, 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), and can be unfair if due to reasonable-accommodation issues the exam is taken at different times by different people. If you see on a midterm 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 intentionally ask you on a midterm) or makes the
problem meaningless or incoherent, what you should do is that as part of your answer you should clearly explain 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).

Midterm Dates  The dates of the midterms are March 5 for Midterm I and April 18 for Midterm II. (And in light of that, we will have no tutorials on March 5–6, April 23–24, and April 30–May 1, and no workshops on March 7–8, April 18–19, and April 25–26.) The midterms might be located in a room other than our room; in particular, for the Spring 2018 CSC 280/480, Midterms I and II will both be located in Lower Strong Auditorium, during the regular class time on, respectively, Monday 3/5 and Wednesday 4/18.

Regrading and Administrative Error Corrections and Blackboard and Other Logistics  If you want a midterm regraded, you must notify the staff of that by email (to csc280staff “at” cs.rochester.edu, not to our personal addresses) within 48 weekday hours (so Sat. and Sun. do not count against those) of it being given back (this holds even if you did not attend the class at which it was given back), along with an emailed explanation of what you feel was graded incorrectly. You must include as an attachment to the email a good-quality color scan of the entire midterm (not just the problem you are asking to have regraded). Late regrade requests will not be honored. Note that the entire thing (e.g., the whole midterm) 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, e.g., if 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. (Note that some or all the regrades may be done by me, and although your TAs are excellent and sharp-eyed, I’m perhaps even more sharp-eyed and perhaps far more demanding, especially regarding having clean, clear, complete answers; like most professors, I spend much of my research time finding flaws in my own and in other professor’s argument lines, and so we tend to want arguments to be complete, clear, and error-free. And I am not a fan of partial credit for flawed proofs—proofs are right or are wrong; one flaw opens lets in a universe of invalid conclusions.) We will typically have your regraded paper back to you within one or two weeks.

We will be using Blackboard to maintain the course grades. If the grade we wrote on your midterm differs from the one that we recorded in Blackboard, you must inform us of that (and email the TAs and provide them with a copy of the graded item as paper at their office hours or by emailing it as pdf) within 48 weekday hours (Sat. and Sun. do not count against those) of it being given back (grades will typically be available in Blackboard by the time the item is given back, as we use Blackboard to hold your grades) (of course, for the case of us merely correcting, within the allowed window, a grade that is misrecorded in Blackboard, your request that we do that does not trigger a regrade of your item). A corollary is, you are expected to, frequently and routinely, check Blackboard to check on your grades and to make sure to catch any such errors. Grade problems after the 48-hour window won’t be changed; it is your responsibility to keep in such close touch with Blackboard that you catch errors within the time frame noted (and as a side effect, you’ll become quickly aware of any overall pattern grades such as lots of missed classes/workshops/tutorials, since Blackboard will show you all your grades so far in the course); in brief, when you get something back (or know a grade was due to come up), immediately check within Blackboard that we didn’t misrecord its grade in Blackboard.

FYI, I’ll typically label grade-items by their dates (so a typical grade-item label might be “1/1718 Wk- shp” for the workshops that for each of you will fall on January 17 or 18). (Note: Often, I’ll make a grade-item placeholder in Blackboard before we’ve graded what will go in that location, so you may sometimes see grade-items (with no grades in them) for things that are not yet collected or even not yet assigned.
Your daily attendance scores for class/workshops/tutorials will be columns in Blackboard, so you should check that too, along the lines of the above. We will put up the grade for each class/workshop/tutorial by the end of the calendar day on which it happened (and so the 48-hour clock of asking for corrections of misrecordings will be viewed as starting at 1159PM on the day of that item). So should put into your smartphone a reminder to check, one day after each class/workshop/tutorial, that your attendance was correctly recorded, so that in the (we hope very rare) case that it was not you can get your correction in before the deadline for such requests has passed.

If you attended your workshop/class/tutorial appropriately and the column says you did not, then the 48-hour window mentioned above holds regarding bringing that to our attention—by email to csc280staff “at” cs.rochester.edu, but with your letter needing to explicitly mention which workshop you are registered for, e.g., “early-Wednesday Shir”; again, to avoid any lack of clarity about time, the 48 hour window will start at 1159pm on the day of your item, so for workshops, at 1159pm Wednesday or 1159pm Thursday; similarly for tutorials, explicitly mention who you leader is and what your day/time are.

You should not view the class as a competition against your fellow students. The class is not graded on a fixed curve such as “only the top BLORT percent get an A.” Indeed, ideal would be if everyone did very well and got a very good grade. However, as a limited concession to the desire of some to know how they did comparatively on a given item, we set Blackboard to show the average/median of the midterm-exam columns. On the other hand, we will have Blackboard not show a “Total” column—not just because such a total would give you an incorrect impression, given that the course grading systems is far more complicated that a simple totaling, but also because in this course the goal is learning, and even regarding grades, the course is not at all about competing with classmates... indeed, ideally, at the workshops, and even in letting you do discuss exercise sets in groups (see the rules on that), you’ll very often be cooperating with classmates to help each other learn better than you would alone. So, to recap in part, as to grades (and what is made public and what is not), each student gets his or her own grade on each individual item, can typically read the average/median info from Blackboard page both exams (but not on attendance columns or workshop bonus points), and at the end of the course will receive his or her course grade either from the registrar or from me.

This class is available for audit, but please do speak with me if you want to do that (and do be aware it won’t be any help toward your CS major requirements if you take it as an audit).

The only exception to this document’s 48-nonweekend-hour time limits is that during the last 10 calendar days before the last day of classes (i.e., from April 22 onward), anything on which you want a correction has a single 24-calendar-hour-after-the-class-where-it-was-available-for-return-or-was-up-in-Blackboard time limit for being submitted for regrading (so look over attendance and, if any, other grades during the last ten days within the first 24 hours of getting them back or them going up, please). However, that 24-calendar-hour exception does NOT apply to the second midterm; even though it will be given back during the last 10 days most likely, you still get 48 weekday hours to ask for a regrade. There is one more exception: The attendance grade for the last class will (if that class is not excluded from counting toward the attendance grade) will not be subject to correction as I will right in class read off what is in the column and that will be your one and only chance to ask for a correction on that one grade item.

Textbook: The required text is:

- (In the course we will sometimes refer to this as SIP.) Michael Sipser, Introduction to the Theory of

*Note 1:* Do not confuse the 3rd edition named above with the Third Edition (International Edition), as that has different problems/problem numbering in some places; if you use the Third Edition’s “International Edition” version, you’ll probably sometimes do the wrong problems due to the sometimes different numbering and that could result in a 20% tutorial attendance grade on the day that exercise set is turned in.

*Note 2:* Do not confuse the 3rd edition with any of the earlier editions! If you use the second or first or preliminary edition, beware, as problem-numbers and pages and sections and even the core meaning of some notions may differ, so you will really want to use the third edition.

**Books on Reserve:** On reserve, for this course, at Carlson Library, are quite a few books, including our Sipser textbook (make sure to use the 3rd edition, even if I also put earlier editions on reserve), texts covering some or all of course’s topics, some more advanced (and less advanced) textbooks, some review books on discrete mathematics, and some just-plain-interesting books that I thought you might enjoy as developing computer scientists. You can get to the reserve list directly from the link to it within our course’s area within Blackboard.

Among the on-reserve books that provide many worked examples are: (a) (In the course we may refer to this as MAR, though I doubt we’ll draw on it much or at all—SIP is quite excellent itself) J. Martin, Introduction to Languages and the Theory of Computation, McGraw Hill and (b) Daniel I.A. Cohen, Introduction to Computer Theory, Wiley. But beware: Different books use different notations and different models/pictures/conventions, and that can be confusing.

**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/=CSC280/

regularly (i.e., daily, so that, for example, you see and do the reading and exercise sets that will be listed on that web site). *Be very, very, very careful to make sure your browser isn’t caching and showing you an old version (browsers love to do that).* The web site also provides a copy of the slides (and warmest thanks to Prof. Ogihara, who created the original version of most of them), has various other important links (such as regarding academic honesty information), and (near the bottom of the page) has tidbits of advice. This web site, however, does not have day-to-day announcements. Those will be transmitted using the Blackboard “Announcements” feature.

**Blackboard Announcements:** Most day-to-day announcements, if any, will be transmitted using the Blackboard “Announcements” feature. You can see these announcements within Blackboard, and I will try to have each sent to you as email by Blackboard.

However, in case on one of them I don’t remember to check the “mail-to-all” box, I strongly recommend that you make the slightly tricky change to your Blackboard settings that will cause Blackboard to send to you by email all course announcements. Here is how to do that, with my thanks to the UR Blackboard Administrator who provided this: In your main BlackBoard screen, click on the caret 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 it 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 an error message, retry it, or wait a hour and retry it, and with luck it will work.)