Course Information

1 Staff

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World Wide Web:	http://theory.lcs.mit.edu/classes/6.046		
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2 Distance learning

This course will be taught concurrently at MIT in the United States and as part of the Singapore-MIT Alliance (SMA) program in Singapore. All aspects of the course — lectures, recitations, problem sets, and exams — will be essentially the same in the two countries. The lectures, all of which will be given live at MIT, will be recorded, digitized, and made available to the students in

Singapore via the course website. The recorded lectures will also be available to MIT students. Prof. Lee will participate in the administration of the course with Profs. Demaine and Leiserson, help produce course materials, and teach recitations for the SMA students.

3 Prerequisites

A strong understanding of programming and a solid background in discrete mathematics, including probability, are necessary prerequisites to this course.

MIT students: This course is the header course for the MIT/EECS Engineering Concentration of Theory of Computation. You are expected to have taken 6.001 *Structure and Interpretation of Computer Programs* and 6.042J/18.062J *Mathematics for Computer Science*, and received a grade of C or higher in both classes. If you do not meet these requirements, you must talk to a TA before registering for the course.

SMA students: All SMA students are required to take this course. If you do not think you have sufficient background, please talk to Prof. Lee.

4 Lectures

MIT students: Lectures will be held in Room 2-190 from 9:30 A.M. to 11:00 A.M. ET on Mondays and Wednesdays.

SMA students: SMA students can expect to have access to the videotaped lectures by midday SGT on Tuesdays and Thursdays.

You are responsible for material presented in lectures, including oral comments made by the lecturer.

5 Recitations

Students must attend a one-hour recitation session each week. The course staff will schedule recitations. You are responsible for material presented in recitation. Attendance in recitation has been well correlated in the past with exam performance. Recitations also give you a more intimate opportunity to ask questions and interact with the course staff.

MIT students: MIT recitations will be taught by the teaching assistants on Fridays. Handout 3 asks you to fill out the sign-up sheet on the course web page to indicate your preferences for recitation sections. Recitation assignments made by the scheduling office are inoperative.

SMA students: SMA recitations will be taught by Prof. Lee on either Friday at 3:00 P.M. or Monday at 1:00 P.M. SGT in the video-conference room.

6 Handouts

Most handouts will be made available on the course web page in formats suitable for printing. Students should download and print out the handouts from the course web page. You will receive an email reminder when the handouts are available online. The email message will say where and when the few handouts that are not available from the web page can be obtained.

7 Textbook

The primary written reference for the course is the second edition of the textbook *Introduction to Algorithms* by Cormen, Leiserson, Rivest, and Stein. In previous semesters the course has used the first edition of this text. The second edition is a substantial revision of the first, making the first edition unsuitable as a substitute.

MIT students: The textbook can be obtained from the MIT Coop, the MIT Press Bookstore (a 20% discount coupon can be found in the MIT Student Telephone Directory), and at various other local and online bookstores.

SMA students: The textbook is available from the NUS Co-op bookshop at LT27.

8 Course website

Please bookmark the course website:

`http://theory.lcs.mit.edu/classes/6.046`

It provides links to all the distance-learning materials, including video recordings of the lectures. Available here are also links to electronic copies of handouts, corrections made to the course materials, and special announcements. You should visit this site regularly to be aware of any changes in the course schedule, updates to your instructors' office hours, etc.

9 Extra help

MIT students: Each Teaching Assistant will post his or her weekly office hours on the course website.

In addition, as a free service to its students, the MIT Department of Electrical Engineering and Computer Science provides one-on-one peer assistance in many basic undergraduate Course VI classes. During the first nine weeks of the term, you may request a tutor who will meet with you for a few hours a week to aid in your understanding of course material. You and your tutor arrange the hours that you meet, for your mutual convenience. More information is available on the HKN web page:

`http://hkn.mit.edu/act-tutoring.html`.

Tutoring is also available from the Tutorial Services Room (TSR) sponsored by the Office of Minority Education. The tutors are undergraduate and graduate students, and all tutoring sessions take place in the TSR (Room 12-124) or the nearby classrooms. For further information, go to

`http://web.mit.edu/tsr/www`.

SMA students: Prof. Lee will be available for consultation on every Monday from 2:00 P.M. to 3:00 P.M. and for an additional hour during the collection of each problem set. (Times will be announced via email.) Appointments are required for consultation at other times.

10 Registration

MIT students: You are asked in Handout 3 to fill out a sign-up sheet on the course web page. The information you provide will help the course staff to get to know you better and create a mailing list and a course directory. Signing up is a requirement of the course. You will find it difficult to pass the course if you aren't in the class! You should notify your TA immediately if you drop the course after having registered. Listeners should also register for the course in order to be on the mailing list.

You must register before 7:00 P.M. on Wednesday, September 5. We will email your recitation assignment to you before noon on Thursday, September 6. If you do not receive this information from us by Thursday noon, please send email to `greenie@mit.edu`.

SMA students: SMA students will be registered automatically. We will email your recitation assignment to you by noon on Thursday, September 6.

11 Problem sets

Nine problem sets will be assigned during the semester. The course calendar, Handout 2, shows the tentative schedule of assignments and due dates, but the actual due date will always be on the problem set itself.

- Late homeworks will generally not be accepted. If there are extenuating circumstances, you should make *prior* arrangements with your recitation instructor.

  MIT students: An excuse from the Dean's Office will be required if prior arrangements have not been made.

- Each problem should be written up on a separate sheet (or sheets) of paper, since problems may be graded by separate graders. Mark the top of each sheet with the following:

  - your name,
  - the name of your recitation instructor,
  - the problem number,
  - the people you worked with on the problem (see Section 14), or "Collaborators: none" if you solved the problem completely alone.

  MIT students: You must write up your answers on three-hole punch paper. The course staff puts rings through the holes to avoid losing homeworks. In addition, your graded homeworks can easily be included in your loose-leaf course notebook.

- You should be as clear and precise as possible in your write-up of solutions. Understandability of your answer is as desirable as correctness, because communication of technical material is an important skill.

  A simple, direct analysis is worth more points than a convoluted one, both because it is simpler and less prone to error and because it is easier to read and understand. Sloppy answers will receive fewer points, even if they are correct, so make sure that your handwriting is legible. It is a good idea to copy over your solutions to hand in, which will make your work neater and give you a chance to do sanity checks and correct bugs.

- The problem sets includes exercises that should be solved but not handed in. These questions are intended to help you master the course material and will be useful in solving the assigned problems. Material covered in exercises will be tested on exams.

12 Describing algorithms

You will often be called upon to "give an algorithm" to solve a certain problem. Your write-up should take the form of a short essay. A topic paragraph should summarize the problem you are solving and what your results are. The body of your essay should provide the following:

1. A description of the algorithm in English and, if helpful, pseudocode.
2. At least one worked example or diagram to show more precisely how your algorithm works.
3. A proof (or indication) of the correctness of the algorithm.
4. An analysis of the running time of the algorithm.

Remember, your goal is to communicate. Graders will be instructed to take off points for convoluted and obtuse descriptions.

13 Grading policy

The final grade will be primarily based on problem sets (P), one in-class quiz (Q_1), one take-home quiz (Q_2), and a final (F). The problem sets will together be worth about 80 points, the in-class quiz about 80 points, the take-home quiz about 150 points, and the final exam about 180 points.

Although the problem sets account for only 80 points in your final grade, you must do them. The following table shows the impact of failing to do problems:

Problems skipped	Impact
0	None
1	One-hundredth of a letter grade
2	One-tenth of a letter grade
3	One-fifth of a letter grade
4	One-fourth of a letter grade
5	One-third of a letter grade
6	One-half of a letter grade
7	One letter grade
8	Two letter grades
9 or more	Fail

Please observe that this table is for *problems* skipped, not *problem sets*.

The specifics of this grading policy are subject to change if the need arises.

14 Collaboration policy

The goal of homeworks is to give you practice in mastering the course material. Consequently, you are encouraged to collaborate on problem sets. In fact, students who form study groups generally do better on exams than do students who work alone. If you do work in a study group, however, you owe it to yourself and your group to be prepared for your study group meeting. Specifically, you should spend at least 30–45 minutes trying to solve each problem beforehand. If your group is unable to solve a problem, talk to other groups or ask your recitation instructor.

You must write up each problem solution by yourself without assistance, however, even if you collaborate with others to solve the problem. You are asked on problem sets to identify your collaborators. If you did not work with anyone, you should write "Collaborators: none." If you obtain a solution through research (e.g., on the web), acknowledge your source, but write up the solution in your own words.

No collaboration whatsoever is permitted on exams. The course has a take-home exam for the second quiz which you must do entirely on your own, even though you will be permitted several days in which to do the exam. More details about the collaboration policy for the take-home exam will be forthcoming in the lecture on Wednesday, November 28. Please note that this lecture constitutes part of the exam, and attendance is mandatory.

Plagiarism and other antiintellectual behavior cannot be tolerated in any academic environment that prides itself on individual accomplishment. If you have any questions about the collaboration

policy, or if you feel that you may have violated the policy, please talk to one of the course staff. Although the course staff is obligated to deal with cheating appropriately, we are more understanding and lenient if we find out from the transgressor himself or herself rather than from a third party.

This course has great material, so HAVE FUN!