CSCI 2300 Intro to Algorithms
Syllabus and Class Policies

I. Course Overview

This class has in-person lectures, lab sessions, and exams. Here is the additional information:

1. Class website will be hosted in Piazza (you should have received invites already) where we will post the home works, notes, and anouncements.
2. Homeworks will be submitted to https://submitty.cs.rpi.edu/ (you should be automatically registered), you can access your grades there as well.
3. RPI Webex Teams will host the video recordings of this class from a previous year here (when necessary): webexteams://im?space=1d607f10-05dc-11ec-987c-b7ece79a5410

This course presents fundamental ideas and techniques of modern algorithm design and analysis. After completing this course, students should be able to analyze and design efficient algorithms for a variety of computational problems. Students will learn a variety of algorithm design techniques, how to apply them to different problems, and how to choose which technique should be used for which problem.

Learning Outcomes:
• The goal of this course is to provide a strong foundation in algorithms and data structures in preparation for jobs in industry or for more advanced courses. Algorithms are the basic language of computer science. After taking this course, you, the student, should be able to:
• Understand the correctness of, and analyze the running times of, different algorithms.
• Use different algorithm-design techniques, including, but not limited to, greedy, divide-andconquer, and dynamic programming techniques, to solve particular problems.
• Model real problems abstractly using the language of graphs and flows.
• Solve problems by reducing to other problems whose solution is known, and show that problems are hard by reducing from other problems.
• Make intelligent decisions about alternative data structures and algorithmic techniques in the context of practical problems, choosing from existing data structures and algorithms or designing your own when necessary.
See Section V for more details.

Textbooks:
The required course textbook is Algorithms by *Dasgupta, Papadimitriou, and Vazirani*. See also the textbook errata.
Although the lectures will mostly be drawn from the textbook, we will still cover things that do not appear in the text, and the textbook includes material that we will not cover in class. You are responsible for the content of the lectures as well as any assigned readings. You may also find the following books useful for reference and for different perspectives:
• Cormen/Leiserson/Rivest/Stein: Introduction to Algorithms.
• Kleinberg/Tardos: Algorithm Design. (See also slides by Kevin Wayne.)

II. General Class Policies

We will make extensive use of Piazza as the primary website for this class, and Webex Teams (for posting the video recordings). You are responsible for checking the course website regularly for announcements and course materials, as well as your e-mail for communications related to the class.

Lectures:
Lectures will be held during class hours in-person. You are responsible for all material covered and announcements made in lecture.

Exams:
There will be
1. one midterm exam in-person tentative date: on MARCH 15 or 16 and a
2. comprehensive final exam tentative date: MAY 1-5 week.

All exams are closed textbook, notes, laptops, cellphones or any other internet capable devices (more details will follow).
We will not provide make-up exams unless the absence is excused by the Dean of Students. Any students with special circumstances must notify the instructor during the first two weeks of class.

Homeworks:
There will be 8-10 Homeworks (approximately every week). Homeworks will be submitted using SUBMITTY.

Labs:
There will be 8-10 Labs (approximately every week). See section IV for more information.

Grading:
The midterm exam will count for 30% of your final grade, the final exam for 40%, the home works for 20% and labs for 10%. We will give an approximate grade breakdown right after each exam, and grades will be posted online.

Regrades:
Any request to re-evaluate a grade must be made within one week of the return date of the homework or exam in question. You must explain why you think your grade should be changed in writing, and submit your request to an instructor or a TA, together with the original problem solution. The second grade will remain. Your entire assignment or exam will be regraded and your grade may go up or down, or it may stay the same.

Policy on Academic Integrity:
Student-teacher relationships are based on trust. For example, students must trust that teachers have made appropriate decisions about the structure and content of the courses they teach, and teachers must trust that the assignments that students turn in are their own. Acts which violate this trust undermine the educational process. The Rensselaer Handbook of Student Rights and Responsibilities defines various forms of Academic Dishonesty and you should make yourself familiar with these.
In this class, you are allowed (and encouraged) to discuss homework and lab problems with other members of the class, and to formulate ideas together. However, everyone must write up their assignments completely separately, and include the names of must write up their assignments completely separately, and include the names of everyone you discussed the assignment with. When working on lab assignments, you may discuss general approaches to the problem, but you may not look at anyone else's code or show your code to them: all the actual programming must be done entirely on your own.
Failure to write the solution to a homework or lab completely on your own will be considered a breach of academic integrity. You may not copy (or near-copy) a solution from another, or use resources other than the class notes or the class textbook. Use of materials other than the class textbooks, including any material found on the Internet or material from previous versions of this course, is a clear breach of academic integrity and will be punished severely. No collaboration, or any electronic devices, is allowed during exams. Violating the above policy will result in the final grade being reduced by a letter and a 0-grade for the assignment for both parties. Depending on the circumstances, harsher penalties may be used, including a failing grade for the class.

III. Homework Guide Homework Submission

Homeworks will be submitted using SUBMITTY on or before the deadline. You will not be allowed to turn in late homework for any reason without a written note from the office of the Dean of Students.

Writing Proofs and Algorithms:

The best way to explain an algorithm is usually in English, with some mathematical notation. Some pseudo-code together with a short English explanation is also fine. Solutions that simply give a long piece of pseudo-code without an explanation, however, tend to contain mistakes, and can be very hard to understand. We reserve the right to deduct points for such solutions, even if they turn out to be correct.

You should write up both your algorithms and your proofs clearly and neatly, as this will make your solution easier to understand, and will earn you more partial credit. We will take off points if your writing is illegible, or if we do not understand what you are trying to say. Because of this, it is in your best interest to type your work (we suggest using LaTeX), and to explain everything clearly and concisely.

You are allowed to use any algorithm that is described in class or in the textbook in your solutions, without having to re-formulate it from scratch (in other words, you can just cite the textbook in your solution). The same holds for any results proven in class or in the textbook.

Working Together:

You are allowed (and encouraged) to discuss homework problems with other members of the class, and to formulate ideas together. There is no penalty for working in groups. However, everyone must write up their assignments separately, and include the list of "collaborators" that you discussed the assignment with. Make sure that you spend a lot of time thinking about the problems yourself and writing up the solutions; students who only follow their collaborators' lead will find the exams much more difficult.

You may not copy (or near-copy) a solution from another student or any other (e.g., online) forum. Failure to write the solution to a homework completely on your own will be considered a breach of academic integrity, and may result in the final grade being reduced by a letter and a 0-grade for the homework for both parties. No collaboration is allowed during exams.

Grading:

Any request to re-evaluate a grade must be made within one week of the return date of the homework or exam in question. You must explain why you think your grade should be changed in writing, and submit your request to the TA. The second grade will remain. Furthermore, we will not accept regrade requests that dispute the amount of partial credit awarded; we are only interested in instances where an actual mistake has been made. Do not be surprised if your regrade takes a long time, as we will only process them periodically.

IV. Lab Guide

The purpose of labs is to help you with the course material in a smaller setting. You will be required to complete a programming assignment for each lab. This assignment will be handed out in advance, and ideally, you will finish the assignment in advance of the lab. However, you can get help from the TAs during lab if you are unable to finish in advance. See the class hour schedule for the time and place of your lab section. Labs will be held weekly and attendance to scheduled labs is required. Those who show up late for lab or those who leave without completing the lab risk not receiving full credit. Labs cannot be made up: the only way to receive credit for a missed lab is to obtain a written note from the office of the Dean of Students excusing your absence. The exams may contain material covered in labs. Due to the size of the sections, you must attend your assigned lab section. The TA will take attendance and you will not receive credit unless you attend your assigned section.

The labs must use python for programming. You are expected to be a competent programmer coming in. The TAs and undergraduate mentors can provide some help on programming issues in lab, but you should be able to answer your own programming and debugging questions.

Lab Grading:
To obtain credit for a completed lab assignment, you must show your code and results to a TA/Mentor during your assigned lab section. Please do not submit your code: we will ignore it. The only way to get credit for a lab is to show your results and code to a TA in person during your assigned lab section. Please make sure that the TA checks you off: do not leave the lab section before the TA records your name and grade. If your results are shown to the lab TA before the end of the section, then the grading will be as follows:

- 3 - The results and code are essentially correct.
- 2 - The results and code have some problems, but the main ideas are mostly correct.
- 1 - Given at discretion of the TA.
- 0 - Did not attend lab, or results and code are completely wrong or incomplete.

V. Tentative Topics to be Covered