

CSE 331, Introduction to Algorithm Analysis and Design

SUMMER 2015

Lecture: Tuesday, Thursday 2:00 - 4:00pm, Norton 218

Recitation: Tuesday, Thursday 4:10 - 5:15pm, Norton 218

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- Thanks to Atri Rudra/Carl Alphonse for allowing the use of some language from his syllabus in this document.
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Instructor Information

Jesse Hartloff (<http://www.acsu.buffalo.edu/~hartloff/>)

- *Email:* hartloff "at" buffalo "dot" edu
- *Office:* 203 Davis
- *Office Hours:* TBD

Office hours will be determined based on everyone's availability. To meet outside of office hours, send me an email and we set up a time to meet.

Class Webpage

<http://www.acsu.buffalo.edu/~hartloff/331>

Course Description

(From the course catalog)

Introduces methods for algorithm design, paradigms such as divide and conquer, greedy, and dynamic programming, and techniques for algorithm analysis, such as asymptotic notations and estimates, as well as time/space tradeoffs. Topics include sorting, searching, scheduling, string matching, graph algorithms, computational geometry, and more.

Pre-requisites

Data Structures (CSE 250), Discrete Math (CSE 191) and College Calculus II (MTH 142). You need a grade of C- or above in these courses. If you do not satisfy the requirement, please come and see me.

References

We will be using the following textbook:

Jon Kleinberg and Éva Tardos, “Algorithm Design.” Addison Wesley, 2005.

Occasionally, we might study topics that are not covered in the textbook. In such cases, supplementary material will be provided.

The following textbook could be a useful reference:

Thomas S. Cormen, Charles E. Leiserson, Ronald Rivest, and Clifford Stein, “Introduction to Algorithms (2nd Ed).” MIT Press, 2001.

Schedule

We will have roughly 11 weeks worth of classes. Here is a tentative list of topics that we will cover (KT refers to the textbook):

- Introduction [KT, Chap 1] (1 week).
- Asymptotic Analysis [KT, Chap 2] (1 week).
- Graph Basics [KT, Chap 3] (2 weeks).
- Greedy Algorithms [KT, Chap 4] (2.5 weeks).
- Divide and Conquer Algorithms [KT, Chap 5] (2 weeks).
- Dynamic Programming [KT, Chap 6] (2 weeks).
- NP-completeness and other advanced topics [KT, Chap 8] (1 lecture).

A more detailed schedule will appear on the class webpage.

Grading Policy

Here is the distribution of grades:

- Homeworks (40%)
- Programming Assignments (40%)
- Exams (20%)

The grade cutoffs will be as follows. For extreme cases I reserve the right to lower these cutoffs, but I will not make the cutoffs more strict than this.

A	90%
A-	87%
B+	84%
B	80%
B-	77%
C+	74%
C	70%
C-	65%
D	60%
F	<60%

Homeworks and Programming Assignments

Homeworks will be assigned at least one week before they're due. There will be 4 homeworks and 4 programming assignments throughout the semester each worth 10% of your total grade. In addition, there will be a Homework 0 which will be graded but will not count towards your final grade. Homework 0 is meant to give you feedback on your proofs so that you can avoid mistakes in the homeworks that will count towards your grade. *Submitting Homework 0 is optional.*

No late submission will be accepted. Late submissions will result in a grade of 0 on that assignment.

Exams

There will be a mid-term and final exam in this course. Each is worth 10% of your final grade.

No makeup exams will be given except in *provably extreme circumstances*. Please note the following additional policies/suggestions with respect to makeup exams:

- Notify your instructor 24 hours prior to the exam via e-mail if you are going to miss an exam. If it is medically *impossible* for you to give prior notice, please obtain a note from a physician detailing the period (and the reason) you were medically incapable of communicating with the instructor.
- If you miss an examination because of sickness or similar reasons, *visit a physician and obtain a note detailing the period and the reason you were medically incapable of taking the exam.*
- The exam dates are stated below. Please plan your travel and other activities accordingly.
- Exam times are stressful and one could forget about the exam time. Please make sure you arrange for multiple reminders so that you do not forget about the exam(s).

Mid-term exam

There will be an in-class exam on July 9 at the usual meeting time and place. This will be a two hour exam.

Final exam

The final exam will be held on August 13 during class. This will be a three hour exam (i.e. it will be held during lecture and recitation).

Miscellaneous Notes

Here are some other policies/suggestions to keep in mind:

1. Your grade will solely depend on your performance in this semester: you will not get any opportunity to do extra work to improve your grade. It is your duty to make sure you understand what is expected of you. This course will require a fair bit of work so if you are busy this semester, please plan accordingly.
2. If there is a genuine reason for re-grading, please contact me within *a week* of when the graded material is handed back.
3. See this blog post by Atri Rudra from Fall 2009 on some tips on how to do well in this course (hint: work hard!)

<http://cse331.wordpress.com/2009/10/24/how-to-do-better-in-this-class/>

Disabilities

If you have a diagnosed disability (physical, learning, or psychological) that will make it difficult for you to carry out the course work as outlined, or that requires accommodations such as recruiting note-takers, readers, or extended time on exams or assignments, you must consult with the Office of Disability Services (25 Capen Hall, Tel: 645-2608, TTY: 645-2616, Fax: 645-3116, <http://www.student-affairs.buffalo.edu/ods/>).

You must advise your instructor during the first two weeks of the course so that we may review possible arrangements for reasonable accommodations.

Counseling Center

Your attention is called to the Counseling Center (645-2720), 120 Richmond Quad. The Counseling Center staff are trained to help you deal with a wide range of issues, including how to study effectively and how to deal with exam-related stress. Services are free and confidential. Their web site is

<http://www.student-affairs.buffalo.edu/shs/ccenter/>

Academic Integrity

tldr; If you cheat, I will make life hard for you.

Source: http://www.cse.buffalo.edu/undergrad/policy_academic.php

The academic degrees and the research findings produced by our Department are worth no more than the integrity of the process by which they are gained. If we do not maintain reliably high standards of ethics and integrity in our work and our relationships, we have nothing of value to offer one another or to offer the larger community outside this Department, whether potential employers or fellow scholars.

For this reason, the principles of Academic Integrity have priority over every other consideration in every aspect of our departmental life, and we will defend these principles vigorously. It is essential that every student be fully aware of these principles, what the procedures are by which possible violations are investigated and adjudicated, and what the punishments for these violations are. Wherever they are suspected, potential violations will be investigated and determinations of fact sought. In short, breaches of Academic Integrity will not be tolerated.

Departmental Statement on Academic Integrity in Homework Assignments

The following statement further describes the specific application of these general principles to a common context in the CSE Department environment, the production of homework assignments. It should be thoroughly understood before undertaking any cooperative activities or using any other sources in such contexts.

All academic work must be your own. Plagiarism, defined as copying or receiving materials from a source or sources and submitting this material as one's own without acknowledging the particular debts to the source (quotations, paraphrases, basic ideas), or otherwise representing the work of another as one's own, is never allowed. Collaboration, usually evidenced by unjustifiable similarity, is never permitted in individual assignments. Any submitted academic work may be subject to screening by software programs designed to detect evidence of plagiarism or collaboration.

It is your responsibility to maintain the security of your computer accounts and your written work. Do not share passwords with anyone, nor write your password down where it may be seen by others. Do not change permissions to allow others to read your course directories and files. Do not walk away from a workstation without logging out. These are your responsibilities. In groups that collaborate inappropriately, it may be impossible to determine who has offered work to others in the group, who has received work, and who may have inadvertently made their work available to the others by failure to maintain adequate personal security. In such cases, all will be held equally liable.

These policies and interpretations may be augmented by individual instructors for their courses. Always check the handouts and web pages of your course and section for additional guidelines.

Departmental Policy on Violations of Academic Integrity

Any student accused of a violation of academic integrity will be so notified by the course director. An informal review will be conducted, including a meeting between these parties. After this review and upon determination that a violation has occurred, the following sanctions will be imposed. **It is the policy of this department that, in general, any violation of academic integrity will result in an F for the course, that all departmental financial support including teaching assistantship, research assistantship or scholarships be terminated, that notification of this action be placed in the student's confidential departmental record, and that the student be permanently ineligible for future departmental financial support.** A second violation of academic integrity will cause the department to seek permanent dismissal from the major and bar from enrollment in any departmental courses. Especially flagrant violations will be considered under formal review proceedings, which may in addition to the above sanctions result in expulsion from the University.