

CS Bootcamp: Theory Autumn 2015

Course Description

This course is designed to prepare incoming graduate students for the theory components for their upcoming coursework. It covers the material from the undergraduate courses COMP2300 Discrete Structures in Computer Science and COMP 2370 Introduction to Algorithms & Data Structures at an accelerated pace with additional topics added.

While there are no explicit prerequisites, students are expected to have some familiarity with basic discrete math and programming concepts.

Course Objectives

By the completion of the course, students should learn the following skills:

- Write basic proofs
- Identify complete logical arguments when presented as proofs
- Perform basic algorithmic analysis
- Use simple enumerative methods
- Apply enumerative methods to elementary probability theory including conditional probability
- Identify and implement several sorting algorithms
- Identify and implement several basic data structures including linked lists, hash tables, stacks, and trees

Ultimately successful students should be prepared for the theory coursework they will take as graduate students.

Textbook & Materials

There are two suggested textbooks:

- Discrete Mathematics and Its Applications Seventh Edition by Kenneth Rosen ISBN:0073383090
- Introduction to Algorithms Third Edition by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein ISBN: 9780262033848

References to sections and pages within these editions of the books will be throughout the course material. If you choose to obtain a different edition, it is your responsibility to determine the appropriate sections and pages. All assigned homework problems will include full problem statements, so it is not necessary to obtain these exact editions to complete the homework.

I do recommend that you get the third edition of Introduction to Algorithms. It is a common reference book and potentially may be used in some of your later courses (Advanced

Data Structures & Algorithms, and Theory of Algorithms, depending on the instructor). The edition of Rosen is less important. Its main purpose is to provide a different perspective on the material than will be provided through the lectures and posted online material. It is unlikely that Rosen will be used as a textbook for your future courses.

You will also need to have a reliable computer with internet access.

Instructor Information

Instructor: Will Mitchell
Email: mitchell@cs.du.edu
Office: Aspen Hall North Suite 203
Office Hours: Mondays and Wednesdays 1-3pm

Course Webpage

Material for the course and homeworks will all be posted on the course website at

<http://cs.du.edu/~mitchell/bootcamp/>

You will need to regularly check this site for updates.

Instructor Availability

If you have questions outside of class and office hours please email me.

For personal questions regarding grades, absences, etc., please email me directly or see me during office hours. I will generally reply to questions within 24 hours during the week, and by Monday for questions emailed on the weekend.

Notifications and Email Communication

Your official DU email address (e.g. `firstname.lastname@du.edu`) will be used for course communications. Ensure that you either check this email regularly or forward it to an account that you do check regularly.

Exams

Exams must be entirely your own work. They will be given at the following times:

Final: November 18, 2015

If you are unable to take an exam at the scheduled time, you must notify the instructor as soon as possible. Rescheduling of exams and assignments will be possible only in exceptional circumstances. You should plan any travel for after the final exam.

Homework

Homework assignments are to be completed individually, although you can talk with other students to help understand the material. If you do so, you will need to acknowledge that collaboration in your assignment. For homework programming assignments, you may not copy code from other students or from other outside sources. Any other work drawn from

outside sources, whether quoted directly or paraphrased, must contain citations to the original work. These citations or acknowledgements will not negatively impact your grade, nor that of the person that helped you, but failing to do so may violate student conduct policies.

The due date and time will be noted in the assignment description. Late submissions no later than 48 hours after the deadline will be accepted with a 20% penalty. Exceptions may be made to this policy on a case-by-case basis. Please notify the instructor as soon as possible, preferably in advance, if you believe you have a valid reason for an exception to this policy.

All homework must be submitted by the CS Departments Gitlab server. Except for source code, all work must be submitted typed and as PDFs. The use of L^AT_EX is strongly recommended, but Microsoft Word or LibreOffice Writer will suffice. It is your responsibility that exported PDFs are rendered correctly.

Assignments which are turned in on time will be graded as soon as possible. Late assignments will have a lower priority in grading than ontime assignments, and may take somewhat longer to grade.

More details about the requirements of assignments can be found on the course webpage.

Grade Evaluation

Assignments and exams are graded without a curve. Final grades will be determined on a relative curve. The course grade will be made up of the following components:

Homeworks	70%
Final Exam	30%

General Policies

I reserve the right to update this syllabus as class needs arise. Be assured that I will communicate to you any changes to the schedule, syllabus or policies quickly and efficiently by using email to your official DU address.

Honor Code

All students are expected to abide by the University of Denver Honor Code. These expectations include the application of academic integrity and honesty in your class participation and assignments. Violations of these policies include, but are not limited to:

Plagiarism, including any representation of another's work or ideas as one's own in academic and educational submissions. Cheating, including any actual or attempted use of resources not authorized by the instructor(s) for academic submissions. Fabrication, including any falsification or creation of data, research or resources to support academic submissions. Violations of the Honor Code may have serious consequences including, but not limited to, a zero for an assignment or exam, a failing grade in the course, and reporting of violations to the Office of Student Conduct.

Students with Disabilities

If you have a disability/medical issue protected under the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act and need to request accommodations,

please visit the Disability Services Program website. You may also call (303) 871-2372, or visit them in person on the 4th floor of Ruffatto Hall; 1999 E. Evans Ave., Denver, CO.

Disability Services determines accommodations based on documented disabilities/medical issues. Please submit a Faculty Letter to the instructor from Disability Services in a timely manner so that your needs may be addressed.

Religious Accommodations

Accommodations will be provided to students for religious obligations and observances according to University policy. You are expected to notify the instructor by the end of the first week of class of any absences or other conflicts with the course schedule. For further details, please see the the University of Denver Religious Accommodation Policy.

FERPA and Privacy

The University of Denver is committed to the safeguarding and accurate maintenance of student records. The Family Educational Rights and Privacy Act (FERPA) of 1974 provides students with a number of rights regarding their educational records. For more information about this act and student privacy, see the Notification to Students of Educational Records and Student Information Rights and Policies or contact the Office of the Registrar at 303.871.4300 or registrar@du.edu.