

CMSC 250–Discrete Structures, Syllabus

Fall 2012

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1 Overall course description

We will focus on the fundamental mathematical structures and logical principles that are relevant to computer science. In this course, students will be encouraged to develop an understanding of how modern mathematics provides as a sound foundation upon which to build a deeper understanding of the elements of computing. In addition to textbook problem-sets, students may possibly engage many mathematical and logical principles through short, focused programming activities.¹

1.1 Texts, and other instructional materials

Resource	Details...
<i>Text book(s)</i>	Discrete Mathematics with Applications Epp [2011]
<i>Class webpage</i>	www.cs.umd.edu/class/fall2012/cmsc250/
<i>Piazza</i>	piazza.com/class#fall2012/cmsc250

Table 1: Textbook(s) and website locations.

The fourth edition was used in planning this course, but students may use any edition of the text. Students should check the class webpage regularly for updates, and the Piazza site for help with homework and class content.

1.2 Overview of course topics

Computer Science is, in many ways, a product of engineering and modern mathematics—stemming from the early twentieth century. And thus, students’ developing a robust sense of modern mathematical thinking in the context of computing is a primary goal in designing this course. This course provides students with an introduction to essential elements of mathematics for computing: sets, relations and functions, formal logic, axiomatic method and theorem proving, induction and recursion, and an introduction to graphs. Topics discussed in this course include but are not limited to

1. Chapter 1: Introducing the elements of modern mathematics. We introduce students to the language of modern mathematics: sets, constructions and relations, universal and conditional statements, and reasoning about functions through the use of diagrams.
2. Chapters 2 & 3: Propositional and predicate logic.

¹Note: Students are permitted to use any computer language for these activities. Non-programmers may choose instead to provide textual representations of the algorithm.

3. Chapter 4: Elements of numbers theory that are relevant to computer science, such as divisibility, prime factorizations, and common proof techniques, including direct and indirect proof, as well as proof by induction.
4. Chapter 5: Summations, recurrences, and mathematical induction.
5. Chapter 6: Set theory. Although the text formally introduces sets in this chapter, we will focus on sets and their constructions (informally) from the outset.
6. Chapter 7: Functions and their properties: Armed with an understanding of sets, formal properties of functions are introduced, such as cancellation properties, partitions, and algebraic relations.
7. Chapter 8: Formal treatment of binary relations, including orderings and equivalences.
8. Chapter 9: Combinatoric counting principles, including sum and product rules, pigeonhole principle, and some treatment of probability.
9. (Time permitting) Chapter 10: Graph theory (generalized relations).

2 Instructor & TA Information

Sections 0101, 0102	Sections 0201, 0202, and 0101 Honors
Tom Reinhardt 3239 A.V. Williams, 405-2773 tomr55@cs.umd.edu Office Hours: Mondays 11:00am-1:00pm	Clyde Kruskal 3215 A.V. Williams, 405-2685 kruskal@cs.umd.edu Office Hours: Fridays 2-5pm

Table 2: Contact information for Course Instructors.

Name	Email Address	Office Hours	Location
Issac Julien	ijulien6@gmail.com	Mondays 10:00am - 1:00pm	1112-AVW
Reza Khani	khani@cs.umd.edu	Tuesdays 3:00-6:00pm	1112-AVW
Ang Li	angli@cs.umd.edu	Fridays 9:00am-Noon	1112-AVW
Hui Miao	hui@cs.umd.edu	Wednesdays 9:00am - Noon	1112-AVW
Yoav Segev	segev@cs.umd.edu	Tuesdays, Thursdays 3:30pm-5:00pm	1112-AVW

Table 3: TAs, addresses, office hours, and location.

Section	TA	Date/Time	Room
0101	Hui	MW 8-8:50am	CSI 3118
0102	Yoav	MW 11-11:50am	CSI 3118
0201	Hui	MW 9-9:50am	CSI 3118
0202	Yoav	MW 10-10:50am	CSI 3118
0301	Reza	MW 12-12:50am	CSI 3118
0302	Reza	MW 1-1:50pm	CSI 3118
0303	Issac	MW 9-9:50am	CSI 2118

Table 4: Discussion group breakout

3 Grading

3.1 Weighting

Homework:	Assigned weekly	1% each.
Quizzes:	weekly in discussion sections	1% each.
Midterms:	two midterms	$\approx 44\%$ (22% each)
Final:	will be comprehensive	$\approx 30\%$

Note that, we will in effect drop the lowest quiz and lowest homework score during the computation of final grades for the semester.

3.2 Exams

Note: *two evening* mid-terms exams are given for this course.

Midterm #1:	Monday 15 October 2012	By Discussion group, TBA
Midterm #2:	Monday 5 November 2012	By Discussion group, TBA
Final exam:	Saturday 15 December 2012, 4:00 - 6:00PM	TBA

3.3 Exceptional conditions, conflicts, etc.

The final exam will be rescheduled only for students having another final exam at *exactly* the same time, or for students who have more than three final exams scheduled on the same day. If this is the case, let your Instructor know by Wednesday 5 September 2012.

4 Quizzes, Homework, Excused Absences, Disability policy, Academic Integrity, Laptop Policy

Quizzes are given every Monday in Recitation. Unless you have an excused absence (described in greater detail in the next section), to receive credit you must take a quiz during

your own Discussion section time.

Homework will be *posted* by Tuesday nights and *collected* the following Wednesday indicated on the Homework assignment. Homework must be handed in during the first 10 minutes of the Discussion. If you are late to Discussion without an excused absence (again, see the next section) you will receive a zero on that particular Homework assignment.

Homework assignments are only accepted in person, in-class. Homework assignments must be written legibly, single-sided on your own paper with the answers clearly labeled, and in sequential order as assigned. You must put your name, your University ID numbers, the name of your TA, and the time of your lecture and Discussion section in the upper right-hand corner of your Homework. Staple all pages together, and be sure that your name appears on each sheet of paper.

You may discuss Homework with other students; however, you must write up any solutions yourself.

4.1 Contesting Exam Grades

Students who feel that an item has been incorrectly graded must present a *written statement* that clearly states their case. This statement must be presented to the Instructor within one week of the assignment. Note, requests for reassessment may positively or *negatively* impact a student's grade: if it is determined that the student's proposed solution would have resulted in *fewer points being awarded* for the item in question, then the Instructor may reduce the student's score. This means, in extreme cases, a student might receive a *negative grade*.

4.2 Use of electronic devices in lecture

We strongly suggest that students refrain from using electronic devices during lecture owing to the nature of this content. Students may elect to use portable electronic devices, such as laptops, to take class notes. Instructors reserve the right to ask these students to show their notes to the Instructor. Naturally, students with appropriate accommodations may use whatever recording media and methods per their accommodations.

4.3 Use of Slides, worksheets, and other instructional materials

While considerable effort has gone into the design and creation of slides for this course, students should *substitute these slides for attending all class and discussion sections*.

4.4 Students with disabilities

Students who have been certified by Disability Support Services as needing any type of accommodations should see their Instructors as soon as possible, during the Schedule adjustment period.

All arrangements for exam accommodations as a result of a disability <i>must</i> be made and arranged with the Student's Instructor <i>at least three</i> (3) business days prior to the Exam date, or accommodations cannot <i>cannot</i> be made.

5 Excused Absences

Reasons for missing coursework, such as illness, religious observances, participation in required University activities, or family and/or personal emergencies (such as a serious automobile accident or a close relative's funeral) will be considered to justify an excused absence.

Students requesting excused absences for any reason must apply in writing <i>as soon as possible</i> and must furnish documentary support that the absence qualifies as excused.
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5.1 Illness

Absences due to medical reasons must be supported with documentation from the health-care professional who treated you. Note: this documentation should clarify that you were *incapacitated* or in some way incapable of undertaking normal work and must contain a telephone number and the dates of your visit. In other words: self-documentation of illness is *not* sufficient evidence for purposes of classwork.

5.2 General provisions

In the general case, excused absences are granted pending documentation, as outlined above. Excused absences will not be provided *after the fact*. In particular, an excused absence will not be granted *after performing coursework*. For example: you cannot take an exam and then claim to have been ill.

Students who might miss exams for any reason other than those mentioned above must contact the Instructor *in advance* to discuss particular circumstances. Bear in mind that an Instructor is *not obliged* to offer a substitute assignment or give a student a makeup assessment unless the failure to perform was due to an excused absence. Students' responsibilities for make-up work is as follows:

Exams A make-up exam will be given ASAP.

Homework Students with excused absences will be given a *short* extension (such as an extra day in typical cases); contact your Instructor as soon as possible in such cases to discuss appropriate arrangements.

Quizzes After documenting the excused absence with their Instructor, the teaching TA will be informed, and the student will arrange with their teaching TA to take the make-up quiz as soon as possible.

5.3 Religious observances

It is the University's policy to provide accommodations for students with religious observances that conflict with coursework. It is, however, the *student's responsibility* to provide Instructors written notification *in advance* of anticipated absences. In the case of conflicts with one of the tentative mid-term exams, which are scheduled for 15 October and 5 November, notice must be provided by Monday 1 October 2012.

6 Academic Integrity

As a general principle: you are permitted to discuss what the homework problems are asking with your classmates, but your solutions must strictly be your own work (although these may incorporate content from Instructional staff).

Any evidence of cooperation on homework assignments, quizzes or exams, or use of unauthorized materials while taking a quiz or an exam, or other possible violations of the Honor Code will be submitted to the Student Honor Council, which could result in an XF for the course, suspension, or expulsion.

If you have any questions whether a particular situation would violate any of the provisions of the Academic Integrity Code, talk with your Instructor in advance. Should you have difficulty with the coursework you should *see the Teaching Assistants during Office Hours*. Do not solicit help from anyone else in violation of Academic Integrity rules. Remember:

It is the responsibility, under the Honor Policy, of anyone who suspects that an incident of academic dishonesty has occurred to report it to their Instructor, or directly to the Honor Council.

Every semester our Department has discovered a number of students attempting to cheat on their coursework, in violation of the academic integrity requirements. Students' academic careers have been significantly impacted by poor decisions. Consider this carefully before undertaking any actions that might jeopardize your career. Students are encouraged to discuss homework, classwork, as well as questions on exams and quizzes *after* they are submitted!

7 Right to change information

Although every effort has been made to be complete, compete and accurate, unforeseen circumstances arise during the semester that could require the adjustment of any of the items contained within this document. Consequently, Instructors reserve the right to change this syllabus or other course materials.

8 Copyright

All course materials are copyright of the Instructors ©2012. All rights reserved. Students are permitted to use course materials for their own personal use only. Course materials may not be distributed publicly or provided to others (excepting other Students in the course), in any manner or format.

References

Susanna S. Epp. *Discrete Mathematics with Applications*. Brooks/Cole, a Division of Cengage Learning, Inc., 20 Channel Center Street, Boston, MA, 2011.