Syllabus for MATH 2310, Discrete Mathematics

Northeastern University, Spring 2015

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Office hours: Mondays and Wednesdays 3.30 pm – 5.30 pm, or by appointment.

Meeting times and location: MWR, 10.30 am – 11.35 am at Snell Library 111.

Textbook: *Discrete Mathematics and Its Applications by Kenneth H. Rosen (seventh edition).*

Web Materials: All class announcements, material, and grades will be posted on Blackboard.

Homework and Quizzes: Homework will NOT be collected. There will be six 60-min in-class quizzes during the semester. Quizzes will be given on January 22, February 5, February 19, March 5, March 26, and April 9. It is strongly advised that you do all of assigned homework since the quizzes will closely resemble the homework problems. There will be NO make-up quizzes.

Final exam:

Final exam will be on April 28, 2015 from 1 pm to 3 pm. Location of the final exam is to be determined. **Check for exam schedule conflicts as soon as possible**. Only two finals at the same time or three in one day is a University recognized legitimate reason to be excused from taking the final at the scheduled time. Students with such a conflict should complete a final exam conflict form, available on the registrar's website.

Snow days: If classes are cancelled due to snow, or for other official reasons, any scheduled quiz or test will occur on the next class meeting.

Grading: The course grade will be determined as follows:
Final exam: 40%
Quizzes: 60% (10% each)

Letter grades are determined numerically:

$A \geq 93$, $92 \geq A- \geq 90$, $89 \geq B+ \geq 87$, $86 \geq B \geq 83$, $82 \geq B- \geq 80$,
$79 \geq C+ \geq 77$, $76 \geq C \geq 73$, $72 \geq C- \geq 70$, $69 \geq D+ \geq 67$, $66 \geq D \geq 63$,
$62 \geq D- \geq 60$, $F \leq 59$

The grade I (Incomplete) will be given only if you have a good attendance record, have missed the final exam for a good reason, and otherwise are doing passing work. An incomplete is given at the discretion of the instructor.

Additional Resources:

The Mathematics Department Tutoring Center is in Room 540B, Nightingale Hall. This peer tutoring is free. Peer Tutoring appointments can be booked via MyNEU under TUTORING. Although you can walk in, it is really best to sign up in advance. Tutoring requests are scheduled by students in real-time and confirmed by email. Next-day appointments must be booked by 9:00 pm the previous day. See http://www.northeastern.edu/csastutoring/setting-up-appointments/ For more information about peer tutoring.

Issues with the course/instructor: If you have issues with this course and/or instructor which you are not comfortable discussing with your instructor, you should contact the Teaching Director, Prof. Massey, at d.massey@neu.edu.

Academic Honesty: Collaboration on quizzes, tests and final exam is not allowed. From Student Code of Conduct (see http://www.northeastern.edu/osccr/academicintegrity): "A necessary prerequisite to the attainment of the goals of the University is maintaining complete honesty in all academic work. Students are expected to present as their own only that which is clearly their own work in tests and in any material submitted for credit. Students may not assist others in presenting work that is not their own. ... Offenders are subject to disciplinary action." For more on Academic Integrity see: http://www.northeastern.edu/registrar/courses/cat1213-univ-proc.pdf

Note the Following Dates:

January 26, *is the last day to elect pass/fail for Spring-15 class*
February 2, *is the last day to drop a Spring-15 class without a W grade*
February 4, *is the last day to file a Final Exam Conflict Form for Spring-15 classes*
April 7, *is the last day to drop a Spring-15 class with a W grade*

Important:

1) Any student with a disability is encouraged to meet with the instructor during the first week of classes to discuss accommodations. The student must bring a current Memorandum of Accommodations from the Disability Resource Center (DRC).

2) If you are an athlete and have conflicts with an important class activity (quiz, mid-term, or final), you should let your instructor know before the end of second week of classes. You should also bring an official letter from the Office of Athletics.

3) All electronic devices (mobile phones, laptops etc.) should be turned off during class time, quizzes, tests and final exam.

Syllabus: Syllabus is subject to change**.** It is your responsibility to be aware of any changes the instructor may make to the syllabus as they are announced in class. Students are responsible for all information given when they are absent.

TRACE: Please complete the TRACE evaluations at the end of the course.

Schedule of Topics and Suggested Homework Exercises

Week 1: January 12 – 16

1.1 Propositional logic #1, 3, 4, 9, 11, 13, 15, 17, 23, 25, 27, 31, 35, 36, 37, 39

1.3 Propositional equivalences #1, 3, 4, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33

Monday, January 19, Martin Luther King Jr.'s Birthday, no classes

Week 2 (partial): January 20 – 23

2.1 Sets #1, 3, 5, 6, 7, 8, 9, 11, 13, 15, 17, 19, 21, 25, 27, 31, 32, 33, 35, 37, 39

Quiz 1 (based on 1.1 and 1.3)

Week 3: January 26 – 30

2.2 Set operations #1, 3, 5, 7, 9, 11, 13, 15 (a), 17 (a), 18, 19, 22, 23, 25, 27, 29, 31, 47, 51

2.3 Functions #1, 9, 15, 23, 30, 31, 32, 33, 36, 37, 38, 40, 44, 45, 69, 70, 72

Week 4: February 2 – 6

2.3 Functions (contd.) #1, 9, 15, 23, 30, 31, 32, 33, 36, 37, 38, 40, 44, 45, 69, 70, 72

2.4 Sequences and summations #1, 3, 9, 11, 12, 15, 17, 19, 25, 29, 30, 31, 33, 35, 37, 39, 40, 43

Quiz 2 (based on 2.1, 2.2, and 2.3)

Week 5: February 9 – 13

2.5 Cardinalities of sets #1, 11, 15, 17, 19, 20, 21, 23

5.1 Mathematical induction #5, 7, 11, 13, 15, 21, 31, 33, 37, 39

Monday, February 16, President's Day, no classes

Week 6 (partial): February 17 – 20

5.3 Recursive definitions and structural induction #1, 3, 5, 7, 13, 15, 18, 26 (a), 27 (a)

Quiz 3 (based on 2.4, 2.5, and 5.1)

Week 7: February 23 – 27

6.1 The basics of counting #1, 3, 5, 7, 8, 9, 21, 23, 29, 34, 35, 36, 40, 52, 53

6.3 Permutations and combinations #1, 3, 5, 6, 7, 8, 10, 13, 15, 17, 19, 21, 27, 30, 33

Week 8: March 2 – 6

6.4 Binomial coefficients and identities #1, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 25

8.1 Applications of recurrence relations #3, 4, 7, 9,13

Quiz 4 (based on 5.3, 6.1, 6.3, and 6.4)

March 9 – 13, Spring break

Week 9: March 16 - 20

8.2 Solving linear recurrence relations #1, 3, 12, 13, 14, 15, 18, 19, 23, 29, 33, 35

8.5 Inclusion-exclusion #1, 7, 10, 11

Week 10: March 23 - 27

8.5 Inclusion-exclusion (contd.) #1, 7, 10, 11

8.6 Applications of inclusion-exclusion #8, 9, 13

Quiz 5 (based on 8.1, 8.2, 8.5, and 8.6)

Week 11: March 30 – April 3

10.1 Graphs and graph models #8, 9, 13

10.2 Graph terminology and special types of graphs #1 - 5, 7 - 9, 20 (a) (b) (c) (d), 21 - 25, 26 (a) (b), 56 - 58

Week 12: April 6 – 10

10.3 Representing graphs and graph isomorphism #1 - 8, 10 - 15, 17, 20, 21, 23, 26, 27, 35, 37, 39, 41, 57, 61, 63

10.4 Connectivity #1, 3-5, 11, 19, 21

Quiz 6 (based on 10.1, 10.2, and 10.3)

Week 13: April 13 – 17

11.1 Introduction to trees #1, 3, 9, 15, 17

11.4 Spanning trees #2-6, 7, 8-10, 11

Monday, April 20, Patriot's Day, no classes

Week 14 (partial): April 21 – 22

Review

Thursday, April 23, reading day

April 24, and April 27 – May 1 final exams