CSCI-4260/MATH-4150: Graph Theory
www.cs.rpi.edu/~slotag/classes/SP18/index.html

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Office Hours: Monday/Thursday 2-4pm in 317 Lally

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Class Hours: 4-5:50pm Monday/Thursday in 203 Ricketts

1 Course Description

This course discusses fundamental concepts of Graph Theory and its applications in computer, social, and natural sciences. The topics include: graphs as models; representation of graphs; trees; universal trees; distances; matchings; connectivity; flows in networks; colorings; cycles; planarity; and other computational problems and algorithms. Concepts and methods will be presented through proofs, exercises, and applications.

1.1 Prerequisites

Students should have taken a course in discrete mathematics, such as CSCI-2200 Foundations of Compute Science or MATH-4090 Foundation of Analysis. Additionally, although not formally required, students should have some programming experience to best understand the coding-based application demonstrations and algorithmic discussion. Students will not be required to write their own code, although knowledge and understanding of algorithms and basic data structures is necessary.

1.2 Course Resources

The course textbook is *Introduction to Graph Theory - 2nd Edition* by Douglas B. West. The textbook can be found at the student bookstore or online through Amazon/Ebay/etc. Course notes and code and additional resources will be available through the course website.

2 Course Schedule

Classes will meet every Monday and Thursday at 16:00 in 203 Ricketts during the Spring 2017 semester with the following exceptions:

January 15: No class - MLK Day
February 19: Class scheduled for February 20 due to Presidents' Day
March 12 and 15: No class - Spring Break
May 3: No class - final exam study day

The following is a **tentative** schedule for exams (**may change**):

Exam 1 - February 16
Exam 2 - March 8
Exam 3 - April 12
Final - TBD

For an up-to-date schedule with class notes and content, check the website.

3 Coursework and Grading Policies

Quiz policy: Quizzes will comprise 10% of the course grade. There will be approximately 10 in-class quizzes throughout the semester, on a weekly basis. Quizzes will be open book and open neighbor – consider them as in-class practice of the material versus an actual "quiz". Although attendance is not mandated, a missed quiz will result in a zero with no chance for a makeup outside of a verifiable excuse (i.e., one supported by the school/department). The lowest two quiz scores will be dropped to account for any potential non-excuses absences. Quiz solutions will be posted online and worked through through in class, time-permitting.

Exam policy: There will be an 2-3 in-class midterm exams worth in total 50% of the course grade and a final worth 40% of the course grade. **Exams will be closed book**. There will be no makeups for exams unless there is either a verifiable medical excuse or a prior arrangement is made with the instructor. Students who know they are going to miss a test must notify me in advance. Special circumstances can be accommodated only if I am notified about them in advance. Any questions about scores must be discussed ASAP with the instructor, especially before final grades are posted.

Homework policy: There will be no graded homeworks. However, there will be practice problem sets created for each exam. It is **highly** recommended that students complete these problem sets to prepare for the exams. If you complete and fully understand all assigned problems, you are likely to do very well.

Grade Modifiers Policy: Grade modifiers will be used in this class. You can expect to earn a B- if your score is greater than 79.5 and less than 83, B if your score is greater than 83 and less than 86, B+ if your score is greater than 86 and less than 89.5. The similar modifier

points occur for the A, C and D ranges except that there is no A+ nor is a D- allowed under the RPI Grade Modifier Policy. **Requests for grade changes will be ignored, unless there was an identifiable error on my/the TA's part**.

4 Academic Integrity

Collaboration is allowed during in-class quizzes, but is forbidden during exams. The evaluation of student performance is a service provided by Rensselaer. Attempts to undermine this service lower Rensselaer's reputation. Therefore, it is essential that academic honesty be preserved. You are encouraged to cooperate with one another inside and outside of class on the solutions to prescribed practice problems, quizzes, and other study material. However, you may not collaborate on examinations or otherwise misrepresent another person's work as your own. You may not bring crib sheets to examinations, and you may not write on or alter examination materials that you submit for re-grading. Students who violate the spirit or letter of these rules are subject to penalties according to the principles outlined in the Rensselaer Handbook:

`http://www.rpi.edu/dept/doso/resources/main/2014-2016StudentHandbookrevOctober2015.pdf`

5 Learning Outcomes

At the end of this course, you will:

- understand some of the main topics and results in basic Graph Theory
- gain problem solving skills and proof techniques for problems on graphs
- have learned several graph applications and algorithms