

VIRGINIA COMMONWEALTH UNIVERSITY  
Department of Mathematics & Applied Mathematics  
MATH 750 – Posets & Mobius Inversion  
Spring 2020

**Instructor:** Dr Larson

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**Office Hours:** 11:00-12:30 TTh

**Prerequisite(s):** MATH 650.

**Text and Other Materials:** None required.

**Topics:** We will begin with basic results from the theory of partially ordered sets, turn to Rota's famous 1964 paper, "On the Foundations of Combinatorial Theory I. Theory of Mobius Functions", and look at some applications in number theory and combinatorics.

We will also spend some time applying these ideas to partially ordered sets of graphs---following ideas of chemists like Doug Klein---to see how they can be used as a tool for calculating graph (and molecular) properties.

**Learning Goal:** Learn how to use posetic ideas to estimate parameters of combinatorial structures with natural substructure poset representations that are computationally intractable.

**Attendance:** There is no attendance policy per se, but there will be homework and in-class assignments that are due.

**Expectations:**

- You are expected to attend class, complete homework, and ask questions during class or office hours.
- When presenting your work, I expect you to show all significant steps that are used to complete each problem. In cases where work is missing, you will not be given full credit.
- I encourage you to work with others on homework problems, however, any assignments to be turned in must be written up on your own. If you work with others, you must write who you worked with on your assignment.
- Please write neatly on all assignments to be graded; exceptionally messy work may not be graded.
- Only selected homework problems will be graded; other problems will be graded for completion.
- **There are no make-ups on in-class assignments.** I will drop your three lowest in-class assignments, assuming that you couldn't come to class for excusable reasons.
- Make up tests will be considered under exceptional circumstances: if you miss a test and want to be considered for a make-up, you *must* contact me immediately.

## Tests and Determination of Grades:

There will be two equally weighted tests. Here is the *tentative* schedule:

Test #1, Tues., Mar. 3

Test #2, Thurs., Apr. 30, 12:30-3:20 (during our scheduled **FINAL** time).

- The tests are closed-book and closed-notes.
- The tests will be *closely based on* the in-class assignments and assigned homework.
- Use of calculators or other computing technology is not allowed on the tests.
- Tests are written under the assumption that you are studying the material at least 6 hours per week outside of class.

Your final average will be computed as follows:

Tests: 50% (25% each)

Homework: 20%

In-class assignments: 20%

Project 10%

**Grade Scale:** The 10-point scale: 90-100 A, 80-89 B, etc.

## Important Dates to Know:

- Reading Day: Wed., Apr. 29
- Classes end: Tues., Apr. 28

**VCU Syllabus Statement:** Students should visit <http://go.vcu.edu/syllabus> and review **all** syllabus statement information. The full university syllabus statement includes information on safety, registration, the VCU Honor Code, student conduct, withdrawal and more.