

Spring 2021  
Combinatorics

Instructor Fedor Bogomolov  
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Lectures: MW 3.30 p.m-4.45 p.m zoom  
Office hours :Thursday zoom by appointment (e-mail)  
Recitations :Friday 3.30-4.45 p.m

Instructor Sixian Liu

Course description:

Elements of graph theory :

Planar graphs, colouring problems, trees, searching algorithms,  
network

flows.

Enumeration:

Arrangements, Generating functions, Recurrences, Partitions.

Textbook: Alan Tucker ” Applied Combinatorics” 6th Edition R. Brualdi  
”Combinatorics” 5th Edition. Notes for the course

Additional textbook : R.Brualdi ”Introductory Combinatorics”

Homework : Assigned weekly (during the Wednesday class) and collected  
at the beginning of next Wednesday class ( 5-6 problems a week)

Exams: There will be several Quizzes , Midterm, Prefinal and Final ex-  
ams.

Prefinal exam will be given about two weeks before the Final.

The exact days of Exams and Quizzes are to be determined. Grading  
policy: Homeworks, Quizzes, Midterm and Final exam will all count (the  
better grade between Final and Prefinal exams will be counted)

Calendar

1. Week 1 Graphs, basic properties
2. Week 2 Planar Graphs, graph colouring
3. Week 3 Hamiltonian circuits and Euler cycles
4. Week 4 Trees, searching algorithms and Salesmen problem
5. Week 5 Network flows and Matching problems
6. Week 6 Arrangement and Selection

7. Week 7 Binomial identities
8. Week 8 Generating functions
9. Week 9 Partitions, Recurrence relation models
10. Week 10 Linear recurrency
11. Week 11 Inclusion-exclusion formulas, Rook polynomials
12. Week 12 Polya formula
13. Review of the course