

## Mathematics 302 – Spring 2012

This is a tentative syllabus as of 01/15/12. It is subject to change without notice.

**Text:** Kenneth H. Rosen, *Discrete Mathematics and Its Applications*, 7th ed., McGraw-Hill Companies, Inc., ISBN 978-0-07-338309-5 .

*Week 1: Jan. 17–20*

- 3.1 Introduction to algorithms
- 3.2 the growth of functions

*Week 2: Jan. 23–27*

- 3.2 the growth of functions
- 1.1 logic
- 1.3 propositional equivalence

*Week 3: Jan. 30–Feb. 3*

- 1.4 predicates and quantifiers
- 1.5 nested quantifiers

*Week 4: Feb. 6–10*

- 1.6 rules of inference
- 1.7. introduction to proofs
- 1.8. proof methods and strategy (self study)

*Week 5: Feb. 13–17*

- 2.1 sets
- 2.2 set operations

**Test I**

*Week 6: Feb. 20–24*

- 2.3 functions, composition
- 2.3 inverse function

*Week 7: Feb. 27–Mar. 2*

- 2.4 sequences and Summations
- 2.5 cardinality of a set
- 5.1 Mathematical induction

*Week 8: Mar. 5–9*

- 5.1 Mathematical induction
- 5.2 Strong induction and well-ordering
- 5.3 recursive definitions and sequences

**No class on March 9.**

*Spring break: Mar 12–16.*

*Week 9: Mar 19–23*

8.1. recurrence relations

8.2 Solving recurrence relations

*Week 10: Mar 26–30*

8.3 divide and conquer algorithms, Masters theorem

8.4 generating functions (optional) **Test II**

*Week 11: Apr. 2–9*

6.1 basics of counting, inclusion-exclusion

6.3 permutations and combinations

No class on April 6.

6.5 generalized permutations and combinations

*Week 12: Apr. 11–16*

6.5 generalized permutations and combinations (II)

6.4 binomial coefficients and identities

8.5 Inclusion-Exclusion

*Week 13: Apr. 18–23*

2.6 matrices

9.1 relations and their properties

9.3 representing relations, counting relations

*Week 14: Apr. 25–30*

9.4 closure of relations

9.5 equivalence relations

9.6 partial orderings

*Week 15: May 1*

Catch up and review

**Note: May 1 is a redefined FRIDAY.**

**Thir exam:** May 7, Monday, 3:30–4:30pm.