

Discrete Mathematics (Math 330) — Spring, 2012

Location and Time: Bouillon 210, 11:00-11:50, MTWThF

Instructor: Dr. Dan Curtis

Office: 107a Bouillon

Office Hours: MTWThF 12:00-12:50 and by appointment.

CWU e-mail: curtiswd@cwu.edu

Web Page: www.cwu.edu/~curtiswd

Final Exam: Friday, June 8, 8:00-10:00 am

Textbook: No Textbook Course materials will be in the form of class notes and handouts.

Course Content: There will be a series of handouts containing notes and problem sets. The topics to be covered are:

1. Techniques and results on integer divisibility, congruences, modular arithmetic, and encryption methods including affine encryption and the RSA method.
2. Mathematical induction and its relation to recursion.
3. Solving problems by recursion. Explicit solution of linear recursions.
4. Differences and applications to summation problems.
5. Elements of graph theory: types of graphs, graph traversal, Hamiltonian and Euler circuits, planarity.

Classwork and Homework: You are expected to attend class daily. The handouts will contain problems to be solved; these will not be handed in for grading, but it is essential that you work these problems. Many exam problems will be very similar to those appearing in the notes. Time will be available in class for discussion of these problems.

Course Prerequisites: Mathematics 260 (Sets and Logic) is a prerequisite for this course. We will be proving things in this course, so you must know how to read and do proofs. You don't have to be an expert at proofs, since one goal of this course is to increase your level of sophistication in dealing with theoretical mathematics, but you must know the basics going in.

Learner Outcomes: Upon successful completion of this course, the student will be able to:

- understand the division theorem, the Euclidean algorithm, and applications to solve problems;
- work with congruences and apply them to devise schemes for encryption of messages.
- use the various forms of induction to give a variety of proofs;
- formulate recursive algorithms or recursive definitions;
- use recursion to solve problems and be able to solve linear recursions with constant coefficients;
- formulate and solve problems using ideas of graph theory.

Grading: Your course grade will be determined by the following:

1. Three in-class exams counting for up to 100 points each.
2. A comprehensive final exam worth up to 100 points. (Comprehensive, but weighted toward material covered after the second exam.)

Your point total will be the sum of your in-class exams and your score on the final exam, a maximum possible 400 points. Your course grade will be determined by the percentage p of these points you earn, according the following scale:

| | | | |
|--------------------|----|--------------------|----|
| $90 \leq p$ | A | $65 \leq p < 77.5$ | C |
| $89 \leq p < 90$ | A- | $64 \leq p < 65$ | C- |
| $87.5 \leq p < 89$ | B+ | $62.5 \leq p < 64$ | D+ |
| $80 \leq p < 87.5$ | B | $50 \leq p < 62.5$ | D |
| $79 \leq p < 80$ | B- | $p < 50$ | F |
| $77.5 \leq p < 79$ | C+ | | |

Students with disabilities: If you require accommodation based on a documented disability, have emergency medical information to share, or need special arrangements in case of emergency evacuation, please discuss the situation with me as soon as possible

Class Schedule (48 class days)

| Date | Class Activity | Date | Class Activity |
|-------------|-----------------------|-------------|-------------------------------|
| 03/26 | | 05/07 | |
| 03/27 | Classes begin | 05/08 | |
| 03/28 | | 05/09 | |
| 03/29 | | 05/10 | |
| 03/30 | | 05/11 | |
| | | | |
| 04/02 | | 05/14 | |
| 04/03 | | 05/15 | |
| 04/04 | | 05/16 | |
| 04/05 | | 05/17 | |
| 04/06 | | 05/18 | |
| | | | |
| 04/09 | | 05/21 | |
| 04/10 | | 05/22 | |
| 04/11 | | 05/23 | |
| 04/12 | | 05/24 | |
| 04/13 | Exam 1 | 05/25 | Exam 3 |
| | | | |
| 04/16 | | 05/28 | HOLIDAY: Memorial Day |
| 04/17 | | 05/29 | |
| 04/18 | | 05/30 | |
| 04/19 | | 05/31 | |
| 04/20 | | 06/01 | Last day of classes |
| | | | |
| 04/23 | | 06/04 | Prof. Dev./ Student Study Day |
| 04/24 | | 06/05 | |
| 04/25 | | 06/06 | |
| 04/26 | | 06/07 | |
| 04/27 | | 06/08 | Final Exam (8:00-10:00 am) |
| | | | |
| 04/30 | | | |
| 05/01 | | | |
| 05/02 | | | |
| 05/03 | | | |
| 05/04 | Exam 2 | | |