

# CSci 1311 Discrete Structures I

## Syllabus

### Course and Contact Information

Course: CSci 1311-10 Discrete Structures I, Department of Computer Science

Semester: Spring 2016

Meeting time: Tuesday/Thursday, 3:45-5:00pm

Location: Fungler Hall 108

Course Web site: [www.seas.gwu.edu/~ayoussef/cs1311/](http://www.seas.gwu.edu/~ayoussef/cs1311/)

### Instructor

Name: Abdou Youssef

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Office hours: Tuesday 1:30-3:30pm

### Bulletin Course Description

Mathematics for computer science. Sets, functions, sequences. Propositional and predicate calculus, formal proofs, mathematical induction. Matrices, semigroups, groups, isomorphism. Relations, partitions, equivalence relations, trees, graphs. May be taken for graduate credit by students in fields other than computer science.

### Prerequisites

MATH 1220 or MATH 1231.

### Required Text(s)

- Required textbook:

Author	Title	Edition
Susanna S. Epp	Discrete Mathematics with Applications	4 <sup>th</sup> Edition

### Learning Outcomes

As a result of completing this course, students will be able to:

1. see and analyze a problem from a mathematical perspective
2. convert informal English statements to formal logic statements
3. formulate problems in rigorous mathematical terms and concepts such as functions, relations, graphs, trees, and Boolean logic, which are conducive to methodical problem-solving.
4. prove a wide range of mathematical assertions using a variety of proof techniques, including direct and indirect proofs as well as proofs by induction
5. solve recursively defined functions and sequences, with applications to time complexity analysis of algorithms
6. count the numbers of various combinatorial entities, including permutations, arrangements, and combinations, which form a foundation for probability theory and algorithm analysis
7. design basic logical circuits and basic graph algorithms

8. grasp preliminarily certain applications of discrete math to computing such as: algorithmic complexity analysis, digital circuit design and optimization, relational databases, data types, cryptography, AI, etc.

### Class Schedule [week-by-week]:

Date	Topic(s) and readings	Assignment(s) Due
Week 1	Sets: Sections 1.2, 6.1, 6.2	
Week 2	Logic: Sections 2.1, 2.2, 3.1-3.2, notes	
Week 3	Proofs: Notes, sections 4.1, 4.5, 6.2, 6.3 Functions: Sections 7.1, 7.2	Homework 1 due January 28 <sup>th</sup>
Week 4	Functions: Sections 7.3, 7.4 Proofs by induction: Sections 5.2-5.4	
Week 5	Recurrence Relations: Sections 5.6-5.8, notes	
Week 6	Recurrence Relations: Sections 5.6-5.8, notes Counting Techniques: Sections 9.2,9.3, notes	Homework 2 due February 16 <sup>th</sup>
Week 7	Counting Techniques: Sections 9.4-9.6, notes	
Week 8	Relations: Sections 8.1-8.4	Homework 3 due March 1 <sup>st</sup>
Week 9	Relations: Section 8.5, notes <b>Midterm (Open Book and open notes)</b>	Midterm on March 10 <sup>th</sup>
	<b>Spring Break</b>	
Week 10	Graphs: Sections 10.1-10.4	Homework 4 due March 22 <sup>nd</sup>
Week 11	Graphs and trees: Sections 10.5-10.7, notes	
Week 12	Boolean Algebra: Section 6.4, notes	Homework 5 due April 7 <sup>th</sup>
Week 13	Boolean Algebra: Notes, Section 2.4	
Week 14	Applications of Logic and Boolean Algebra: Section 2.5 Review	Homework 6 due April 21 <sup>st</sup>
	<b>Final Exam (Open Book and open notes)</b>	Final exam in May 2-10 (TBD)
NOTE: In accordance with university policy, the final exam will be given during the final exam period and not the last week of the semester		

## Assignments and Grades

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### Grading

- Six homework assignments (42%)
- Nine pop quizzes (18%). Each quiz counts for 2%. Actually, there will be at least 12 quizzes -- the best 9 quizzes will be selected. No make-up quizzes will be given.
- Midterm exam (20%)
- Final exam (20%)
- Recitation attendance as extra bonus points: 3 bonus points for 100% attendance; 2 bonus points if you miss just one recitation session; 1 bonus points if you miss just two recitation sessions; and no bonus points if you miss more than two recitation sessions.

## Assignments

Assignment	Description	Total Points
Homework 1	Sets; logic	7
Homework 2	Proofs; functions	7
Homework 3	Recurrence relations; counting techniques; proofs	7
Homework 4	Relations; proofs	7
Homework 5	Graphs and trees; proofs	7
Homework 6	Boolean algebra	7
	<b>Total Possible Points</b>	<b>42</b>

## University Policies

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### University Policy on Religious Holidays

1. Students should notify faculty during the first week of the semester of their intention to be absent from class on their day(s) of religious observance.
2. Faculty should extend to these students the courtesy of absence without penalty on such occasions, including permission to make up examinations.
3. Faculty who intend to observe a religious holiday should arrange at the beginning of the semester to reschedule missed classes or to make other provisions for their course-related activities

### Support for Students Outside the Classroom

#### Disability Support Services (DSS)

Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in the Rome Hall, Suite 102, to establish eligibility and to coordinate reasonable accommodations. For additional information please refer to: [gwired.gwu.edu/dss/](http://gwired.gwu.edu/dss/)

#### Mental Health Services 202-994-5300

The University's Mental Health Services offers 24/7 assistance and referral to address students' personal, social, career, and study skills problems. Services for students include: crisis and emergency mental health consultations confidential assessment, counseling services (individual and small group), and referrals. [counselingcenter.gwu.edu/](http://counselingcenter.gwu.edu/)

### Academic Integrity Code

Academic dishonesty is defined as cheating of any kind, including misrepresenting one's own work, taking credit for the work of others without crediting them and without appropriate authorization, and the fabrication of information. For the remainder of the code, see: [studentconduct.gwu.edu/code-academic-integrity](http://studentconduct.gwu.edu/code-academic-integrity)