

CSci 1311 Discrete Structures I

Syllabus

Course and Contact Information

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

Semester: Spring 2019

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

Location: MPA 309

Course Web site: www.seas.gwu.edu/~ayoussef/cs1311/

Instructor

Name: Abdou Youssef

Campus Address: Science and Engineering Hall, Office 5820

Phone: 4-4953

E-mail: ayoussef@gwu.edu

Office hours: Tuesday 12-3pm

TA's and their office hours (Location: **SEH 4450** behind SEH 4040):

Name	Email	Office Hours
Thinh Dang	thinh@gwmail.gwu.edu	Mon 12:00-2:00, Wed 11:30-12:30
Zhantong Liang	zhantong_liang@gwmail.gwu.edu	Thur 9:30-10:30, Thur 1:30-3:30 (Tompkins 404)
Yan Meng	mengy@email.gwu.edu	Thur 6:00-7:00, Fri 5:00-7:00

LA's and their office hours (Location: **SEH 4450** behind SEH 4040):

Name	Email	Office Hours
Julia Bristow	julia_bristow@gwmail.gwu.edu	Mon 10:00-12:00, Wed 10:00-11:00
Sarah Morin	sarahmorin@gwmail.gwu.edu	Mon 3:00-5:00, Tues 1:00-2:00
Seamus Malley	seamusmalley@gwmail.gwu.edu	Wed 1:00-3:00, Fri 12:00-1:00

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 th Edition

Amount of Time Expected for this Course:

- 2.5 hours of direct instruction (i.e., class time) per week
- 5 hours of independent learning (i.e., out of class effort) per week
- Total: 112.5 hours per semester

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 31 st
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	Homework 2 due February 14 th
Week 6	Recurrence Relations: Sections 5.6-5.8, notes Counting Techniques: Sections 9.2, 9.3, notes	
Week 7	Counting Techniques: Sections 9.4-9.6, notes	Homework 3 due February 28 th
Week 8	Review Midterm (you can have a 2-sided cheat sheet)	Midterm on March 7 th
	Spring Break	
Week 9	Relations: Sections 8.1-8.3, 8.5, notes	
Week 10	Modular Arithmetic: 8.4; Graphs: Sections 10.1-10.3	Homework 4 due March 28 th
Week 11	Graphs and trees: Sections 10.4-10.7, notes	
Week 12	Boolean Algebra: Section 6.4, notes	Homework 5 due April 11 th
Week 13	Boolean Algebra: Notes, Section 2.4	
Week 14	Applications of Logic and Boolean Algebra: Section 2.5 Review	Homework 6 due April 25 th
	Final Exam (you can have a 2-sided cheat sheet)	May 7 th , 3-5pm.
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

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
	Total Possible Points	42

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%)
- Extra points from recitation attendance: 3 bonus points for 100% attendance; 2 bonus points if you miss just one recitation session; 1 bonus point if you miss just two recitation sessions; and no bonus points if you miss three or more recitation sessions.

Late Homework Policy: A homework assignment not submitted by 6pm of the due date can be turned in up to 5 days late with a 10% penalty. No homework will be accepted after that because the solution will be posted online.

University Policies

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

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

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/

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/

Safety and security

In the case of an emergency, if at all possible, the class should shelter in place. If the building that the class is in is affected, follow the evacuation procedures for the building. After evacuation, seek shelter at a predetermined rendezvous location.