CpE 602: Applied Discrete Mathematics

Department of Electrical and Computer Engineering

Instructor: Prof. K.P. (Suba) Subbalakshmi

Canvas Course Address: https://sit.instructure.com/courses/49826

Course Schedule: Thursdays at 3:30pm

Contact Info: ksubbala@stevens.edu; Burchard 208

Office Hours: Thursdays 12:00 to 12:30pm and 3:00 to 3:30pm; Wednesdays 11:30 to 1:30pm

Cross-listed with: NIS 602

COURSE DESCRIPTION

This is a foundation course for computer engineering graduate students.

You will learn the foundations of discrete mathematics which is an important foundation for a wide variety of ECE concepts from error correcting codes and encryption all the way to machine learning and AI. Throughout the course I will be giving you examples of where each concept is used today and what technology evolutions it has impacted in the course of time.

STUDENT LEARNING OUTCOMES

After successful completion of this course,

- The student will learn the concept of logic and proof techniques
- The student will understand the concept of sets, functions and growth of functions and be able to calculate O(.), W(.) and Q(.) of functions
- The student will understand integers, division and advanced counting techniques
- The student will have a basic understanding of discrete probability and random variables
- The student will understand the basics of graph theory

COURSE FORMAT AND STRUCTURE

TENTATIVE COURSE SCHEDULE

(Tentative)

Note that this is a tentative schedule and can change over time.

Make sure to keep in touch with the happenings in class as well as Canvas for accurate dates.

Week 1: Chapter 1**:** Logic and proofs,

Week 2: Chapter 2: everything other than matrices,

Week 3: Chapter 3: Growth of functions,

Week 4: Review for Midterm 1

Week 5 Midterm 1

Week 6: Chapter 4: Number Theory and Cryptography (excluding Section 4.2);

Week 7: Chapter 5: Induction and Proof by Induction; Chapter 6: Counting;

Week 8: Chapter 7: Discrete Probability;

Week 9: Chapter 8: Advance Counting Methods: recurrence relations and solving linear recurrence relations;

Week 10: Midterm 2

Week 11: Chapter 10: Graphs

Week 12: Graphs

Week 13: Thanksgiving No Class

Week 14: Graphs

Week 15: Final exam (comprehensive)

COURSE MATERIALS

Textbook(s): Discrete mathematics and its applications, 7th Edition, Kenneth H. Rosen, McGraw Hill Publishers.

COURSE REQUIREMENTS

Participation: This class will only be as interesting as you make it. So, make sure to participate in the class. The course is designed to maximize student participation. I divide students into 3 or 4 groups of about 3 to 4 students at the start of each class. During class, I pose questions or problems for you all to answer. Each question is posed to the groups in round robin fashion. If the first team doesn't get the answer, the second team gets it and so on. So, try to be on time for class so that this process can go smoothly.

While I will try to follow the textbook closely, examples and notes not found in the textbook will also be used in the class. Since I do not use powerpoint or other slides in the class it is your responsibility to attend the class for the notes.

Exams: There will be two midterms and 1 final exam. The midterms are modular and the final exam is comprehensive.

GRADING PROCEDURES

Grades will be based on:

- Two closed book mid-term exams (30% each)
- Comprehensive closed book final exam (40%)

Other Grading Related Policies

- Re-exams will not be given if you miss an exam unless you have an extraordinary reason. Sufficient documentation must be provided if you miss an exam.
- If you need to take an exam you missed because of the above reason, you need to bring this to the attention of the professor as soon as you are well enough to go about your life but before two weeks from the date of your return.
- If you need to appeal your grade in any of the midterms, it needs to be done within the week after the graded midterms are returned to you. No changes past this deadline.
- Final letter grade will be based on relative scores.

Academic Integrity

Graduate Student Code of Academic Integrity

All Stevens graduate students promise to be fully truthful and avoid dishonesty, fraud, misrepresentation, and deceit of any type in relation to their academic work. A student's submission of work for academic credit indicates that the work is the student's own. All outside assistance must be acknowledged. Any student who violates this code or who knowingly assists another student in violating this code shall be subject to discipline.

All graduate students are bound to the Graduate Student Code of Academic Integrity by enrollment in graduate coursework at Stevens. It is the responsibility of each graduate student to understand and adhere to the Graduate Student Code of Academic Integrity. More information including types of violations, the process for handling perceived violations, and types of sanctions can be found at www.stevens.edu/provost/graduate-academics (Links to an external site.).

EXAM CONDITIONS

The following procedures apply to exams for this course. As the instructor, I reserve the right to modify any conditions set forth below by printing revised Exam Conditions on the quiz or exam.

1. Students may use the following materials during quizzes and/or exams. Any materials that are not mentioned in the list below are not permitted.

Material	Permitted?	
	Yes	No
Handwritten Notes Conditions: i.e. size of note sheet		X
Typed Notes Conditions: i.e. size of note sheet		X
Textbooks Conditions: i.e. specific books		X
Readings Conditions: i.e. specific documents		X
Other (specify)		

2. Students are/are not allowed to work with or talk to other students during quizzes and/or exams.
3. Put succinctly: During your exams, you are required to disable all wireless or data plans. If you are using laptops or other non-calculator devices as calculators (there should be very minimal need for this), be sure to disable wireless connections on these devices. No verbal/non verbal communication with any of your friends/foes/relatives/classmates/droids/mediums and/or Math Ninjas for the duration of the exam either in person, via electronic or other mediums of contact.

LEARNING ACCOMMODATIONS

Stevens Institute of Technology is dedicated to providing appropriate accommodations to students with documented disabilities. The Office of Disability Services (ODS) works with undergraduate and graduate students with learning disabilities, attention deficit-hyperactivity disorders, physical disabilities, sensory impairments, psychiatric disorders, and other such disabilities in order to help students achieve their academic and personal potential. They facilitate equal access to the educational programs and opportunities offered at Stevens and coordinate reasonable accommodations for eligible students. These services are designed to encourage independence and self-advocacy with support from the ODS staff. The ODS staff will facilitate the provision of accommodations on a case-by-case basis.

For more information about Disability Services and the process to receive accommodations, visit https://www.stevens.edu/office-disability-services (Links to an external site.). If you have any questions please contact: Phillip Gehman, the Director of Disability Services Coordinator at Stevens Institute of Technology at pgehman@stevens.edu or by phone 201-216-3748.

Disability Services Confidentiality Policy

Student Disability Files are kept separate from academic files and are stored in a secure location within the Office of Disability Services. The Family Educational Rights Privacy Act (FERPA, 20 U.S.C. 1232g; 34CFR, Part 99) regulates disclosure of disability documentation and records maintained by Stevens Disability Services. According to this act, prior written consent by the student is required before our Disability Services office may release disability documentation or records to anyone. An exception is made in unusual circumstances, such as the case of health and safety emergencies.

INCLUSIVITY

Name and Pronoun Usage

As this course includes group work and class discussion, it is vitally important for us to create an educational environment of inclusion and mutual respect. This includes the ability for all students to have their chosen gender pronoun(s) and chosen name affirmed. If the class roster does not align with your name and/or pronouns, please inform the instructor of the necessary changes.

Inclusion Statement

Stevens Institute of Technology believes that diversity and inclusiveness are essential to excellence in academic discourse and innovation. In this class, the perspective of people of all races, ethnicities, gender expressions and gender identities, religions, sexual orientations, disabilities, socioeconomic backgrounds, and nationalities will be respected and viewed as a resource and benefit throughout the semester. Suggestions to further diversify class materials and assignments are encouraged. If any course meetings conflict with your religious events, please do not hesitate to reach out to your instructor to make alternative arrangements.

You are expected to treat your instructor and all other participants in the course with courtesy and respect. Disrespectful conduct and harassing statements will not be tolerated and may result in disciplinary actions.

MENTAL HEALTH RESOURCES

Part of being successful in the classroom involves a focus on your whole self, including your mental health. While you are at Stevens, there are many resources to promote and support mental health. The Office of Counseling and Psychological Services (CAPS) offers free and confidential services to all enrolled students who are struggling to cope with personal issues (e.g., difficulty adjusting to college or trouble managing stress) or psychological difficulties (e.g., anxiety and depression). CAPS is open daily from 9:00 am – 5:00 pm M-F. Evening hours are available by appointment in the Fall / Spring semesters and up-to-date information regarding the availability of evening appointments can be found by visiting www.stevens.edu/CAPS (Links to an external site.). To schedule an appointment, call 201-216-5177.

Due to the pandemic, in-person appointments may be limited until further notice. Up-to-date information about the availability of in-person services can be found at www.stevens.edu/CAPS (Links to an external site.). Teletherapy (therapy via secure video platform) is available to registered students physically located in the states of New York or New Jersey. Students located outside of NY / NJ are encouraged to pursue local treatment through their personal health insurance. To learn more about the process of finding a therapist please visit the CAPS webpage on Seeking Help Off-Campus (Links to an external site.).

EMERGENCY INFORMATION

In the event of an urgent or emergent concern about the safety of yourself or someone else in the Stevens community, please immediately call the Stevens Campus Police at 201-216-5105 or on their emergency line at 201-216-3911. These phone lines are staffed 24/7, year round. For students who do not reside near the campus and require emergency support, please contact your local emergency response providers at 911 or via your local police precinct. Other 24/7 national resources for students dealing with mental health crises include the National Suicide Prevention Lifeline (1-800-273-8255) and the Crisis Text Line (text "Home" to 741-741). If you are concerned about the wellbeing of another Stevens student, and the matter is *not* urgent or time sensitive, please email the CARE Team at care@stevens.edu. A member of the CARE Team will respond to your concern as soon as possible.

e