

State University of New York Polytechnic Institute

MAT 115 : Finite Math for Computer Science

Fall 2016

Instructor: Dr. Chen-Fu Chiang
Time: MW 2:00 pm - 3:50 pm
Location: Kunsela B117
Office Hours: MWF: 9:30 am - 11:00 am, MW: 4:00 pm - 5:00 pm or by appointment
Office: Kunsela C225
Email: chiangc@sunyit.edu
Phone: 315-792-7379

TA: Hem Bhatt
Office Hours: Wednesday: 1:00 pm - 2:00 pm
Location: Kunsela C122
Email: bhatth@sunyit.edu

Text and References

Recommended: A Short Course in Discrete Mathematics for Students of Computer and Computational Science, and Mathematics for Algorithm and System Analysis, by Edward A. Bender and S. Gill Williamson, 2004. Available for download at <http://cseweb.ucsd.edu/~gill/BWLectSite/>. The material covered in this course is fairly standard, and so is covered in numerous textbooks and websites on finite mathematics. You are encouraged to use other resources for alternative viewpoints on course material.

Course Description and Goals

Math 115 Finite Mathematics for Computer Scientists will cover a number of topics useful to students majoring in Computer and Information Science (CS), Computer and Information Systems (IS), Applied Computing, and Network and Computer Security (NCS). See the course outline below for details of our coverage.

Course Goal

- Introduce students to finite mathematics and motivate the topic through examples from computer science
- Introduce the basics of propositional and predicate logic, concepts from set theory, functions, relations, lists, several methods of logical proof, and introduce students to the basics of probability theory, counting techniques, and graph theory
- Provide students with a framework of homework assignments and assessments that develop their logical problem-solving capabilities
- Provide students with problems and exercises in class to solve in groups to develop their capability to learn and work in a team environment

Objectives

Upon completion of this course the student should be able to:

- Apply definitions to a wide variety of problems in the areas of logic and set theory
- Solve problems applying basic definitions of functions and relations

- Apply counting principles to a variety of problems in finite mathematics
- Solve problems in elementary probability theory and graph theory
- Demonstrate the ability to construct proofs using a variety of techniques
- Demonstrate the ability to apply abstract reasoning concepts to practical problems in computer science
- Demonstrate the ability to communicate mathematical ideas to improve problem solving skills in a team environment

Topics

- Arithmetic and Logic
 - Boolean Functions
 - Truth Table
 - (Propositional + Predicate) Logic
- Numbers, Sets and Functions
 - Number Theory and Cryptography
 - Induction Proofs
 - Sets and Equivalence
 - Functions and Permutations
- Lists, Probability and Graphs
 - Lists and Counting
 - Introduction to Probability Theory
 - Basic Concept in Graph Theory
- If time allows, we will explore topics such as Decision Tree and Satisfiability Problems.

Grading (Tentative)

The lecture format will be the basic mechanism used in the course. Computer demonstrations in the classroom will be used whenever appropriate. Assessment of student performance will use a criterion-referenced model which will include written assignments and quizzes (45%), regular examinations (midterms 30%, the best 2 of 3 midterm scores will be counted), and a comprehensive final exam (25%). Due to the size of the class, and the logistics involved, late homework will not be accepted unless you have made prior arrangements with me. The acceptable format of your solution will be specified in the assignment. All examinations are closed-book. A typical grading scale will be as follows:

Percent	Grade
97 - 100	A+
93 - 96	A
90 - 92	A-
87 - 89	B+
83 - 86	B
80 - 82	B-
77 - 79	C+

73 - 76	C
70 - 72	C-
65 - 69	D+
60 - 64	D
Below 60	F

Attendance Policy

Attendance and active class participation are required. Be prepared to participate by asking and answering questions during class meetings. Please send me an email if you know you have to miss a class.

Academic Integrity/Policy

Plagiarism and Cheating of any kind on an examination, quiz, or assignment will result at least in an F for that assignment (and may, depending on the severity of the case, lead to an F for the entire course). I will assume for this course that you will adhere to the academic creed of this University and will maintain the highest standards of academic integrity. In other words, do not cheat by giving answers to others or taking them from anyone else. The code of academic conduct is detailed on the SUNY Poly student handbook. Make-ups are only given under extreme circumstances. I will also adhere to the highest standards of academic integrity, so please do not ask me to change (or expect me to change) your grade illegitimately or to bend or break rules for one person that will not apply to everyone.

Accommodations for Students with Disabilities registered at SUNY Polytechnic Institute

In compliance with the Americans with Disabilities Act of 1990 and with Section 504 of the Rehabilitation Act, SUNY Polytechnic Institute is committed to ensuring educational access and accommodations for all its registered students seeking access to meet course requirements and fully participate in programs or activities. SUNY Poly students with documented disabilities and medical conditions are encouraged to request these services by registering with the Disability Services Office and discussing your need for accommodations. For information or an appointment contact Suzanne Sprague at the Disability Services Office by phone (315) 792-7170, e-mail suzanne.sprague@sunyit.edu, or at the Utica office located in room B101 Kunsela Hall.