1 Prerequisite

A grade of C or better in Calculus 1 (MATH 221, 226 or 231) and a passing grade in Introductory Programming (CS152 or CS 201).

2 Instructor Info

Instructor: Christine Cheng, EMS 1011, 229-5170, ccheng@uwm.edu.
Office Hours: T 12:00-1:00pm or by appointment.

3 Discussion Sections

You must be enlisted in one of the two discussion sections for this class:

DIS 601 12-1:45pm W EMS W120
DIS 602 12-1:45pm R EMS W130

On most weeks, there will be a short quiz at the beginning of the section based on that week’s lectures.

4 Textbook:


5 Objectives:

CS 317 is one of the foundational classes in your CS curriculum. It is a direct or indirect prerequisite to courses in Algorithms, Theory of Computation/Compilers, Artificial Intelligence, Data Security, Computer Graphics, Operating Systems. The class has three major themes:

1. **Mathematical Reasoning.** You will learn logic and proof techniques so you can show that a mathematical statement is true.

2. **Discrete Structures.** You will learn important mathematical structures – used to represent objects and their relationships – in Computer Science. These discrete structures include sets, functions and relations, graphs, etc.

3. **Counting and Probability.** Yes, you will learn how to count! Once you know how, you will be able to compute the probabilities of many events. Both skills are important for designing algorithms.
6 An Outline

- LOGIC
  1.1 Propositional Logic, 1.2 Applications of Propositional Logic, 1.3 Propositional Equivalences, 1.4 Predicates and Quantifiers, 1.5 Nested Quantifiers.

- PROOFS
  1.6 Rules of Inference, 1.7 Introduction to Proofs, 1.8 Proof Methods and Strategy.

- SETS, FUNCTIONS, and RELATIONS
  2.1 Sets, 2.2 Set Operations, 2.3 Functions, 9.1 Relations and their properties, 9.5 Equivalence Relations

- PROOFS CONTINUED
  5.1 Mathematical Induction

- BASIC COUNTING
  6.1 Basics of Counting, 6.3 Permutations and Combinations, 6.5 Generalized Permutations and Combinations, 6.4 Binomial Coefficients

- DISCRETE PROBABILITY
  7.1 An Introduction to Discrete Probability, 7.2 Probability Theory, 7.3 Bayes’ Theorem, 7.4 Expected Value and Variance

- GRAPHS
  10.1 Graphs and Graph Models, 10.2 Graph Terminology and Special Types of Graphs, 10.3 Representing Graphs and Graph Isomorphism, 10.4 Connectivity, 10.5 Euler and Hamiltonian Paths, 10.8 Graph Coloring

7 HWs, Exams, and Grading Scheme

Grades will be posted on the D2L page of this class.

*Homeworks.* Weekly homework will be posted on the class webpage every Tuesday and is due the following Tuesday in class. *No homeworks will be accepted after the deadline.* On the other hand, the lowest two or three homework grades will be dropped at the end of the semester.

You are allowed to collaborate with your peers *but* you must write up the solutions on your own and cite your collaborators. *If you obtained your solution from a book, website, etc., you must indicate the title of the book and page no., the address of the website, etc.* Deductions will be made if this policy is violated.

*Exams and finals.* There will be two exams and a comprehensive final exam. The final exam will be held on Dec. 19, Wednesday from 10 AM to 12 noon in the same room.

*A tentative grading scheme.* Quizzes 5%, Homeworks 20%, Exam I 25%, Exam II 25%, Final 25%. Active participation in class will be taken into account when your final score is in between two letter grades (e.g., between a B and a B-, etc.).

In case of an emergency, contact the instructor at the earliest possible opportunity via e-mail or phone. No arrangements will be made for missed exams unless these rules are followed, and an acceptable evidence of legitimate emergency is submitted.

8 Academic Misconduct

Copying someone else’s work in a homework or an exam is academic dishonesty. It will be dealt with severely. For more information, check the website [www4.uwm.edu/acad_aff/policy/academicmisconduct.cfm](http://www4.uwm.edu/acad_aff/policy/academicmisconduct.cfm).