CS317-001 Discrete Information Structures
Summer 2017 (1st Six-Week Session 5/30/17 – 7/8/17)
TR 9:00 am – 12:20 pm, LAP N103

Instructor: Ichiro Suzuki, EMS 1219, 414-229-3718, suzuki@uw.edu
Office Hours: Tue Thu 12:30 pm – 1:15 pm (till 6/29/17), or by appointment.
Prerequisite: Math Placement A; C or better in CS250(P) (Introductory Computer Programming).

C or better in CS317 is required to take some other CS courses, including CS417, CS535 and CS537.

Course Homepage: Go to D2L.


Objectives: (Prof. Cheng) CS317 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, and 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, graphs, etc.

3. Counting and Probability. You will learn how to count! And once you know how to count, you will be able to compute the probabilities of various events. Both skills are important for designing algorithms.

Tentative Lecture Schedule:

1. Tue 5/30
   1.1 Propositional Logic
   1.2 Applications of Propositional Logic
   1.3 Propositional Equivalence

2. Thu 6/1
   1.4 Predicates and Quantifiers
   1.5 Nested Quantifiers

3. Tue 6/6
   1.7 Introduction to Proofs
   5.1 Mathematical Induction
   2.4 Sequences and Summations (brief)

4. Thu 6/8
   2.1 Sets
   2.2 Set Operations
   8.5 Inclusion-Exclusion (brief)
   2.3 Functions
   6.2 The Pigeonhole Principle (brief)
   2.5 Cardinality of Sets (time permitting)

5. Tue 6/13
   Exam I (5/30 – 6/6 material)
   6.1 The Basics of Counting

6. Thu 6/15
   6.3 Permutations and Combinations
   6.5 Generalized Permutations and Combinations

7. Tue 6/20
   7.1 An Introduction to Discrete Probability
   7.2 Probability Theory

8. Thu 6/22
   7.3 Bayes’ Theorem
   7.4 Expected Value and Variance

9. Tue 6/27
   10.1 Graphs and Graph Models
   10.2 Graph Terminology and Special Types of Graphs
   10.3 Representing Graphs and Graph Isomorphism (brief)
10. Thu 6/29
   10.4 Connectivity (brief)
   10.5 Euler and Hamilton Paths

11. Thu 7/6
   **Final Exam** (6/8 – 6/29 material)

**Grading:**

1. Homework 25%
2. Exam I (Tue 6/13/17 9:00 am – 10:15 am) 25%
3. Final Exam (Thu 7/6/15 9:00 am – 11:00 am) 50%

All exams are closed books and notes.
Approximate grading scale (subject to adjustment): A or A- for a total score of 90/100 or higher, B+, B or B- for 80 or higher, C+, C or C- for 70 or higher, D+, D or D- for 60 or higher, and F for below 60.

**Study Guidelines and Rules:** TBA

**Administration:** TBA