Discrete Structures for Computer Science

CS 0441 – Spring 2014

Lectures: TH: 11:00 AM-12:15 PM
Classroom: Lawrence Hall (LAWRN) 205

Course web page:
   http://www.cs.pitt.edu/~milos/courses/cs441/

Instructor:
   Milos Hauskrecht
   5329 Sennott Square Building
   milos@cs.pitt.edu
   (412) 624–8845
   office hours: TBA

Recitations:
   Section 21725: Thursday: 4:00 – 4:50 PM, 5313 SENSQ, TA: Zitao Liu
   Section 21726: Friday: 11:00 – 11:50 AM, 5313 SENSQ, TA: Zitao Liu

TAs:
   Zitao Liu
   5406 Sennot Square
   ztliu@cs.pitt.edu
   (412) 624-9182
   office hours: TBA

Course Description:

The purpose of this course is to understand and use (abstract) discrete structures that are backbones of computer science. In particular, this class is meant to introduce logic, proofs, sets, relations, functions, counting, and probability, with an emphasis on applications in computer science.

Prerequisites: 2 years of high school algebra.

Text:
   Kenneth H. Rosen. *Discrete Mathematics and Its Applications*, 7th Edition, McGraw Hill, 2012.

Requirements and Grading:

Exams: **50%**
Homework Assignments: **40%**
Lectures/Recitations: **10%**

Homework assignments

There will be weekly homework assignments. Homework **must be handed** in at the **beginning of lecture** on the day that it is due (penalty will apply otherwise). No late homework will be accepted.

Lectures/Recitations

Recitation attendance is strongly encouraged. Problems similar to those that occur in homework will be practiced during recitations. Short quizzes may be given during recitations/lectures. Unannounced quizzes, that count 10% of the total grade, will be given throughout the term to prepare you for the exams. Quizzes will be based on lecture material, reading assignments, and homework. Quizzes may be given in lecture or in recitation without prior announcement. No make up quizzes are allowed.

Policy on Cheating

All the work in this course should be done independently. **Collaborations on *quizzes, exams* and *homework assignments* are not permitted.** Cheating and any other anti-intellectual behavior, including giving your work to someone else, will be dealt with severely. If you feel you may have violated the rules speak to us as soon as possible.

Please make sure you read, understand and abide by the Academic Integrity Code for the Faculty and College of Arts and Sciences.

Students With Disabilities

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and Disability Resources and Services, 216 William Pitt Union, (412) 648-7890 as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course.

Tentative Syllabus

- **Logic:** propositional logic, logical equivalence, predicates & quantifiers, and logical reasoning.
- **Sets:** basics, set operations
- **Functions:** one-to-one, onto, inverse, composition, graphs
- **Integers:** greatest common divisor, Euclidean algorithm.
- **Sequences and Summations**
- **Mathematical reasoning and induction:** Proof strategies, Mathematical Induction, Recursive definitions, Structural Induction
- **Counting:** basic rules, Pigeonhole principle, Permutations and Combinations, Binomial coefficients and Pascal triangle.
- **Probability:** Discrete probability. Expected values and variance
- **Relations:** Properties, Combining relations, Closures, Equivalence, Partial ordering
- **Graphs:** directed, undirected graphs.