CRN: 01279 MATH-022.-23 Discrete Math, Wtr, 2016

Instructor: Dr. Karl Schaffer
Class meeting days: Tue/Thu
Class time 1:30-3:345 PM
Classroom: E-36
email: schafferkarl@fhda.edu

Office phone: 408-864-8214
Office: E-23A
Office Hrs: : Mon/Wed/ 5:30-6:20 PM, Tue/Thu 12:30-1:20 PM
or by appointment
Class web site: http://nebula2.deanza.edu/~karl/
Class link login name: mathstudent password: 1234

Description: Elements of discrete mathematics with applications to computer science. Topics include methods of proof, mathematical induction, logic, sets, relations, graphs, combinatorics, and Boolean algebra.

Course Philosophy: Discrete Mathematics encompasses a variety of topics of contemporary importance in applications, especially in areas of decision science, computer science, and computer engineering, but also in diverse fields such as biology and the social sciences. The Mathematics Association of America recommends that the course be taught at the "intellectual level" of calculus. Discrete mathematics incorporates work with algorithms, which are the codified procedures used to solve particular problems. The course explores what proof is, and provides students with practice in constructing proofs of different types, especially mathematical induction. Graph theory, investigating how things are connected and combinatorics, the science of counting complex arrangements, are important components this course. It explores recursion, and may go as deeply into that subject as to include generating functions. It also includes an introduction to symbolic logic and set theory, and their ramifications, and notes how Boolean algebras arise in each of these subjects. As the seemingly diverse topics covered in this course are examined, the student discovers that these distinct topics are interwoven and interrelated at many levels. Discrete mathematics can engage the student in challenging problem-solving, and leaves room for the instructor to include topics of contemporary and historical interest and the world-wide history of these topics.

Student Learning Outcomes:
(1) Critique a mathematical statement for its truth value, defend choice by formulating a mathematical proof or constructing a counterexample.
(2) Analyze and apply patterns of discrete mathematical structures to demonstrate mathematical thinking.

Recommended: Programmable graphing calculator. You may not use computer or cell phone or any electronic device with communication capability during classes or exams; this rule will be strictly enforced.

Text: ***Discrete Mathematics with Ducks***, by sarah-marie belcastro. Publisher: CRC Press. Recommended: ***Student Handbook for Discrete Mathematics with Ducks*****,** by belcastro, CRC Press, 2016, ppb.
We will cover chapters 1-8 and 10-13. We may also cover additional material on modular arithmetic, number theory, and big oh notation. You should have a graphing calculator - you may use it on all exams and quizzes. I recommend the TI-86 or one of the newer TI's, as they are also used in other math classes on this campus. You may NOT use a computer or cell phone or any electronic device with communication capability during classes or exams; this rule will be strictly enforced!! No emailing, texting, messaging, tweeting, facebooking, youtubing or bitcoining, or anythinging!!

Grades: 90-100 A, 80-89 B, 70-79 C, 60-69 D, < 60 F, based on:

5% Attendance: You may miss 3 classes without it affecting your grade. Each additional class missed counts 0.5% off. Leaving more than 20 minutes early or arriving more than 20 minutes late counts as a half-absence.

15% **Several short quizzes** or in-class assignments, usually to be given during class. These will often involve group work. You may drop your lowest score. These assignments will together constitute one exam. An individual or group project at the end of the quarter may count as two quizzes.

20% **One hour exam**, Tue., Jan. 26 (Open book, open notes)

20% **One hour exam**, Tue., Feb. 23 (Open book, open notes)

20% **Homework** assignments. Homework is assigned during each class. Your homework will be turned in only **at the end of every two chapters**. Homework is graded for completion, not correctness. NO LATE HOMEWORK ACCEPTED. EVER!

First homework assignment: read chapter one and work the “Check Yourself” problems as you read (not to be turned in, answers are in the back). As part of the homework that you will turn in, do these problems in section 1.7: 1,2,4,5,8-11,13-17,19,20,22-25. Begin reading chapter 2.

20% **Final Exam**: mandatory, comprehensive, given on **Tuesday, Mar. 22, 1:45-3:45 PM**. (Open book, open notes) There will be no make-ups or early exams. The final exam will be used to replace one of the two one-hour exams, ONLY if final is higher.

NO LATE WORK IS ACCEPTED - NO MAKE-UPS. IF YOU MUST MISS ONE MAJOR EXAM, IT WILL BE REPLACED WITH THE FINAL EXAM SCORE, BUT THIS IS NOT A GOOD IDEA! HOMEWORK ASSIGNMENTS MAY BE CHECKED AT ANY TIME, SO KEEP YOUR WORK CURRENT!

Some background on the instructor: Ph.D. and MA in Mathematics from UC Santa Cruz, undergraduate work at University of Chicago and University of Alabama. Grew up in New England and Alabama. Do research in the mathematics of “networks,” (graph theory) and am very active in math education. I am interested in and use collaborative learning and interdisciplinary learning techniques in the class. I am also a modern dance performer and choreographer, and company I co-direct does shows about math and dance, among other things; see http://www.mathdance.org/.