Syllabus for Math 170: Discrete Mathematics
Spring 2014

Instructor Information:

Instructor:	Dr. Lipika Deka
Phone:	(831) 582-4139
Email :	ldeka@csumb.edu
Office:	Room S215, Chapman Science Academic Center
Office hours:	Monday and Wednesday: 12.00pm-2.00pm and other times by appointment.

Class information:

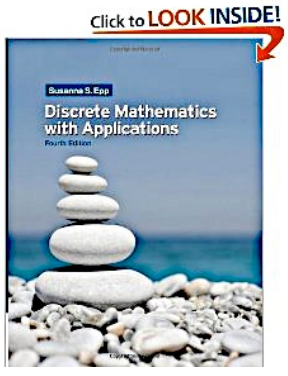
Meeting time:	Tuesday & Thursday: 12.00pm-1.50pm
Room:	Room 1188, Tanimura & Antle Family Memorial Library
Class Number	**20358**

Course Prerequisites:

MATH 130 or equivalent, or a satisfactory score on the Calculus Advisory Test.
Failure to satisfy the prerequisites will result in a final grade assignment of a "WU" grade in the course.

Course Reading:

Text book: *Discrete Mathematics with Applications, Fourth edition*



Author: Susanna S. Epp; ISBN-10:0-495-39132-8

Note: You can find a copy for the book reserved for you in the library.

Course Description

This class is one of the important steps towards completion of the BS CSIT MLO #4 and Mathematics MLO #2, for both the major and minor. It is the gateway course to advanced topics in computer science as well as in mathematics. We will focus on logic, set theory, combinatorics, and graph theory each of which have applications in mathematics, computer science and many other fields of study.

Discrete Math is the study of discrete mathematical objects. An object is said to be *discrete* if it consists of distinct (usually finitely many) elements. The kinds of problems we will be exploring in this class include

- How many ways are there to choose a valid password on a computer system?
- What is the probability of winning a lottery?
- What is the shortest path between two cities using a transportation system?
- How many valid Internet addresses are there?
- How does a computer add two numbers?
- How do you write a mathematical proof of a valid statement?

This course will be using a Project Based Learning (PBL) model to help you learn the course material in a fun and more effective way. We will have one big project that you will work in groups of three that will be broken up into three parts to be completed at various times during the semester. The parts of the bigger project are directly related to the group activity you will work during every class. The main focus of the project is to help you solve real-world problem using the course content learnt in class. You will be presenting all your works on your project by creating your own e-portfolio.

What is Project-Based Learning?

Project-based learning hails from a tradition of pedagogy, which asserts that students learn best by experiencing and solving real-world problems. According to researchers project-based learning essentially involves the following:

- Students learning knowledge to tackle **realistic problems** as they would be solved in the real world.
- Increased **student control** over his or her learning.
- Teachers serving as **coaches and facilitators** of inquiry and reflection.
- Students working in **pairs or groups.**

Teacher will create real-world problem-solving situations by designing questions and tasks that correspond to *project-based learning*, which involves a complex task and some form of student presentation, in our case an e-portfolio.
These inquiry-based teaching methods engage students in creating, questioning, and revising knowledge, while developing their skills in critical thinking, collaboration, communication, reasoning, synthesis, and resilience.

Project based Learning outcomes:

- Increase long-term retention of content.
- Improve problem-solving and collaboration skills.
- Improve students' attitudes towards learning mathematics.

Outcome	How to meet the outcome?	How to assess the outcome?
Increase long-term retention of content.	The different parts of the project will make you use the course content in various different ways at different times to help with retention.	On quizzes, exams and e-portfolio by giving problems based on same content at various times.
Improve problem-solving and collaboration skills.	By solving application problems on your class activities and group project	Problem solving is assessed on quizzes and exams and collaboration skill is assessed on the group project.
Improve students' attitudes towards learning mathematics.	By doing real life application problems on your project and by working in class activities in class	Use in-class surveys throughout the semester to assess this.

Course Learning Outcomes

This course meets two major outcomes for two different majors.
1) Major Learning Outcome # 1: Mathematics Content for mathematics major
- Students perform operations on sets and use basic mathematical logic.
- Students represent and solve both theoretical and applied problems using such techniques as graph theory, matrices, sequences, difference equations and Combinatorics.

2) Core Outcome 4: Mathematics for Computing for CSIT major
- Use mathematical concepts and constructs to express ideas and solve problems in Computer science, and to communicate quantitative information.
- Use mathematical ideas to solve problems in Computer Science and Information Technology.
- Use mathematical thinking and models, charts, graphs, tables, figures, equations, and appropriate technologies to express ideas and concepts.
- Demonstrate an understanding of discrete mathematical concepts used in computing: Articulate and apply the concepts of binary numbers, combinatorics, logic, truth tables, graph theory and algorithms to problems in Computer Science and Information Technology.
- Analyze and evaluate the mathematical thinking and strategies of others.

Keeping the two major outcomes we developed the following course learning outcomes for the course. At the completion of Math 170, successful students will be able to do the following:

- Answer the question: "What is Discrete Mathematics and where does it arise in the real world?"
- Demonstrate an understanding of logical connectives and the rules of logic
- Understand and perform set operations.
- Have the ability to use direct and indirect argument to derive new results from those already known to be true.
- Demonstrate an understanding of counting principles
- Understand and perform discrete probability.
- Demonstrate an understanding of graphs and trees
- Correctly apply Logic and Boolean Algebra to design logical networks.
- Understand and use applications of discrete structures in natural sciences and computer science
- Confidently approach a mathematical problem never seen before.
- Cultivate an enjoyment of mathematics and the problem solving process.
- Develop the ability to think abstractly about a mathematical problem.
- Learn to work on group projects successfully and develop skills to be a good team player.
- Learn to solve and put together small pieces of a bigger problem to solve the big problem.

Outcome	How to meet the outcome?	How to assess the outcome?
MLO 1 for Math: Mathematics content	The course content is designed to meet all the mathematics content needed for this MLO. Reading the text, attending lecture regularly, by working on class activity, doing homework problems will help to meet the outcomes.	The knowledge of the content is assessed continuously on weekly quizzes, three exams and the e-portfolio for project work.
Core Outcome 4: Mathematics for Computing	The course content is designed to incorporate the mathematical content and application to computing by doing application problems in class, on tests and particularly on the group project. Reading the text, attending lecture regularly, by working on class activity, doing homework problems will help to meet the outcomes	The knowledge of the content is assessed continuously on weekly quizzes, three exams and the application to computing is assessed on the group project and the e-portfolio.

Assessments

A typical day in class will encompass both lecture and group activities. Assessment for this class depends on the following components.

Homework (0%) You will be given written homework assignments, which will not be collected for a grade. However, you will be expected to be able to do problems similar to the assigned homework problems on the weekly quizzes described below.

Quizzes (20%) Quizzes will be given once a week. The questions will be similar to the week's homework and activities. You are allowed to **miss two quizzes** throughout the semester.

Project and e-portfolio (20%) There will be a major group project in this course, which will consist of multiple elements. This project will require teamwork and group thinking. In our modern world, employers are expecting job seekers to be skilled in both independent work as well as group work. The big project will be divided into three small parts. Your will be working in a group of three. The due dates for each part are listed on the weekly schedule and also on course ilearn page. You will create your own e-portfolio and present your project work on it. More details and resources to create your e-portfolio and what to include in it will be provided to you.

Exams (60%) Two Midterms (20% each) and a **cumulative** final (20%) will be administered throughout the semester. Midterm 1 will be on Thursday of 5th week, Midterm 2 will be on the Thursday of 10th week and Final Exam will be on Tuesday of the assessment week. There will be no make up exam, so if you have a conflict let me know as soon as possible.

Extra credits: If you do the class activities for the previous week and submit it with the current week's quiz you can get up to 2% extra credit points for your final grade. To receive the extra credits you must complete the activities correctly.

Weighting for class grades are the following:

Quiz	20%
Project	20%
Midterm 1	20%
Midterm 2	20%
Final Exam	20%
Total	100%

Grading

Grades for Math 170 are awarded as follows:

Grade	A+	A	A-	B+	B	B-	C+	C	D	F
%	97-100	93-96	90-92	86-89	82-85	79-81	75-78	70-74	60-69	0-59

Note: The instructor reserves the right to adjust these percentages.

Credits and Time expectations

Although this class will require a lot of hard work, your efforts will be rewarded. The course is a **four-unit course**. As such, there are four hours of class time per week, and a rule-of-thumb expectation of **two additional hours** of work outside of class for each hour in class, or **a total of eight hours of work outside class per week,** averaged over the semester. This means that you should plan on spending about 8 hours a week outside of class on homework, reading your textbook, and thinking about the material from class. I will try to stay well within this rule-of-thumb expectation, but individuals vary; some people may spend significantly less time, others more, and the time required to meet expectations will vary from week to week.

Class polices

Attendance and Participation: Students must attend all classes. Absences from class will inhibit your ability to fully participate in class discussions and problem solving session and therefore, affect your grade. Tardiness to class is very disruptive to the instructor and fellow students and will not be tolerated.

Students need to treat each other and their professor with respect at all times. Disruptive behavior will not be tolerated. If anyone needs to leave class early you must let the instructor know before the class starts.

Cellular Phones, beepers, iPods (all electronic devices) must be switched off during all class times and put away inside your pocket or backpack. No earphones are allowed.

Makeup Exam Policy: There will be no makeup quizzes and exams, except in rare situations where the student has a legitimate reason for missing the exam, including illness, death in the family, accident, requirement to appear in court, etc.

Academic Integrity:

Plagiarism and cheating are serious offenses and may be punished by a warning, administrative probation, suspension, and expulsion from CSUMB. Additionally, the student is subject to any academic penalty imposed by their instructor, for example, a failing grade in the class, or a failing grade on the assigned work. Cheating is an act of obtaining, or attempting to obtain, credit for academic work through the use of a dishonest, deceptive, or fraudulent means. Cheating includes but is not limited to the following.

- Copying, in part or in whole, from another's test or other assessment instrument.
- Submitting work previously presented in another course, if contrary to the rules of either course.
- Using or consulting during an examination, sources or materials not authorized by the instructor.
- Altering or interfering with grading or grading instructions.
- Sitting for an examination by a surrogate, or as a surrogate.

- Any other act committed by a student in the course of his or her academic work, which defrauds or misrepresents, including aiding or abetting in any of the actions defined above.

Plagiarism is the act of representing the work of another as one's own (without giving appropriate credit) regardless of how that work was obtained, and submitting it to fulfill academic requirements. Plagiarism, includes but is not limited to: the act of incorporating the ideas, works, sentences, paragraphs, or parts thereof, or the specific substance of another's work, without giving appropriate credit, and representing the product as one's own work; and representing another's artistic/scholarly works such as musical compositions, computer programs, photographs, paintings, drawings, sculptures, or similar works as one's own.
For more information contact the Judicial Affairs Office, Bldg. 80, room 56. Phone: (831) 582-4597.

Resources for Extra Help outside of class

ASAP: One-on-one drop-in and appointment tutoring is available at the Academic Skills and Achievement Program (ASAP) in the library. Students can make appointments in the following ways:
Online: http://csumb.mywconline.com/
By Phone: 831-582-4104
By Email: asap@csumb.edu

ASAP's hours are Monday-Thursday: 10am-8pm at ASAP in the library. Our tutor for the course is Kevin Kullback. Find out his hours at ASAP.

Open Lab: Monday-Thursday: 6pm-8pm at ASAP in the Library.

My Office hours: Visit my office hours as frequently as you can.

Special Needs

Students with disabilities who may need accommodations please see me by **February 3rd, 2014** during office hours, or make an appointment by email: ldeka@csumb.edu. Also, contact the Student Disability Resources (SDR) at CSU Monterey Bay. The contact information is listed below.
Building 47, Student Services, First Floor
Email: student_disability_resources@csumb.edu
Phone: (831) 582-3672 voice, 582-4024 fax/TTY
Website: http://sdr.csumb.edu/

Important Dates:

January 21 ~ First day of instruction
February 3 ~ Last day to add/drop classes
February 20 ~ Midterm 1
March 17-21 ~ Spring break
March 27 ~ Midterm 2
March 31 ~ César Chávez Day ~ Campus closed
May 9 ~ Last day of instruction
May 13 ~ Final Exam

Check your grades online

All class announcements, activities, Homework assignments, quiz keys and your grade-book will be posted every week online at ***http://ilearn.csumb.edu***. It is your responsibility to make sure all your grades are up on *ilearn*. Quiz grades will take a week to appear on your account.