



MATH 112 Discrete Structures

SEMESTER (Spring 2016)

PROFESSOR/CLASS INFORMATION

Dr. Shieu-Hong Lin

Course Title: Discrete Structures

Term: Spring, 2016

Location: Rood 58

Office Phone: 562 903-4741

Office Hours: M-Th 8:30-10:30am,
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Class Website: <http://csci.biola.edu/math112/>

Course Code/#: MATH 112

Class Days/Time: T Th 10:30-11:45am

Credit Hours/Units: 3

Office Location: Grove 8

Meetings with Professor: Make Appt via Email

Admin Assistant: Jerriane Smith, x4741

Dept. Website: <http://csci.biola.edu>

COURSE DESCRIPTION

Elementary properties of sets, discrete probability and combinatorial analysis, graphs, relations, orderings, functions, simple algebraic structures, binary arithmetic and other bases, methods of proof. Offered every year

COURSE OBJECTIVES AND STUDENT LEARNING OUTCOMES

By the completion of this course including class participation, class assignments (referred to as "Tasks"), class readings and group interaction, the following objectives and learning outcomes will be assessed and demonstrated:

IDEA Objective #4: Developing specific skills, competencies, and points of view needed by professionals in the field most closely related to this course (Essential emphasis).

STUDENT LEARNING OUTCOMES (The learner will demonstrate that he or she has satisfactorily fulfilled IDEA Objective #4 by being able to):

- Describe the nature and applications of fundamental discrete mathematical structures such as propositional logic, predicate logic, sets, relations, and graphs in different domains.
- Cultivate basic proof skills to prove properties of discrete structures and to apply counting techniques to examine discrete structures.

- Apply basic skills of mathematical modeling using the fundamental discrete structures and use them in analysis and problem solving.

REQUIRED TEXTS

- Kenneth Rosen, *Discrete Mathematics and Its Applications*, 7th Ed., McGraw Hill, 2011.

LEARNING TASKS (Assignments) & ASSESSMENT (Grading)

Description and Weighting of Assignments:

Task 1: Weekly Reading Report

Due Date: Tuesday of the week (**14 assignments**)

Weighting: 14%

Possible Points: 4 points for each assignment.

Description:

For each reading assignment, the student needs to finish the reading on time and submit the following information online as a report.

Effort (2 points):

Record the information such as (i) a **numerical** amount of time he/she spent for the reading, (ii) a **numerical percentage** regarding the percentage of stuff in the reading actually read and understood, and (iii) whether the student has come to the class this week.

Reflection on the reading (2 points):

The student need to put down 1 to 2 paragraphs of his/her thoughts about the reading such as new insight you gained, interesting things encountered, questions of things you don't understand, and so forth.

Assessment:

For the effort part,

the student is expected to **(i)** have attended the class this week at least once (0.5 point), and **(ii)** **have either** gained a good understanding of 80% or more of the contents **or** have spent at least three hours in the reading (1.5 points).

For the reflection part,

the student is expected to show substantial evidence of understanding or effort of trying to understand the contents in the reading.

Task 2: Weekly Homework Assignment (9 assignments)

Due Date: Monday of the week

Weighting: 36%

Possible Points: 6 points each.

Description: There will be about 9 homework assignments, which form the backbone of the course. They require the student to apply the concepts of fundamental discrete structures learned in the class. **You should write down the problem solving steps and the answers on paper and bring them to Dr. Lin in person or leave them in his mailbox by the due date.**

Integrity rules for homework assignment:

- **Peer discussion is encouraged:** Peer discussion is encouraged to cultivate an open learning environment in the class, but you should carefully read the guidelines below to avoid any dishonest behavior and never step over the guidelines explicitly described in the following.
- **Never copy the work done by others:** Any copy-and-paste of work done by others is viewed as cheating and you will get 0 points for the assignment.
- **Never pass your finished work to others:** Peer discussion of the homework and working together using the board or on paper is acceptable for the problem solving purpose and for the explanation of ideas. But you should never pass around your finished work (electronically or on the board or on paper) to others except for the TA and the instructor. Violating this rule is viewed as cheating in the class and the provider will receive 0 points for the assignment.
- **Demonstrate the credibility of your authorship of the work:** When you submit your own work for points, you should make sure that you are able to explain your work and reconstruct the work from scratch without any outside help when requested. If you are not able to do that on your own when requested, you will get 0 points for the assignment and there will be an investigation.
- **Consequence of cheating in the class:** Cheatings end in 0 points for the assignments followed by discipline actions described in the student handbook.

Assessment: We'll grade each problem based on the following general guidelines.

If the problem solving steps, proofs, or explanation are required, but nothing is presented except for the final answer, no points given.

If the approach is generally correct but there are mistakes in the problem solving steps, proofs, or explanation that are required,

- deduce 25% of the points for each minor mistake and
- deduce 75% of the points for each major mistake.

Task 3: Exams (Tests)

Weighting: 50%

Description: We plan to have a test every 2-3 weeks after a major subject area is explored.

Late policy

- **Penalty for late submission within 2 days after the due date:**
You should write down the problem solving steps and the answers on paper and bring them to Dr. Lin in person or leave them in his mailbox by the due date. You will get a deduction of 20% of total points for being late if they are submitted within 2 days of the due date.
- **No submission accepted more than 2 days after the submission due date:** No submission will be accepted more than 2 days after the submission due date, except for extremely exceptional situations such as a serious disabling health problem with evidence from the doctors.

Computation of Final Grade:

Weekly Progress Report	14 %
Weekly Homework Assignments	36%
Exams	50 %
Total	100%

Final grades will be awarded on the following point system:

A	93%
A-	90%
B+	87%
B	84%
B-	80%
C+	77%
C	74%
C-	70%
D+	67%
D	64%
D-	60% to pass class

GENERAL INFORMATION

1. The GPA System used by the University Registrar's Office is:

A = 4.0	B = 3.0	C = 2.0	D = 1.0
A- = 3.66	B- = 2.66	C- = 1.66	D- = 0.66
B+ = 3.33	C+ = 2.33	D+ = 1.33	F = 0.0

Tentative Schedule

Weeks 1-2	Propositional Logic	Chapter 1
Weeks 3-4	Predicate Logic	Chapter 1
Weeks 5-6	Basics of Proof Techniques	Chapter 1
Weeks 7-8	Sets	Chapter 2
Weeks 9-10	Induction and Recursion	Chapter 5
Weeks 11-12	Counting principles	Chapters 6, 8
Weeks 13-14	Probability	Chapters 6, 8
Weeks 14-15	Relation & Graphs	Chapters 9,10
