



DAVIS UNIVERSITY

## COURSE SYLLABUS

### MTH105: INTRODUCTION TO DISCRETE MATHEMATICS

**COURSE SYLLABUS FOR:** MTH105 INTRODUCTION TO DISCRETE MATHEMATICS

**CREDIT HOURS:** 5 CREDITS

**INSTRUCTOR:**

**INSTRUCTOR EMAIL:**

**INSTRUCTOR OFFICE HOURS:**

**COURSE DESCRIPTION:** Introduction to the foundations of discrete mathematics, including functions, relations, sets, simple proof techniques, Boolean algebra, fundamentals of logic, partial orders, elementary number theory and the fundamentals of counting etc.

**TEXT:** *Discrete Mathematics with Applications*, 5ed, Susanna S. Epp, ISBN: 978-1-337-69419-3

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- Paraphrase the original so that many of the phrases are the same as the original. A good rule is no more than 3 or 4 words in a row should be the same as the original.
- Copy the original sentence pattern, substitution synonyms for key words.
- Neglect to indicate the source of the original material.

## ASSESSMENTS:

### Content

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Final Exam	28%
Midterm Exam	20%
Homework Assignments (20 total)	20%
Module Quizzes (8 total)	32%
Total	100%

## COURSE GRADE:

Letter Grade	Range	GPA
A+	97–100	4.0
A	93–96	4.0
A–	90–92	3.7
B+	87–89	3.3
B	83–86	3.0
B–	80–82	2.7
C+	77–79	2.3
C	73–76	2.0
C–	70–72	1.7
D+	67–69	1.3
D	63–66	1.0
D–	60–62	0.7
F	Below 60	0.0

## TENTATIVE COURSE OUTLINE:

(Subject to change)

Modules/Units	Content Covered	Assignments
<b>Module 1</b>	<b>Logic and Logical Reasoning</b> Propositional logic and logical equivalence Predicates and quantifiers ● <u>Text Sections:</u> 2.1, 2.2, 3.1, 3.2	Homework 1&2 Quiz 1
<b>Module 2</b>	<b>Proof Techniques and Induction</b> Methods of proof Properties of the integers Mathematical induction (weak and strong) ● <u>Text Sections:</u> 4.1, 4.3, 5.2	Homework 3&4 Quiz 2
<b>Module 3</b>	<b>Recursion and Recurrence Relations</b> Recursive definitions Recurrence relations Applications to counting and algorithms ● <u>Text Sections:</u> 5.6	Homework 5 Quiz 3
<b>Module 4</b>	<b>Sets, Functions, and Discrete Structures</b> Set theory and set operations Cartesian products Functions and function notation One-to-one and onto functions ● <u>Text Sections:</u> 6.1, 7.1, 7.2	Homework 6-8 Quiz 4
<b>Module 5</b>	<b>Relations and Modular Arithmetic</b> Relations and their properties Equivalence relations and partial orders Modular arithmetic and introductory rings ● <u>Text Sections:</u> 8.1, 8.2, 8.3, 8.4	Homework 9-11 Quiz 5 Midterm Exam
<b>Module 6</b>	<b>Counting Techniques</b> Fundamental principles of counting Permutations and combinations Principle of inclusion and exclusion ● <u>Text Sections:</u> 9.1, 9.2, 9.3	Homework 12-14 Quiz 6

<p><b>Module 7</b></p>	<p><b>Graph Theory and Trees</b></p> <p>Graph terminology and representations Paths, cycles, and connectivity Trees and spanning trees</p> <ul style="list-style-type: none"> <li>● <u>Text Sections:</u> 10.1, 10.2, 10.4, 10.5</li> </ul>	<p>Homework15-18 Quiz 7</p>
<p><b>Module 8</b></p>	<p><b>Optimization, Logic Systems, and Computation</b></p> <p>Optimization and matching Boolean algebra and switching functions Languages and finite state machines Generating functions</p> <ul style="list-style-type: none"> <li>● <u>Text Sections:</u> 10.6, 6.4, 12.1, 12.2</li> </ul>	<p>Homework19-20 Final Exam</p>