Instructor Information:
OFFICE HOURS : Tuesdays: 8:20AM-11:50AM, Thursdays 8:20AM-10:20AM
OFFICE LOCATION: CMS 124

Text: *Discrete Mathematics and its applications*, **7th Edition**, by Kenneth Rosen, McGraw Hill
Supplementary/Recommended Text: *How to Prove it: A Structured Approach,* by Daniel Velleman

Important Dates:

Last day to add a class with an Add Permission Code:	February 23
Last day to drop without receiving a "W" (By Internet Only):	February 23*
Last day to drop with a "W" (By Internet Only):	May 10
Final Exam:	**June 8, 7:30 am - 9:30 am**

Catalog Description: Introduction to sets, relations, functions and logic along with formal methods of proof such as contradiction, contrapositive, induction, diagonalization, recursion, and the Pigeonhole principle. These ideas and methods are developed by looking at problems from combinatorics and counting, elementary number theory, and graph theory. Topics from map coloring, complexity, and cryptography are also discussed.

Prerequisite: Math 266, and CSIT 440 or 452, or appropriate skill level demonstrated through the assessment process, or by permit

Course Content:

- Logic and Proofs
- Sets, Functions
- Algorithms, the Integers
- Induction and Recursion
- Counting
- Discrete Probability
- Advanced Counting Techniques
- Relations
- Graphs
- Trees
- Boolean Algebra
- Basic Algorithms and their Implementation

Student Learning Outcomes: The student will be able to:

1. Construct and verify mathematical arguments using logical connectives and quantifiers.

2. Demonstrate the ability to solve problems using counting techniques and combinatorics in the context of discrete probability.

3. Perform operations on discrete structures such as sets, functions, relations, and sequences.

4. Construct proofs using direct proof, proof by contraposition, proof by contradiction, proof by cases, and mathematical induction.

Attendance: Regular attendance is expected and required. If you miss more than 2 class meetings, you may be administratively withdrawn from the course without prior notice or refund. See Attendance and Grading Procedures in the Student Handbook or in the Catalog for the official college policy.

Homework: Regular homework is assigned each week. It will be collected, checked, and a select number of problems will be graded based on a 5 point scale. Homework is a very important component of the course.

Exams: There will be three exams and cumulative final exam given during the course. No make-up exams will be given. A missed exam results in a grade of zero. The exams are closed book, closed notes. You may use your scientific calculator. No graphing calculators will be allowed**.** The final exam will cover the whole course.

Projects: Each student must complete a project which involves exploration of a topic, and solving a series of problems. They may choose from one of the following topics. More information/details will be provided online.

- Algorithm Complexity
- Complexity & Logic: Exploration of First Order Logic
- The Euler Project Puzzles
- Uncountable Sets
- Cantor-Schroder-Bernstein Theorem
- Number Theory: Proof of Fermat's Little Theorem
- Number Theory: Euclidean Algorithm, Theorem of Bézout
- Mathematical Induction: Proofs involving the Fibonacci Numbers
- Combinatorics: Combinatorial Proofs

Make-up exams policy: If you missed an exam, the make-up exam is not automatic. It is up to your professor's discretion. You are requested to contact your professor the day of the exam and provide documentation (a physician's note, court document, bereavement notice, accident report or other authoritative proof of the need to be absent).

Evaluation and Final Grade:

Three Exams	30%
Quizzes	10%
Homework	20%
Project	10%
Final Exam	30%

Average score range	90 - 100	80 - 89	70 - 79	60 - 69	59 or less
Grade	A	B	C	D	F

Accommodations for DSPS students:

LAMC students with verified disabilities who are requesting academic accommodations should use the following procedure:

Step 1: Obtain documentation of your disability from a licensed professional. You may contact DSPS to request a Disability Verification Form.

Step 2: Make an appointment to meet with a DSPS Specialist to review your documentation and discuss reasonable accommodations. To schedule a meeting, please call DSPS at (818)364-7732.

Step 3: Bring your disability documentation to your DSPS appointment. The DSPS office is located in room 1018 of the Instructional Building.
Step 4: Each semester, reach written accommodation agreement with the DSPS Specialist and your instructor.

To be most effective, students should complete this process by the end of the 3rd week of the semester. Tests with required accommodations must be taken at the DSPS office.

Tutoring and Support:

- Topic -specific supports are available through (noncredit) Academic Preparation 027CE Statistics Skills and Preparation I and Academic Preparation 028CE Statistics Skills and Preparation II. Students are highly encouraged to attend these sessions for their successful completion of Math 227.
- Free math tutoring is available in the Math Center (http://lamission.edu/mathcenter/) located in CMS 121: Monday thru Thursday 11:00 am-7:00 pm and
  in the LRC Math Lab (http://www.lamission.edu/learningcenter/): Monday thru Thursday 9:00 am-6:00 pm and Friday 10:00 am-4:00 pm.

Tentative Weekly Schedule

Week 1	1.1: Propositional Logic 1.2 Applications of Propositional logic 1.3: Propositional Equivalences 1.4: Predicates and Quantifiers
Week 2	1.5: Nested Quantifiers 1.6: Rules of Inference 1.7: Introduction to Proofs 1.8: Proof Methods
Week 3	2.1: Sets 2.2: Set operations 2.3 Functions 2.5 Cardinality of Sets
Week 4	3.1. Algorithms 3.2: The Growth of Functions 4.1: Divisibility and Modular Arithmetic 4.2: Integer Representations and Algorithms
Week 5	4.3: Primes and Greatest Common Divisors 4.4: Solving Congruences **TEST 1** : Chapters 1 – 4.2
Week 6	5.1: Mathematical Induction 5.2: Strong Induction and Well-Ordering 5.3: Recursive Definitions and Structural Induction 5.4: Recursive Algorithms
Week 7	6.1: The Basics of Counting 6.2: The Pigeonhole Principle 6.3: Permutations and Combinations 6.4: Binomial Coefficients and Identities

Week 8	6.5: Generalized Permutations and Combinations 7.1: An introduction to Discrete Probability 7.2: Probability Theory 7.3: Bayes' Theorem
Week 9	Spring Break
Week 10	8.1: Applications Recurrence Relations 8.2: Solving Linear Recurrence Relations 8.3: Divide-and-Conquer Algorithms and Recurrence Relations 8.4: Generating Functions
Week 11	8.5: Inclusion-Exclusion 8.6: Applications of Inclusion-Exclusion 9.1: Relations and Their Properties 9.2: n-ary Relations and their Applications
Week 12	9.3: Representing Relations 9.4: Closures of Relations 9.5: Equivalence Relations **TEST 2: Chapters 4.3 - 8**
Week 13	9.6: Partial Orderings 10.1: Graphs and Graph Models 10.2: Graph Terminology and Special Types of Graphs 10.3: Representing Graphs and Graph Isomorphism
Week 14	10.4: Connectivity 10.5: Euler and Hamilton Paths 10.6: Shortest-Path Problem 10.7-8 Planar Graphs and Graph Coloring
Week 15	11.1: Introduction to Trees 11.2: Application of Trees 11.3: Tree Traversal 11.4: Spanning Trees **TEST 3: Chapters 9 - 10**
Week 16	11.5: Minimum Spanning Trees 12.1: Boolean Functions 12.2: Representing Boolean Functions 12.3: Logic Gates
Week 17	**In Class Cumulative Final Exam**