



STARK STATE COLLEGE

GENERAL SYLLABUS

Course Information

Course Name: Discrete Mathematics
Course Number: MTH214

Required Materials

Textbook(s): Free online textbook: <https://discrete.openmathbooks.org/dmoi4/frontmatter.html>
Required Readings: None
Additional Materials: None

Course Outline/Calendar

The date of coverage and order of coverage may be modified based on the faculty member and events beyond the control of faculty members that interfere with class times and teaching.

16 Week Calendar

Week	Chapter and Content	Course Objectives
1	Chapter 1 – Logic and Proofs 1.1 Mathematical Statements <ul style="list-style-type: none">Identify StatementsTranslate English Sentences into StatementsQuantifiers 1.2.1 Implications <ul style="list-style-type: none">Understanding Truth TablesRelated Statements and Connectives	1.1, 1.2
2	Chapter 1 – Logic and Proofs 1.3 Rules of Logic <ul style="list-style-type: none">Truth Tables for Compound StatementsLogical EquivalenceDe Morgan LawValidity of a Quantified Statement	1.3

3	Chapter 1 – Logic and Proofs 1.4 Proofs <ul style="list-style-type: none"> • Direct Proof Method • Identify Logical Errors and Disprove Statements • Introduction to Mathematical Induction • Other Methods of Proof 	1.4
4	Ch. 5: Discrete Structures Revisited 0.2.2 Introduction to sets 5.1 Sets <ul style="list-style-type: none"> • Relationships between Sets • Operations on Sets • Venn Diagrams 	5.1
5	Ch. 5: Discrete Structures Revisited 0.2.3 Introduction to Functions 5.2 Functions <ul style="list-style-type: none"> • Describing functions • Surjections, Injections and Bijections 	5.2
6	Ch. 4: Sequences 0.2.4 Introduction to Sequences 4.1 Describing Sequences <ul style="list-style-type: none"> • Sequences and Formulas • Partial Sums and Differences 4.2 Rate of Growth <ul style="list-style-type: none"> • Arithmetic Sequences • Geometric Sequences 	4.1, 4.2
7	Ch. 4: Sequences 4.5 Mathematical Induction	4.5
8	Ch. 3: Counting 3.2 Combining outcomes <ul style="list-style-type: none"> • The Sum and Product Principles • Combining Principles 3.3 Non disjoint outcomes	3.2, 3.3
9	Ch. 3: Counting 3.4 Combinations and Permutations <ul style="list-style-type: none"> • Counting Sequences • Counting Sets • The Quotient Principle 	3.4
10	Ch. 3: Counting 3.6 Combinatorial Proofs <ul style="list-style-type: none"> • Patterns in Pascal’s Triangle • Binomial Theorem 	3.6

11	Ch. 3: Counting 3.7 Applications to probability <ul style="list-style-type: none"> • Computing Probabilities • Probability Rules • Conditional Probability 	3.7
12	Ch. 6: Additional Topics 6.2 Introduction to Number Theory	6.2
13	Ch. 2: Graph Theory 0.2.5 Introductions to Relations 0.2.6 Introduction to Graphs 2.1 Problems and Definitions 2.2 Trees 2.4 Euler Trails and Circuits <ul style="list-style-type: none"> • Conditions for Euler trails • Hamilton Path 	2.1, 2.2, 2.4
14	Ch. 2: Graph Theory 2.6 Relations and Graphs <ul style="list-style-type: none"> • Properties of Relations • Equivalence Relations • Equivalence Classes and Partitions 	2.6
15	Review	
16	Final Exam	