

MATH 150: Introductory Discrete Mathematics
Fall 2016 **Section 001** **3 Credit Hours**

Instructor:	Tom Polaski	Course Time and Location:
Office:	Bancroft 152	MW 9:30-10:45 a.m., Owens 103
Office Phone:	803-323-4604	Office Hours:
Math Department Phone:	803-323-2175	M 2:00-3:30 p.m., WR 1:00-2:00 p.m.
Campus Email:	polaskit@winthrop.edu	TF 10:00-11:00 a.m.
		Other times may be arranged by appointment.

The instructor reserves the right to make modifications to the course syllabus. Students will be notified in class and by email. This syllabus is available at the instructor's website (<http://faculty.winthrop.edu/polaskit/>) and the course Blackboard site.

Text, Materials and Learning Aids

- Required Text: *Mathematics For Winthrop University*. Boston: Pearson Learning Solutions, 2014.
- A scientific calculator is required.
- Students are encouraged to use office hours as a way to receive extra help.
- A Blackboard review environment is available at <https://bb-winthrop.blackboard.com/> using your Winthrop login information.
- The Mathematics Tutorial Center (Bancroft 271) is available for students who need help with MATH150. Information is available at <http://www.winthrop.edu/mtc>.
- Winthrop's Academic Success Center is a free resource for all undergraduate students seeking to perform their best academically. The ASC offers a variety of personalized and structured resources that help students achieve academic excellence, such as tutoring, academic skill development (test taking strategies, time management counseling, and study techniques), and group/individual study spaces. The ASC is located on the first floor of Dinkins, Suite 106. Tutoring in MATH 150 is offered through the office. If you wish to request a tutor, you must attend ONE Tutee Seminar, offered every Friday until October 23rd. Please contact the ASC at [803-323-3929](tel:803-323-3929) or success@winthrop.edu if you have any questions. For more information on ASC services, please visit www.winthrop.edu/success.

Quizzes

From time to time during the course, you will be given quizzes to check on your progress at understanding the class material. These quizzes will consist of a few questions that resemble homework problems that you have been assigned. No make-up quizzes will be given. At the end of the course your quiz grades will be averaged and rescaled to a 100-point scale. The grading scales for the quizzes will also be averaged and rescaled.

Tests and Grading

Four 100-point tests will be given along with a 200-point final exam on the dates indicated on the course schedule. No make-up tests will be given unless prior arrangements have been made with the instructor. A point system will determine your final grade. There are 700 points possible: 400 from the tests, 200 from the final, and 100 from the quizzes. An approximate grading scale for each test will be determined after it is graded. The semester grading scale will be based on these approximate grading scales, the grading scale for the quizzes, and on the scale for the final exam. Pluses and minuses are awarded at the discretion of the instructor.

Equal Access to Education

Winthrop University is dedicated to providing access to education. If you have a disability and need specific accommodations to complete this course, please contact the Office of Accessibility (OA) at 323-3290 as early as possible in the semester. Once you have your official notice of accommodations from the Office of Accessibility, please inform your instructor.

Academic Integrity

Review the student code of conduct for university policies on academic misconduct. Academic misconduct will not be tolerated and will result in a failing grade on the assignment and/or in the course. The full handbook is available online at <http://www2.winthrop.edu/studentaffairs/handbook/StudentHandbook.pdf>.

Electronic Devices

All electronic devices (including cell phones) other than a calculator should be on silent and kept in your book bag or purse throughout class time unless otherwise instructed. NOTE: if you have some educational, health, or physical reason for an electronic device you must notify your instructor of this accommodation.

Attendance Policy

Attendance at all scheduled class meetings is strongly encouraged. Your number of absences will not be counted, and will not be used directly to determine your grade. However, attendance is mandatory for those class sessions that include a test. If no prior arrangements are made with the instructor, a zero will be recorded for a test not taken due to absence. Likewise a zero will be recorded for any quiz not taken due to absence. If you will not be in class, it is your responsibility to notify the instructor.

Course Goals

Students in this course will

- develop basic skills in set theory, logic, combinatorics, probability, and statistics;
- use concepts in set theory, logic, combinatorics, probability, and statistics to demonstrate reasoning through solving problems;
- use the notion of sets to analyze survey data and count responses of different types;
- analyze data using descriptive statistics;
- use formal logic to analyze complicated arguments carefully and discover whether they are valid; and
- use concepts within combinatorics and probability for the analysis of risk in various settings.

General Education Goals

The course meets the Quantitative Skills requirement in the General Education program, and addresses the following general education goals. For purposes of departmental and program assessment of student learning in this course, individual tests and course grades may be used as an indication of progress toward these goals.

- 2.1 Solve mathematical problems of the type necessary for living in today's and tomorrow's world.
- 2.2 Make valid inferences from data.
- 2.3 Understand that quantitative analysis is important to almost every endeavor of humankind.
- 2.4 Understand the concept and application of quantitative relationships.
- 3.1 Identify sound and unsound reasoning.
- 3.2 Analyze and use a variety of information gathering techniques.

University Level Competencies

This course addresses the following university-level competencies.

Competency 1: Winthrop graduates think critically and solve problems. Winthrop University graduates reason logically, evaluate and use evidence, and solve problems. They seek out and assess relevant information from multiple viewpoints to form well-reasoned conclusions. Winthrop graduates consider the full context and consequences of their decisions and continually reexamine their own critical thinking process, including the strengths and weaknesses of their arguments.

Competency 3: Winthrop graduates understand the interconnected nature of the world and the time in which they live. Winthrop University graduates comprehend the historical, social, and global contexts of their disciplines and their lives. They also recognize how their chosen area of study is inextricably linked to other fields. Winthrop graduates collaborate with members of diverse academic, professional, and cultural communities as informed and engaged citizens.

Tentative Course Schedule

Date		Section	Topic	Key Ideas
W	8/24	M 3.1	Statements and Quantifiers	<ul style="list-style-type: none"> Statements: Compound; Conditionals; Connections to symbolic notation; Connectives; Contrapositives; Converses; Disjunctions & conjunctions; Equivalence; Inverses; Negations; Qualifiers; Tautology Notation: $\wedge, \vee, \leftrightarrow, \sim, \rightarrow, \equiv$ DeMorgan's Laws Argument Analysis using Truth tables and Euler Diagrams
M	8/29	M 3.2	Truth Tables and Equivalent Statements	
W	8/31	M 3.3 & 3.4	The Conditional & More on the Conditional	
W	9/7	M 3.5	Analyzing Arguments with Euler Diagrams	
M	9/12	M 3.6	Analyzing Arguments with Truth Tables	
W	9/14		Review	
M	9/19		Test 1	
W	9/21	8.1	Sets	<ul style="list-style-type: none"> Sets: notation, elements, subsets, complements, unions, intersections Venn Diagrams: construct diagrams, solve word problems, apply addition rule for counting Probability: definition of probability, sample spaces, events, addition rule, complement rule, odds, relative frequencies, product rule, dependence, independence, conditional probability
M	9/26	8.2	Applications of Venn Diagrams	
W	9/28	8.3	Introduction to Probability	
M	10/3	8.4	Basic Concepts of Probability	
W	10/5	8.5	Conditional Probability / Independent Events	
M	10/10	8.6	Bayes Formula	
W	10/12		Review	
W	10/19		Test 2	
M	10/24	9.1	Probability Distributions and Expected Value	<ul style="list-style-type: none"> Probability: weighted averages using probability distributions, random variables, histograms Counting: advanced counting problems, application to computation of probabilities, probability associated with binomial distributions, Bernoulli trials, expected value
W	10/26	9.2	Multiplication Principle, Permutations, Combinations	
M	10/31	9.3	Applications of Counting	
W	11/2	9.4	Binomial Probability	
M	11/7		Review	
W	11/9		Test 3	
M	11/14	10.1	Distributions	<ul style="list-style-type: none"> histogram, frequency polygon, stem-and-leaf plots, mean, median, mode, range, variance, standard deviation, continuous distributions, skew, normal curves, area, z-scores, quartiles relationship between normal and binomial distributions
W	11/16	10.2	Measures of Central Tendency	
M	11/21	10.3	Measures of Variation	
M	11/28	10.4	Normal Distributions and Boxplots	
W	11/30		Review	
M	12/5		Test 4	

Drop/Add: Through F 8/26
Fall Break: F 10/14 and M 10/17

SU and Course Withdraw Date: F 10/21
Final Exam: M 12/12 11:30 a.m.

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Suggested Homework Problems

Text: *Mathematics for Winthrop University*, Boston: Pearson Learning Solutions, 2014
 or *Mathematics with Applications and Logic, Custom Edition for Winthrop University*, Boston: Pearson Learning Solutions, 2014.

Section	Homework
M 3.1	23, 25, 27, 29, 31, 33, 35, 49, 51, 53, 55, 57, 59, 61, 63, 75
M 3.2	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71
M 3.3	11, 13, 15, 17, 19, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 81, 83, 85, 87, 89
M 3.4	1, 3, 5, 7, 9, 19, 21, 23, 25, 27, 29, 31, 33, 41
M 3.5	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 25, 27, 29
M 3.6	13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37
Chapter 3 Test	1, 3, 5, 7, 9, 11, 13, 15, 17, 25, 27, 29
8.1	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 51, 53, 55, 57, 59, 61, 63, 65, 67
8.2	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 31, 33, 35, 37, 39, 41, 43
8.3	3, 5, 7, 9, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39
8.4	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 43, 45, 47, 49, 51, 53, 55, 57, 59
8.5	1, 3, 5, 15, 17, 19, 21, 23, 25, 27, 29, 31, 43, 45, 47, 49, 51, 53, 55, 57, 61
8.6	7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33
Chapter 8 Review	1, 3, 5, 7, 11, 13, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 59, 61, 63, 65, 67, 69, 71, 73, 79, 81, 85, 87, 89
9.1	1, 5, 9, 11, 13, 15, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 45
9.2	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 25, 27, 29, 31, 33, 39, 41, 43, 45, 47, 49, 53, 55, 57, 59, 63
9.3	1, 3, 5, 7, 9, 11, 25, 27, 29, 31, 33, 35, 37
9.4	1, 3, 5, 7, 9, 11, 13, 15, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41
Chapter 9 Review	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 27, 29, 33, 35, 37
10.1	1, 3, 5, 7, 9, 11, 13, 15, 17, 19
10.2	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 23, 25, 27, 29, 31
10.3	3, 5, 7, 9, 11, 13, 23, 25, 27, 29, 35, 36, 37
10.4	5, 7, 9, 11, 13, 15, 17, 19, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 57, 59
Chapter 10 Review	1, 3, 5, 7, 11, 13, 21, 23, 25, 29, 31, 39, 41, 43, 51, 53