Massasoit Community College

Instructor:
Office:
Email:
Phone:
Office Hours:

Course: Topics in Mathematics I
Course Number: MATH152-XX
Semester:
Classroom:
Day and Time:

Course Description: This course is provided for students who wish to know what mathematics is about but who do not wish to be mathematicians. Topics are elementary logic, set theory, probability, and statistics. Prerequisite: D- or higher in MATH003 Preparation for College Math III or MATH012 Intermediate Algebra or a score of 72 or higher on mathematics placement testing results; or departmental approval.

Required Text and Materials:

1. *A Survey of Mathematics with Applications*, 10th Edition, Angel, Abbott, and Runde, Pearson Education, 2017
2. You will need a calculator for this course. A scientific calculator, such as the TI30X-IIS should be able to handle all of the calculations needed for the course. A graphing calculator, such as the TI-84 Plus should work as well. You may not use any other technologies such as a cell phone, iPod, tablet, laptop, etc. as a calculator on assessments.
3. You will be completing homework online using MyMathLab (www.mymathlab.com). You will have to purchase access to our course on MML to do this. There are two ways of doing so. You can obtain access to the online homework by either:
    a. Buying a new version of the textbook from the bookstore. New versions of the textbook from the bookstore come with an access code which will allow you to enroll in our course on MML. If you are buying a hardcopy of the textbook, DO NOT buy a used copy or a new or used copy from outside sources (such as Amazon). Used textbooks or textbooks purchased through Amazon (or elsewhere) are not guaranteed to come with a working access code for MML. Or:
    b. Purchasing access directly on www.mymathlab.com. This comes with an electronic version of the textbook as well (no hardcopy). This option should be slightly cheaper than option 1.

    The MyMathLab Course ID for this course is:

Homework can provide a significant boost to your final grade, and will serve as an important means of extra credit/learning the material in the course. If you are waiting on financial aid, you have the option to enroll in our MML section using temporary access. Temporary access gives you full access to the course for approximately 14 days. You must purchase access to the course using one of the two methods above within this time. If you do not pay for access within this time, you will be automatically removed from MML until you do.

Course Topics:

Chapter 2: Sets
- 2.1 Set Concepts
- 2.2 Subsets
- 2.3 Venn Diagrams and Set Operations
- 2.4 Venn Diagrams with Three Sets and Verification of Equality of Sets
- 2.5 Applications of Sets
- 2.6 Infinite Sets

Chapter 3: Logic
- 3.1 Statements and Logical Connectives
- 3.2 Truth Tables for Negation, Conjunction, and Disjunction
- 3.3 Truth Tables for the Conditional and Biconditional
- 3.4 Equivalent Statements
- 3.5 Symbolic Arguments

Chapter 11: Probability
- 11.1 Empirical and Theoretical Probabilities
- 11.2 Odds
- 11.3 Expected Value (Expectation)
- 11.4 Tree Diagrams
- 11.5 OR and AND Problems
- 11.6 Conditional Probability
- 11.7 The Counting Principle and Permutations
- 11.8 Combinations
- 11.9 Solving Probability Problems by Using Combinations
- 11.10 Binomial Probability Formula

Chapter 12: Statistics
- 12.1 Sampling Techniques and Misuses of Statistics
- 12.2 Frequency Distributions and Statistical Graphs
- 12.3 Measures of Central Tendency
- 12.4 Measures of Dispersion
- 12.5 The Normal Curve
- 12.6 Linear Correlation and Regression

Teaching Procedures: New material will be discussed in lecture/discussion format with student interaction expected throughout each class. Problem solving skills will be reinforced through the use of in-class problem sets.

Instructional Objectives:

COURSE OUTCOMES	**OUTCOMES ACTIVITIES**
Upon completion of this course, students will be able to:	
Demonstrate an understanding of the language and basic definitions of set theory in order to apply them to solve related problems involving set operations.	1. Use set notation. (W,CT,R) 2. Indicate a set using description, roster, and set-builder notation. (W,CT,R) 3. Distinguish between 'is an element of' and 'is a subset of.' (CT,QS) 4. Identify the empty set. (CT,QS) 5. Identify the universal set for a given problem. (CT,QS,R) 6. Distinguish between subset and proper subset. (CT,R) 7. Determine the number of distinct subsets of a set. (CT,R,QS)
Solve problems using basic set operations and Venn diagrams to develop the skills needed to solve related problems in this and other courses.	1. Determine the complement, union, and intersection of sets. (W,CT,R) 2. Determine if two sets are equal, equivalent, or both. (W,CT,R) 3. Construct Venn diagrams representing set operations. (CT,R) 4. Solve survey problems using Venn diagrams. (CT,R,QS)
Use symbolic logic in order to write simple and compound statements.	1. Identify a compound statement as a negation, conjunction, disjunction, conditional, or biconditional. (R,CT,W) 2. Translate statements from symbolic logic to English and from English to symbolic logic. (R,CT,W) 3. Use DeMorgan's Laws. (R,CT,W) 4. Write the converse, inverse, and contrapositive of a statement. (R,CT,W) 5. Translate arguments into symbolic form. (R,CT,W) 6. Write the negation of statements involving all, some, some … not, and none. (CT,R,W)

Construct truth tables in order to use them to solve related problems	1. Determine the basic truth tables for negation, conjunction, disjunction, conditional, and biconditional. (R,CT) 2. Construct truth tables for compound statements. (R,CT) 3. Use truth tables to determine if compound statements are equivalent. (R,CT) 4. Determine the truth value of a compound statement. (R,CT) 5. Use truth tables and comparison to standard forms to determine the validity of an argument. (R,CT,W)
Use the basic counting rules in order to solve problems in probability.	1. Use formulas for factorial, permutations, and combinations. (CT,QS,R,TS) 2. Apply the Fundamental Counting Principle. (CT,QS,R,TS) 3. Determine whether a problem should be solved using the Fundamental Counting Principle, permutations, or combinations. (CT,QS,R,TS) 4. Solve problems involving the Fundamental Counting Principle, permutations, and combinations. (CT,QS,R,TS)
Use the rules of basic probability in order to solve related applications problems.	1. Apply the basic concepts of probability including the addition and multiplication rules. (CT,QS,R,TS) 2. Find conditional probabilities. (CT,QS,R,TS) 3. Find probabilities from contingency tables. (CT,QS,R,TS) 4. Determine odds in favor of and against an event. (R,CT,QS,TS)
Use the basic definitions and rules of descriptive statistics in order to apply them later in this course and in the real world.	1. Draw and interpret histograms, circle graphs, and box-and-whisker plots. (CT,QS,R,TS) 2. Find the mean, median, mode, range, and standard deviation of ungrouped data. (CT,QS,R,TS) 3. Summarize data using frequency tables. (CT,QS,R,TS)
Use properties of the normal distribution in order to solve related applications problems.	1. Find *z*-scores. (CT,QS,R,TS) 2. Find probabilities. (CT,QS,R,TS) 3. Find the data value for a given probability. (CT,QS,R,TS) 4. Solve related applications problems. (CT,QS,R,TS)

Strengthen Core Competencies** in order to increase success in this and other courses and in the workplace.	Referenced above

**Indicate the Core Competencies that apply to the outcomes activities and assessment tools: Critical Thinking (CT); Technology Skills (TS); Oral Communications (OC); Quantitative Skills (QS); Reading (R); Writing (W).

Basis for Student Grading: Grades for this course will be assigned as follows:

Grade	Average
A	93%-100%
A-	90%-92%
B+	87%-89%
B	83%-86%
B-	80%-82%
C+	77%-79%

Grade	Average
C	73%-76%
C-	70%-72%
D+	67%-69%
D	63%-66%
D-	60%-62%
F	0-59%

The grade you earn is the grade you will receive in this course. Grades are not negotiable. You will not be allowed to make up work, substitute alternative assignments, or submit extra assignments in order to improve your grade during the semester or after the semester ends.

Grades of incomplete are given only in situations when extenuating circumstances prevent a student from taking the final exam or fulfilling a specific requirement in the course. The grade of "I" cannot be used to give students additional time to complete course assignments in order to raise their grade.

Basis for Evaluating Student Performance: The grade for this course will be weighted based on the following categories:

- *Exams (95%):* There will be four in-class exams giving throughout the semester, as well as a cumulative final exam. The individual exams are worth:
    - Highest of five exams: 35%
    - Second highest of five exams: 30%
    - Third highest of five exams: 20%
    - Fourth highest of five exams: 10%
    - Lowest of five exams: 0%

  All in-class exams are open notes, though not open book. Anything that you have handwritten may be used as a reference on the exams. Additionally, anything that I have given you in class (handouts, etc.) may be used as a reference on the exams. Other than that, you may not use any notes that are not handwritten by you, including another student's photocopied notes, your textbook, phtocopies of textbook pages, or internet printouts. I will inspect your notes during

the exams and any resources that voilate these guidelines will result in an undroppable zero on the exam and further academic discipline.

- *Homework (5%):* There will be four homework sets assigned through MyMathLab, one corresponding to each of the first four exams. These homework sets are due on the date of the corresponding exam, without exception.
- *In-Class Problem Sets:* Throughout the course, you will work on in-class problem sets based on the material recently studied. You are free to work on these problem sets in groups, provided all of the work submitted represents your own! Successfully completed problems will be worth bonus points toward the next exam.

Tentative Test/Assignment Schedule:

Assignment:	Tentative Date:
MML Homework 1 Test 1	
MML Homework 2 Test 2	
MML Homework 3 Test 3	
MML Homework 4 Test 4	
Final Exam	

Attendance Policy: Attendance for this course is mandatory. After the third absence, students will lose two points per absence thereafter from their final average. I will take attendance at the beginning of every class, and students not present at that time will be marked absent for the class, even if they show up late. If you must miss a regular class, you are still responsible for the material that was presented in class. The average student needs to attend all class meetings in order to be successful in this course.

Accommodations Statement: Massasoit's Disability Services office provides accommodations to students who qualify for services based on a documented disability. Students interested in accessing classroom or testing accommodations must contact Disability Services directly. In an effort to avoid any lapse in services, new and returning students are encouraged to contact Disability Services at the beginning of each semester to receive an Accommodation Letter for the current semester. Students on all campuses can contact Disability Services at 508-588-9100 X 2132 or by e-mail at DisabilityServices@massasoit.edu for further information or questions.

Title IX Statement: Massasoit Community College is committed to providing a safe learning and work environment for all. If you believe you have experienced discrimination, sexual harassment, sexual assault, domestic/dating violence, stalking, or retaliation, we encourage you to report it to *Yolanda Dennis, Chief Diversity Officer and Title IX Coordinator, Office of Diversity and Inclusion, at 508-588-9100, x1309 or* ODI@massasoit.edu. While you may talk to a faculty member, understand that as a "responsible employee" of the College, the faculty member must report what you share to the College's

Title IX Coordinator. On and off campus resources and interim measures are available to assist you. Information about both of these policies can be found at www.massasoit.edu/title-ix and www.massasoit.edu/eeo. We are here to support you.

Academic Integrity: Academic dishonesty will not be tolerated. Please see the following URL for more information on the college's policies on academic integrity:

http://www.massasoit.edu/academics/policies/academic-honesty/index