

Topics in Mathematics I

MATH152

Spring 2016

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.

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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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).