Updated May 2015—Office of Assessment

NM HED Area II: Mathematics - College Algebra Competencies
UNM Core Area 2: Mathematics

Core Competency *Students will:*	**Rationale/Elaboration** *Students should:*	**Assessment Suggestions**
1. Construct and analyze graphs and/or data sets.	• Sketch the graphs of linear, quadratic, higher-order polynomial, rational, absolute value, exponential, logarithmic, and radical functions. • Construct graphs using a variety of techniques including plotting points, using properties of basic transformations of functions, and by using key characteristics of functions such as end behavior, intercepts and asymptotes. • Determine the key features a function such as domain/range, intercepts, and asymptotes.	• Pre/post tests • Test/quiz questions • Routine use of an accepted Classroom • Assessment Technique (CAT) • Oral presentations • Written presentations • Student-created portfolios • Capstone projects • Peer review • Student self-assessments • Group research and presentations on real-life problems analyzed/solved by using algebra
2. Use and solve various kinds of equations.	• Solve quadratic equations using techniques such as factoring, completing the square and the square root method, and the quadratic formula. • Solve equations using inverse operations for powers/roots, exponents/logarithms and other arithmetic operations. • Use the equation of a function to determine its domain, to perform function operations, and to find the inverse of a function.	
3. Understand and write mathematical explanations using appropriate definitions and symbols.	• Correctly use function notation and the vocabulary associated with functions. • Describe the implications of key features of a function with respect to its graph and/or in relation to its real world context.	
4. Demonstrate problem solving skills within the context of mathematical applications.	• Apply the knowledge of functions to identify an appropriate type of function to solve application problems. • Solve application problems including those requiring maximization or minimization of quadratic functions and exponential growth & decay problems. • Interpret the results of application problems in terms of their real world context.	

NM HED Area II: Mathematics - Liberal Arts Math Competencies
UNM Core Area 2: Mathematics

Core Competency *Students will:*	**Rationale/Elaboration** *Students should:*	**Assessment Suggestions**
1. Construct and analyze graphs and/or data sets.	• Gather and organize information. • Understand the purpose and use of various graphical representations such as tables, line graphs, tilings, networks, bar graphs, etc. • Interpret results through graphs, lists, tables, sequences, etc. • Draw conclusions from data or various graphical representations.	• Pre/post tests • Test/quiz questions • Routine use of an accepted Classroom Assessment Technique (CAT) • Oral presentations • Written presentations • Student-created portfolios • Capstone projects • Peer review • Student self-assessments • Group research and presentations on real-life problems analyzed/solved by using mathematics • Student journals • Individual or group projects • Cooperative learning activities
2. Use and solve various kinds of equations.	• Understand the purpose of and use appropriate formulas within a mathematical application. • Solve equations within a mathematical application. • Check answers to problems and determine the reasonableness of results.	
3. Understand and write mathematical explanations using appropriate definitions and symbols.	• Translate mathematical information into symbolic form. • Define mathematical concepts in the student's own words. • Use basic mathematical skills to solve problems.	
4. Demonstrate problem solving skills within the context of mathematical applications.	• Show an understanding of a mathematical application both orally and in writing. • Choose an effective strategy to solve a problem. • Gather and organize relevant information for a given application. • Draw conclusions and communicate the findings.	

NM HED Area II: Mathematics - Statistics Competencies
UNM Core Area 2: Mathematics

Core Competency *Students will:*	**Rationale/Elaboration** *Students should:*	**Assessment Suggestions**
1. Construct and analyze graphs and/or data sets.	• Organize data and display in frequency distribution and find percentile points and ranks for the distribution • Graph data distributions using the correct format for graphs, to include: histograms, frequency polygons, box plots and scatter plots and draw appropriate inferences	• Pre/post tests • Test/quiz questions • Routine use of an accepted Classroom Assessment Technique (CAT) • Oral presentations • Written presentations • Student-created portfolios • Capstone projects • Peer review • Student self-assessments • Group research and presentations on real-life problems analyzed/solved by using statistics
2. Use and solve various kinds of equations.	• Compute mean, median, mode, and standard deviation • Calculate the least squares regression equation and the correlation coefficient • Determine basic probabilities and probabilities associated with the standard normal curve • Understand the binomial distribution and its properties • Compute sampling distributions of sample means • Compute the mean and standard deviation of sample means • Calculate margin of error given sample size and sample size given margin of error • Construct confidence intervals for population means and proportions • Calculate test statistics	
3. Understand and write mathematical explanations using appropriate definitions and symbols.	• Use Z-scores appropriately • Construct probability distributions • Write confidence intervals • Understand the Central Limit Theorem and when to apply it • Write null and alternate hypotheses • Understand the concept of significance level and P values • Apply the steps for inference/hypothesis testing • Describe the basic elements of sampling and experimental design • Define parameters and statistic	
4. Demonstrate problem solving skills within the context of mathematical applications.	• Determine appropriate methods to display data • Compare measures using Z-scores • Identify and analyze outliers • Use least-square regression equations to predict values • Select appropriate sampling techniques • Determine if random variables are continuous or discrete • Choose and construct appropriate hypothesis tests for population means and proportions	