

Course Title & Number: MAT*H232 Applied Calculus

Competency Area: **QUANTITATIVE REASONING** (Goal: Students will learn to recognize, understand, and use the quantitative elements they encounter in various aspects of their lives. Students will develop a habit of mind that uses quantitative skills to solve problems and make informed decisions.)

Faculty submitting the Learning Outcomes: Jane Wampler, Harry Burt, Ruth Urbina-Lilback, Katie Lozo

Date: 3/7/13

[Instructions: Please match the Learning Outcomes in the left hand column to those of the course you are submitting for Gen Ed approval. List the corresponding course outcomes in the right hand column to indicate a match.]

BOR TAP's Learning Outcomes	Corresponding Outcomes for Course Named Above
1. Represent mathematical and quantitative information symbolically, graphically, numerically, and verbally.	<ul style="list-style-type: none">D. Applications of the Derivative —<ul style="list-style-type: none">1. Use the first derivative to analyze where a function increases or decreases.2. Use the second derivative to analyze where a function is concave up or down.3. Sketch functions using intercepts, relative extrema, asymptotes and points of inflection.F. Definite integrals and applications —<ul style="list-style-type: none">2. Apply the Fundamental Theorem of Calculus.
2. Apply quantitative methods to investigate routine and novel problems. This includes calculations/procedures, mathematical and/or statistical modeling, prediction, and evaluation.	<ul style="list-style-type: none">B. Limits and continuity —<ul style="list-style-type: none">1. Calculate rates of change and slope.2. Calculate several types of limits.C. Derivatives —<ul style="list-style-type: none">1. Define the derivative in terms of a limit.2. Find derivatives of polynomials.3. Find derivatives of products and quotients.4. Use the Chain Rule to find derivatives of powers of functions.D. Applications of the Derivative —<ul style="list-style-type: none">1. Use the first derivative to analyze where a function increases or decreases.2. Use the second derivative to analyze where a function is concave up or down.

	<ol style="list-style-type: none"> 3. Sketch functions using intercepts, relative extrema, asymptotes and points of inflection. 4. Use differentiation to optimize functions by finding the minimum or maximum values. <p>E. Indefinite Integrals —</p> <ol style="list-style-type: none"> 1. Find the anti-derivative. 2. Find the indefinite integral. 3. Find the particular integral. <p>F. Definite integrals and applications —</p> <ol style="list-style-type: none"> 1. Find the definite integral. 2. Apply the Fundamental Theorem of Calculus. <p>G. Exponential and Logarithmic functions —</p> <ol style="list-style-type: none"> 3. Find the derivatives of exponential and logarithmic functions. 4. Find the indefinite and definite integrals of exponential and logarithmic functions.
3. Interpret mathematical and quantitative information and draw logical inferences from representations such as formulas, equations, graphs, tables, and schematics.	<p>D. Applications of the Derivative —</p> <ol style="list-style-type: none"> 1. Use the first derivative to analyze where a function increases or decreases. 2. Use the second derivative to analyze where a function is concave up or down. 3. Sketch functions using intercepts, relative extrema, asymptotes and points of inflection. 4. Use differentiation to optimize functions by finding the minimum or maximum values. <p>F. Definite integrals and applications —</p> <ol style="list-style-type: none"> 2. Apply the Fundamental Theorem of Calculus.
4. Evaluate the results obtained from quantitative methods for accuracy and/or reasonableness.	Evaluate the results obtained from quantitative methods for accuracy and/or reasonableness.
	<p><i>Additional Outcomes</i></p> <p>A. Functions and graphs —</p> <ol style="list-style-type: none"> 1. Define and recognize linear and quadratic functions.

	<ul style="list-style-type: none">2. Sketch the graphs of linear and quadratic functions.3. Apply horizontal and vertical and stretching transforms. <p>G. Exponential and Logarithmic functions —</p> <ul style="list-style-type: none">1. Define and recognize exponential and logarithmic functions.2. Sketch the graphs of exponential and logarithmic functions.
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