

Course Title & Number: _MAT*H256 Calculus II_____

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.)

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[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.	<p>A. Exponential, Logarithmic and Inverse Trigonometric Functions —</p> <ol style="list-style-type: none">1. Find the derivative for any function containing exponential expressions.2. Find the integral for any function containing a simple exponential expression.3. Find the derivative for any function containing logarithmic expressions (including those found by the method of logarithmic differentiation).4. Find the integral for any function whose antiderivative involves the natural logarithmic function.5. Solve a separable differential equation as obtained from applications of the exponential law of growth or decay.6. Find the derivative for a function containing inverse trigonometric functions and evaluate an integral whose antiderivative involves the inverse trigonometric functions.7. Use L'Hopital's Rule to determine the limit for an expression which initially results in an indeterminate form. <p>C. Integration Techniques —</p> <ol style="list-style-type: none">1. Evaluate an integral by any of the following methods:<ul style="list-style-type: none">• Integration by parts• Completing the square• Trigonometric substitution• Partial fractions

	<ol style="list-style-type: none"> Evaluate an integral involving powers of trigonometric functions by using an appropriate combination of substitution, identities or tables. Evaluate an improper integral involving infinite limits of integration and/or infinite discontinuities.
<p>2. Apply quantitative methods to investigate routine and novel problems. This includes calculations/procedures, mathematical and/or statistical modeling, prediction, and evaluation.</p>	<ol style="list-style-type: none"> Exponential, Logarithmic and Inverse Trigonometric Functions — <ol style="list-style-type: none"> Find the derivative for any function containing exponential expressions. Find the integral for any function containing a simple exponential expression. Find the derivative for any function containing logarithmic expressions (including those found by the method of logarithmic differentiation). Find the integral for any function whose antiderivative involves the natural logarithmic function. Solve a separable differential equation as obtained from applications of the exponential law of growth or decay. Find the derivative for a function containing inverse trigonometric functions and evaluate an integral whose antiderivative involves the inverse trigonometric functions. Use L'Hopital's Rule to determine the limit for an expression which initially results in an indeterminate form. Applications of Integration — <ol style="list-style-type: none"> Find the area under the curve or the area between curves. Find the volume of a solid of revolution using the disc or washer method. Find the volume of a solid with known cross sections (slicing method). Find the volume of a solid of revolution using the shell method. Find the arc length for a smooth curve. Find the area for a surface of revolution. Integration Techniques — <ol style="list-style-type: none"> Evaluate an integral by any of the following methods:

	<ul style="list-style-type: none"> • Integration by parts • Completing the square • Trigonometric substitution • Partial fractions <ol style="list-style-type: none"> 2. Evaluate an integral involving powers of trigonometric functions by using an appropriate combination of substitution, identities or tables. 3. Evaluate an improper integral involving infinite limits of integration and/or infinite discontinuities. <p>D. Infinite Series —</p> <ol style="list-style-type: none"> 1. Determine the convergence or divergence of a sequence by an appropriate method. 2. Determine the convergence or divergence of any positive term series by applying any of the following tests: <ul style="list-style-type: none"> • Test for divergence • Geometric series test • Integral test • P-series test • Direct comparison test • Limit comparison test
<p>3. Interpret mathematical and quantitative information and draw logical inferences from representations such as formulas, equations, graphs, tables, and schematics.</p>	<p>A. Exponential, Logarithmic and Inverse Trigonometric Functions —</p> <ol style="list-style-type: none"> 1. Find the derivative for any function containing exponential expressions. 2. Find the integral for any function containing a simple exponential expression. 3. Find the derivative for any function containing logarithmic expressions (including those found by the method of logarithmic differentiation). 4. Find the integral for any function whose antiderivative involves the natural logarithmic function. 5. Solve a separable differential equation as obtained from applications of the exponential law of growth or decay. 6. Find the derivative for a function containing inverse

	<p>trigonometric functions and evaluate an integral whose antiderivative involves the inverse trigonometric functions.</p> <p>7. Use L'Hopital's Rule to determine the limit for an expression which initially results in an indeterminate form.</p> <p>B. Applications of Integration —</p> <ol style="list-style-type: none"> Find the area under the curve or the area between curves. Find the volume of a solid of revolution using the disc or washer method. Find the volume of a solid with known cross sections (slicing method). Find the volume of a solid of revolution using the shell method. Find the arc length for a smooth curve. Find the area for a surface of revolution. <p>C. Integration Techniques —</p> <ol style="list-style-type: none"> Evaluate an integral by any of the following methods: <ul style="list-style-type: none"> Integration by parts Completing the square Trigonometric substitution Partial fractions Evaluate an integral involving powers of trigonometric functions by using an appropriate combination of substitution, identities or tables. Evaluate an improper integral involving infinite limits of integration and/or infinite discontinuities.
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.
	<i>Additional Outcomes</i>