

## KRSN MAT2010 – Calculus I

For specific Institutional Transfer Articulation information visit: [kansasregents.org/institutional-transfer-information](http://kansasregents.org/institutional-transfer-information).

<b>Institution</b>	<b>Course ID</b>	<b>Course Title</b>	<b>Credit Hours</b>
Allen CC	MAT 123	Calculus with Analytic Geometry I	5
Barton CC	MATH 1832	Analytic Geometry and Calculus I	5
Butler CC	MA 151	Calculus I with Analytic Geometry	5
Cloud County CC	MA 120	Analytic Geometry and Calculus I	5
Coffeyville CC	MATH 115	Calculus with Analytic Geometry I	5
Colby CC	MA 220	Analytic Geometry and Calculus I	5
Cowley CC	MTH 4435	Calculus I	5
Dodge City CC	MATH 120	Analytic Geometry and Calculus I	5
Fort Scott CC	MAT 1015	Calculus I with Analytic Geometry I	5
Garden City CC	MATH 122	Calculus and Analytic Geometry I	5
Highland CC	MAT 106	Calculus I	5
Hutchinson CC	MA 111	Analytical Geometry and Calculus I	5
Independence CC	MAT 1055	Analytic Geometry and Calculus I	5
JCCC	MATH 241	Calculus I	5
KCKCC	MATH 0122	Calculus and Analytic Geometry I	5
Labette CC	MATH 130	Calculus I	5
Neosho County CC	MATH 150	Analytic Geometry and Calculus I	5
Pratt CC	MTH 191	Analytic Geometry and Calculus I	5
Seward County CC	MA 2605	Analytic Geometry and Calculus I	5
FHTC	Not Offered	Not Offered	
Manhattan Tech	Not Offered	Not Offered	
NCK Tech	Not Offered	Not Offered	
NWKTC	MATH 240	Analytic Geometry and Calculus I	5
SATC	MAT 160	Analytical Geometry and Calculus I	5
WATC	MTH 125	Calculus I	5
ESU	MA 161	Calculus I	5
FHSU	MATH 234	Calculus I	5
KSU	MATH 220	Analytical Geometry and Calculus I	4
PSU	MATH 150	Calculus I	5
KU	MATH 125	Calculus I	4
WSU	MATH 242	Calculus I	5
Washburn	MA 151	Calculus and Analytic Geometry	5

## **Calculus I - MAT2010 CORE OUTCOMES**

Course Effective Date: Fall 2013

Outcome Approval Date: Fall 2017

Next Outcome Review Date: Fall 2022

Upon completion of MAT2010, students will be able to:

The course outcomes for Calculus I included in this document apply to any Kansas public college or university teaching a calculus I course that is the equivalent of the first semester in a three-semester calculus sequence.

- I. Using Limits
  - a. Evaluation of Limits
    - Evaluate the limit of a function at a point both algebraically and graphically
    - Evaluate the limit of a function at infinity both algebraically and graphically
    - Use the definition of a limit to verify a value for the limit of a function
  - b. Use of Limits
    - Use the limit to determine the continuity of a function
    - Apply the Intermediate-Value Theorem
    - Use the limit to determine differentiability of a function
  - c. Limiting Process
    - Use the limiting process to find the derivative of a function
- II. Finding Derivatives
  - Find derivatives involving powers, exponents, and sums
  - Find derivatives involving products and quotients
  - Find derivatives involving the chain rule
  - Find derivatives involving exponential, logarithmic, and trigonometric functions
  - Find derivatives involving implicit differentiation
- III. Using Derivatives
  - a. Curve Sketching
    - Use the first derivative to find critical points
    - Apply the Mean-Value Theorem for derivatives
    - Determine the behavior of a function using the first derivative
    - Use the second derivative to find inflection points
    - Determine the concavity of a function using the second derivative
    - Sketch the graph of the function using information gathered from the first and second derivatives
    - Interpret graphs of functions
  - b. Applications of Derivatives
    - Use the derivative to find velocity, acceleration, and other rates of change
    - Use the derivative to find the equation of a line tangent to a curve at a given point
    - Use optimization techniques in areas such as economics, the life sciences, the physical sciences, and geometry
    - Solve related rates problems
    - Use Newton's Method
    - Use differentials to estimate change
- IV. Finding Integrals
  - Find area using Riemann sums and integrals
  - Express the limit of a Riemann sum as a definite integral
  - Evaluate the definite integral using geometry
  - Integrate algebraic, exponential, and trigonometric functions
  - Evaluate definite integrals using the Fundamental Theorem of Calculus
  - Apply the Mean-Value Theorem for integrals
  - Integrate indefinite integrals

- Integrate using substitution
- Approximate integrals using Simpson's Rule and the Trapezoidal Rule