KRSN MAT2010 – Calculus I

For specific Institutional Transfer Articulation information visit: kansasregents.org/institutional-transfer-information.

Institution	Course ID	Course Title	Credit Hours
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
      - Use the definition of a limit to verify a value for the limit of a function.
      - 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
   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