

## SYLLABUS

<b>DATE OF LAST REVIEW :</b>	09/2019
<b>CIP CODE:</b>	24.0101
<b>SEMESTER:</b>	Departmental Syllabus
<b>COURSE TITLE:</b>	Calculus I (Non-Engineering)
<b>COURSE NUMBER:</b>	MATH0120
<b>CREDIT HOURS:</b>	3
<b>INSTRUCTOR:</b>	Departmental Syllabus
<b>OFFICE LOCATION:</b>	Departmental Syllabus
<b>OFFICE HOURS:</b>	Departmental Syllabus
<b>TELEPHONE:</b>	Departmental Syllabus
<b>E-MAIL:</b>	Departmental Syllabus <i>KCKCC-issued email accounts are the official means for electronically communicating with our students.</i>
<b>PREREQUISITE(S):</b>	Students need to meet the correct placement measure for this course, or have a grade of “C” or better in MATH 105/106 College Algebra (w/wo review) OR MATH 108 Pre-Calculus OR with consent of a fulltime Calculus instructor

### **KRSN Course MAT 1050**

**This course is approved by the Kansas Board of Regents for System Wide Transfer (SWT) among all Kansas public postsecondary institutions offering an equivalent course. The learning outcomes and competencies detailed in this course outline or syllabus meet or exceed the learning outcomes and competencies specified by the Kansas Core Outcomes Groups project for this course as approved by the Kansas Board of Regents. A list of courses available at each institution is located at [https://kansasregents.org/academic\\_affairs/transfer-articulation](https://kansasregents.org/academic_affairs/transfer-articulation).**

**REQUIRED TEXTS AND MATERIALS:** Please check with the KCKCC bookstore <http://www.kckccbookstore.com> for the required text for your particular class.

**COURSE DESCRIPTION:** Calculus I is designed for students in business, life science, or social science. Content includes the study of the derivative and anti-derivative and their applications as applied to algebraic, exponential, and logarithmic functions. Students will be expected to use appropriate technology as one tool to achieve competency in Calculus I.

**METHOD OF INSTRUCTION:** A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, and panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

**COURSE OUTLINE:**

- I. Analysis of Linear and Non-linear Functions
  - A. Linear
  - B. Quadratic
  - C. Exponential
  - D. Behavior
    1. Limits
    2. Continuity
  - E. Modeling functions
  
- II. Rate of change for Derivatives
  - A. Percentage change
  - B. Average rate of change
  - C. Rules for finding the derivative
  - D. Derivative at a point
  
- III. Change and Applications of Derivatives
  - A. Optimization
  - B. Inflection points
  - C. Curve sketching
  - D. Mathematical models
  
- IV. Accumulated change in Integrals
  - A. Interpretation of area
  - B. Approximation of area
  - C. Interpretation of definite integrals
  - D. Calculation of definite integrals
  - E. Fundamental Theorem of Calculus
  - F. Anti-derivatives

**EXPECTED LEARNER OUTCOMES:**

- A. The student will be able to evaluate limits of functions.
- B. The student will be able to use limits to determine continuity of a function at a point.

- C. The student will be able to determine differentiability of a function at a point.
- D. The student will be able to differentiate algebraic, exponential, and logarithmic functions.
- E. The student will be able to interpret derivatives as the slopes of tangent lines, instantaneous rates of change, and marginal.
- F. The student will be able to use derivatives to describe the behavior of a function.
- G. The student will be able to apply derivatives to problems in economics, business, and the physical, social, and life sciences.
- H. The student will be able to antidifferentiate algebraic and exponential functions.
- I. The student will be able to evaluate definite integrals.
- J. The student will be able to apply antiderivatives to problems in economics, business, and the physical, social, and life sciences.

**COURSE COMPETENCIES:**

Upon successful completion of this course:

*The student will be able to analyze linear and non-linear functions.*

- 1. The student will be able to analyze linear functions.
- 2. The student will be able to analyze quadratic functions.
- 3. The student will be able to analyze exponential functions.
- 4. The student will be able to describe function behavior.
- 5. The student will be able to define and find limits.
- 6. The student will be able to define continuity.
- 7. The student will be able to model functions.

*The student will be able to find and interpret the derivative numerically, algebraically and graphically.*

- 8. The student will be able to determine the percentage change.
- 9. The student will be able to determine the average rate of change.
- 10. The student will be able to find and interpret derivatives.
- 11. The student will be able to evaluate the derivative at a point.

*The student will be able to analyze change by using derivatives in applications.*

- 12. The student will be able to use the derivative to determine when a maximum and minimum occur in the function.
- 13. The student will be able to use the second derivative to determine when inflection points occur in a function.
- 14. The student will be able to interpret and sketch the graph by using the first and second derivatives.
- 15. The student will be able to analyze and interpret mathematical models using real life applications.

*The student will be able to find accumulated change in terms of integrals.*

- 16. The student will be able to interpret the area between a graph and the horizontal axis.
- 17. The student will be able to approximate the area between a graph and the horizontal axis.

axis.

18. The student will be able to interpret the definite integral of a function.
19. The student will be able to calculate the definite integral of a function.
20. The student will be able to explain the Fundamental Theorem of Calculus.
21. The student will be able to write algebraic anti-derivatives of functions.

**ASSESSMENT OF LEARNER OUTCOMES:**

Student progress is evaluated by means that include, but are not limited to, exams, written assignments, and class participation.

**SPECIAL NOTES:**

Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student's progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

Kansas City Kansas Community College offers equal educational opportunity to all students as well as serving as an equal opportunity employer for all personnel. Various laws, including Title IX of the Educational Amendments of 1972, require the college's policy on non-discrimination be administered without regard to race, color, age, sex, religion, national origin, physical handicap, or veteran status and that such policy be made known.

*Kansas City Kansas Community College complies with the Americans with Disabilities Act. If you need accommodations due to a documented disability, please contact the disabilities services office at (913) 288 -7664.*

All enrolled students at Kansas City Kansas Community College are subject to follow all rules, conditions, policies and procedures as described in both the Student Code of Conduct as well as the Student Handbook. All Students are expected to review both of these documents and to understand their responsibilities with regard to academic conduct and policies. The Student Code of Conduct and the Student Handbook can be found on the KCKCC website.