

SYLLABUS

DATE OF LAST REVIEW:	09/2019
CIP CODE:	24.0101
SEMESTER:	Departmental Syllabus
COURSE TITLE:	Calculus II (Non-Engineering)
COURSE NUMBER:	MATH0121
CREDIT HOURS:	3
INSTRUCTOR:	Departmental Syllabus
OFFICE LOCATION:	Departmental Syllabus
OFFICE HOURS:	Departmental Syllabus
TELEPHONE:	Departmental Syllabus
EMAIL:	Departmental Syllabus <i>KCKCC-issued email accounts are the official means for electronically communicating with our students.</i>
PREREQUISITES:	Students need to meet the correct placement measure for this course, or have a grade of “C” or higher in MATH-120 Calculus I (Non-Engineering)

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.

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 II is designed for students in business, life science, or social science. Content includes a review of Calculus I with an emphasis on applications involving elementary functions, functions of several variables, trigonometric functions, integration techniques, and differential equations. Students will be expected to use appropriate technology as one tool to achieve competency in Calculus II.

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. Analyzing Accumulated Change
 - A. Area of a region under a curve
 - B. Interpret area under a curve
 - C. Sketch a graph of a function
 - D. Anti-derivative of a function
 - E. Fundamental Theorem of Calculus
 - F. Definite integral
 - G. Differential equations

- II. Analyzing Change Using Integrals
 - A. Area between two curves
 - B. Improper integrals
 - C. Investments and biological populations
 - D. Economic problems
 - E. Average value

- III. Ingredients of Multivariable Change
 - A. Cross-sections of data
 - B. Cross-sections of multivariable functions
 - C. Sketch contours of data
 - D. Sketch contours of multivariable functions
 - E. Critical points on multi-variable functions

- IV. Analyzing Multivariable Change
 - A. Relative and absolute extrema and saddle points
 - B. Critical points on three-dimensional functions
 - C. Identify critical points on multi-variable functions
 - D. Interpret critical points on multi-variable functions
 - E. Contour graph

- V. Trigonometric Functions
 - A. Sine and cosine functions
 - B. Derivatives of the sine and cosine functions
 - C. Integrals of the sine and cosine functions
 - D. Other trigonometric functions

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 marginals.
- 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 accumulated change using different functions

1. The student will be able to approximate the area of a region using left rectangle, right rectangle, trapezoids, and midpoint rectangles.
2. The student will be able to label and interpret the area of a region.
3. The student will be able to sketch a graph of an accumulated function.
4. The student will be able to write algebraic anti-derivatives of functions.
5. The student will be able to interpret and demonstrate the Fundamental Theorem of Calculus.
6. The student will be able to calculate the definite integral of a function.
7. The student will be able to solve differential equations.

The student will be able to use integrals to find, estimate, and interpret accumulated change.

8. The student will use definite integrals to calculate and interpret the area of a region between two curves.
9. The student will be able to interpret an improper integral.
10. The student will be able to use definite integrals to estimate future and present values of investments or biological populations.
11. The student will be able to use integrals to find and interpret economic problems.
12. The student will be able to interpret the average value of a function.

The student will be able to graph multivariable functions

13. The student will be able to fit models to cross-sections of data.
14. The student will be able to interpret cross-sections of multivariable functions.
15. The student will be able to sketch contours using tables of data.
16. The student will be able to sketch contours of multivariable functions.
17. The student will be able to read and interpret points on contour graphs.

The student will be able to locate critical points of multi variable functions

18. The student will be able to identify relative and absolute extrema and saddle points on tables and contour graphs.
19. The student will be able to identify critical points on graphs of three-dimensional functions.
20. The student will be able to identify and interpret critical points on multivariable functions.
21. The student will be able to use contour graphs to identify the type of critical point.

The student will be able to use the trigonometric functions of sine and cosine.

22. The student will be able to describe the sine and cosine functions.
23. The student will be able to calculate the derivatives of the sine and cosine functions.
24. The student will be able to calculate the integrals of the sine and cosine functions.
25. The student will be able to differentiate and integrate other trigonometric 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.