



JOHNSON COUNTY COMMUNITY COLLEGE

Math Department
Course Syllabus –College Now
Eudora High School
Calculus I
MATH 241-OP1
CRN: 83304
Fall 2010



INSTRUCTOR INFORMATION:

Name: Mr. Scott Keltner
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E-mail: scottkeltner@eudoraschools.org or skeltne1@jccc.edu
Class webpage: www.eudoraschools.org/keltner
Classroom: Eudora High School, room D-116
Meeting Time: Monday through Friday, 7th hour, 2:29 to 3:22 p.m.
Planning Period: 2nd hour, 9:12 to 10:05 a.m.

COURSE INFORMATION:

Credit: 5 hours
Course Type: Transfer
Prerequisites: **JCCC:** MATH 172 Trigonometry or MATH 173 Precalculus or equivalent course
With grade of “C” or higher
Or appropriate score on an assessment test (COMPASS test qualifying score or 28 on Math composite on the ACT)
EHS: Senior status according to accumulated credits as well as Algebra 2 **and** Precalculus at Eudora High School or equivalent transfer course credit

TEXTBOOK:

Calculus: Early Transcendentals, 11th Edition (2008) by George B. Thomas, Jr. ISBN: 978-0-321-49575-4.

SUPPLIES:

While one is not required for class, it is ***strongly recommended*** that students in this class have access to a graphing calculator. Recommended models include the Texas Instruments TI-83 or TI-84 series’ of calculators, but can include others. It is also recommended that students ***not*** use or have access to either the TI-89 or TI-92 series’ of calculators. Additional (out-of-pocket) expense considerations that students should expect in addition to course tuition, fees, and textbooks will range from \$10 to \$120.

CAVEATS:

1. The majority of mathematics courses are sequential. Students must earn a grade of C or higher in a prerequisite mathematics course to progress to its subsequent mathematics course.
2. If a student is found not to have successfully fulfilled the prerequisite(s) for this course, the student will be dropped from the course. He/she will be allowed to enroll in the appropriate level math course provided space is available for them.
3. Student IEPs may call for a student to be enrolled in a level at or above this course. School administration and special education staff will be consulted in such instances for suggested enrollment and placement in course(s).
4. For part of the College Now course requirements, students may encounter questions about enrollment or obtaining JCCC course transcripts. The College Now website is located at <http://www.jccc.edu/collegenow> and includes information about enrollment, qualifications, and outcomes that you may find helpful.

COURSE DESCRIPTION:

This is the first of a three-semester sequence on calculus designed for engineering, physics, and math majors. Rates of change, areas and volumes will be studied. To accomplish this, the students will study and apply limits and

continuity. Differentiation and integration of algebraic, trigonometric, and transcendental functions will also be a major focus of this course. 5 hrs./wk. NOTE: The prerequisite of MATH 172 (Trigonometry) or MATH 173 (Precalculus) require a grade of "C" or higher.

COURSE OBJECTIVES:

Upon successful completion of this course the student will:

1. Evaluate the limits of functions.
2. State whether a function is continuous or discontinuous based on both the graph and the definition of continuity.
3. Use limits to describe instantaneous rates of change, the slope of the tangent line, and the velocity and acceleration of a moving particle.
4. Differentiate algebraic, trigonometric, and transcendental functions explicitly and, where appropriate, implicitly.
5. Use derivatives for curve sketching.
6. Use and interpret the derivatives of functions to solve problems from a variety of fields, including physics, and geometry.
7. Integrate algebraic, trigonometric, and transcendental functions.
8. Compute definite integrals by the Fundamental Theorem of Calculus, by numerical techniques, and by substitution.
9. Use integration results to calculate areas, volumes, and mean values.

CONTENT OUTLINE AND COMPETENCIES:

- I. Using Limits
 - a. Evaluation of limits
 - i. Evaluate the limit of a function at a point both algebraically and graphically.
 - ii. Evaluate the limit of a function at infinity both algebraically and graphically.
 - iii. Use the definition of a limit to verify a value of the limit of a function.
 - b. Use of limits
 - i. Use the limit to determine the continuity of a function.
 - ii. Use the limit to determine the differentiability of a function.
 - c. Limiting process
 - i. Use the limiting process to find the derivative of a function.
- II. Finding Derivatives
 - a. Find derivatives involving powers, exponents, and sums.
 - b. Find derivatives involving products and quotients.
 - c. Find derivatives involving the Chain Rule.
 - d. Find derivatives involving exponential and logarithmic functions.
 - e. Find derivatives involving trigonometric and inverse trigonometric functions.
 - f. Find derivatives involving implicit differentiation.
 - g. Use the derivative to find velocity, acceleration and other rates of change.
 - h. Use the derivative to find the equation of a line tangent to a curve at a given point.
- III. Using Derivatives
 - a. Curve sketching
 - i. Use the first derivative to find critical points.
 - ii. Apply the Mean-Value Theorem for derivatives.
 - iii. Determine the behavior of a function using the first derivative.
 - iv. Use the second derivative to find inflection points.
 - v. Determine the concavity of a function using the second derivative.
 - vi. Sketch the graph of the function using information gathered from the first and second derivatives.
 - vii. Interpret graphs of functions.
 - b. Applications of the derivative
 - i. Solve related rates problems.
 - ii. Use optimization techniques in economics, the physical sciences, and geometry.
 - iii. Use differentials to estimate change.

- IV. Finding Integrals
- Find area using Riemann sums.
 - Express the limit of a Riemann sum as a definite integral.
 - Evaluate the definite integral using geometry.
 - Integrate definite integrals using numerical approximation.
 - Evaluate definite integrals using the Fundamental Theorem of Calculus.
 - Integrate algebraic, natural exponential, natural logarithm, trigonometric, and inverse trigonometric functions.
 - Integrate indefinite integrals.
 - Integration by substitution.
 - Integration by parts.
- V. Using the Integral
- Utilize the Mean-Value Theorem for Integrals.
 - Calculate the area between curves using integration.
 - Calculate the volume of a solid of revolution by the disk method.
 - Calculate the volume of a solid of revolution by the washer method.
 - Calculate the volume of a solid of revolution by the cylindrical shells method.
 - Calculate the arc length and surface area using integration.

COURSE REQUIREMENTS/TENTATIVE COURSE SCHEDULE:

Students will be given at least 5 unit exams, one comprehensive final exam, and daily assignments.

Below is a tentative schedule of material and assignments that will be covered during the course.

Monday	Tuesday	Wednesday	Thursday	Friday
Aug. 16 th <i>Teacher Inservices</i>	Aug. 17 th <i>Teacher Inservices</i>	Aug. 18 th <i>Teacher Workday</i>	Aug. 19 th <i>New Student Orientation</i>	Aug. 20 th Syllabus, Textbooks, Course Overview
Aug. 23 rd Chapter 1 Review	Aug. 24 th Chapter 1 Review	Aug. 25 th 2.1	Aug. 26 th 2.1/2.2	Aug. 27 th 2.2
Aug. 30 th 2.3	Aug. 31 st 2.3	Sept. 1 st 2.4	Sept. 2 nd <i>Activity Period</i> 2.4/2.5	Sept. 3 rd 2.5
Sept. 6 th Labor Day No School	Sept. 7 th 2.6	Sept. 8 th <i>Early Release</i> 2.7	Sept. 9 th 2.7/Review	Sept. 10 th Exam 1
Sept. 13 th 3.1	Sept. 14 th Enrollment Deadline 3.2	Sept. 15 th 3.3	Sept. 16 th <i>Activity Period</i> 3.4	Sept. 17 th 3.5
Sept. 20 th 3.5	Sept. 21 st 3.6	Sept. 22 nd 3.6	Sept. 23 rd 3.7	Sept. 24 th 3.8
Sept. 27 th 3.9	Sept. 28 th 3.10	Sept. 29 th Review	Sept. 30 th Exam 2	Oct. 1 st Work Day
Oct. 4 th 4.1	Oct. 5 th 4.2	Oct. 6 th 4.3	Oct. 7 th <i>Activity Period</i> 4.4	Oct. 9 th 4.4/4.5
Oct. 11 th <i>Inservices—No School</i>	Oct. 12 th 4.5	Oct. 13 th <i>Early Release</i> 4.7	Oct. 14 th 4.7	Oct. 15 th 4.8
Oct. 18 th 4.8/Review	Oct. 19 th Exam 3	Oct. 20 th 5.1	Oct. 21 st <i>Activity Period</i> 5.2	Oct. 22 nd <i>No School</i>

			<i>End 1st Qtr.</i>	
Oct. 25 th 5.2	Oct. 26 th 5.2/5.3	Oct. 27 th 5.3	Oct. 28 th <i>No School</i>	Oct. 29 th <i>No School</i>
Nov. 1 st 5.4	Nov. 2 nd 5.4	Nov. 3 rd 5.5	Nov. 4 th <i>Activity Period</i> 5.5	Nov. 5 th 5.6
Nov. 8 th 5.6	Nov. 9 th 8.2	Nov. 10 th <i>Early Release</i> 8.2/8.7	Nov. 11 th 8.7	Nov. 12 th Exam 4a
Nov. 15 th <i>Last Drop Day with</i> <i>“W” on transcript</i> Exam 4b	Nov. 16 th 6.1	Nov. 17 th 6.1/6.2	Nov. 18 th <i>Activity Period</i> 6.2	Nov. 19 th <i>2:00 Dismissal</i>
Nov. 22 nd <i>No School</i>	Nov. 23 rd <i>No School</i>	Nov. 24 th <i>No School</i>	Nov. 25 th <i>No School</i>	Nov. 26 th <i>No School</i>
Nov. 29 th 6.3	Nov. 30 th <i>Study Hall</i> <i>Schedule</i> 6.3	Dec. 1 st 6.4	Dec. 2 nd <i>Activity Period</i> 6.4/6.5	Dec. 3 rd 6.5
Dec. 6 th Review	Dec. 7 th Exam 5	Dec. 8 th <i>Early Release</i> Exam 5	Dec. 9 th Final Review	Dec. 10 th Final Review
Dec. 13 th Final Review	Dec. 14 th Final Exam, Pt. 1	Dec. 15 th Final Exam, Pt. 2	Dec. 16 th <i>Activity Period</i>	Dec. 18 th <i>2:00 Dismissal</i>

OTHER IMPORTANT DATES TO NOTE:

- Wednesday, September 14th: COMPASS testing deadline, if applicable
- Wednesday, September 14th: Enrollment deadline (payment due the day of enrollment)
- Thursday, September 15th: Last Day to Drop with 100% Refund
- Thursday, September 15th: Last Day to Drop without a “W” on Transcript
- Monday, November 15th: Last Day to Drop with “W” on Transcript or Request a Pass/Fail Grade

CALCULATOR USE POLICY:

You will be issued one of the school’s graphing calculators ONLY after the Calculator Use Form has been completed and signed by both the student and their parent or guardian.

The school provides you free use of a graphing calculator for an entire school year. In doing this, the batteries of your calculator may need replacement. If replacement of batteries is necessary, this is a small expense that I would expect you to pick up in exchange for using the calculator for the entire school year. Some schools **require** students to purchase their own calculator or charge a rental fee for using one, so replacing some batteries is not that big an expense in comparison.

If you would like to purchase your own graphing calculator, they are available from many vendors, both in-store and online (WalMart, Target, Office Depot, and others have them in stock year-round). There tend to be some good deals on new or used calculators on eBay, Craigslist, and Larryville, but this is completely up to you as to whether you would like to use one of those sources.

CLASSROOM EXPECTATIONS:

The principles and ideas below are some basic expectations that I have of each of you. Above all, common courtesy should be exhibited at all times.

1. **Attendance**—Learning is far more difficult for someone who has to hear it third-hand, so make sure you are present for daily lectures and presentations.
2. **Be on time**—Believe it or not, I am one of those teachers who keeps track of tardies. Do not expect the rest of the class to wait for your arrival.
3. **Be prepared**—You wouldn’t take a driving test without your keys, so why would you show up for class without your materials? Also, I will NOT sign a pass for you to use the restroom or return to your locker within the first 15 minutes of class.

4. **Have a positive attitude**—I try my hardest to come to class each day with a smile on and would appreciate if you returned the favor. Math may not be at the top of your list, but we may as well help each other weather the storm.
5. **Do your best**—“Anything less than your best is sacrificing the gift.”—Steve Prefontaine. This class may not be considered a sport by any means, but there is a pretty easy way for me to keep track of who is “winning” and “losing” (passing and failing).
6. **Respect others and their belongings**—Treat something borrowed as if it were yours.
7. **No personal grooming**—Whenever I start doing my hair and filing my nails on class time, feel free to join in. But until that time, find another time and place to do it.

EVALUATION AND GRADING SCALE:

Course Grade will be broken down into three subcategories: Exams/Summatives, Daily Work, and Projects/Activities. They will be weighted as follows and use the grading scale indicated:

Exams	50%	A	90-100%
Daily Work	30%	B	80-89%
Projects/Activities	+ 20%	C	70-79%
	100%	D	60-69%
		F	59 and below

Daily work will be scored primarily on accuracy, not simply on completion. Scores will be recorded out of 10 points, where the student’s raw score will be rounded up to the next highest score. For instance, if a student scores the equivalent of 8.3 out of 10 on an assignment, the student’s score will be recorded as a 9.

Late work is accepted, but highly discouraged due to the pace of the coursework. One or two instances of late work are understandable, but beyond three instances, exceptions will not be made and could result in the issuing of detentions to the student.

The instructor is available both before and after school if additional help becomes a necessity. Students should not feel as if the instructor is unavailable or impossible to find. If necessary, appointments can be made to work with the student’s extra-curricular schedule.

INFORMATION ON STUDENT ACCESS AND ACADEMIC DISHONESTY:

Eudora High School provides a range of services to allow persons with disabilities to participate in educational programs and activities. If you are in need of support services, contact the school office at (785) 542-4980.

Student Code of Conduct and Academic Dishonesty Policies are addressed in the school handbook. It is your responsibility as a student to make sure you are familiar with these policies and consequences that arise as a result of violating policies.