MAT 130
Elementary Calculus

Course Description
This course includes the following topics: differentiation and integration of polynomials; rationales, logarithmic, and exponential functions; and interpretation and application of these processes.

Prerequisites: MAT 110.

3.0 Cr (3 lect/pres, 0 lab, 0 other)

Course Focus
Upon satisfactory completion of this course, students should be able to perform the following tasks:
- Identify and graph linear, quadratic, exponential, logarithmic, and rational functions.
- Find the limit of a function and determine its continuity.
- Find the derivative and integral of a function.
- Sketch the graph of a curve.
- Use the derivative and integral to solve applications.
- Use the integral to determine area between curves.

Text and References

MAT 130 Core Curriculum Competencies
All courses approved for the general education core curriculum help students develop communication skills and/or critical thinking.
This course develops communication skills, as demonstrated by the following:
- Critique linear functions.
- Discuss continuity of graphs.
- Describe the concavity of a function.
- Compose the derivative of a function.
• Adapt integration to problem solving.

This course develops critical thinking skills, as demonstrated by the following:

• Perform implicit differentiation.
• Solving related rates problems.
• Differentiate exponential and logarithmic functions.
• Solve rational equations.
• Differentiate functions using the product, quotient and/or chain rule.

Course Goals

The following list of course goals will be addressed in the course. These goals are directly related to the performance objectives. (*designates a CRUCIAL goal)

1. Critique linear functions
2. Deliver equations of lines
3. Find regression equations of lines
4. Find slopes of lines
5. Apply reflections to functions
6. Apply transformation to graphing a function
7. Critique exponential functions
8. Describe the properties of a function
9. Identify logarithmic functions
10. Identify quadratic functions
11. Identify rational functions
12. Compute the limit of a function
13. Detect average rate of change
14. Determine graphical differentiation
15. Discuss continuity
16. Determine the continuity of a function
17. Find instantaneous rate of change
18. Adapt derivatives to problem solving
19. Compose the derivative of a function
20. Differentiating exponential functions
21. Differentiating logarithmic functions
22. Differentiation using chain rule
23. Differentiation using product rule
24. Utilize growth and decay in problem solving
25. Differentiation using quotient rule
26. Apply extreme to solving problems
27. Compose higher order derivatives
28. Describe the concavity of a function
29. Determine extreme
30. Determining a functions interval of decrease
31. Determining a functions interval of increase
32. Solve related rates problems
33. Troubleshoot using the 2nd derivative test
34. Perform implicit differentiation
35. Adapt integration to problem solving
36. Calculate definite integration
37. Calculate the integral of a function
38. Calculating anti-derivatives
39. Detect area between two curves
40. Detect area under a curve
41. Integrate improper integrals
42. Perform integration by substitution
43. Use the fundamental thm of calculus
44. Calculating the average value
45. Calculating volume
46. Solve polynomial equations
47. Solve rational equations
48. Utilize integration by parts

Student Contributions
Materials: TI-83 or TI-83 Plus Graphing Calculator

Course Evaluation
Your final grade will be obtained from the average of your Homework, Unit test, and Final Examination.

Course Schedule
The class meets for 3 lecture/presentation hours per week. The sequence of this course will follow the sequence of course objectives listed above. We will cover approximately 3-4 objectives per week.

Developed/Revised: February 18, 2010

ADA STATEMENT
The Technical College of the Lowcountry provides access, equal opportunity and reasonable accommodation in its services, programs, activities, education and employment for individuals with disabilities. To request disability accommodation, contact the counselor for students with disabilities at (843) 525-8228 during the first ten business days of the academic term.

ACADEMIC MISCONDUCT
There is no tolerance at TCL for academic dishonesty and misconduct. The College expects all students to conduct themselves with dignity and to maintain high standards of responsible citizenship.

It is the student’s responsibility to address any questions regarding what might constitute academic misconduct to the course instructor for further clarification.

The College adheres to the Student Code for the South Carolina Technical College System. Copies of the Student Code and Grievance Procedure are provided in the TCL Student Handbook, the Division Office, and the Learning Resources Center.

ATTENDANCE
The College’s statement of policy indicates that students must attend ninety percent of total class hours or they will be in violation of the attendance policy.

- Students not physically attending class during the first ten calendar days from the start of the semester must be dropped from the class for NOT ATTENDING.
• Students taking an online/internet class must sign in and communicate with the instructor within the first ten calendar days from the start of the semester to indicate attendance in the class. Students not attending class during the first ten calendar days from the start of the semester must be dropped from the class for NOT ATTENDING.

• Reinstatement requires the signature of the division dean.

• In the event it becomes necessary for a student to withdraw from the course OR if a student stops attending class, it is the student’s responsibility to initiate and complete the necessary paperwork. Withdrawing from class may have consequences associated with financial aid and time to completion.

• When a student exceeds the allowed absences, the student is in violation of the attendance policy. The instructor MUST withdrawal the student with a grade of “W”, “WP”, or “WF” depending on the date the student exceeded the allowed absences and the student’s progress up to the last date of attendance or

• Under extenuating circumstances and at the discretion of the faculty member teaching the class, allow the student to continue in the class and make-up the work. This exception must be documented at the time the allowed absences are exceeded.
  ▪ Absences are counted from the first day of class. There are no "excused" absences. All absences are counted, regardless of the reason for the absence.
  ▪ A student must take the final exam or be excused from the final exam in order to earn a non-withdrawal grade.
  ▪ A copy of TCL’s STATEMENT OF POLICY NUMBER: 3-1-307 CLASS ATTENDANCE (WITHDRAWAL) is on file in the Division Office and in the Learning Resources Center.

HAZARDOUS WEATHER
In case weather conditions are so severe that operation of the College may clearly pose a hardship on students and staff traveling to the College, notification of closing will be made through the following radio and television stations: WYKZ 98.7, WGCO 98.3, WGZO 103.1, WFXH 106.1, WWVV 106.9, WLOW 107.9, WGZR 104.9, WFXH 1130 AM, WLVL 101.1, WSOK 1230 AM, WAEV 97.3, WTOC TV, WTGS TV, WJWJ TV, and WSAV TV. Students, faculty and staff are highly encouraged to opt in to the Emergency Text Message Alert System. www.tcl.edu/textalert.asp

EXTRA:

Emergency Text Message Alert
Students, faculty and staff are highly encouraged to opt in to the Emergency Text Message Alert System. Participants receive immediate notification of emergency events and weather cancelations via text messaging on their cell phones. Participants can also opt in to receive non-emergency news and announcements. Go to www.tcl.edu. On the homepage, click on “emergency TextAlert at TCL” and fill out the form or go to www.tcl.edu/textalert.asp

GRADING METHODOLOGY
The final grade must be 70 or more (a grade “C” or better) in order to pass the course and progress to the next course. Students absent from an examination or presentation will receive a “0” grade for the examination unless other arrangements are made with the individual instructor prior to the examination or presentation day or on the examination or presentation day before the test/presentation is scheduled to be given.
The student is responsible for notifying the instructor for the reason of the absence. It is also the responsibility of the student to contact the appropriate instructor to arrange to make up the examination. Arrangements may be completed by telephone.

If the instructor is not available, a message should be left on the instructor’s voice mail AND with another member of the faculty or administrative assistant. The make-up exam will be scheduled and the instructor will decide the method of examination. Messages sent by other students are unacceptable.