



TECHNICAL COLLEGE OF THE LOWCOUNTRY

Technical College of the Lowcountry
921 Ribaut Road
Beaufort, SC 29901

Arts & Sciences Division
Building 9, Room 102
843-525-8281

MAT 140

MAT 140 Analytical Geometry & Calculus I

Course Description

This college transfer course includes the following topics: derivatives and integrals of polynomials, rational, logarithmic, exponential, trigonometric and inverse trigonometric functions; curve sketching; maxima and minima of functions; related rates; work; and analytic geometry.

Prerequisites: MAT 110, MAT 111 or MAT 112.

4.0 Cr (4 lect/pres, 0 lab, 0 other)

Course Focus

Upon satisfactory completion of this course, students should be able to perform the following tasks: Solve equations and inequalities algebraically and graphically. Use transformations to graph functions and inverses. Find the limit of a function. Determine whether a function is continuous. Find the derivative of a function. Find the instantaneous rate of change and other related rates. Use derivatives to solve applications. Find the definite /indefinite integral of a function

Text and References

Larson, Ron & Bruce H. Edwards. Calculus of a Single Variable (loose-leaf with multi-semester access code), 11th Edition. Cengage Learning, 2018. ISBN: 1337604765.

MAT 140 Core Curriculum Competencies

All courses approved for the general education core curriculum helps students develop communication skills and/or critical thinking.

This course develops communication skills, as demonstrated by the following:

- Discuss continuity.
- Develop algebraically algebraic equations.
- Define critical values.
- Finding area under a curve.
- Define instantaneous rate of change.

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

- Determine whether a function is continuous.
- Solve equations and inequalities algebraically and graphically.
- Evaluate limits.
- Compute derivatives of trig functions.
- Implement the fundamental THM of calculus.

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. Apply the intermediate value THM *
2. Calculate one sided limits *
3. Define horizontal asymptotes
4. Depict limits graphically
5. Detect average rate of change
6. Detect limits of trig functions
7. Determine if functions are continuous *
8. Diagnose the limits at infinity
9. Discuss continuity
10. Evaluate limits
11. Find infinite limits
12. Finding limits numerically
13. Finding limits of functions *
14. Learn the properties of limits
15. Calculate derivatives *
16. Compute derivatives of trig functions
17. Define instantaneous rate of change
18. Derive first derivative of a function
19. Derive higher order derivatives *
20. Determine the slope of a tangent line
21. Determining equation of a tangent line *
22. Diagnose second derivative implicitly
23. Differentiating using the sums rules
24. Differentiation using the chain rules
25. Differentiation using the differences rules
26. Differentiation using the power rules
27. Illustrate problems with related rates
28. Learn the basic differentiation rule
29. Perform implicit differentiation *
30. Use the chain rule
31. Use the product rule
32. Use the quotient rule
33. Applying mean value THM
34. Compute inflection points
35. Conduct the first derivative test
36. Conduct the second derivative test

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37. Define critical values *
38. Detect the extreme on an interval
39. Discuss concavity
40. Implement the mean value THM
41. Incorporate Rolle's THM *
42. Incorporate Simpsons rule *
43. Manage the trapezoidal rule *
44. Solve optimization problems *
45. Apply integrals *
46. Applying integration by substitution
47. Compute definite integrals
48. Find anti derivatives *
49. Find indefinite integrals
50. Finding area under a curve *
51. Integrate using substitution
52. Implement the fundamental THM of calculus
53. Integrate with Riemann sums *
54. Manage change of variables
55. Differentiate logarithmic functions *
56. Integrate logarithmic functions *

Student Contributions

A minimum of 6 hours per week should be spent outside of class to practice and prepare for the material covered in the course. Graphing Calculator - TI-83, 84 preferred or 89. Completion of MAT 111 with a C or better

Course Evaluation

Your final grade will be obtained from the average of your homework and/or quizzes, unit tests, and final exam. The student **must** earn a grade of C or better in order to pass the course.

The grading scale is as follows:

90 - 100	=	A
80 - 89	=	B
70 - 79	=	C
60 - 69	=	D
Below 60	=	F

Course Schedule

The class meets for 4.0 lecture/presentation hours per week.

STATEMENT OF NON-DISCRIMINATION

The Technical College of the Lowcountry is committed to a policy of equal opportunity for all qualified applicants for admissions or employment without regard to race, gender, national origin, age, religion, marital status, veteran status, disability, or political affiliation or belief.

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) 525-8219 or (843) 525-8242 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** complete an assignment designated by 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 contact the instructor via e-mail requesting to be withdrawn from the class.** Withdrawing from class may have consequences associated with financial aid and time to completion. Students are strongly encouraged to consult with Financial Aid prior to withdrawing from any class, particularly if the student is currently on a warning or probation status.
 - When a student exceeds the allowed absences, the student is in violation of the attendance policy. The instructor **MUST** withdraw 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.

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- 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.

ONLINE ATTENDANCE PROCEDURE

For all online courses, students must complete an assignment designated by the instructor during the first week of classes. The instructor will drop the student from the course if the initial assignment is not completed.

Instructors will withdraw students from the class when 90% attendance is not maintained. Attendance in an online course is defined by regular course access and by timely completion of assignments as required by the instructor. Each student will be expected to access the web class at least once a week and complete 90% of assignments on time. Additional access is encouraged and may be necessary for successful completion of classes.

Failure to log in and complete assignments will result in the student being withdrawn from the course. The instructor will assign a grade of "W," "WP," or "WF" based upon the student's academic standing as the last date of attendance, which is the last login. Students are responsible for any financial matters associated with an administrative withdrawal. If a student fails to email the instructor (using the my.tcl.edu email account) requesting to be dropped from the course and has not submitted the initial assignment required during the first week of class, the instructor will assign a "Never Attended" code in the student information system (web-advisor) no later than ten calendar days after the first day of the class. Students who are dropped as a result of never attending the course are still responsible for all fees associated with the course.

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, WWVW 106.9, WLOW 107.9, WGZR 104.9, WFXH 1130 AM, WLVH 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. <http://www.tcl.edu/current-students/text-alert>

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 cancellations 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 <http://www.tcl.edu/current-students/text-alert>

GRADING METHODOLOGY

The final grade must be 70 or more in order to pass the course and progress in the program. 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.

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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.

SAFETY ADDENDUMS

Purpose

The purpose of this safety addendum is to provide each student with safety guidelines during an incident, emergency, or disaster at TCL. In addition, it provides students guidelines for lockdown procedures, evacuation procedures, and active shooter.

Definitions

An incident is any event, potential or actual, that may impact normal operations but has no immediate health or life threatening consideration or serious effect on the overall functional capacity of the College. An event of this nature should be reported to the Office of the Vice President for Administrative Services. Also notify the off-site campus administrator if applicable.

An emergency is any incident, potential or actual, which may endanger life or health or which affects an entire building or buildings, and will disrupt the overall operations of the College. Outside emergency services will probably be required, as well as major efforts from campus support services. Major policy considerations and decisions will usually be required from the college administration during times of crises. An emergency should be reported immediately by directly using **911** if life or health/injury considerations exist and then to the Office of the President or Vice President for Administrative Services as quickly as possible. Also notify the off-site campus administrator if applicable.

A disaster is any event or occurrence that has taken place and has seriously impaired or halted the operations of the College. In some cases, mass personnel casualties and severe property damage may be sustained. A coordinated effort of all campus-wide resources is required to effectively control the situation. Outside emergency services will be essential. In all cases of disaster, an Emergency Control Center will be activated, and the appropriate support and operational plans will be executed. The disaster should be immediately reported, first by calling **911** and then to the Office of the President or Vice President for Administrative Services. Also notify the off-site campus administrator if applicable.

Types of Emergencies

- Hurricane
- Tornado
- Fire
- Biochemical or Radiation Spill
- Explosion/Bomb
- Downed Aircraft (crash which directly impacts campus operations)
- Utility Failures
- Violent or criminal behavior
- Psychological Crisis

Procedures:

Active Shooter

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Run/hide/fight (<http://www.fbi.gov/about-us/cirg/active-shooter-and-mass-casualty-incidents/run-hide-fight-video>)

Building Evacuation

1. Building evacuations occur when an alarm sounds and/or upon notification by Security or the Emergency Director.
2. When the building evacuation alarm is activated during an emergency, individuals should exit according to the building evacuation plan and alert others to do the same.
3. Once outside, individuals should proceed to a clear area that is at least 500 feet away from the affected building. Streets, fire lanes, hydrant areas and walkways should be kept clear for emergency vehicles and personnel.
4. Individuals should not return to an evacuated building unless told to do so by Security or the Emergency Director.
5. Individuals should assist persons with disabilities in exiting the building. Elevators are reserved for disabled persons

Campus Evacuation

1. A uniformed Security Guard, the Emergency Director, or an Emergency Resource Team member will announce evacuation of all or part of the campus grounds.
2. All persons (students and staff) are to immediately vacate the campus, or in the case of a partial evacuation relocate to another part of the campus grounds as directed.

Lockdown

1. Clear the halls
2. Report to the nearest classroom/office
3. Assist those needing special assistance
4. Ensure classroom/office doors are closed and locked
5. Turn off lights
6. Stay away from doors and windows (out of the line of sight)
7. BE QUIET and follow instructor's directions
8. Silence cell phones
9. Wait for the "All Clear" before leaving