MAT 141

Analytical Geometry & Calculus II

Course Description
This college transfer course includes the following topics: continuation of Calculus of one variable, including analytic geometry, techniques of integration, and volumes by integration, and other applications; infinite series, including Taylor series and improper integrals.

Prerequisites: MAT 140.

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

Course Focus
Through guided practice and lecture, the student will learn to:
1. Find the derivative of and integrate functions
2. Use integration to calculate such things as area between curves, volumes, and surface area
3. Understand the relationship between the inverse functions $e^x$ and $\ln x$ and applications
4. Develop basic integration techniques using paper-pencil and graphing calculator including techniques for improper integrals
5. Develop understanding of infinite (power) series and the use of Taylor's formula

Text and References

MAT 141 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:
• Sketch the curves described by parametric equations.
• Develop the inverse of a function.
• Derive volumes of various shapes.
• Discover centroids.
• Determine the applicability of L’Hopital’s Rule.

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

• Differentiation of exponential functions.
• Solving problems using trigonometric substitution.
• Evaluate improper integrals.
• Simplify expressions using partial fractions.
• Diagnose tangents of polar equations.

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. Determining the derivative of natural logs *
2. Calculation of integrals of natural logs *
3. Determine derivatives of inverse trig functions *
4. Calculate the integral of inverse trig functions *
5. Develop the inverse of a function
6. Differentiation of bases other than e
7. Differentiating hyperbolic functions
8. Differentiation of exponential functions *
9. Find the inverse of log functions
10. Integrating hyperbolic functions
11. Graph slope fields
12. Solve using spar of variables
13. Solving differential equations *
14. Solving homogeneous differential equations
15. Finding area between 2 curves
16. Deriving volume using disc method *
17. Derive volume shell method *
18. Integration of exponential functions *
19. Deriving volume using washer method *
20. Solve using trig substitutions
21. Calculating center of mass
22. Calculation of work problems
23. Determination of moments
24. Derive surface area
25. Discover arc length
26. Discover centroids
27. Evaluate improper integrals *
28. Application of integration by parts *
29. Use integration rule
30. Apply trig identities to integration *
31. Figure Bernoulli equations
32. Integrating using partial fractions
33. Integration of bases other than e
34. Simplify using partial fractions
35. Using partial fractions *
36. Apply l’hospital’s rule *
37. Deduce limits of subsequences
38. Conduct the integral test
39. Derive the radius of convergence *
40. Determine convergence of a series *
41. Deduce slopes of parametric equations
42. Applicability of the p series
43. Applying the ratio test
44. Differentiate power series
45. Finding a power series *
46. Integrals of power series
47. Create McLaurin polynomials *
48. Create Taylor polynomials *
49. Determining equations of conic sections
50. Convert rectangular to polar coordinates
51. Describe graphs of polar equations
52. Develop polar equations of conics *
53. Determination of parametric equations *
54. Diagnose tangents of polar equations
55. Diagnose equation of lines tangent to parametric equations
56. Sketch the curves described parametric equations *
57. Calculate slope in polar form
58. Calculating area of polar curves *
59. Find arc length of polar functions
60. Sketch graphs of polar equations *

Student Contributions
The lecture method is used to explain new materials and answer questions on previous assignments. Any remaining class time is used for students to work on assignments in groups and under close supervision of instructor. The student is expected to participate in class discussion and complete each assignment.

Course Evaluation
Your grade will be determined from the averages of your grades in the following categories homework, 3 quizzes 3 chapter tests (and a cumulative final exam).

Course Schedule
The class meets for 4 lecture/presentation hours per week.

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, WLWH 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
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 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.

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.

Revised: 10/1/2012

Reviewed/Approved by Dean of Arts & Sciences 10/1/2012