

LIBERTY UNIVERSITY
Math 132 – Calculus and Analytic Geometry II – (4 Credit Hours)
Online Semester 2018

Dr. James Cook
jcook4@liberty.edu

434--582-2476:
DH: 3183

I. Course Description

A continuation of MATH 131. Techniques of integration, improper integrals, applications of integration, introduction to differential equations, sequences, infinite series, parameterizations of curves.

II. Rationale

This course provides a standard introduction to the study of calculus. It presents the theory and applications of elementary calculus necessary for further study of mathematics.

III. Prerequisite statement

MATH 131 or ENGR 131, grade of “C” and basic proficiency in a computer algebra system. It is the student’s responsibility to make up any prerequisite deficiencies, as stated in the Liberty University Catalog, which would prevent the successful completion of this course

IV. Materials List

Calculus with Early Transcendentals by James Stewart. ISBN: 978-1-285-74155-0

V. Learning Outcomes

The student will be able to:

1. Integrate functions by parts, partial fractions, and trigonometric substitutions
2. Demonstrate knowledge of computing arc length and parametrization
3. Be able to solve elementary differential equations.
4. Sketch and understand functions in polar coordinates
5. Set up integrals in polar coordinate and compute areas
6. Determine if a series converges or diverges.
7. Demonstrate knowledge of the application of integration by solving problems in written form using proper mathematical notation and terminology.
8. Begin to develop the ability to accurately and effectively communicate mathematics to others.
9. Gain an appreciation for mathematics as a major factor in modern society

VI. Assignments/Requirements

1. Cognitive growth:

- a. Demonstrate mathematical proficiency by applying the concepts of differentiation in solving problems and the concepts of integration in solving problems with and without appropriate technology. See all the learning outcomes in section V above.
- b. Demonstrate mathematical proficiency by analyzing and criticizing proofs. See all the nine learning outcomes in section V above.
- c. Demonstrate mathematical proficiency by constructing proofs of specified theorems. See all the learning outcomes in section V above.

2. Product:

- a. Three (3) hand written exams plus a hand written comprehensive final exam.
- b. Online homework assignments.

- c. Five (5) Quizzes: one online prerequisite quiz the first day of class and one hand written quiz the week before each of the hand written exams.

Note: For all of the items, a – c, see all the learning outcomes in section V above.

3. Process:

Students will demonstrate their individual progress by solving problems in homework assignments, quizzes and tests. See the learning outcomes in section V above.

VII. Grading Policies

1. **Grading system:** Your grade will be the average of three (3) tests (150 points each), a required comprehensive final exam (300 points), online homework (120 points total), an online prerequisite quiz on the first day of class (50 points) and hand written quizzes the week before each exam (20 points each). This constitutes the 1000 possible points for the course.
2. **Homework:**
 - a. Homework will be assigned through WebAssign™. Homework will be due on Wednesdays and Sundays each week of the term. Even though homework problems are given online, students are encouraged to work out solutions on paper using correct mathematical notation before entering data into WebAssign™. Remember, almost all the graded work for the course will be in written form. For each homework assignment, you have been supplied a set of problems worked out for you. Please look over these solutions!! Not only are these problems similar to the assigned problems (and similar to test problems) but also, they are written using correct mathematical notation. On all written work, **YOU WILL BE EXPECTED TO WRITE CORRECT MATHEMATICS** and points will be deducted if you do not. It is helpful to practice writing correct Mathematics when it is not critiqued so that it becomes second nature when required.
 - b. Doing homework correctly takes time. Please plan for it. Doing homework correctly is how students can actually gain understanding of the material. Doing homework incorrectly will gain students quick, easy homework points but not give preparation for tests.
3. **Final Exam:** The final exam is comprehensive, covering material from the entire semester. As such, if the percentage grade on the final is greater than the percentage grade of the lowest test, the score on that test will be replaced by 1/2 of the grade from the final exam. (to scale out of 150) This may be done for one test only.
4. **Final Grade:** Grades are based on **academic performance** and no extra credit is available. Your final course grade will be determined by using a 100 point scale.

A 900 – 1000 points B 800 – 899 points C 700 – 799 points D 600 – 699 points F below 600

VIII. Other Policies

Honor Code

We, the students, faculty, and staff of Liberty University, have a responsibility to uphold the moral and ethical standards of this institution and personally confront those who do not.

Limits of Confidentiality

Students are encouraged to share prayer requests and life concerns with the professor in this class. Not only will the professor pray for and care for students, but can guide students to appropriate University resources if desired.

However, in the event of a student's disclosure, either verbally or in writing, of threat of serious or foreseeable harm to self or others, abuse or neglect of a minor, elderly or disabled person, victim or witness of a crime or sexual misconduct, or current involvement in criminal activity, the faculty, staff, administrator, or supervisor will take immediate action. This action may include, but is not limited to, immediate notification of appropriate state law enforcement or social services personnel, emergency contacts, notification of the appropriate program chair or online

dean, or notification to other appropriate University officials. All reported information is treated with discretion and respect, and kept as private as possible.

Academic Misconduct

Academic misconduct includes: academic dishonesty, plagiarism, and falsification. See [The Liberty Way](#) for specific definitions, penalties, and processes for reporting.

Disability Statement

Students with a documented disability may contact the [Office of Disability Academic Support](#) (ODAS) in DeMoss Hall 1118 to make arrangements for academic accommodations. For all disability testing accommodation requests (i.e. quieter environment, extended time, oral testing, etc.) the [Testing Center](#) (DeMoss Hall 1036) is the officially designated place for all tests administered outside of the regular classroom.

DROP/ADD POLICY

A Fall/Spring course may be dropped without a grade, tuition, and fee charges within the first five days of the semester. From the sixth day until the end of the tenth week (see academic calendar for exact date), a Fall/Spring course may be withdrawn with a grade of 'W'.

IX. SEMESTER CALENDER: See below:

	Monday	Tuesday	Wednesday	Thursday	Friday	Weekend
Wk 1	Math 131 Review Gateway quiz	Sect 7.1	Sect. 7.2 Homework 1	Sect. 7.3	Sect 7.4	Homework 2 Quiz 2
Wk 2	Sect. 7.5	Sect 7.7	Sect. 7.8 Homework 3	Sect. 7.8	Sect 7.8	Homework 4 Test 1
Wk 3	Sect. 8.1/8.2	Sect 8.3/8.5	Sect. 11.1 Homework 5	Sect. 11.2	Sect 11.3	Homework 6 Quiz 3
Wk 4	Sect. 11.4	Sect 11.5	Sect. 11.6 Homework 7	Sect. 11.7	Sect 11.7	Homework 8 Test 2
Wk 5	Sect. 11.8	Sect 11.9	Sect. 11.10 Homework 9	Sect. 11.11	Sect 11.11	Homework 10 Quiz 4
Wk 6	Sect. 10.1	Sect 10.1	Sect.10.2 Homework 11	Sect. 10.2.	Sect 10.2	Homework 12 Test 3
Wk 7	Sect. 10.3	Sect 10.3	Sect. 10.4 Homework 13	Sect. 9.1/9.2	Sect 9.3	Homework 14 Quiz 5
Wk 8	Sect. 9.4	Sect 9.4	Sect. 9.4 Homework 15	Review	Review	Final Exam

(I will add dates and many more details here as I work out the day-by-day structure of the course, which is more or less already clear in the box-schedule above)

Schedule	Topic	Stewart	Recommended Problems
	Integration by Parts	7.1	
	Trigonometric Integrals	7.2	
	Trigonometric Substitution	7.3	
	Integration of Rational Functions by Partial Fractions	7.4	
	Strategy for Integration (combined concept problems)	7.5	
	Approximate Integration	7.7	
	Improper Integrals	7.8	
	TEST 1: integration techniques		
	Arc Length	8.1	
	Surface Area of Surface of Revolution	8.2	
	Applications to Physics and Engineering	8.3	
	Probability	8.5	
	Sequences	11.1	
	Series	11.2	
	The Integral Test and Estimates of Sums	11.3	
	The Comparison Tests	11.4	
	Alternating Series	11.5	
	Absolute Convergence and the Ratio and Root Tests	11.6	
	Strategy for Testing Series	11.7	
	TEST 2: applications of integration, sequences, series		
	Power Series	11.8	
	Representation of Functions as Power Series	11.9	
	Taylor and Maclaurin Series	11.10	
	Applications of Taylor Polynomials	11.11	
	Curves Defined by Parametric Equations	10.1	
	Calculus with Parametric Curves	10.2	
	TEST 3: power series, parametrization, polar coordinates		
	Polar Coordinates	10.3	
	Areas and Lengths in Polar Coordinates	10.4	
	Modeling with Differential Equations	9.1	
	Direction Fields and Euler's Method	9.2	
	Separable Equations	9.3	
	Linear Equations	9.5	
	Comprehensive Final Examination		