

Math 131-001 Calculus and Analytic Geometry I, Fall 2009	Liberty University, Lynchburg Virginia
James S. Cook, Office Hours: M-W-TH from 5:00pm-6:20pm and by appointment	Applied Science 105 Email: jcook4@liberty.edu (preferred) office phone: 434-582-2476
<i>Thus shall you say to them: "The gods who did not make the heavens and the earth shall perish from the earth and from under the heavens" It is he who made the earth by his power, who established the world by his wisdom, and by his understanding stretched out the heavens.</i> Jeremiah 10:11-12 (E.S.V.)	Lectures and tests in Science Hall 134 Lecture Times: M-W-F 8:50-9:40am, T-TH 9:15 -10:30am

I. Course Description

Functions and graphs, limits, the derivative, techniques of differentiation, continuity, applications of differentiation, the integral.

II. Rationale

This course, along with MATH 132, 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 128 with a minimum grade of C.

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

- Required Text: Calculus, Sixth Edition, By James Stewart, Brooks/Cole Publishing Co. 2008.
- Supplemental Materials: course notes and more available online at the course website.
- No graphing calculator is required for this course. Mathematica can do much more than even the best graphing calculator. I will allow (basic) scientific calculators during tests, but no graphing calculators, laptops, PDAs, IPODS, cell phones, bluetooth-type devices, or any other electronic device capable of either data storage or communication. If in doubt ask.

V. Learning Outcomes

The student will be able to:

1. Find limits of elementary functions.
2. Demonstrate knowledge of continuity of functions by solving problems in written form using proper mathematical notation and terminology.
3. Carry out the differentiation of elementary functions.
4. Sketch and discuss the graphs of elementary functions.
5. Demonstrate knowledge of the application of differentiation by solving problems in written form using proper mathematical notation and terminology.
6. Carry out integration of elementary functions.
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 the nine learning outcomes in section V above.
 - b. Demonstrate mathematical proficiency by analyzing and criticizing proofs. See the nine learning outcomes in section V above.
 - c. Demonstrate mathematical proficiency by constructing proofs of specified theorems. See the nine learning outcomes in section V above.
2. **Product:**
 - a. Four (4) exams plus a comprehensive final exam.
 - b. Daily assignments.
 - c. Quizzes – announced and unannounced
Note: For all of the items, a – c, see the four learning outcomes in section V above.
3. **Process:**

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

VII. Grading Policies

- Free tutoring may be available in the Testing/Tutoring Center (TE 128) and in the Math Help Center (SH 134).
- late assignments are penalized.
- Quizzes may be announced or unannounced, take-home or in class, open or closed book, group or independent work.
- No make-up quizzes will be given.
- Students are expected to abide by the Liberty University Honor Code as stated in *The Liberty Way*.

Your score for the course is earned as follows:

1. [1500pts] Regular Text Homework: The Homework will be collected weekly in general. A complete list of problems as well as due dates is given on the course website. Typically there are 5pts per moderate homework problem. There are certain harder homework problems which require more work and are worth more.
2. [500pts] Quizzes: may be given at any time during the semester, usually I give a quiz to alert you to the fact the test is coming. No makeup quizzes are given.
3. [1000pts] Homework Projects: there are four of these, one for each test.
4. [4000pts] Tests: there will be four tests, each is worth 1000pts of the final course grade.
5. [3000pts] Comprehensive final exam.
6. Bonus points are possible, the points listed are all that is required.

•Course Grade: Your minimum final course grade will be determined by the following point scale (no rounding)
9000-9999+ = A 8000-8999 = B 7000-7999 = C 6000-6999 = D 0-5999 = F

•Forming study groups is encouraged. However, it is important that you do not simply copy other student's homework. You may check answers, but you should not replicate steps. Exceptions to this rule should be clear; no

group work on tests and no group work when I outlaw it. For example, I typically outlaw group work on an easy take-home test.

•**Missed Tests:** If you have an emergency absence then the final exam will substitute for the missed test. In particular, your grade on the missed-test material will be substituted for the missed test. For example, if you miss test IV and if my final has 800 points of test-IV-type integration and you earn 720 of the 800 points on integration on the final then you get 90% of 1000 =900 for test IV. If your absence is known ahead of time then you need to notify me so we can make arrangements.

Comment: I do not “give grades”, rather you EARN your grade through your responsible and continual efforts to master the material. I want everyone to pass my course, but it is you who must do the work. I will do everything in my power to help you work effectively. The recipe for passing is quite simple: come to class, pay attention, do your homework. I rarely fail anyone who actually does these three simple things.

VIII. Attendance Policies

- Class attendance is essential and students are expected to be present each class. If an absence is unavoidable, then the student should notify the professor in writing or by email in advance. If advance notice is not possible, then an email should be sent promptly after the absence. It is your responsibility to get up to speed on any missed material.
- Phones, beepers, iPods, etc. should be turned off and put away during class.
- Students will arrive on time and stay for the entire class.
- Students will bring printed lecture notes, pen/pencil, paper, calculator, and completed homework to class.
- (text not expected)

IX. Other Policies

Dress Code: Students are expected to come to class dressed in a manner consistent with The Liberty Way.

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.

Academic Misconduct: Academic misconduct includes: academic dishonesty, plagiarism, and falsification. See The Liberty Way for specific definitions, penalties, and processes for reporting.

Disability Statement: Any student with a documented disability may contact the Office of Disability Academic Support (ODAS) in Teacher Education Building-TE 127 in order to make arrangements for an academic accommodation.

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, a Fall/Spring course may be withdrawn with a grade of W or WF.

Classroom Policies: The inappropriate use of technology, such as cell phones, iPods, laptops, calculators, etc. in the classroom is not tolerated. Other disruptive behavior in the classroom is not tolerated. Students who engage in such misconduct will be subject the penalties and processes as written in the Liberty Way. **Also, I may dedicate pop-quizzes to those caught texting in lecture.**

Agenda of Class Sessions:

The Test and Homework Project due dates are as follows:

Assignment	Due Date
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Homework Project 1	Friday, Sept. 14
Test 1	Tuesday, Sept. 17
Homework Project 2	Friday, Oct. 12
Test 2	Tuesday, Oct. 13
Homework Project 3	Friday, Nov. 9
Test 3	Tuesday, Nov. 10
Homework Project 4	Friday, Dec. 2
Test 4	Thursday, Dec. 3
Comprehensive Final Exam.	LU-officially scheduled time, usual room.

-The Homework Projects are posted as pdf-files on the course webpage.

-See the course website <http://www.supermath.info/math131f09.html> for detailed instructions and due dates.

Disclaimer : While I have attempted to completely specify the content of this course, I reserve the right to change this syllabus if necessary. It is your responsibility to monitor your Liberty University email account for any changes in the syllabus. I will notify you via email and announce in class in the event something needs modification.

Additional comments from your instructor:

This is the first in a 3-semester course on Calculus. The methods and concepts presented in this course are fundamental to most, if not all, technical disciplines. Differentiation allows us to analyze the change in a variable. Integration allows us to analyze the total value of a variable. Calculus is used to phrase many of the laws of physics which describe much of the natural world. This means that if we know calculus then we can better appreciate the general revelation of God.

It is important that you master the techniques of MATH 131. I look forward to helping you toward that goal, but ultimately you must think for yourself. The ability to think in math comes from practice (for most of us anyway) so make sure you set aside plenty of time throughout the week to work out the subject for yourself.

It is possible that you may not use calculus in your daily life, but there is still something to be gained by its study. As Christians we are called to sharpen our minds towards the purpose of defending our faith and winning others to Christ. Mathematics demands that we think more precisely than in many other avenues of discussion. In short, I argue that mathematics can help you think better. Think of it as weight lifting for your brain. No pain, no gain.

Finally, there is beauty. Mathematics can be beautiful and we can thank our Creator for allowing us to comprehend that beauty. A well crafted proof can be appreciated much the same way as other fine art. This is often sufficient motivation for pure mathematicians.