

Math 164: Integrated Calculus and Analytic Geometry II

Meets: TuTh 6:00–8:15p in SL 137

Final Exam: Saturday, December 8, 3:30–5:30p

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General Information and Goals

Calculus is one of the outstanding intellectual achievements of the human mind in addition to being the foundation of many applications of mathematics to physics, chemistry, biology, statistics, economics, and many other natural and social sciences. The roots of calculus go back to Eudoxus, Archimedes and other Greek thinkers more than 2000 years ago, but the calculus as we know it began with the work of Isaac Newton, Gottfried Leibnitz, and other mathematicians of the 17th century with many improvements in understanding, development of applications, and refinements and extensions of the theory in the 18th and 19th century. Much more recently, beginning in the second half of the 20th century, machines have been developed that, with human guidance, can solve calculus problems. In this course, we will keep all of these threads in mind as we learn about calculus and try to connect it to areas that are of interest to each of you.

Math 164 here at IUPUI forms part of the mathematical foundation for many majors in Science and Engineering but is taken by many other students as well. The course is open to all students who have the appropriate mathematical background in beginning calculus, equivalent to a grade of “C–” or better in Math 163. The course will cover Chapters 7 to 12 of the

Text: *Calculus*, 5th edition(2003), by James Stewart

My goals for you in this course are

Short term goal: That you master the ideas and computations of the course, both theoretical and applied.

Long term goal: That you recognize the uses or ideas of calculus as you see them in your professional or your personal life and that you know or can quickly relearn the computations that are important to you throughout your life.

Honors Version of Math 164

It may be possible for you to add advanced work to this course and get Honors credit on your transcript. There is paperwork that must be completed by Sept 7 or shortly thereafter, so if you are interested, please see me very soon to discuss it.

Attendance, Homework, and Quizzes

To quote from my colleague, Professor Morton: “Attendance is required to do well in this class. Based on experience, we can say with a fair degree of certainty, that if you do not come to class, you will not pass the course. Learning mathematics requires steady and persistent effort. Coming to class and making an effort to focus on the material being discussed is half the battle. The other half is practicing the concepts by doing the homework.” In this section of Math 164, because it meets only two times per week, it is especially challenging to master the material because there is not enough time to digest the ideas as they pass by so quickly. Missing a single class is missing half of a week of material!

It is important to read the text, both before and after coming to class. Reading before will prepare you for the discussion in class and reading after will help solidify your understanding. Reading mathematics books is a skill that will take time to master, but will pay off in your later study both in other math classes, but also in any classes that depend on reading detail. One of the biggest differences between reading mathematics and other kinds of reading is that to be successful in reading mathematics, you must read slowly and pay attention to the details you are reading. If you have trouble with material from the textbook, please ask me about it in class or office hours.

Homework will be assigned and collected regularly with grading mostly to check the work you are doing: 2 points for most problems attempted with substantive work, 1 point for about half of the problems attempted with substantive work, 0 points for most problems not attempted with substantive work or no paper turned in, plus up to 2 points for your work on each of the problems that are more thoroughly graded. Make-up/late homework will **not** be graded for credit.

Quizzes based on the homework will be announced in advance and will be done the last ten minutes or so of the class or of the part of class before the break. No make-up/late quizzes will be graded for credit; the two lowest quiz grades will be dropped, with missed quizzes counted as zeros.

The developing schedule for the course will be announced in class, but will also be on the website for the class, updated regularly.

Test, Exam, and Grading Policies

In addition to the course-wide, departmental, Final Exam on December 8, there will be 4 tests during the semester, of which one, Test 1, will be a “mastery test” (see below). Each test will contribute about 15% of the grade, the homework and quizzes, together, will contribute about 15 – 20% of the grade, and the Final Exam grade will constitute the remaining 20 – 25% of the course grade.

Tests 2 through 4 will be ordinary tests with 100 points possible and partial credit will be granted for answers that are mostly, but not completely correct. The grading scale on each of these tests is not fixed in advance, but will be announced in class after each test. Test 2 will be at the end of September or beginning of October and will cover Chapters 7 and 8. Test 3 will be in mid-October and will cover Chapters 9 and 10. Test 4 will be mid-November, before Thanksgiving, and will cover Chapter 12.

Test 1, September 6, on computation of derivatives and integrals (3.3, 3.5, 3.6, 3.7, 3.8, 5.3, 5.4, 5.5, 7.2, 7.4, and 7.5), covers the most basic and fundamental skills and will be

a mastery test. By “mastery test” I mean that the test will cover material that must be mastered for success in the course. For this test, no partial credit will be given – each answer is completely correct, or it will receive no credit. BUT, the test may be repeated at arranged times until noon on October 31st or until a score of 90 or more is achieved. The test will have 20 questions. A perfect score is 110 points, but for each incorrect answer, 10 points will be deducted. That is, on the first day the test is given, you will receive 110 points if you get all 20 questions correct, 100 points if you miss 1 question, 90 points if you miss 2 questions, 30 points if you get only 12 correct, and –30 points if you get only 6 correct. After the first day, 100 points will be the maximum score, given for no wrong or 1 wrong, and otherwise the scoring will be the same. I expect everyone will get 90 points or more on this test after taking it no more than three or four times because it will contain no “hard” questions. Students who do not pass this test with a score of 90 or above by the deadline of noon on October 31 will be advised to drop the course.

The Department of Mathematical Sciences enforces course-wide policies for the Final Exam in Math 164. These same policies will apply for all tests and quizzes in the course. These policies include:

- No calculators, cell phones, pagers, *ipods*, or other electronic devices are permitted to be on during the tests.
- No notes, books, or other of your papers may be used during the tests.
- The only items permitted on your desk during the test are the test paper, scratch paper provided by the instructor, and pen, pencil, and eraser.
- No bulky clothing or hats are permitted to be worn during the test.
- No talking will be permitted in the test room until *all* the tests have been turned in.
- If a student **MUST** miss a scheduled test or exam, the student should supply a legitimate reason and evidence for the reason to the instructor at least a week before the test or exam so that an alternate test can be scheduled. An alternate exam date for the Final will be scheduled before December 8. For unexpected emergencies, the student should notify the instructor as soon as possible and provide evidence of the emergency in order for an alternative test or exam to be scheduled.

A sample final and the official final from Spring 2007 will be on the Department’s webpage.

General Academic Policies

The work you submit for homework, quizzes, tests, and the final exam must be your own. For homework you will probably find it beneficial to consult with other students about the material and this kind of conversation and collaboration is encouraged. At the end of the consultation, however, each participant is expected to prepare their own summary of the discussion and their own solutions to the problems. More information about student conduct can be found at

<http://registrar.iupui.edu/misconduct.html>

More information concerning adaptive services for learning or other disabilities at IUPUI can be found at

<http://life.iupui.edu/aes/>

The policies for this class will be those derived from IUPUI's policies on academic conduct and adaptive services.

Approximate Course Outline

<i>Date</i>	<i>Chapter</i>	<i>Topics</i>
Aug 23	7.1, 7.2	Inverse functions, exponentials
Aug 28	7.3, 7.4	Logarithmic functions
Aug 30	7.5, 7.6	Inverse trig, hyperbolic functions
Sept 4	7.7, 5.5	Indeterminate forms, u substitution
Sept 6		Test 1 (mastery test on basic derivatives and integrals)
Late Sept	Chaps 7, 8	Test 2
Oct 16		Last day to withdraw with automatic "W"
Mid Oct	Chaps 9, 10	Test 3
Oct 31		Last day to retake Test 1
Nov 13		Last day to withdraw with permission of advisor and instructor
Mid Nov	Chap 12	Test 4
Nov 22		Thanksgiving Day (no class!!!)
	Chap 11	
Dec 8		Departmental Final Exam