

# Integral Calculus

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Office Hours: 7:45-8:30 Tuesdays and Fridays

## PREREQUISITE

Calculus 1 (Math 251) with a grade of “C–” or better. Prerequisite grade must have been completed within the past four terms.

## COURSE DESCRIPTION

Math 252 is a second-term calculus course covering definite and indefinite integrals. Specific topics covered include conceptual development of the definite integral, properties of the definite integral, the Fundamental Theorem of Calculus, constructing antiderivatives, techniques of indefinite integration, approximating definite integrals, and applications. Analytical, graphical, and numerical methods support one another in developing the course material.

## COURSE OBJECTIVES

Upon completion of the course, the successful student will:

1. estimate & calculate totals given information about rates of change.
2. understand the definite integral as a limit of Riemann sums.
3. interpret the meaning of and use correct notation for a definite integral.
4. compute definite integrals using the First Fundamental Theorem of Calculus.
5. understand how the definite integral and the average value of a function are related.
6. use properties and theorems pertaining to integrals.
7. graphically and numerically construct antiderivatives.
8. work with elementary differential equations.
9. work with functions defined in terms of definite integrals with a variable limit(s) of integration and apply the Second Fundamental Theorem of Calculus to the analysis of these functions.
10. understand that the indefinite integral represents a family of antiderivative functions.
11. find definite & indefinite integrals using basic rules, the substitution method, integration by parts, and trigonometric substitution.
12. use the midpoint, trapezoid, and Simpson's rule to approximate definite integrals.
13. identify improper integrals that converge or diverge and compute their values where possible.
14. use the methods & techniques of integral calculus to solve a variety of application problems.
15. use a programmable graphing calculator as an effective tool in confirming analytical work and obtaining numerical and graphical results related to integral calculus

## Required Materials

1. *Calculus, Single Variable*, 3rd edition, by Hughes-Hallett, Gleason, et al. We will cover selected sections from Chapters 1, 2, 3, and 4 of the text.
2. A programmable graphing calculator: the TI-84 Plus CE or TI-Inspire CX is recommended.
3. Graph paper. A graph paper notebook would work best.

## Class Format

Most classes will begin with a warmup. These warmups are for your own benefit. They will be the types of questions you'll see on quizzes or tests. During warmup time, attendance will be

taken. After the warmup, we will go over homework questions, then proceed to new material. There will be quizzes or in-class assignments on some days instead of new material.

### **Classwork**

Classwork is an extremely important part of your learning. Math is a very interactive discipline where practice is vital to your understanding. After most lessons you will have an in-class assignment. These will be checked or turned in by the end of class for a score on that assignment. When time is given in class to work on class work or homework you are expected to be working on it. This means you will be working on Calculus and no other subject. Since my class is Calculus you will lose credit for the assignment given if you are working on another subject's work or not working at all. Throughout the course of the trimester we'll have approximately 40 of these assignments. If you have an excused absence you will be excused from the assignment. However, you can still do them. These assignments will be posted on my blog. If you decide to do the assignment please show me at the beginning of class on the day you return.

### **Homework**

Every once in awhile you will have a homework assignment that will be for extra credit. The points will be added to your test scores. These problems are more thought provoking and difficult. They will be due on test day for the chapter we're working on.

### **Tests and Quizzes**

On the last day of every week we will have either a test or a quiz. You will be allowed to use notes on most of the quizzes but not on the tests.

### **Late Work**

No late classwork or homework is accepted. Classwork is due at the end of class and homework at the end of the week. If you miss a quiz or test, you have one week from your return to make it up.

### **Grading**

You will be assigned a letter grade on your transcript based on the following breakdown: 70% of your grade will be based on tests, 15% on quizzes, and 15% on homework and other assignments.

### **Attendance Policy**

I am required to submit attendance online within the first ten minutes of class. If you come to class after the ten minutes are up, you will be required to go to the front office to get an admit slip.

### **Electronics Policy**

Cell phones and ipods are a distraction to your learning. If I see them out during class, I will give you a choice to give them to me for the period or to leave for the class.

### **Getting Help**

1. Come to office hours.
2. Consult with classmates and form study groups – math doesn't have to be a solitary struggle.

3. Get help from a free or paid tutor.
4. Consult your lesson notes which will be posted to remind.com and are also available via email by request.

Si necesita más información en Español sobre esta clase, por favor comuníquese con María Ladona al 541-790-5151 o por correo electrónico [schaad\\_ma@4j.lane.edu](mailto:schaad_ma@4j.lane.edu).