

# Analytic Geometry & Calculus I with Review

Math 106 B

MTWF: 10:20 - 11:10

“Mathematics, rightly viewed, possesses not only truth, but supreme beauty – a beauty cold and austere, like that of sculpture, without appeal to any part of our weaker nature, without the gorgeous trappings of painting or music, yet sublimely pure, and capable of a stern perfection such as only the greatest art can show”

*Bertrand Russell*

**Instructor:** Christopher Godbout

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**Office Hours:**

**Text:** Stewart, James. *Calculus*, 5<sup>th</sup> ed.

Ebersole, Schattschneider, Sevilla, Somers. *A Companion to Calculus*.

**Calculators:** A graphing calculator is optional, but will be helpful in visualizing the functions and concepts we'll be working with.

## Course Description

Calculus, at its heart, is the study of change. This is often phrased in many bizarre ways, but it comes down to asking, “How fast is something changing at one instant in time?”. Even though this question seems pretty simple, it has many applications and makes many other things in mathematics and science possible.

## Course Outcomes

- Understand and compute limits.
- Understand and compute derivatives - one of the most important tools in mathematics.
- Apply these tools in various ways, such as drawing a graph, finding rates of change, and finding optimum solutions.
- Be able to think mathematically.
- Become rich and famous.

### **Attendance**

Attendance in this course is not required and I will not be keeping track of students' attendance (or lack thereof). Even though attendance is not required, it is **highly** recommended.

If you are going to be absent for a quiz or test, I will need advance notification. Failure to notify me may result in a 0 for the quiz or exam.

### **Homework**

Homework will be a very important part of this course. Working problems is vital to your understanding of the material. Every week there will be a problem set for you to complete and hand in on Tuesday. Working together is not only acceptable, it is encouraged. Just remember that you have to hand in your own work and you will not be allowed to work together on quizzes or exams. Additionally, you must indicate with whom you worked on your assignment.

Late homework will not be accepted.

Finally, work must be shown on the homework. An answer with no justification might not receive full credit even if it's correct.

### **Quizzes and Exams**

There will be a short ten to fifteen minute quiz every Friday (except for the first Friday of the term). The quiz will cover material on the homework handed in that Tuesday. There will be no makeup quizzes without talking to me beforehand.

There will also be a midterm exam and a final exam, the dates of both to be determined. The final exam will be cumulative.

### **Grading**

The breakdown of your final grade is as follows:

Homework and Quizzes	50%
Midterm	25%
Final	25%

The grade distribution I will use is: A (93 and up), A- (90 to 93), B+ (87 to 90), B (83 to 87), B- (80 to 83), C+ (77 to 80), C (73 to 77), C- (70 to 73), D+ (67 to 70), D (60 to 67), F (Below 60).

### **Academic Dishonesty**

Please refer to Moravian's "Policy on Academic Dishonesty" that is outlined in the student handbook.

### Tentative Course Outline

Topic	Stewart	CTC
Cartesian Coordinate System		1-A
Graphs		1-B
Lines		1-C
Distance Between Points		1-E
Circles		1-F
Trigonometry	App. D	
Function Notation		2-A
Domain and Range		2-B
Representations of Functions		2-C
Graphing Functions		2-D
Essential Functions	§1.2	2-E
Combining Functions	§1.3	
Graphing Calculators and Computers	§1.4	
Negative and Rational Exponents		7-A
Rules of Exponents		13-A
Exponential functions	§1.5	
Inverses and Logarithms	§1.6	
Tangents and Velocity	§2.1	
Limits	§2.2	
Simplification of Functions		3-B
Limit Laws	§2.3	
Inequalities		3-C
Precise Definition of a Limit	§2.4	
Continuity	§2.5	
Limits at Infinity	§2.6	
Tangents and Velocities	§2.7	
Derivatives	§2.8	
The Derivative as a Function	§2.9	
Derivatives of Polynomials and Exponentials	§3.1	
Power and Quotient Rules	§3.2	
Applications	§3.3	
Derivatives of Trig Functions	§3.4	
The Chain Rule	§3.5	
Implicitly Defined Functions		9-A
Implicit Differentiation	§3.6	
Higher Derivatives	§3.7	