

BOROUGH OF MANHATTAN COMMUNITY COLLEGE

City University of New York

Department of Mathematics

**Analytic Geometry & Calculus
MAT 301**

Instructor Information:

Name: Prof Wladis

Email: profwladis@gmail.com

(**This is the best way to reach me.**)

Class hours: 4

Lab hours: 2

Phone: 212-220-1363 (email is the best way to reach me)

Office: N539 (inside the math department N520)

Box: in the math department, N520

Course webpage: www.cwladis.com/math.php

Course Description: An integrated course in analytic geometry and calculus applied to functions of a single variable. A study of functions; limits; continuity; related rates; differentiation of algebraic and transcendental functions; Rolle's Theorem; The Mean Value Theorem; Maxima and Minima; curve sketching; differentials; and introduction to integration.

MAT 301 has a computer laboratory component. Students utilize computer software such as graphing packages, a computer algebra system, and a mathematical word processor to complete laboratory assignments associated with their calculus course.

Prerequisites / Co-requisites: Precalculus (MAT 206) or the equivalent with departmental approval.

Student Learning Outcomes:

Course Student Learning Outcomes	Measurements
1. Students will be able to calculate the limit analytically and geometrically. They will use the limit to determine continuity.	1. Homework assignments and/or take home projects; Quizzes and/or Midterm Exams; Final Exam; Lab Projects.
2. Students will be able to use the concept of the limit to compute the derivative. Students will be able to calculate the derivative for algebraic and transcendental functions. Students will use implicit and explicit differentiation to solve applied problems.	2. Homework assignments and/or take home projects; Quizzes and/or Midterm Exams; Final Exam; Lab Projects
3. Students will be able to compute higher order derivatives and apply this to curve sketching and optimization problems.	3. Homework assignments and/or take home projects; Quizzes and/or Midterm Exams; Final Exam; Lab Projects.
4. Students will be able to use the Fundamental Theorem of Calculus to compute the definite integral.	4. Homework assignments and/or take home projects; Quizzes and/or Midterm Exams; Final Exam; Lab Projects.

General Education Outcomes and Assessment:

General Education Learning Outcomes	Measurements
Communication Skills - Students will be able to write, read, listen and speak critically and effectively.	Assignments and/or take home projects; exams and/or Midterm Exam; Final Exam and Lab Projects.
Quantitative Reasoning - Students will be able to use quantitative skills and the concepts and methods of mathematics to solve problems.	Assignments and/or take home projects; exams and/or Midterm Exam; Final Exam and Lab Projects.
Information & Technology Literacy - Students will be able to collect, evaluate and interpret information and effectively use information technologies.	Assignments and/or take home projects; exams and/or Midterm Exam; Final Exam and Lab Projects.

Required Text: Calculus - Alternate Sixth Edition; Ronald E. Larson, Robert P. Hostetler, Bruce H. Edwards; Houghton Mifflin Company, Boston, New York; 1998, **with webassign access code. ISBN: 9781133539278**

Use of Technology: All students are required to use the **WebAssign** online courseware system. It contains videos, homework problems, chapter tests and quizzes, step-by-step help, an online version of the textbook, and more. Students can access the online courseware only by buying a **new textbook** that contains a student access card or by buying a **separate access code** from the bookstore or the publisher (at <http://www.cengagebrain.com/micro/bmccmat>, or www.webassign.net).

To register for WebAssign, go to the following address, and follow the instructions given there:
<http://www.cwladis.com/math301webassign.html>.

Evaluation and Requirements of Students:

Assignments:

This class has several kinds of assignments:

- *Homework* (15% of your final grade)
Each chapter has its own homework assignments; I'll tell you which ones to do in class.
The homework is completed in WebAssign, and is due **by the next class period**.
If you get a low score on a homework assignment, you can keep redoing it to improve your score until the last day of classes for the semester.
- *Labs* (10% of your final grade)
You will keep all your labs in a single notebook or folder, and submit this notebook whenever you take an exam in class.
- *Projects and Quizzes* (25% of your final grade)
This includes labs, in-class activities, and group work that may be done in or out of class.
- *Section Tests* (30% of your final grade)
We will have 3 section tests throughout the semester. I will make announcements in class a week or two ahead of time.
- *Final exam* (20% of your final grade)
At the end of the class, we will have a final exam. It will be cumulative. It will be very similar in structure and difficulty to the chapter tests. If you have studied and done well on all the previous tests, you will probably do well on the final.

Attendance Policy:

Attendance at this class is mandatory.

BMCC policy states that a professor may give a student an F or a WU grade once the student has missed more than [1+(the number of hours the course meets each week)] hours of a course for the semester. Because this is a 3 hour course, this means that once you miss **more than 4 hours of class** (every class meeting counts as 1 or 2 hours), I could assign you a grade of F or WU.

However, if you:

1. have a good reason for missing class AND
2. you contact me (preferably ahead of time) to let me know what is going on AND
3. you turn in all work,

then I will not assign you an F or a WU grade. If, however, you fail to get in touch with me and/or fail to turn in or make up missing work, you may receive an F or a WU for excessive absences.

Policy on Late Work:

What you should do if you believe you have an excused reason for missing work or turning it in late: **Contact me as soon as possible!** The best way to contact me is via email or in person before or after class. Illness or death in the family are the most common valid reasons why you may get permission to make up a test or turn work in late; just be prepared, especially if you have missed a test, to give me some kind of **documentation**. Other unexpected events of a magnitude similar to these may also be considered; just be sure to contact me as soon as possible. The longer you wait to contact me about a situation, the less likely it is that you will be able to make up the missed work.

Penalty for late work turned in:

- *Before the last day of classes:* You will receive 75% of the credit for the assignment. This means that the highest grade you can get at this point on the assignment is a 75.
- *After the last day of classes:* You will receive **NO credit** on this work unless you have a valid excuse (i.e. sickness, death in the family, etc.) with some kind of documentation, and you have let me know about the problem ASAP.
- *Tests and quizzes:* If you have a valid excuse, you may make up missed tests and quizzes for full credit; if this happens, contact me ASAP! If you do not have a valid excuse, tests and quizzes may not be able to be taken late.

College Attendance Policy

At BMCC, the maximum number of absences is limited to one more hour than the number of hours a class meets in one week. For example, this is a four-hour class. In this class, you would be allowed 5 hours of absence (not 5 days). In the case of excessive absences, the instructor has the option to lower the grade or assign an F or WU grade.

Academic Adjustments/Students with Disabilities:

Students with disabilities who require reasonable accommodations or academic adjustments for this course must contact the Office of Services for Students with Disabilities (Room N320; 220-8180). BMCC is committed to providing equal access to all programs and curricula to all students.

BMCC Policy Statement on Plagiarism:

Plagiarism is the presentation of someone else's ideas, words or artistic, scientific, or technical work as one's own creation. Using the idea or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations require citations to the original source. Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism. Students who are unsure of how and when to provide documentation are advised to consult with their instructors. The library has guides designed to help students to appropriately identify a cited work. The full policy can be found on BMCC's web site, www.bmcc.cuny.edu.

What to do if you Need Math Help:

1. **Ask me for help:** Come see me after class or come to my office hours. You can also email me any questions you may have. Be sure to be specific - give me a particular problem or example that you are having trouble with and explain where you are getting lost - the more specific you are about what you don't understand, the more I can help you. "I just don't get this chapter," or "I just don't understand how to do truth tables," for example, are requests for help that don't really give me any information about what you are struggling with, and so it makes it hard for me to give you any meaningful help.
2. **Go to the Math Lab:** You can go to the Math Lab in **room S511** any time they are open to get help. You can get tutoring here, but you will have to be patient, as the tutors are usually helping several students at a time in several different subjects. You will need a **valid BMCC student ID** to get into the math lab. The usual math lab hours are below, but you will need to be careful as these hours may change, particularly around holidays. **Hours: M-Th 10am-8pm, F 10am-7pm, Sat 10am-4pm, Sun (Room S-500) 10am-5pm.** You can also check out the Math Lab webpage at www.bmcc.cuny.edu/mathlab/.
3. **Contact the Learning Resource Center:** The Learning Resource Center offers several kinds of tutoring. You can take a look at their webpage at www.bmcc.cuny.edu/lrc/index.html. Some specific kinds of tutoring they offer are:
 - a. **One-on-one tutoring:** To sign up for this, drop by the LRC at the main BMCC campus in **room S500**, call the Tutor Hotline at **212-220-1383**, or email the LRC at lrc@bmcc.cuny.edu. You should have your student ID and your schedule available. If you are interested in one-on-one tutoring at the LRC, it is a good idea to check out the information about what you can expect at tutoring: www.bmcc.cuny.edu/lrc/tutoring/expect.html or the LRC's frequently asked questions about tutoring: www.bmcc.cuny.edu/lrc/tutoring/faq_tutoring.html.
 - b. **Online tutoring:** The LRC also offers online e-tutoring, where you can submit any questions via email and get a response within 24 hours (or if it is a weekend or vacation, by the next day that classes are in session). To submit a question to the e-tutors, just visit the webpage: www.bmcc.cuny.edu/etutoring/. You can also contact the e-tutoring office by phone at **212-220-1380** or by email at e-tutoring@bmcc.cuny.edu if you have any questions about the program.

Outline of Topics

TOPICS

TEXT PAGES

Chapter 1: Review

- 1.5 Functions (Definition, Classifications and Graphs) 36 – 44

Chapter 2: Limits and Their Properties

- 2.1 An Introduction of Limits 51 – 61
2.2 Techniques for Evaluating Limits 63 – 67
2.3 Continuity 69 – 74
2.4 Infinite Limits 77 – 82

Chapter 3: Differentiation

- 3.1 The Derivative and the Tangent Line Problem 95 – 102
3.2 Velocity, Acceleration, and Other Rates of Change 105 – 111
3.3 Differentiation Rules for Powers, Constant Multiple and Sums 113 – 119
3.4 Differentiation Rules for Products and Quotient 121 – 127
3.5 The Chain Rule 128 – 134
3.6 Implicit Differentiation 135 – 141
3.7 Related Rates 142 – 148

Chapter 4: Application of Differentiation

- 4.1 Extrema on an Interval 155 – 160
4.2 Rolle's Theorem and The Mean Value Theorem 162 – 166
4.3 Increasing and Decreasing Functions and the First Derivative Test 167 – 172
4.4 Concavity and the Second Derivative Test 174 – 180
4.5 Limits at Infinity 182 – 187
4.6 A Summary of Curve Sketching 189 – 196
4.7 Optimization Problems 198 – 203
4.8 OPTIONAL: Newton Method 205 – 210
4.9 Differentials 212 – 218

Chapter 7: Exponential and Logarithm Functions

- 7.1 Exponential Functions 357 – 361
7.2 Differentiation of Exponential Functions 365 – 367
7.3 Inverse Functions 371 – 377
7.4 Logarithmic Functions 379 – 384
7.5 Logarithmic Functions and Differentiation 386 – 392
7.6 Indeterminate Forms and L'Hôpital's Rule 406 – 413

Chapter 8: Trigonometric Functions and Inverse Trigonometric Functions

- 8.1 REVIEW: Trigonometric Functions 419 – 425
8.2 Graphs and Limits of Trigonometric Functions 428 – 435
8.3 Derivatives of Trigonometric Functions 437 – 446
8.5 Inverse Trigonometric Functions and Differentiations 458 – 466

Chapter 5: Introduction to Integration

- 5.1 Antiderivatives and Indefinite Integration 229 – 237
5.2 Area 239 – 248
5.3 Riemann Sums and the Definite Integral 250 – 258
5.4 The Fundamental Theorem of Calculus 260 – 267