

# Calculus II w/ intro to Multivariable Calculus

## MATH 212 Spring 2020

**Section GH: M,W 6:00pm – 7:40pm in NAC 1/201**

**Website:** <http://math.sci.ccny.cuny.edu/pages?name=Math+212+GH+Spring+2020>

**Section RS2: T,Th 4:00pm – 5:40pm in NAC 6/121**

**Website:** <http://math.sci.ccny.cuny.edu/pages?name=Math+212+RS2+Spring+2020>

**Instructor:** Jhevon Smith (“Jhevon” is fine.)

**Email:** [JhevonTeaches@gmail.com](mailto:JhevonTeaches@gmail.com) (Do not email me at any other email address.)

**Office Hours:** M 4:30 – 5:30pm, Th 2:30 – 3:30pm, or by appointment.

**Location for hours above:** NAC 1/219 (tentative).

**My Website:** [http://math.sci.ccny.cuny.edu/people?name=Jhevon\\_Smith](http://math.sci.ccny.cuny.edu/people?name=Jhevon_Smith)

**Text:** [Thomas’ Calculus: Early Transcendentals](#) 14<sup>th</sup> edition, by Hass, Heil, and Weir; Pearson

**Math Dept.:** NAC 8/133      **Math Dept. website:** <http://math.sci.ccny.cuny.edu/>

**Math 212 website:** [https://math.sci.ccny.cuny.edu/courses?name=MATH\\_21200](https://math.sci.ccny.cuny.edu/courses?name=MATH_21200)

**Disclaimer:** Consider this syllabus tentative. I do not expect to make changes, but I may have to depending on how the semester goes. I reserve the right to make updates to the syllabus at any point during the semester.

**Course description:** Techniques of integration, improper integrals, infinite sequences and series, parametric equations, vectors and the geometry of space, functions of several variables and partial differentiation.

**Calculator/Technology:** The use of calculators, smart phones or other electronic devices are NOT permitted in any quiz or exam, but may be useful in self-study.

**Text:** You do not need to purchase a physical text, but you will need paid access to the online homework system offered by the text; MyMathLab. By purchasing this access, you will gain access to the eText as well. More info on this later.

**Grading:** Grades will be assigned according to the following chart.

Letter Grade	G.P.A.	Grade	Letter grade	G.P.A.	Grade
A	4.00	94-100	C+	2.33	77-79
A <sup>-</sup>	3.66	90-93	C	2.00	74-76
B <sup>+</sup>	3.33	87-89	C-	<b>1.66</b>	<b>70-73</b>
B	3.00	84-86	D	<b>1.00</b>	<b>60-69</b>
B-	2.66	80-83	F	<b>0</b>	<b>Below 60</b>

Departmental policy demands that the final exam be worth 40% of your grade in this course. The other 60% will come from your in-class grade. The grade breakdown for our class is as follows:

**Quizzes: 10%** (In general you will have a quiz every week; two grades dropped)

**Homework: 5%** (Online via Pearson’s MyLab)

**Participation: 5%** (Based on attendance, but I’ll notice if you participate further)

**In-class tests: 40%** (We will have two non-cumulative in-class tests)

**Final Exam: 40%** (This will be a departmental cumulative exam given at the end of the course.)

**Make-up Policy:** There are no make-ups for missed quizzes or HW. Make-ups for exams may only be given if you missed the exam for a very compelling (and documented) reason.

**Attendance:** Attendance will be taken at the beginning of class. You are *late* if you arrive after your name is called. You will be assigned a WU (failing) grade if you accumulate 5 unexcused absences or if you stop attending class without officially withdrawing (please don't do this, if you're thinking about it, come talk to me—or at least talk to your academic advisor).

To be excused for an absence (or lateness) you must email me no later than one day after that particular absence (or lateness) with the reason. Of course, proof is required where applicable. For example, if your absence or lateness was due to a doctor's appointment, I expect to see a doctor's note. If you miss a class, it is your responsibility to catch up.

**Work ethic:** You are not to slack off (more on this in class)! You are to read ahead! Very Important! Read about each section before coming to class. Maybe even try some problems or watch some instructional videos. It's better if you have your mind working on the concepts before coming to class—it will be easier for you to keep up and ask intelligent questions. Start working hard from day 1, don't put yourself in a position where you'll have to catch up. Prevention is better than cure. I expect you to give 110% effort here. Even if you've taken this class before—no, *especially* if you've taken this class before. 100% might do if you're GREAT at algebra and calculus I.

**Homework/quizzes/tests:**

Homework will be submitted online through Pearson's MyLab. I believe the price is ~\$80. If you'd also like a paper version of the text, it'll cost ~\$115 via a special discount for CCNY students. Registration instructions are posted on the class webpage.

Quizzes will be given during class, at the beginning, every week (when you don't have a test). In general, they will be short-answer, fill-in-the-blank type questions and you won't get partial credit. You will do your work on scrap paper and then write your answers on the sheet provided.

Tests will also be given during class. Their dates can be found in the topics list. The tests are not cumulative. You must show all your work for tests and you will be given paper/booklets in which to write. In general, partial credit will be given on tests.

The final exam is cumulative and will be given during finals week. You must also show all your work on the final exam to be assessed for partial credit. For classes beginning before 6pm, the final will be a uniform final written by the Math Dept, but graded by me. I do not have any control over the questions that will be asked, so a part of my job is to prepare you for a potentially difficult final written by someone else.

When going through each assessment, do not expect a homogeneous learning experience. This will not be the case and it is not good for you anyway. The text, my lectures, homework, quizzes and tests all have their place in helping you learn. Don't expect them to all be the same or cover the same material in the same way with the same level of difficulty. This is an unrealistic and unhelpful expectation. I will be forthcoming on what you will be tested on and how you will be tested, but other than that, I will not "teach to the test". So don't expect that.

**Prerequisites:** I also expect you to remember the math that you have done before this course. Math is cumulative. Each math class in a sequence builds on the class that came before it. The prereqs for this course are precalculus and calculus I. I will assume you are all experts at these lower-level math courses; not much choice here, we have a packed syllabus and we won't have time to go over too much prereq material, if any. If you're not an expert in these courses, become one—quickly; like by the end of the week. I have video lectures for a precalculus course I taught in spring 2019, which may help in your review. You can find the playlist for that course here: [https://www.youtube.com/playlist?list=PLYoxM3oLTvxLx7IF\\_6KbnphUUiuXdIO5U](https://www.youtube.com/playlist?list=PLYoxM3oLTvxLx7IF_6KbnphUUiuXdIO5U)  
You can find video recordings of my Fall 2019 Math 201 – Calculus I class here: [https://www.youtube.com/playlist?list=PLYoxM3oLTvxI-dWJFB4B0d2rumv\\_qQ6iE](https://www.youtube.com/playlist?list=PLYoxM3oLTvxI-dWJFB4B0d2rumv_qQ6iE)

**Blasphemies:** At this level, certain mistakes will be considered unforgivable and will result in an instant zero in any problem where such mistakes are made. These are:

1. Canceling across sums
2. Distributing powers across sums
3. Dividing by zero
4. Making the mistake of thinking  $\int 1/x^n dx = \ln |x^n| + C$  (this is NOT true unless  $n = 1$ !!!). It is also wrong to think that  $\int \frac{1}{f(x)} dx = \ln |f(x)| + C$  when  $f(x)$  is \*not\* a monic linear polynomial.
5. Making the mistake of thinking the derivative (or integral) of a product (or quotient) is just the product (or quotient) of the derivatives (or integrals). That sounded confusing, I'll explain this in class.
- 6\*. While you won't be penalized outright for this, please use parentheses when appropriate. You'll end up penalizing yourself for not doing so.

**Avoid these mistakes at all costs. I will punish you severely for making them—tough love. And yes, “+C” is required when computing an indefinite integral.**

**Contact:** When necessary, I will contact you via the email you have in CUNYfirst. If this isn't the best email to use, you should email me from your preferred email address and inform me of this. Please check this email address regularly and read the emails I send you—either from my email or JupiterGrades.

**Help:** Besides your online HW platform (which has many resources to help you), there are MANY resources available to help you succeed in this class. Some of these are:

- First, there's me! Come see me during my office hours if you're having any difficulties. Drop by during my office hours or email me to set up an appointment. Talk to me. I'm here to help you learn and succeed.
- I'll be uploading solutions to tests and answers to quizzes on the webpage for the class (See “Class Website” on page 1), practice problems, as well as general advice on the class website. Be sure to check these out. The topics list towards the end of this document also has suggested problems for you to attempt from the text. These will not be collected, but it is highly recommended that you attempt them. You can see me or a tutor if you have issues. Which brings me to the next point.
- FREE Tutoring is available daily in Marshak 403—the Math/Physics Tutoring Center. You can find information about the tutoring center and its hours of operation here: <http://math.sci.cny.cuny.edu/pages?name=tutoring>

- There are also online resources available. A great place to get math help, even at odd hours, is <http://mathhelpforum.com/>. There are other forums like Math Stack Exchange. Another great resource on the web is <https://www.wolframalpha.com/>. You can use that site to check your answers. Brilliant site. <https://www.symbolab.com/> is another great site to check your answers, especially if you know what you'd like to compute and like using templates. I use <http://graph.tk/> if I need to graph something quickly. Some kids like <https://www.desmos.com/> for their graphing and computational needs. Of course, there are other online contenders like YouTube (where I'll also be posting videos of our lectures), Khan Academy, Paul's Online Math Notes, etc. Check them out. Google is your friend...and big brother. A quick Google search can do wonders.
- And don't forget your classmates. You should get the contact information of at least one person that you can study with or get missed notes from if you are absent, etc. You're all in this together, help each other out.

**Student Disability Services:** If you have a disability that may affect your academic performance, please go to the Student Disability Services (SDS), A.K.A. The AccessAbility Center (AAC), office as soon as you possibly can. You may be entitled to extra time or other accommodations. Everyone should be given an equal opportunity to do well; be sure to see the SDS if you believe you may qualify for accommodations that will allow you to put your best foot forward. It is a good idea to touch base with them even if you have a disability that you don't think will affect your academic performance. You should see them within the first week of classes. For more information, see: <https://www.cuny.edu/accessibility>

**Some class rules:** Please silence your cell phones and don't use them when in class. Eating in class is NOT allowed. Drinking is permitted, as long as you remove your garbage afterwards. If I catch you with a cellphone or smart watch in an exam, I will take away your exam and give you an F for that exam. If I catch you with a cellphone or smart watch in the final, I will take away your final and give you an F for the course. Similar, or more severe actions, will be taken if I catch you cheating by other means. Work hard, be honest. If you do the right things, cheating won't be necessary. And passing a class for real is a lot more rewarding anyway. This brings us to...

**Academic Integrity:** Any act of academic dishonesty will be dealt with by applying the most stringent penalties permitted. Cheating includes, but is not limited to, receiving help during exams and submitting homework without properly acknowledging persons who assisted you. Please read carefully the Policy on Academic Integrity posted on the CUNY website with URL [http://www1.cuny.edu/portal\\_content/2004/policies/image/policy.pdf](http://www1.cuny.edu/portal_content/2004/policies/image/policy.pdf)

**I really don't like cheating; the university doesn't like it either. Please don't do it. There, I asked nicely. Don't make me act on this warning. I will; and it's not comfortable for anyone.**

**More advice:** Believe in yourself (i.e. have/get a "growth mindset"); listen to Jhevon; work hard AND work smart. Also remember that one of the definitions of insanity is to do the same thing over and over and expect different results. More on this in class. Be honest with yourself and seek help when you need it. The quizzes, homework and tests will let you know when you need help, NOT your personal feelings about how much you understand. Pay attention for more advice as the semester goes on. I have no incentive to fail you; I will give you advice that works. Ignore it at your peril.

## Selected Events from the Spring 2020 Academic Calendar

For the full calendar: <https://www.cuny.edu/registrar/spring-2020-academic-calendar>

<b>DATES</b>	<b>DAYS</b>	
January 27	Monday	Classes begin! Yay!
February 03	Monday	Verification of Enrollment Rosters Available to faculty; Course Withdrawal drop period beings (A grade of 'WD' is assigned to students who officially drop a course);
February 12	Wednesday	College Closed
<b>February 16</b>	<b>Sunday</b>	<b>Verification of Enrollment Rosters Due from Faculty; Last day to drop without the grade of "W", course withdrawal drop period ends (Last day for "WD" grades);</b>
February 17	Monday	College Closed; Grade of 'W' is assigned to students who officially withdraw from a course;
<b>April 01</b>	<b>Wednesday</b>	<b>Course withdrawal period ends. Last day to withdraw from course with a grade of 'W'; Last day to file for Pass/NC option;</b>
<b>April 07</b>	<b>Tuesday</b>	<b>Classes follow Wednesday schedule</b>
<b>April 08 – 16</b>	<b>Wednesday – Thursday</b>	<b>Spring Recess</b>
April 10	Friday	INC grades for Fall 2019 for Undergraduate students convert to FIN;
<b>May 14</b>	<b>Thursday</b>	<b>Last Day of Classes</b>
May 15	Friday	Reading Day / Final Examinations
<b>May 18 – 22</b>	<b>Monday – Friday</b>	<b>Final Examinations – Day/Evening Classes</b>
May 28	Thursday	Final Grade Submission Deadline

**Tentative syllabus for the course, with minimal set of practice problems (do more if needed!):**

Required problems programmed into the publisher associated online HW system MML (My Math Lab) are in **boldface**, listed along with additional suggested problems for extra practice. Problems with an asterisk \* are more challenging.

Section	Topics	Suggested Exercises from text
5.5	Review of Indefinite Integrals (not done in class)	<b>3, 11, 18, 21, 25, 29, 37, 39, 47, 55, 59, 61</b>
5.6	Review of Definite Integrals (not done in class)	<b>3, 7, 9, 11, 29, 31, 33, 37, 41</b>
7.1	The Logarithm Defined as an Integral (not done in class)	<b>3, 5, 7, 11, 14, 19, 23, 30, 31, 37, 38, 61</b>
7.3	Hyperbolic Functions	<b>1, 2, 3, 4, 5, 6, 11, 12, 13, 15, 17, 41, 43, 75, 76*</b>
8.1	Using Basic Integration Formulas (not done in class)	<b>1, 2, 3, 4, 5, 6, 7, 9, 10, 12, 15, 21, 27, 29, 32, 33, 45, 51</b>
8.2	Integration by Parts	<b>5, 8, 9, 13, 17, 21, 25 – 33, odd, 39, 41, 47, 51, 57, 64a, 67, 69</b>
8.3	Trigonometric Integrals	<b>7, 11, 13, 15, 17, 19, 35, 37, 41</b>
8.4	Trigonometric Substitution	<b>1, 5, 9, 11, 17, 19, 23, 31, 35, 39, 43, 51, 53, 57, 58</b>
8.5	Integration of Rational Functions by Partial Fractions	<b>11, 15, 16, 19, 25, 27, 28, 31, 33, 35, 39, 41</b>
8.7	Numerical Integration (omit error estimates)	<b>23, 24, 25</b>
8.8	Improper Integrals	<b>1, 2, 3, 5, 6, 17, 19, 20, 21, 27, 51, 53, 54, 55, 57, 59, 65</b>
10.1	Sequences	<b>1, 3, 4, 6, 9, 11, 16, 17, 19, 23, 35, 37, 40, 42, 45, 47, 49, 51, 53, 63, 67, 92, 97, 107, 121, 123, 137*</b>
10.2	Infinite Series	<b>1, 5, 7, 8, 9, 13, 17, 19, 22, 23, 27, 31, 33, 35, 45, 53, 57, 65, 79, 81, 84, 89, 97, 100*, 103*</b>
10.3	The Integral Test (omit error estimates)	<b>3, 6, 7, 11, 15, 17, 18, 23, 27, 37, 51, 52, 61, 64*</b>
10.4	Comparison Test	<b>1, 2, 3, 4, 5, 6, 9, 10, 13, 15, 17, 19, 20, 21, 22, 25, 26, 35, 47, 55, 58, 59*, 60*, 62*</b>
10.5	Absolute Convergence: The Ratio and Root Tests	<b>1, 3, 4, 5, 6, 9, 11, 13, 15, 27, 29, 35, 36, 42, 43, 67, 70*</b>
10.6	Alternating Series and Conditional Convergence	<b>1, 3, 4, 6, 7, 11, 15, 18, 19, 22, 23, 24, 25, 27, 31, 32, 34, 35, 39, 49, 51, 63, 67</b>
10.7	Power Series (omit multiplication of series)	<b>5, 9, 11, 12, 15, 21, 29, 31, 32, 37, 41, 53</b>
10.8	Taylor and Maclaurin Series	<b>1, 2, 3, 4, 5, 7, 11, 13, 15, 19, 21, 22, 23, 25, 29, 30, 31, 35, 37, 40, 41*</b>
10.9	Convergence of Taylor Series (omit Theorem 24, Rem Thm)	<b>1, 3, 5, 7, 8, 10, 11, 13, 15, 21, 22, 25, 47*, 50*</b>
*	<b>Test 1 – covering up to 10.9 at most</b>	<b>Section GH: Wed Mar 25; Section RS2: Thur Mar 26</b>
10.10	The Binomial Series and Applications of Taylor Series (cover Evaluating Non-elementary integrals only)	<b>23, 25, 27, 61</b>
11.1	Parametrizations of Plane Curves	<b>2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 16, 17, 19, 20, 21, 22, 23, 24, 25, 29, 31, 33, 37, 38, 43</b>
11.3	Polar Coordinates	<b>1, 3, 5, 11, 27, 47, 53, 55</b>
12.1	Three-Dimensional Coordinate Systems	<b>1, 3, 6, 7, 11, 13, 14, 17, 20, 21, 26, 27, 31, 32, 33, 35, 37, 39, 41, 43, 44, 55, 59, 63, 65, 71</b>
12.2	Vectors (omit applications)	<b>3, 5, 9, 11, 13, 14, 15, 17, 19, 21, 25, 27, 29, 31, 33, 35, 41</b>
12.3	The Dot Product (omit work)	<b>1, 2, 3, 5, 7, 8, 19, 20, 25, 29</b>
12.4	The Cross Product (omit torque)	<b>1, 3, 4, 7, 11, 12, 15, 17, 18, 19, 21, 27, 29, 30, 31</b>
12.5	Lines and Planes in Space	<b>3, 7, 9, 17, 19, 22, 23, 25, 27, 29, 31, 35, 41, 45, 47, 51, 57, 59, 61, 67, 69, 71, 72, 75</b>
12.6	Cylinders and Quadric Surfaces	<b>1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 17 – 31, odd, 41</b>
14.1	Functions of Several Variables	<b>1, 2, 3, 5, 6, 8, 9, 11, 14, 15, 16, 18, 19, 23, 49, 51, 57, 61, 64</b>
14.2	Limits and Continuity in Higher Dimensions (omit computing epsilon-delta, only cover $\epsilon$ - $\delta$ definition)	<b>5, 9, 11, 13, 19, 21, 29, 31, 33, 35, 39, 42, 43, 45, 47, 49, 65, 68, 72*</b>
14.3	Partial Derivatives	<b>4, 5, 7, 8, 9, 11, 14, 16, 19, 25, 26, 27, 35, 36, 43, 46, 47, 57</b>
*	<b>Test 2 – covering everything after test 1</b>	<b>Section GH: Wed May 13; Section RS2: Thur May 14</b>
*	<b>Cumulative Final Exam</b>	<b>Date, Time and Location TBA. Most up-to-date final exam schedule can be found here: <a href="https://www.cuny.cuny.edu/spring-2020-final-exam-schedule">https://www.cuny.cuny.edu/spring-2020-final-exam-schedule</a></b>

## Anonymous Questionnaire

What is your major? \_\_\_\_\_

Are you sure you need this class? \_\_\_\_\_ (think about it again, and answer).

What is the highest level of math you have to complete for your major? \_\_\_\_\_

How did you get into this class? (Passed the prerequisite course, placed here upon college entry, placed by an advisor, etc)

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Are there any dates during the semester for which you will not be able to take an exam/quiz due to religious reasons? If so, please state the date(s) and occasion(s) below.

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How good would you say you are at Algebra? \_\_\_\_ Precalc? \_\_\_\_ Calc 1? \_\_\_\_ Calc 2? \_\_\_\_  
(Enter 5 for "I can do it in my sleep!", 4 for "I'm not the best at it, but pretty awesome.", 3 for "I'm just OK; I'm good at the basics.", 2 for "I'm not the worst, but far from the best.", 1 for "The class was a blur that got more obscure over time!", 0 for "I haven't taken before!")

With the same scale as above, rate your comfort level with math in general: \_\_\_\_\_

Any general feelings or concerns towards this course? (For example, are you: Scared? Excited? Curious? Indifferent? Based on your perceived ability in math, what grade are you expecting? etc)

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Are there any other relevant comments that you wish to add?

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