

Linear Algebra and Vector Analysis for Engineers
MATH 392, Section 1XB, Summer 2019
T,W,Th 10:30am – 12:10pm, NAC 7/305

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

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

Office Hour: Tuesdays after class, or by appointment. **Office:** NAC 6/291B.

My Website: http://math.sci.ccny.cuny.edu/people?name=Jhevon_Smith

Class Website: <http://math.sci.ccny.cuny.edu/pages?name=Math+392+1XB++Summer+2019>

Texts: 1. Stewart’s *Essential Calculus, 2nd edition*, published by Cengage.

2. Heuvers’ *Linear Algebra for Calculus*, published by Brooks/Cole.

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

Math 392 Website: http://math.sci.ccny.cuny.edu/courses?name=Math_39200

Websites: I gave you my website since I will be posting documents and instructions for the class there, such as: review topics, announcements, solutions to tests and quizzes, etc. I gave you the math 392 website so you can access resources like past finals. I gave you the math. dept. website because, well, you should have it.

Texts: You are NOT required to purchase the texts. Do so if you’d like, but they can be accessed at the library or at the Math Tutoring Center.

Calculators/Technology: While you may use these to do your homework or explore some topic in depth, you will not be allowed to use them on any quiz or exam.

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	97-100	C+	2.33	77 - 79
A	4.00	95-96	C	2.00	74-76
A ⁻	3.66	90-94	C-	1.66	70-73
B ⁺	3.33	87-89	D	1.00	60-69
B	3.00	84-86	F	0	Below 60
B-	2.66	80-83			

As department policy demands, the final exam is worth 40% of your grade in this course. The remaining 60% will come from your in-class grade, the breakdown of which is as follows:

Quizzes: 15% (In general, you will have one quiz per week—I’ll drop the worst two).

Homework: 10% (Homework will be assigned online).

In-class tests: 30% (Two non-cumulative exams).

Participation: 5% (Based mostly on attendance).

Final Exam: 40% (This is a cumulative exam given at the end of the course).

Warning: The best predictor of how well you will do in this class is your proficiency in Calculus III. In fact, at many other colleges, the first two-thirds of our syllabus is done in their calculus III. The new Calculus III, currently being phased in at City College, will include two-thirds of our syllabus and will eliminate the need for this course. In short, this course will be VERY difficult if your Calculus III is not up

to par, conversely, it will be VERY easy, if your Calculus III skills are excellent. If you're not sharp on your calculus 3 material, get sharp within the first week of classes. You won't do well otherwise. You will already have HW on some calc 3 topics due the first week.

Make-up Exams/Quizzes: There are no make-ups for a missed quiz or HW. Make-ups for tests will only be given if you missed the exam for very compelling reason(s)—such as severe illness or death. If such extenuating circumstances occur, you must inform me immediately, and provide proof of the situation. Afterwards, a make-up can be scheduled.

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. 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.

My Expectations:

Work ethic: You are not to slack off! You are to read ahead! Very Important! Read each section before coming to class. 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, expand your understanding and ask intelligent questions. Later in this syllabus, the topics that we will cover are listed in the order we will cover them, so you can know where we're going and what you need to prepare for ahead of time. 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 it before. 100% might do if you're great at calculus.

To do well in this course, you must study daily. Not just before class or before a test. Work through HW as soon as assigned, begin working on the HW for a section the day it is done in class. This is VERY important. Just showing up to class is not enough. You will need consistent and proper practice to do well.

Try problems yourself before asking for help or discussing with others. If you need help, see me, or go to tutoring. Do not stop working when you "feel" you've understood the material. It is important that you keep studying until you can solve problems as a matter of routine, and you can consistently get problems correct—in a timely manner, without the help of anyone or anything else.

Prerequisites: I also expect you to remember the math that you have done before this course. The first two-thirds of the course, for example, relies heavily on concepts learnt in calculus 3, HEAVILY! This is not a calc 3 course, so I can't take time to go over calc 3 stuff (I will not, for example, teach the sections in topic 9). There is simply not enough time, as much as I'd love to be thorough. You just have to take it upon yourself to review calc 3 (and/or calc 1, 2, algebra, precalc,...) when necessary. I will assume you are all experts at the lower level math courses. If this is not currently true for you, make it true, quickly; like by the end of the week.

Responsibility: I do expect a certain level of responsibility, maturity, and integrity from you. You've made it this far, which means you know what it takes to get through a college math class. No excuses, and no begging for grades at the end of the semester. And no sob stories. Understand, that while I want to see every one do well and have no ill will towards anyone, it is **not** my responsibility to keep your GPA up, or to help you keep that scholarship, or whatever reason it is important that you do well here. These are your responsibilities. My responsibility is to facilitate you learning the material in this syllabus. I shall keep that responsibility. Please keep yours.

Homework: Online homework will be assigned through the WebWork system. Due dates for online homeworks will be listed in the online system. Online, the dates are dynamic, so as the course goes on, I may extend or shorten due dates depending on how quickly we're moving through a topic. So pay attention and set up email alerts to make sure you don't miss anything. **Late homework will NOT be accepted.** The excuse does not matter.

The topics that are to be covered in class are listed on the second to last page of this document, along with some suggested problems from the textbook. These are for your own study; you do not need to hand in any written homework.

To access the online homework system:

1. Go to https://webwork.ccny.cuny.edu/webwork2/19_Su392_1XB/
2. The username is your CCNY email address username, one word all lowercase.¹
For example, my CCNY email address is `jsmith@ccny.cuny.edu`², my username would be `jsmith`
3. The password is the same password you would use to access your CCNY email.³
4. You will be logged in to the page that has the list of assignments that are currently active.

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” (or “+C̄”, as appropriate) is required when computing an indefinite integral.

Contact:

I will be emailing important information from time to time; including progress reports, announcements and advice as needed (to the email address listed for you on CUNYfirst. If this is not a good email address, notify me). Please read the emails. If I email you, it means it is important. You may get emails from my email address listed on the first page, or from JupiterGrades, the online gradebook system I'll be using to record your grades.

Feedback: I encourage you to give me feedback about my teaching or the class, whether positive or negative (just make it constructive please). You can email me or talk to me, or if you don't want to reveal your identity, there is an anonymous feedback page on my website.

¹ See: <https://www.youtube.com/watch?v=bLE7zsJk4AI>

² Follow instructions and do NOT email me at my CCNY email address, but rather the Gmail address on the first page. I like to keep my student's emails separate.

³ The password will remain precisely the same. If you change your CCNY email password, the WebWork password will automatically change to your new email password as well. The accounts are linked.

Help: Besides your online HW platform, 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.
- I'll be uploading reviews, as well as solutions to tests and answers to quizzes on the webpage for the class. 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 in the Marshak Building, room 403. The hours for this semester are: Mondays through Thursdays 12pm – 5pm. Tutoring begins during the first week of classes usually.
- There are also online resources available. A great place to get math help, even at odd hours, is <http://mathhelpforum.com/>. There are a significant number of brilliant people from varying time zones who decide to spend their free time helping others with math. Take advantage of this great service. 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.
- As of last semester, a friend of mine, professor Quinn Culver, is offering free math help available on his live stream, <https://www.twitch.tv/quinnculver>, which is running Sunday-Thursday from 9pm-midnight EST. If you check him out, be sure to tell him I sent you.
- 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 benefits 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. For more information, see: <https://www.cny.cuny.edu/accessability>

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 in an exam, I will take away your exam and give you an F for that exam. If I catch you with a cellphone 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.

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_ur/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; 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 Summer 2019 Academic Calendar

For the full calendar: <https://www.cuny.edu/registrar/summer-2019-academic-calendar-extended-session>

DATES	DAYS	
June 03	Monday	Classes begin. Yay!
June 04	Tuesday	Last day to submit a request for Independent Study;
June 07	Friday	Last day to add a course to an existing enrollment; Last day for 50% tuition refund; Last day to apply for Audit Options; COA rosters available in CUNYFirst faculty self-service;
June 08	Saturday	Course Withdrawal drop period begins (A grade of "WD" is assigned to students who officially drop a course);
June 10	Monday	COA rosters due in CUNYFirst Faculty self-service; MAKE SURE I HAVE YOU IN MY LIST!
June 12	Wednesday	Last day for 25% tuition refund; Last day to drop without the grade of "W"; Course withdrawal drop period ends (Last day for "WD" grades).
June 13	Thursday	Course withdrawal period begins (A grade of "W" is assigned to students who officially drop a class) – No Refund
July 03	Wednesday	Deadline for filling application for Degree for Summer 2019 Graduation
July 04	Thursday	Independence Day – College Closed
July 05	Friday	Course withdrawal period ends. Last day to withdraw from a class with the grade of "W"; Last day to file for Pass/NC option;
July 08	Monday	Classes follow a Thursday schedule
July 22	Monday	Last day of classes
July 23 – 24	Tuesday – Wednesday	Final Exams
July 29	Monday	Last day for grade submissions – Extended Session

Topics and Assignments:

#	Topic	Suggested problems for practice
Part 1: Vector Calculus (Stewart's Essential Calculus)		
1	10.7 Parametrized curves	13 – 16 all, 24, 25, 28 – 30 all, 39 – 42 all, 49, 51.
2	10.8 Arc Length; omit curvature	1 – 4 all, 12.
3	13.1 Vector Fields	1, 21 – 24 all.
4	13.2 Line Integrals	1 – 15 odd, 19, 21, 27(a), 30(a), 37, 39.
5	13.3 Fundamental theorem for line integrals	3 – 19 odd.
6	13.4 Green's Theorem	1, 3, 5 – 13 odd, 17.
7	13.5 Curl and Divergence	1 – 7 odd, 10, 11, 13, 15, 17, 18, 19, 20.
8	12.5-12.7 Triple integrals; cylindrical and spherical coordinates (Skipped in class)	12.5: 3 – 15 odd. 12.6: 17 – 29 odd, 28. 12.7: 21 – 25 all, 37 – 39 all.
9	13.6 Parametric Surfaces and their areas	1 – 4 all, 15 – 21 odd, 29 – 43 odd.
10	13.7 Surface Integrals	5 – 31 odd.
*	Exam #1 on topics 1 through 10	Date: July 2 nd
11	13.8 Stokes' Theorem	1 – 7 all, 11, 12, 13.
12	13.9 Divergence Theorem	1 – 13 odd.
Part 2: Linear Algebra (Heuvers' Linear Algebra for Calculus)		
13	1 Matrices and Matrix Algebra	1 – 14 all.
14	2 Linear Systems, Elementary Row Operations	1, 2, 3(c), 5 – 7 all.
15	3 Varieties of Systems of Linear Equations	1 – 4 all, 7.
16	4 The Determinant of a Matrix	1 – 4 all, 7 – 9 all.
17	5 The Inverse of a Matrix	1 – 4 all; 6(a),(b); 7, 10, 16(a),(d).
18	7 The Eigenvalue Problem (7.1 & 7.2 only) (with applications to systems of ODE's in notes distributed by course supervisor)	4, 5, sample problems and exercises from the M392ODEProblem2011.doc file on the math dept.'s website—392 page.
19	Time permitting: Diagonalization and Powers of Matrices	Modified exercises from chapter 7.
*	Exam #2 on topics 11 through 19	Date: July 18 th
*	Final Exam	Wed, July 24, during regular class time

(It's not in the syllabus, but I recommend that you review, early on, section 10.6 in the text as well).

(The selected problems above are optional and will not be collected, however, if you're struggling in class or you anticipate struggling, consider going through ALL listed problems, and more, as mandatory.)

Anonymous Questionnaire

What is your major? _____

Are you sure you need this class? _____ Are you sure? _____

Will you need to do more math after this? _____

What is the highest math class you've taken? _____

Rate your interest: 5 = math is my life and I'm so excited to be here, down to 1 = I don't really like math, but I'm just here to get a minor or satisfy some requirement. _____

How good are you at Algebra? ____ Precalc? ____ Calc 1? ____ Calc 2? ____ Calc 3? ____
(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've never taken this class before.")

Do you work? Full-time or Part-time? _____

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.

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)

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