# Elements of Calculus
## MATH 205 Section JW, Fall 2016
## M, W 8 – 9:40pm in NAC 6/121

**Instructor:** Jhevon Smith ("Jhevon" is fine.)
**Email:** JhevonTeaches@gmail.com
**Office Hours:** By appointment. Also see tutoring times below.
**Website:** http://math.sci.ccny.cuny.edu/people?name=Jhevon_Smith
**Text:** Stewart and Clegg, *Brief Applied Calculus.*
**Math Dept.:** NAC 8/133      **Math Dept. website:** http://math.sci.ccny.cuny.edu
**Math 205 website:** http://math.sci.ccny.cuny.edu/courses?name=Math_20500
**For this class:** http://math.sci.ccny.cuny.edu/pages?name=For+Math+205+JW+Fall+2016


**Websites:** I gave you my website since I will be posting documents and instructions for the class there, such as: review problems, announcements, solutions to tests and quizzes, etc. The webpage for this specific class is also given, as a shortcut. I gave you the math 205 website because you will need to go to that website to access past finals, and other study materials, etc. I gave you the math. dept. website because, well, you should have it.

**Calculator:** Calculators are *NOT* permitted on any quiz or exam in this course. You may need calculators for certain problems in the homework, but I encourage you to try and do without a calculator as much as possible to create good habits.

**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 | 98-100 | C | 2.00 | 74-76 |
| A | 4.00 | 94-97 | **C-** | **1.66** | **70-73** |
| A$^-$ | 3.66 | 90-93 | **D** | **1.00** | **60-69** |
| B$^+$ | 3.33 | 87-89 | **F** | **0** | **Below 60** |
| B | 3.00 | 84-86 | | | |
| B- | 2.66 | 80-83 | | | |

You need a C to pass this course and move on to the next in the sequence, MATH 209. Depending on your major, you may not have to take MATH 209 and a D may be fine. However, as I see it, why not aim for an A, or an A+ while you're at it.

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 is as follows:

**Quizzes: 20%** (There will be a quiz *at least* once per week. Two quiz grades will be dropped.)
**Homework: 5%** (More info on this below.)
**Participation: 5%** (Based mostly on attendance.)
**In-class tests: 30%** (I will give 4 exams and count the best 3.)
**Final Exam: 40%** (This will be a cumulative exam given at the end of the course.)

**Extra Credit:** Not happening… Stay on top of your coursework so you won't need it.

**Make-up Exams/Quizzes:** No way…don't be absent, sick or have an emergency.

**Attendance:** Attendance will be taken at the beginning of class. You are *late* if you arrive after your name is called. You are considered *absent* if you arrive 15 minutes late. If you are late twice, that is considered as one absence. 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. 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. You can see me during my office hour to discuss what was done in class, or catch up on your own. It's up to you. **To reiterate, there is no make-up for a missed quiz/homework/exam. Seriously! I drop your lowest scores to make up for the fact that there are no make ups.**

**My Expectations:**
      **Work ethic:** You are not to slack off (more on this in class)! 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.

      **Homework:** For homework we will be using the WebWork online open source homework system. There is no charge for this program. See below for instructions on how to access this system. This system will give you instant feedback on your homework and will also provide hints for most, if not all, problems—if you need them. Answers for the problems will also appear after the due date in case you want to go back and practice. Due dates for online homeworks will be listed in the online system. Note: In the system, the dates are dynamic, so as the course goes on, I may extend or shorten due dates depending on how slowly we're moving through a topic. So pay attention and set up email alerts in the system to make sure you don't miss anything. And don't freak out if the dates for topics we haven't covered yet are in the past, etc. **Late homework will NOT be accepted.** The excuse does not matter.

To access the online homework system:
1. Go to https://webwork.ccny.cuny.edu/webwork2
2. Click on 205JW_f16 from the Courses list.
3. 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
4. The password is the same password you would use to access your CCNY email.[3]

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[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.

5. You will be logged in to the page that has the list of assignments that are currently active.

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. If you are not good at algebra, then precalc will be difficult, if you're not good at algebra and precalc, then calculus 1 will be difficult, and so on. Be sure you've mastered the level of math that came before this. I will have to run the class like 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.

Now, the matra.

Repeat the following to yourself 10 times a day. Five times when you wake up and five times before you go to sleep.

*I must NOT cancel across sums,*
*I must NOT distribute powers across sums,*
*I must NOT divide by zero,*
*All these are blasphemy!*
*But I will use brackets when appropriate.*

So yeah, the above may seem like a joke, and it is somewhat, but here's the part that's not funny: **do NOT commit any of the blasphemies mentioned above! Doing so will result in an instant zero (0) on any exam or quiz in which such an offense is made! Regardless of how well you did otherwise.**

**There are other offenses that will incur a similar penalty. Making any one of the following mistakes will result in you getting a zero for the problem you make the mistake in.**

1) Making the mistake of thinking $\int 1/x^n \, dx = \ln |x^n| + C$ (this is NOT true unless $n = 1$!!!)
2) 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 probably sounded confusing, I'll explain this in class.

**Contact: <u>You are to email me at the end of the first day of class, stating your name, your course and its section. I will deduct 5 points off your final grade if you fail to do this.</u>** I will be emailing important information from time to time; including progress reports, announcements, special assignments and advice as needed. Please read the emails. If I email you, it means it is important—important enough for me to take the time to write an email so that you will have it in writing.

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[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, but your CUNY account is the primary account. You cannot change your username or password in the WebWork system, only through CUNY/Citymail system. If you have technical difficulties, see the IT Service Desk in NAC 1/301 (In the Cohen Library).

**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.

**Help:** FREE tutoring is available in the Marshak Building, room 418S. I am also a tutor there. The hours for this semester are: Mondays through Thursdays 12pm – 5pm, Fridays 12pm – 4pm. The tutoring center will be open starting Monday September 5th.There are also online resources available. A great place to get math help, even at odd hours, is www.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 wolframalpha.com. You can use that site to check your answers. Brilliant site. Of course, there are other online contenders like YouTube, 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. And, of course, there is always me! Don't be afraid to come to me if you have questions or concerns. You can contact me via email or see me after class or during my office hour. My office hour is by appointment. I will also be at the tutoring center regularly and you can come and see me there.

**AccessAbility Center:** If you have a disability that may affect your academic performance, please go to the AccessAbility Center located in NAC 1/218 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 AccessAbility Center 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.ccny.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.

**Some 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. Pay attention for more advice as the semester goes on.

**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. Please don't do it. There, I asked nicely.**

# Fall 2016 Academic Calendar

## July

| | |
|---|---|
| 07/13/2016 | Payment Due for Registration through July 1, 2016 |

## August

| | |
|---|---|
| 08/03/2016 | Payment Due for Registration through July 26, 2016 |
| 08/18/2016 | Payment Due for Registration through August 18, 2016 |
| 08/12/2016 | Last day to apply for an e-Permit |
| 08/24/2016 | Last day of Registration |
| **08/24/2016** | **Last day to drop classes for 100% tuition refund** |
| **08/25/2016** | **CLASSES BEGIN** |
| 08/25/2016 | Late Registration fee ($25.00) and change of program fee ($18.00) for adding or swapping courses begins |
| 08/25/2016 - 08/31/2016 | Change of Program |
| 08/27/2016 | **FIRST DAY OF SATURDAY CLASSES** |
| **08/31/2016** | **Financial Aid Certification Enrollment Status date** |
| 08/31/2016 | Last day to drop classes for 75% tuition refund. |
| 08/31/2016 | Last day to drop without the grade of "WD" |
| 08/31/2016 | Last day to add/swap a class to an Existing Program |
| 08/31/2015 | Last day to submit request for Independent Study |
| 08/31/2016 | Last day for Change of Program |
| 08/31/2016 | Last day to file for Pass/Fail and Audit Options |

## September

| | |
|---|---|
| **09/01/2016** | **Course Withdrawal drop period begins (A grade of "WD" is assigned to students who officially drop a course)** |
| 09/01/2016 | COA Roster available in CUNYFirst faculty self service |
| **09/03/2016** | **No Classes Scheduled** |
| **09/05/2016** | **Labor Day - College Closed** |
| 09/07/2016 | Last day to drop classes for 50% tuition refund |
| 09/07/2016 | COA Rosters due in CUNYFirst Faculty self service |
| 09/14/2016 | Last day to drop classes for 25% tuition refund |
| **09/14/2016** | **Last day to change or declare a major, minor and/or concentration effective for Fall 2016; Form A census cutoff.** |
| **09/14/2016** | **Last day to drop classes without the grade of "W"** |

| 09/14/2016 | **Course withdrawal drop period ends (Last day for "WD" grades)** |
|---|---|
| **09/15/2016** | **Course withdrawal period begins (A grade of "W" is assigned to students who officially drop a class) – No Refund** |
| 09/15/2016 | Freshman Convocation |
| 09/24/2016 | Last day to submit proof of immunization for NYS residents |
| **October** | *Academic advising month. Please see your academic advisor.* |
| **10/02/2016 – 10/04/2016** | **No Classes Scheduled** |
| 10/03/2016 | Application for Degree for February 2017 Graduation begins |
| **10/06/2016** | **Classes follow a Monday schedule** |
| **10/10/2016** | **College Closed – no classes scheduled** |
| **10/11/2016 – 10/12/2016** | **No classes scheduled** |
| 10/13/2016 | Last day to submit proof of immunization for non-NYS residents |
| **10/14/2016** | **Classes follow a Tuesday schedule** |
| **November** | |
| 11/02/2016 | INC grades for Spring 2016 and Summer 2016 for Undergraduates students convert to FIN |
| 11/02/2016 | INC grades for Summer 2015, Fall 2015 and for Graduate students convert to FIN |
| 11/04/2016 | 60% date for the term |
| 11/10/2016 | Course withdrawal period ends. Last day to withdraw from a class with the grade of "W". |
| **11/24/2016 – 11/27/2016** | **College Closed – No Classes** |
| **December** | |
| 12/02/2016 | Deadline for filing Application for Degree for February 2017 Graduation |
| **12/12/2016** | **LAST DAY OF CLASSES** |
| 12/13/2016 | Reading Day |
| **12/14/2016 - 12/21/2016** | **Final Exams** |
| 12/21/2016 | End of Fall Term |
| **12/24/2016 - 12/25/2016** | **College Closed** |
| **12/31/2016** | **College Closed** |
| **January** | |
| **01/01/2017** | **College Closed** |
| 01/02/2017 | Last day for grade submissions - Fall 2016 (Subject to change) |

**Topics and Assignments:**

| # | Section/Topic | Textbook problems for extra practice |
|---|---|---|
| 1 | 1.1 Functions and their representations | 1 – 7 odd, 11, 21, 23 – 61 odd |
| 2 | 1.2 Combining and transforming functions | 1 – 31 odd, 37, 39 – 53 odd |
| 3 | 1.3 Linear models and rates of change | 1 – 41 odd |
| 4 | 1.5 Exponential Models | 1 – 41 odd, 49 |
| 5 | 1.6 Logarithmic functions | 1 – 41 odd, 47 |
| * | **Exam #1 on topics 1 – 5** | |
| 6 | 2.1 Measuring change, rates of change | 1, 3, 15, 17, 19, 21 |
| 7 | 2.2 Limits | 1 – 49 odd |
| 8 | 2.3 Limit definition of the derivative | 1 – 41 odd, 55 |
| 9 | 2.4 The Derivative as a function, higher derivatives | 3, 17 – 29 odd, 33, 41, 47 |
| 10 | 3.1 Derivative formulas | 1 – 41 odd, 45, 57, 61, 65 |
| 11 | 3.3 The Product and Quotient rules | 3 – 27 odd, 35, 39, 41 |
| 12 | 3.4 The Chain Rule | 1 – 37 odd, 41, 43, 45, 47, 53, 55 |
| 13 | 3.5 Implicit differentiation and logarithmic differentiation | 1 – 43 odd, 47 |
| 14 | 3.2 Linear approximation and marginal analysis | 1 – 23 odd, 29 |
| * | **Exam #2 on topics 6 – 14** | |
| 15 | 3.6 Exponential Growth and Decay | 1 – 19 odd, 23 – 31 odd |
| 16 | 4.1 Related Rates | 1 – 25 odd, 29, 31 |
| 17 | 4.2 Maximum and minimum values | 1 – 45 odd, 57 |
| 18 | 4.3/4.4/4.5 Curve sketching | 4.3:1, 5, 15, 25, 35. 4.4: 1 – 31 odd. 4.5: 1 – 13 odd, 21 – 27 odd |
| 19 | 4.6/4.7 Optimization | 4.6: 1 – 17 odd, 23 – 27 odd. 4.7: 1, 3, 5, 9, 15, 17, 37, 39 |
| * | **Exam #3 on topics 15 – 19** | |
| 20 | 5.1 The integral; antiderivatives | 3, 9, 11, 13, 17, 19, 21 – 27 odd |
| 21 | 5.2 the Fundamental Theorem of Calculus | 1 – 43 odd, 51 – 61 odd, 65, 69 |
| 22 | 5.4 Integration by substitution | 1 – 29 odd, 33 – 51 odd |
| 23 | 6.1 Areas between curves | 1 – 19 odd, 27, 29, 31 |
| * | **Exam #4 on topics 20 – 23** | |
| * | **Final Exam: Wednesday Dec 14 from 8:30 – 10:45pm.\*\*\*** | **In regular classroom** |

Your real first assignment is to email me, as in the "Contact" instructions above.

# City College of NY :Department of Mathematics
## Mathematics 20500 (Elements of Calculus) Syllabus

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|---|---|
| **COURSE #:   20500**<br>**COURSE TITLE:  Elements of Calculus**<br><br>CATEGORY:  Introductory, part of sequence Math 205, Math 209<br>TERM OFFERED:  Every Term<br>PRE-REQUISITES: Grade C or higher in Math 19500 pre-calculus; or placement by the department. Credit will be given for only one of Math20100 or Math20500.<br>HOURS/CREDITS:  4 hrs/wk; 4 credits<br>DATE EFFECTIVE:  01/01/13<br>COURSE COORDINATOR:   Akin | **CATALOG DESCRIPTION**<br>Limits, derivatives, rules of differentiation, grap sketching, maximum and minimum problems, related rates, exponential an logarithmic functions, differential equati anti-derivatives, area, volume<br><br>Text: Brief Applied Calculus, Stewart and Clegg, Brooks-Cole |

**Section**                     **Topics**                          **Suggested # of Hours**

1.1, 1.2        Review of functions, including piecewise defined functions and composition of functions (Omit transformations of functions)     1

1.3               Lines and Linear Models: Go through page 33.
 Include some linear model verbal problems.          1

1.5, 1.6         Exponential Models and Logs: Introduce $e$ and use exponentials to define logs. Note the change of base formula on page 75. (You might derive it from the formula $\log_a b \cdot \log_b x = \log_a x$ showing that $a$ raised to each of these powers yields x).          2

2.1, 2.2         Rates of change and Limits.          2

2.3               Limit definition of the derivative. Tangent lines.
Go through page 106.          2

2.4, pp.119-123 Leibniz notation and higher derivatives          1

3.1               Initial derivative formulas, including  $e^x$          2

3.2               Linear approximation and marginal cost.          1

3.3               Product and quotient rules.          2

3.4               Chain rule.          2

3.5               Implicit and Logarithmic differentiation. Include derivation of the derivative of ln $x$.          2

3.6               Exponential growth and decay.          2

4.1               Related rates.          2

4.2               Maxima and minima. Include the
closed interval case.          2

4.3, 4.4         Curve sketching.          2

4.5               Curve sketching          2

4.6, 4.7         More optimization problems          2

5.1, 5.2         Introducing the integral, antiderivatives and the Fundamental Theorem of Calculus.          2

5.4               u-substitution          3

6.1               Area between curves          2

6.2, 6.3         Other applications of integration.          2


Total  39 hours

Revised for Fall, 2013

**COURSE LEARNING OUTCOMES**

The student is expected to acquire the skills which are presented in  the text and

demonstrated by the instructor in class.   These skills include the following,

with associated departmental learning outcomes( see below):

| | |
|---|---|
| 1 Use limits to calculate derivatives | a,b.e1.e2 |
| 2.Differentiate algebraic, logarithmic and exponential functions | a,b,e1,e2 |
| 3. Solve related rates problems | a,b,c |
| 4. Apply methods of calculus to curve sketching | a, b |
| 5 Solve maximum and minimum problems | a,b,c,e1,e2 |
| 6. Use exponential functions to model growth and decay | a, c |
| 7 Antidifferentiate polynomial, logarithmic and exponential functions | a,b,c,e1,e2 |
| 8 Use calculus to find areas | a,b |

**COURSE ASSESSMENT TOOLS**

*Please describe below all assessment tools that are used in the course.*
*You may also indicate the percentage that each assessment contributes to the final grade.*

1.  class work and 2 or 3 in class tests  (60%)

2.  departmental final exam  (40%)

**DEPARTMENTAL LEARNING OUTCOMES** *(to be filled out by departmental mentor)*

***The mathematics department, in its varied courses, aims to teach students to***

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a. perform numeric and symbolic computations
b. construct and apply symbolic and graphical representations of
functions
c. model real-life problems mathematically
d  use technology appropriately to analyze mathematical problems
e. state (e1) and apply (e2) mathematical definitions and theorems
f. prove fundamental theorems
g. construct and present (generally in writing, but, occasionally,
orally) a rigorous mathematical argument.
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Course Supervisor: Prof. Ethan Akin

**Questionnaire**

What is your major? _____

Are you sure you need this class? _____ Think again, are you sure?? _____

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)

_____

_____

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.

_____

_____

How good would you say you are at Algebra? _____ Precalc? _____
(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!")

With the same scale as above, rate your overall comfort level with math: _____

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?

_____

_____