

Instructor: Edison Hauptman (he/him/his)**Contact Me:** ERH129@pitt.edu**My Drop-In Hours:** TBD, 4 per week**Prerequisite:** Minimum math placement score of 61, or Math 0031 with minimum grade of C.**Textbook:** Brief Applied Calculus, 7th Edition, by Geoffrey C. Berresford and Andrew M. Rockett**Supplemental Textbook:** Calculus For Business and Social Science, by William J. Adams

Meeting Times

- **Lecture:** Monday/Wednesday/Friday 5pm-5:50pm, A719 Public Health-Crabtree
- **Recitation:** Tuesday/Thursday 11am-11:50am **OR** 1pm-1:50pm (check your TA's Canvas page!)

Drop-In Hours

Are you having trouble understanding an example in the book? Would you like a place to study with your peers, where you can ask questions if you get stuck? Have you discovered something cool that you want to show me? Drop-In Hours are a great way to chat with me or your TA outside of class! Your TAs and I will have Drop-In Hours in the Math Assistance Center (MAC) or our offices every week. There are also tutors in the MAC all throughout the week, so you can also stop by the MAC whenever you are free!

Drop-In Hours are also a great place to find study partners! Working with classmates on this material will help you learn it faster and better. You won't have the exact same view on the course as your partners, so you'll be able to help one another fill in the gaps and advance everyone's knowledge together!

What is Business Calculus?

Calculus is the study of two mathematical ideas:

1. **Rates of Change (the *derivative*):** "The only constant is change!" To the extent that we can model our world with functions, it is often useful to understand how they change as the input changes.
2. **Computing Areas (the *integral*):** We have formulas to calculate the area of simple shapes like rectangles and triangles. Using the integral, we can also calculate the areas of more complicated shapes.

Business Calculus (MATH 0120) has a primary focus on calculus applications relevant to business and economics, including optimization, the price elasticity of demand/supply, and consumer/producer surplus. Most applications that are accessible to us in this course will use the derivative. However, we will also learn about integrals and some of their applications closer to the end of the course.

To understand these applications, we will use techniques from algebra, geometry, and more. However, your TA and I cannot spend lecture or recitation time reviewing these past tools. If you find yourself getting stuck on this background material, you should work to improve those skills *as soon as possible*! I am happy to use Drop-In Hours to help review these, and I will never demean you for not knowing something "basic" or "easy".

Note: Math is hard, but this is a friendly reminder that **YOU CAN DO IT!** Some of you may think that you are not "math people." However, most people will never study calculus, and a little over 300 years ago, almost nobody knew any of this! Like it or not, if you are enrolled in this course, then you *are* "math people," and you belong here even if you don't feel fully prepared! Every single mathematician I know has struggled with math and *currently* struggles with math, because math is very hard! **It will take consistent hard work to learn the material in this course, but I promise you that you can!** Speaking of which...

How to Succeed in this Course

Personally, I don't put much stock in grades. My main objective as your instructor is that you learn this material well enough to use it later in your life, wherever you happen to end up! If you can build a solid foundation with the derivative and the integral, then you can develop a new lens through which you view the world. (*That might sound a bit pretentious, but I'm not kidding!*)

I also want to show you that there is so much more to math besides the memorization and pattern-matching that it's often known for. So in this course, you're going to get the opportunity to flex different mathematical muscles, such as communicating your results, teamwork, and (if you want to push farther) resilience and creativity. These are all skills I use *every day* as a Math Ph.D. student and aspiring mathematician!

But, I still have to report a grade at the end of the term. I'll do that based on how well you do three things:

1. Achieve the **Big Ideas** in Business Calculus,
2. Earn **Engagement Points** by doing assignments that will help *you* gain something from this material,
3. Re-certify your understanding of the Big Ideas on the **Final Exam**.

I will be measuring your *progress* throughout the semester. There won't be a big midterm that "mathematically eliminates" you from earning a B if you do poorly. Instead, you will have many chances to show me that you have *improved* your understanding of the course material, and whenever you do, that will be reflected in your grade! Let's see what that means:

1. Achieving the Big Ideas

Every week, we will have Progress Checks on 1 or 2 **Big Ideas**. Most Progress Checks will occur in your recitations on Thursday, and each Progress Check will be 15 minutes long. The schedule for all Progress Checks will be posted on Canvas.

To achieve a Big Idea, you must answer at least 3 of its 4 questions correctly. You will have three attempts to achieve each Big Idea:

- 1st:** Soon after I cover the material in lecture,
- 2nd:** One week later, after you have feedback from your first attempt,
- 3rd:** In the last week before finals week.

Once you achieve a Big Idea on a Progress Check, you do not need to achieve it again!

Note: Whenever I say "correct answer," I really mean "essentially correct." In other words, if you can demonstrate full understanding of the relevant concepts in the question, you will be marked "essentially correct" even if there is a minor error unrelated to the Big Idea. Whenever it's important enough to give a perfect answer, you'll be able to double-check your notes.

To facilitate your studying, each Big Idea is described using several Learning Outcomes, which are *highly suggestive* of the questions you should expect on each Progress Check. See pages 8-9 for a list of the Big Ideas and Learning Outcomes in this course.

Note: Some Big Ideas (3, 6, and 9) are **CORE Big Ideas**, and you should prioritize achieving these. CORE Big Ideas are foundational to other concepts in this course *and* are highly likely to be needed outside of the course.

2. Earning Engagement Points

Besides the weekly Progress Checks, there are many other assignments in this course which will earn you **Engagement Points**. **I do not expect you to complete *all* of these assignments.** You should choose the assignments that will help you with your own learning, and focus on those!

WeBWoRK Problem Sets (150 pts): WeBWoRK is the computer system where you will complete online homework. Each of you will have different randomly-generated numbers, but the problems are the same across most Business Calculus courses. WeBWoRK can be accessed through my.pitt.edu or Canvas. In most weeks, a problem set will be due on Tuesday night at 11:59pm. You can set up WeBWoRK with your TA in recitation.

If you have any trouble logging into or using WeBWoRK, or if you have difficulty answering a question, **send an email** to me or your TA. Do not use WeBWoRK's "Email Instructor" feature.

Practice Problem Sets (5 pts each, 1/week): For each section we cover, there are recommended textbook problems. If you submit solutions to a few of these in a given week (check Canvas for how many), you will earn 5 points. There are many outside resources with practice problems too; you may use these with prior approval.

Note that Practice Problem Sets will be graded for **completion**, not correctness. If you would like to discuss your solutions to any practice problems, feel free to reach out to me or your TA.

Top Hat Tally (~40 pts): In most lectures, I will ask a few quick questions which you can respond to anonymously using the Top Hat app, for 1 point per response. Active engagement in the lecture will be more difficult than passively listening to me, but it's better for your learning!

Recitation Check In's (5 pts each, 1/week): In the first five minutes of each Tuesday's recitation, your TA will have you reflect on the course material with a partner. This will give you a chance to think about your progress in the course and prepare questions for your TA.

At the college level, it is **impossible** for me to show you enough material in the lecture for you to be fully prepared for assessments. If you do not fully understand the material after a lecture, that is okay and a normal part of learning! Hearing it the second time from a different perspective can clarify a lot of missing details.

A New Perspective (20 pts each): Calculus is studied by a wide diversity of students across majors and mathematical backgrounds. Therefore, for any topic your TA or I may cover in class, you may have a different example or explanation that helps you or a classmate understand it better. If you want to discuss one of these with me or your TA in some detail (ideally in Drop-In Hours), we can give your points for your independent exploration and thought!

This could involve: explaining the calculus concept(s) relevant to a topic of interest; deriving, solving, and/or explaining a model problem related to a topic of interest using at least one calculus technique or idea; or pursuing a topic covered in lecture/recitation at a level beyond what is expected for the course. More information on this assignment will be posted to Canvas.

Group Work (15 pts each, ~3-5 total): To help review for the CORE Big Ideas, there will be occasional gaps in our schedule for practice worksheets. In this assignment, you will work in small teams to solve some practice problems. This assignment may occur in lecture or recitation, and will be graded for completion.

Note: If you are keeping up with the coursework and attending class and recitation, it will be very easy to earn Engagement Points. The Engagement Point totals required for each final grade are minimum standards. Once again, **you should not complete *all* these assignments.** Instead, choose the ones that will help your learning! For many of you, these will be the assignments that will best help you prepare for Progress Checks.

Typical Weekly Schedule

Here is an outline of all the regularly-occurring events and assignments in this course:

Monday	Tuesday	Wednesday	Thursday	Friday
			Practice Problem Sets (<i>due at 11am</i>)	
	Recitation (<i>Recitation Check In</i>)		Recitation (<i>1-2 Progress Checks</i>)	
Lecture at 5pm (<i>Top Hat Tally</i>)		Lecture at 5pm (<i>Top Hat Tally</i>)		Lecture at 5pm (<i>Top Hat Tally</i>)
	WeBWorK (<i>due at 11:59pm</i>)			

(Pre-Final) Course Grade

In order to earn a given letter grade, you must satisfy **all** of the requirements in the corresponding row.

Final Grade	Big Ideas Achieved (9+1)	CORE Big Ideas (3)	Engagement Points Earned
A	9	3	200
B	7	3	150
C	6	2	100
D	3	0	0
F	Did not meet all of the requirements for a D		

Note, if you plan to take Intermediate Micro/Macroeconomics: Business Calculus (MATH 0120) is a prerequisite to ECON 1100 and ECON 1110, with a minimum required grade of ‘B’. By contrast, Analytic Geometry & Calculus 1 (MATH 0220) is accepted as a prerequisite for both of these with a minimum required grade of ‘C’. If you have any questions about minimum required grades or whether to take MATH 0120 or MATH 0220, I *strongly* encourage you to talk to me *and your academic advisor*!

“What about plus or minus grades?” These will be earned based on your score on the **Final Exam**:

3. Final Exam

Pitt’s math department stipulates that all students in day sections of Business Calculus (that includes us!) must take a common **Final Exam** during Final Exam Week. The exam will be designed by a course coordinator, with some input from all Business Calculus professors. You can see the schedule for all final exams here; our exam is scheduled for **Friday, May 1, at 8am**, in a location to be determined.

The final exam is a chance to re-certify the understanding you’ve already demonstrated throughout the semester:

- If your final exam score *slightly exceeds* your course performance, you’ll get a plus (+).
- If your final exam score *matches* or is *slightly worse* than your course performance, no change is made.
- If your final exam score is *much worse* than your course performance, you’ll get a minus (-).

So, if you’ve been doing well the whole course, but do very poorly on the final exam, that will not ruin your grade. On the other hand, if your final exam score is *much better* than your course performance, I will replace your course score with the final exam score. See the tables on the next page for more information.

Final Grade Option 1: “Plus-or-Minus”

(Pre-Final) Course Grade	Final Exam Score	Final Grade
A	93 - 100%	A+ (4.0)
	75 - 92.99%	A (4.0)
	below 75%	A-
B	83 - 86.99%	B+
	65 - 82.99%	B
	below 65%	B-
C	73 - 76.99%	C+
	55 - 72.99%	C
	below 55%	C-
D	63 - 66.99%	D+
	45 - 62.99%	D
	below 45%	D-

Final Grade Option 2: “Super-Final”

(Pre-Final) Course Grade	Final Exam Score	Final Grade
any	93 - 100%	A+ (4.0)
	90 - 92.99%	A (4.0)
	87 - 89.99%	A-
	83 - 86.99%	B+
	80 - 82.99%	B
	77 - 79.99%	B-
	73 - 76.99%	C+
	70 - 72.99%	C
	67 - 69.99%	C-
	63 - 66.99%	D+
	60 - 62.99%	D
	58 - 60.99%	D-
	below 58%	F

Note: The “Super-Final” option can be used whether your pre-final grade is “A”, “B”, “C”, “D”, or “F”. In all cases, scoring 93% or better will earn you an “A+” (etc. for the other grades). However, the better you do in the course throughout the semester, the more room for error you will have on the final exam. **I will automatically choose the final grade option that gives you the highest grade.**

Final Exam Curve: The final exam is purposely a difficult exam, so that it can be curved up (*never* down), in such a way that the grade distribution on the final exam is similar from year to year. For the tables above, I will use your *curved* final exam score to account for irregularities in/difficulty of the department-wide final. I cannot predict the curve in advance.

I will add that studying in a group has been shown to strengthen all group members’ learning more than working alone. Based on this, **I cannot encourage you enough to make friends in this class, perhaps by coming to Drop-In Hours to find someone to study with!**

Other Course Policies

Canvas: Most of this course, including announcements, resources, due dates, and assignments, will be on our lecture's Canvas page. You are responsible for checking Canvas often. Your TA may have additional information on your recitation's Canvas page as well. You will also be able to see scores for all assignments on Canvas. However, I am still figuring out how to make Canvas compatible with this course's grading system, so unless I say otherwise, **your overall grade will *not* appear on Canvas!**

Keeping Track of Your Grade: I will hand out a colored sheet of paper on the first day of class (see page 10). Copies of this sheet will be on our Canvas page. If you have never taken a course like this one before, then this grading system may feel a bit intimidating or complicated. That's okay! **Just like Calculus, if this grading system is new to you, then it will take some time to learn, and I don't expect you to understand it immediately!** Throughout the term, I will dedicate class time to discussing the grading system. Please don't hesitate to ask me or your TA any questions!

Note: If you are ever worried about your grade in this course, please reach out earlier than you think you need to. I am happy to help you make a plan!

Absent from Class: If you miss a class meeting, whether excused or not, you are responsible for using the resources available to you (your peers, Drop-In Hours, the textbook, etc.) to ensure you do not fall behind on the material. If you are absent for an extended period of time, or if you miss the final exam day, please keep me in the loop. I am willing to work with you!

Make-up/Late Assignments: Since you will have three attempts at each Big Idea in this course, **you will not be able to make up missed Progress Checks.** The only assignments that can be made up or submitted late are the Practice Problem Sets. There is a lot of flexibility in this course because I know things will go awry at some point. Please take care of yourself first, and use the flexibility in this course to your advantage!

Email Communication: Aside from Canvas, my only online communication with you about this course will be via my Pitt email, ERH129@pitt.edu. For example, I will send individualized monthly check-in emails to you from my Pitt email. Likewise, when you email me, it should be via your Pitt email, not any personal email.

Textbooks: You were automatically opted in to receive an electronic version of our textbook (Brief Applied Calculus, 7th Edition, by Geoffrey C. Berresford and Andrew M. Rockett) through our Canvas page. If you do not want an electronic copy of this book, you *must* opt out early in the term. You will receive an email with the subject line, "Access your MATH 0120-10556 Materials," which will have more information on this.

Note: This textbook is *not* required for this course. However, you should be aware that many good sources of practice problems that I typically recommend for Calculus students will include trigonometry, which is outside of the scope of this course. We will discuss the textbook and sources for practice problems in more detail on the first day of class.

Additional single-variable optimization examples are presented in our supplemental textbook (Calculus For Business and Social Sciences, by William J. Adams). Any materials referenced in this textbook, including exercises and solutions to selected exercises, will be made available on our Canvas page.

Calculators: Calculators are not permitted on exams or Progress Checks (and are not very useful in most of our assignments), but you may benefit from having a calculator handy for some parts of the course. There are plethora of online calculators available, so a physical calculator may not be useful to you.

Note: Unless I specifically tell you to do so, you will *not* have to simplify your answers on Progress Checks or exams!

Academic Integrity and External Resources: For our purposes, you may consider “cheating” to be any action that could give you an unfair advantage on a Progress Check or exam, and you may consider “plagiarism” to be any presentation of work as produced by you when it was not. **Neither of these are acceptable in a college course.**

You are likely familiar with Large Language Models such as ChatGPT. When calculators were invented, they did not make math obsolete, and the same will be true of LLMs. [In fact, it is my own knowledge of Calculus that informs me that LLMs do not actually *know* anything, and therefore they should *never* be trusted to make decisions or answer questions!]

You should never copy solutions from an LLM or anywhere else for *any* assignment in this course—that’s plagiarizing! I have no issue with you using external resources to study or practice. Just remember that math is not a spectator sport, and understanding someone else’s explanation is only half the battle. **The only way to learn the material in this course is by building your own understanding!**

Also, there is flexibility and leniency built into this grading structure specifically so you can succeed! If you find yourself in a place where you’re considering cheating or plagiarism, please ask me or your TA for help instead, and let’s find a fair way to succeed in this course.

Equity, Diversity, and Inclusion: I have designed this course with the recognition that you all have different opinions about, background knowledge of, and strengths in math. Your diversity of perspectives, intersected with your disability status, race, color, religion, national origin, ancestry, genetic information, marital status, familial status, sex, age, sexual orientation, veteran status, gender identity, etc., can make this course more enriching for all of us. I strive to make my class a space that is respectful, welcoming, and inclusive of every member of the class, and you are expected to contribute to this!

If you or someone else does not feel respected, welcomed, or included in this class, and you are not comfortable talking to me or your TA first, you can reach out to Pitt’s Title IX Coordinator by calling 412-648-7860, or emailing titleixcoordinator@pitt.edu. Reports can also be filed online. If you wish to maintain complete confidentiality, you may also contact the University Counseling Center (412-648-7930).

Disability Resource Services: If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact Disability Resources and Services (DRS), 140 William Pitt Union (412) 648-7890, drsrecep@pitt.edu, (412) 228-5347 for P3 ASL users, as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course.

You should also contact me, so that once I receive an email from DRS, we can make a plan to As with all other things in this course, proactive communication is key!

I wish you all a wonderful semester!

Appendix: List of Big Ideas and Learning Outcomes (Textbook Sections)

1. Exponentials and Logarithms (4.1, 4.2)

- (a) I can simplify expressions and solve equations involving exponentials and logarithms.
- (b) I can use formulas for periodically and continuously compounded interest to solve for desired values.
- (c) I can convert between bases when using logarithms and exponents.

2. Limits and Tangent Lines (2.1, 2.2)

- (a) I can compute limits using algebraic techniques.
- (b) I can differentiate simple functions using the definition of the derivative.
- (c) I can find the equation of the line that passes through two given points, or through one point with a given (or calculated) slope.

3. (CORE) Derivative Rules (2.3, 2.4, 2.5, 2.6, 4.3)

- (a) I can use the Power Rule to differentiate functions.
- (b) I can differentiate exponential and logarithmic functions.
- (c) I can differentiate products and quotients of functions.
- (d) I can differentiate nested (composed) functions using the Chain Rule.
- (e) I can use logarithmic differentiation to differentiate functions.

4. Related Rates of Change (3.6)

- (a) I can compute rates of change and find tangent lines to general curves using implicit differentiation.
- (b) I can use implicit differentiation on model problems to calculate an unknown rate of change.

5. Graph Analysis (3.1, 3.2)

- (a) I can determine where a function is increasing/decreasing, as well as the locations of any local minima/maxima, perhaps based on a relevant graph.
- (b) I can determine where a function is concave up/down, as well as the locations of any inflection points, perhaps based on a relevant graph.
- (c) I can find the x - and y -intercepts, vertical asymptotes, and horizontal asymptotes of a function.
- (d) I can sketch the graph of a function given some or all of the above information.

6. (CORE) Single-Variable Optimization (3.3, 3.4, 3.5)

- (a) I can find the absolute maxima and minima of a single-variable function on a closed interval.
- (b) I can use constraints to reduce a multi-variable objective function into a single-variable objective function.
- (c) I can use calculus techniques to optimize single-variable objective functions based on model problems.

7. Price Elasticity of Demand/Supply (4.4)

- (a) I can compute the relative rate of change of a function.
- (b) I can compute the price elasticity of demand/supply using a demand/supply function.
- (c) I can find optimal prices for demand and supply curves using price elasticity.

8. Multi-Variable Optimization (7.1, 7.2, 7.3, 7.5)

- (a) I can compute the partial derivatives of a multi-variable function.
- (b) I can find critical points for a multi-variable objective function and use appropriate tests to classify each as a local minimum, local maximum, or neither.
- (c) I can use the Lagrange Multipliers technique to optimize a constrained multi-variable objective function.

9. (CORE) Applications of Integrals (5.1, 5.2, 5.3, 5.4, 5.5)

- (a) I can use basic anti-derivative formulas to compute integrals of functions.
- (b) I can compute the total change over a given period given a function describing a rate of change.
- (c) I can calculate the area bounded between two or more curves.
- (d) I can compute the consumer/producer surplus at a specific price for a given set of supply and demand curves.

B. Integration Techniques* (5.1, 5.2, 5.6, 6.1)

- (a) I can use basic anti-derivative formulas to compute integrals.
- (b) I can use the u -substitution technique, as appropriate, to compute relevant integrals.
- (c) I can use the integration by parts technique, as appropriate to compute relevant integrals.

As a reminder, each Big Idea is described using several Learning Outcomes, which are *highly suggestive* of the questions you should expect on each Progress Check.

*Because we will learn u -substitution and integration by parts very late in the semester, there will only be two attempts on this topic before the final exam. These two techniques are also **substantially** difficult compared to the rest of the material, and typically require a lot of practice. So, this whole Big Idea will count as a bonus!

Note: You can find a complete schedule with dates for all Progress Checks on Canvas!

Final Grade Tracker

Big Ideas
☐ BI 1: Exponentials and Logarithms ☐ BI 2: Limits and Tangent Lines ☐ BI 3: (CORE) Derivative Rules ☐ BI 4: Related Rates of Change ☐ BI 5: Graph Analysis ☐ BI 6: (CORE) Single-Variable Optimization ☐ BI 7: Price Elasticity of Demand/Supply ☐ BI 8: Multi-Variable Optimization ☐ BI 9: (CORE) Applications of Integrals ☐ BI B: Integration Techniques

Total Big Ideas:

1	2	3	4	5
6	7	8	9	10

CORE Big Ideas:

1	2	3
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Engagement Points:

WeBWork Problem Sets (150) _____ A New Perspective (20 each) ☐☐☐x20=_____

Top Hat Tally (~40) _____ Bonuses _____

Group Work (15 each) _____+_____+_____+_____+_____+_____ =_____ **Total** _____

Practice Problem Sets (65) ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐x5=_____

Recitation Check In's (65) ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐x5=_____

Total Engagement Points (mark every 5 earned):

C					B					A				
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

(Pre-Final) Course Grade

To earn a given letter grade, you must satisfy **all** of the requirements in the given row.

Final Grade	Big Ideas Achieved (9+1)	CORE Big Ideas (3)	Engagement Points Earned
A	9	3	200
B	7	3	150
C	6	2	100
D	3	0	0
F	Did not meet all of the requirements for a D		

For information on how the Final Exam can modify your grade, see page 5 of the syllabus.

MATH 0120-1180

Business Calculus

Spring 2026

Guidelines for TAs

You may want to read the syllabus on Canvas to get an idea of students' expectations, but all of the critical information you'll need to know is included in these guidelines.

Contact Me: My phone number is (201) 364-4428, and my email is ERH129@pitt.edu. If there's a problem, don't hesitate to reach out!

The Four Pillars: This course structure has been heavily inspired from many other alternatively-graded courses. I will make specific reference to David Clark and Robert Talbert, authors of "Grading for Growth" (and math professors at Grand Valley State University), who discuss four pillars for all good grading systems:

1. Clearly-defined standards
2. Meaningful feedback
3. Marks indicate progress
4. Reassessment without penalty

These four pillars are my primary benchmarks for a successful implementation of this course. Last fall, as the instructor of record for Calculus 1, I used a similar structure, and I have modified it based on my, my TAs', and my students' experiences.

1 Schedule

An outline of all the regularly-occurring events and assignments in this course:

Monday	Tuesday	Wednesday	Thursday	Friday
			Practice Problem Sets (<i>due at 11am</i>)	
	Recitation (<i>Recitation Check In</i>)		Recitation (<i>1-2 Progress Checks</i>)	
Lecture at 5pm (<i>Top Hat Tally</i>)		Lecture at 5pm (<i>Top Hat Tally</i>)		Lecture at 5pm (<i>Top Hat Tally</i>)
	WeBWorK (<i>due at 11:59pm</i>)			

I encourage you to remind your students about these weekly assignments in your recitation. It has been my experience that in courses with lots of moving parts (like this one), students benefit from having a clear structure wherever we can give it.

There will also be a page called "Course Schedule" on Canvas with an up-to-date schedule of the topics I will cover. Note that I will depart from the default schedule on Canvas.

2 Setup Details

Meeting with Me: Please reply to my email to let me know when you can meet with me! I'd like to meet before your first recitation, but since that's on Tuesday, January 13th, that may not happen. Feel free to contact me before the course starts with any immediate questions, though this meeting will also be a good chance for you to ask me questions about the course.

Recitation Meeting Times: Please include the time and location of your recitation on your Canvas page. Note that you meet at **different times to each other**, so it is extremely important that you communicate the time of **your** recitations to your students before your first meeting.

Drop-In Hours: Dr. Hockensmith, the director for the Math Assistance Center, should reach out to everyone to schedule a Drop-In Hour in the MAC. When you know all of your Drop-In Hours, please send an email to me to let me know. Alternatively, you may edit the page titled "Drop-In Hours and Email Contact Info" on Canvas to include your hours.

Once you know your Drop-In Hours, I highly encourage you to share these with your students at the start of every recitation session. I like to write mine down on the board.

First Tuesday Recitation: In the first recitation on Tuesday, I want you to use the questions from the First Recitation Check-In document to set the stage for the semester. Business Calculus can be an intimidating course, especially for first-year students. In the first recitation, I always try to instill a *growth mindset* in my students: one's math ability is not a fixed thing, and everyone can improve at it!

As you flip through students' responses, you may want to consider sharing some of your own experiences learning math. When did math get difficult for you, and what helped you push through anyway? If you have prior experience teaching, you could also talk about previous students of yours (especially in Business Calculus or a less advanced course if you can), and share similar stories. Be as specific as you are comfortable about what you/your students did to improve, or any challenges—if you can make a human connection here, your students will trust you (very important, as they are less likely to trust me as the instructor).

After you do this, spend the rest of the time reviewing material. Most likely, you'll base this on your students' responses that you've collected, but if you don't get anything specific,

an algebra review (specifically, rational functions and exponent rules) is a safe bet.

First Thursday Recitation: In the first Thursday recitation session, please begin by showing students how to set up WeBWorK (see below). Then, once everyone's got it, distribute the practice Progress Check, and when it is finished, go over the answers. This is a great chance to discuss what kinds of errors make an answer “essentially correct” vs. “incorrect” (see below).

3 Recitations

Tuesday recitations will be review sessions for the students. You are welcome to review practice problems, take questions from students, or do a mix of both. It is up to you how you'd like to use (most of) this time, but I encourage you to take cues from your students and figure out what is most valuable to them.

The Recitation Check In Assignment: In the first five minutes of each Tuesday recitation, please give each student a Recitation Check In sheet, then collect it. I will send you a PDF with four copies of this sheet on one page, so you can print small versions for the class and save some paper (there is a paper cutter in the printer room on the third floor). Students will chat with a partner about the course material and take some time to think about where they're at in the course. As you collect these, consider flipping through them—maybe there's a common theme that will shape your recitation.

After recitation, please make sure to mark who has completed the Recitation Check In assignment in the grading spreadsheet, under your recitation tab (I'll mark your sheet with your name), by putting a 5 in the appropriate cell. **Since I might not know which students are in your recitation, you may have to add their names and email IDs into your own sheet.** Then, you can return these to your students in the next recitation so they have a record of their thought process.

Thursday Recitation: There are two recitation sessions per week in Business Calculus. In this course, your Thursday recitation session will **end** with Progress Checks, so you will often have a little less than 20 minutes to review (sometimes 35). I recommend that you address most review questions on Tuesday.

On Thursdays, please do not, unprompted, present questions that are highly similar to the Progress Check(s). One good way to avoid doing this is to have the students to lead this review session with their own questions instead (if they happen to ask about something highly similar, you can show them!).

4 Progress Checks

Progress Checks will be given in your Thursday recitation session in most weeks. You can see the schedule on Canvas to know when each Progress Check will be and what topics it will cover. I will write all Progress Checks, and I will (should) send them to you at least 48 hours before the session where you'll give them. Each Progress Check is based on a Big Idea in Business Calculus, and each one will be given three times (with different questions in each version) during the semester.

I plan for each Progress Check to be 15 minutes long with 4 questions each. Each Progress Check will name the Big Idea and list the associated Learning Outcomes at the top (see the appendix in the syllabus). Students will have three attempts to achieve each Big Idea, so your Thursday recitation session will consist of two Progress Checks in most weeks. When this happens, please give all students the Progress Check on the **new** Big Idea first, with 15 minutes to complete it. Then, after you collect these, give them the Progress Check with the **old** Big Idea, with 15 minutes to complete that. If a student has already achieved the old Big Idea on their first attempt, they don't have to stay.

Accommodations: Some students will have accommodations which include extra time on "exams". You will receive emails from Disability Resource Services (DRS) with specifics for each student. Students wanting to use extra time accommodations on a set of Progress Checks must take them in the Testing Center. You can encourage them to come for the first 20-35 minutes of your Thursday recitation, but then they should not stay in the room during the Progress Checks. Any student who would like to use time accommodations on Progress Checks should reach out to you, me, and the Disability Resource Services Office. I will handle all the paperwork on our end.

Grading Progress Checks: All Progress Checks will be graded through Gradescope. Gradescope is a grading platform that has several features that make grading fast and consistent. Also, once Progress Checks are graded, students can immediately see their results and feedback, so they do not have to wait until the next recitation.

For each Progress Check, I will create a rubric that I will ask you to follow. It will be very easy to mark each question, because there are only four possible outcomes:

- Perfect: No mistakes at all.
- Essentially correct: All of the main ideas have been handled correctly, even if there's a minor error or two.

- Not quite: Something important is missing or wrong.
- Blank/Incomplete: No attempt, or a largely incomplete partial attempt.

I hope this makes grading easy, because you will not need to stress about partial credit. A student's answer is either essentially correct or it's incorrect. If you would like any guidance on which kinds of mistakes make a response “essentially correct” vs. “not quite”, please don't hesitate to reach out—it is critical that we are consistent on this.

For students to achieve the Big Idea in a Progress Check, they must answer 3 out of 4 questions essentially correct or perfect. I will be able to download grades from Gradescope and add them to the grading spreadsheet myself, so you won't need to deal with the grading spreadsheet for Progress Checks.

Helpful Feedback: As you grade students' answers, please make sure to give them meaningful, **helpful feedback**, especially if their answer is incorrect. I like to focus on the major misunderstanding that derailed their solution, because it is clear what they need to study. **Without adequate feedback on these Progress Checks, there is little point in this entire system of retries!** The Grading for Growth blog has a post with some advice for giving helpful feedback, which I encourage you to read and re-read: <https://gradingforgrowth.com/p/the-care-and-feeding-of-helpful-feedback>.

Timeline for Grading Progress Checks: In order for these Progress Checks to be useful to our students, they must be returned **before** students' next attempt, and ideally as soon as possible. After the students have completed their Progress Checks, please scan and upload them into Gradescope as soon as is reasonable.

I will generally grade the first attempts **immediately** (either the same day or the next day). Ideally, you could grade the second attempts by Tuesday (your next recitation), so you can return both papers by then. I hope that this five-day timeline is reasonable, but if not, let me know so we can work something out.

Once your students' Progress Checks have been graded in Gradescope, please mark their papers to indicate which questions were essentially correct or perfect, and whether the Big Idea was achieved. For example, you could circle every question that was answered correctly and put a star at the top of the page if the Big Idea has been achieved.

5 Engagement Point Assignments

WeBWorK: If you've worked with WeBWorK before, it should be largely the same. I will include detailed setup instructions in Canvas; please guide students through these in the first

recitation. Since there is no lab session in Business Calculus (unlike Calculus 1 or 2), you should be prepared to answer WeBWorK questions in recitation.

Top Hat: I will use Top Hat in my lectures. For students to use Top Hat in this course, they must click on the words “Top Hat” in the main Canvas page. This confirms their enrollment in the course. So, if they mention having an issue joining, this is the first thing you could suggest. Feel free to direct students with Top Hat questions to me.

A New Perspective: Students may stop by your Drop-In Hours to chat about a topic in more detail. If they can give you a coherent explanation of a topic in a new context (besides what we’ve shown in lecture or recitation), that’s worth 20 points. This should be more than a 5-minute conversation—maybe the student is using the whiteboard, or if they have something at least half-formed (emphasis on **at least half**), you might talk through ideas together. I don’t expect too many folks to do this assignment, but if they do, please include a note in the appropriate place in the grading spreadsheet with some notes on what y’all discussed. More details for this assignment are on Canvas.

Group Work: Last semester, I tried to incorporate some exploratory assignments, but student feedback was largely negative. So, there will be specific review worksheets instead. I intend for all these assignments to be done in class, but if I am short on time, I will give you instructions for how to run this in your Tuesday recitation. I will give you at least a few days’ notice if this is necessary.

6 Other Notes

The Grading Spreadsheet: Please do not use Canvas to post any grades unless I specifically tell you to. Canvas is very hostile towards this grading system, and requires a delicate approach. Whenever you will enter grades, you will do so in a spreadsheet that I will share with you through Pitt’s SharePoint. I will be responsible for entering all grades into Canvas. I will describe your specific grading responsibilities below.

Strategizing for Success: Many students will come up with strategies for how they study for and answer the Progress Checks so they can maximize their score. **I encourage you to strategize with them!** You should share your own strategies with your students as you learn more about this system, because part of your job is helping your students pass this course. Learning how to work with this course structure is part of the learning process, just

like it is for any course! [For example, my knowledge of how the department-wide final exam is graded has informed how I tell students to study for and take the final.]

I would like students to take advantage of this course design wherever they can. With that said, if you think that there is a substantially unfair loophole in this course, I'd like to hear about it. My intention is that no matter what the students do, they will have to actually learn the material to succeed in this course!

Missing a Recitation: If you know that you will have to miss a recitation, and you cannot find anyone to cover for you, send me an email or text so I can help make arrangements. You are also welcome to send an email to our grad director, Armin Schikorra, since such circumstances are ultimately the grad director's responsibility.

Recitation Observations: I would be happy to visit any of your recitations to observe your teaching and give you feedback. If you need a recommendation letter from someone who can speak to your teaching, you may want to have a Teaching Professor visit you in one of your recitations for my course, since you'll have 45 minutes of instruction on most Tuesdays. Perhaps you want a faculty member to visit you when you are responsible for a Group Excursion (or perhaps not).

Since I am the MAC Assistant this semester, I am responsible for assisting the TA Mentor with class visits. So, I may also proactively reach out and ask to visit your recitation.

No Make-up Assignments: Please do not give students a make-up Progress Check under *any* circumstances. If you need to make me the bad guy here, don't hesitate! There is a ton of flexibility built into this course, in part to account for absences including short-term illness, planned academic/sport trips, short-term family emergencies, etc.. I recognize that our students are human, and that they may have to step back for a bit—that has already been built into the design of this course. Also, this course is a lot to juggle for **us**, and we deserve a consistent schedule. In case of severe extenuating circumstances or long-term absences that come to your attention, please direct students to me; I will handle any/all such cases myself.

Academic Integrity Violations: You may initiate any academic integrity proceedings through Pitt's systems at your discretion (if you do, please tell me). You should also feel welcome to bring a potential violation (or any questions) to my attention first. I will not automatically initiate academic integrity proceedings based solely on information you bring to me. I will **always** talk with you first, since I may need your opinion or input. Note that if I decide to impose sanctions for violations of academic integrity, they will be more severe than

giving zero credit on the assignment, because missed assignments are not a meaningful penalty in this course. I recommend that you read my Academic Integrity policy in the syllabus so we are all on the same page.

Equity, Diversity, and Inclusion: You are responsible for making your recitations respectful, welcoming, and inclusive environments for all of your students. I encourage you to read the Equity, Diversity, and Inclusion statement in the syllabus.

On a related note: not all students come into this course with adequate preparation, particularly in algebra. While you should not feel responsible for “catching people up” in recitation (I have resources on Canvas which you can direct students to), you should **never** demean students for not knowing something “basic” or “easy.” I would consider this a violation of EDI principles.

Final Exam Responsibilities: TAs for day sections are responsible for proctoring and grading the department-wide final exam. The course coordinator for Business Calculus will be in touch with you late in the semester. Note that your primary responsibility is your own coursework, so if there is a conflict, please communicate it to the course coordinator so they can make appropriate adjustments.

Note that I may ask for help grading the third attempts for Progress Checks (given in the week before final exam week). In Calculus 1 in the fall, around 30-50% of the class completed each third attempt, so I would most likely ask you to grade two of these (of your choice).