

# THEORY OF DIFFERENTIAL CALCULUS

## ASSESSMENT

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Fall 2021

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Math 115

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### §A. What assignments will be there?

#### LEARNING TARGETS

There are 12 *Learning Targets* in the course, which together form an outline of all the important concepts in Math 115. Seven (7) of these are designated as **Core** learning targets because they are the most essential topics in the class. **Your main goal in the course is to provide evidence of skill on as many targets as possible.** You will do so through **Checkpoints** which are open-time, open-note take-home exams.

#### PRACTICE AND ENGAGEMENT (PE)

Staying involved with others in the course and building your skill by practicing with the basics are both crucial pieces to success in Math 115. To keep you on track, you'll earn Practice and Engagement (PE) Credits by completing tasks related to this goal throughout the semester.

- The first source of PE credits is completing **Edfinity Homework** Sets, each worth **1 PE credit**. These are online homework assignments to help build your computational skills. There will be at least one Homework set per learning target.
- The second source is by completing three **Application/Extension Problems** posted throughout the semester, each worth **4 PE credits**. AEPs are extended problem sets where you will either apply basic content to real-life problems or explore extensions of those concepts beyond what's in the textbooks.

There will be bonus opportunities to earn PE credit, for example through class engagement, or by using leftover tokens (more on tokens below).

**Note:** All assignments except the Edfinity homework will be due at **5 PM** on the due date (not midnight), unless otherwise noted. You will need to upload them to Moodle, please do not email me with answers.

#### FINAL EXAM

There will be no final exam for the course. Instead, you will have a last checkpoint quiz during the finals week that will give you opportunities to earn "Satisfactory" in some learning targets.

### §B. How are individual assignments scored?

#### LEARNING BASED GRADING

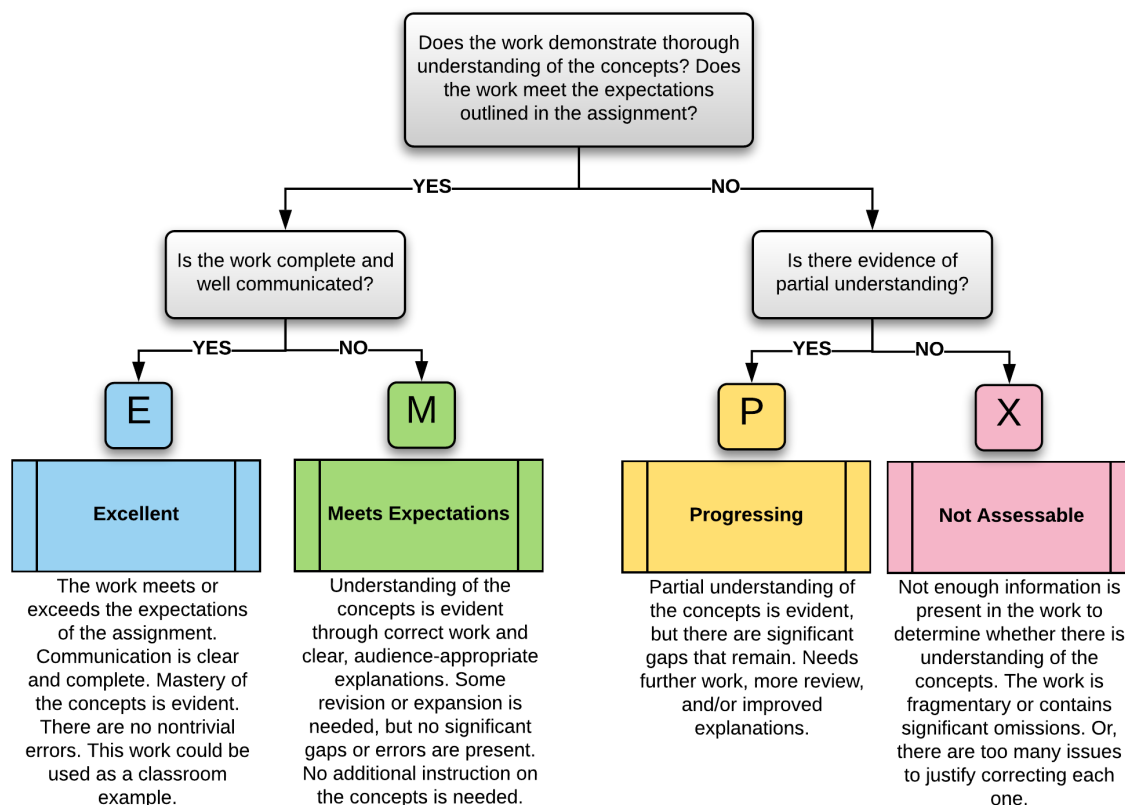
Our course is graded by a methodology called **Learning-Based Grading** system, also called standards-based or mastery-based grading, in which most graded work **do not have a point value or percentage**. Instead, you earn your grade by **demonstrating evidence of skill on the main concepts** in the course and by showing **appropriate engagement** with the course.

When you submit most work, I will evaluate it relative to quality standards made clear on each assignment. If your work meets the standard, then you will receive full credit for it. Otherwise, you will get helpful feedback and, on most items, the chance to reflect on the feedback, revise your work, and then reassess your understanding.

This feedback loop represents and supports the way that people learn: By trying things, making mistakes, reflecting on those mistakes, and then trying again. *You can make mistakes without penalty* as long as you *eventually* demonstrate evidence of skill.

## HOW PE CREDIT IS GRADED

- **Edfinity Homework.** Each Edfinity homework problem can be **reattempted as many times as needed** until the deadline for the problem set. These are graded 1 or 0 PE credit based on whether or not you get a full score. I expect that everyone will get full score on this part.
- **Application/Extension Problems.** These will be graded according to the following rubric.



EMPX rubric based on the EMRF rubric, due to Rodney Stutzman and Kimberly Race: <http://eric.ed.gov/?id=EJ717675>  
EMRN rubric adaptation by Robert Talbert is licensed under CC BY-SA 4.0



Here **E=4**, **M=3**, **P=1**, and **X=0 PE credits**. You will be given generous deadlines and are welcome to ask me questions in office hours before you submit your project. You will be given **one** chance to reflect on the feedback you receive (with a stricter deadline), make corrections and resubmit your work if it is graded **P** or **X**, and can improve your grade up to **M**.

## HOW LEARNING TARGETS (LT) ARE GRADED

An important goal for you in the course is to demonstrate proficiency, and eventually fluency, of all the Core targets and as many of the Supplemental targets as you can. These are assessed on Checkpoints, which are take-home exams offered roughly every week (a schedule is in the Learning Targets document). Checkpoints contain one problem (often with multiple parts) per Learning Target. Each problem is graded separately on a S/NC scale and has its own criteria for what is “satisfactory” work. As a general rule of thumb, you will get S on a problem only if you would have scored more than 90% in a regular scoring system.

Your score is not averaged since they are not numerical. Instead, your grade will be computed in a way that rewards growth and continued proficiency of the material. There are two levels of achievement on each of the Learning Targets: **Proficiency** and **Fluency**. Earning one S on a Learning Target puts you at the **Proficiency** level on that Target. Earning two (or more) S puts you at the **Fluency** level. Once you are “fluent” in a learning target, you do not ever have to attempt a problem on that particular LT again.

A detailed rundown of each Learning Target’s criteria for “satisfactory” work, the items covered on each Checkpoint problem, and a schedule for Checkpoints can be found in the document [Information on Learning Targets and Checkpoints on Moodle](#).

**Note:** One important thing to keep in mind during this class is that you should not be discouraged if you don’t earn “satisfactory” on a LT the first time. That’s normal. I’m only interested in what you can show me you can do by the end of the semester. While a lot of people view it in a bad way, failure is an important part of learning. The way to really learn a subject is to make mistakes, learn from them, and do better the next time. So, it’s important that you be open to making mistakes and asking questions and not feel embarrassed about it.

## HOW DO I REVISE AND RESUBMIT MY WORK?

There are no partial credits in this course. Instead, most of your work **can be revised and reassessed to allow you to improve on earlier attempts and raise your grades**. This can happen in a couple of different ways.

- **Checkpoints.** Each Checkpoint is (partially) cumulative, so for example Checkpoint 2 will cover some new material plus material from Checkpoint 1, and so on.

Each Learning Target will appear on three (3) consecutive checkpoints; for example, a problem for Learning Target L1 first appears on Checkpoint 1 and new versions of that problem will appear on Checkpoints 2 and 3. In this way, if your work on a problem in a Checkpoint doesn’t meet the standard, you can just try it again at a later Checkpoint.

However: **After three Checkpoints, the Learning Target is “retired”** and may only appear in some form on the final exam (or by LT Retake in Office hour, explained below), so you do need to tackle Learning Targets early and fix any misconceptions you have on them reasonably quickly in order to earn a ‘Fluency’ rating (which is earned by completing two Checkpoint problems successfully).

- **Retakes in Office Hours.** You can “unlock” the ability to retake a test on a particular LT (with a similar but new problem). To do this, first, you must have completed the Edfinity homework for that LT. I want to make sure you have put in the time to study and prepare before allowing a retake. For the same reason, you will need to fill out a cover sheet form (available in Moodle) when you ask for a retake.

Second, with my permission (talk to me 24 hours in advance), make a 15 minute appointment to attempt one or two new problems that assess a specific learning target. This can be during office hours or at any

other time we agree on. These may be on paper or at the blackboard. This can be any learning target, no matter where we've assessed it. I may ask you to explain the meaning of the learning target as well.

- **Use your work on an Applied Project**, that, in your view, shows evidence that you know how to perform the task on a Learning Target. In this option, you'll schedule a regular office hour with me and make the case for your work, and I'll listen and then ask some followup questions that you'll need to address.

#### Important Restrictions on Reassessments:

- To earn 'Fluency' level on a Learning Target, **at most** one of your two 'S' ratings may be earned using your work on an AEP Project, (but both can be from LT retakes).
- If you want to reassess a learning target in order to demonstrate fluency, you must wait at least 1 week after earning your first "Satisfactory" score. This is because I want to ensure that you can demonstrate fluency even after some time has passed.
- **LT Retakes will be limited to once a week per student.** This can be any learning target that you've attempted on any assessment. You can reassess the same learning target in multiple weeks.

A 'week' for this course is defined as the period of time starting at 12:01am EST on Monday and ending at 11:59pm EST the following Sunday.

### TOKENS

Each student starts the semester with 3 tokens, which can be used to *purchase* exceptions to the course rules. The token "menu" is below. To spend a token, send me an email. Everything listed here costs 1 token:

- Submit a second revision of an AEP.
- Extend the deadline on a Checkpoint by 24 hours. Deadline extensions must be requested prior to the original deadline.
- Assess two different Learning Targets in the same week.

Please note that tokens may not be "stacked"; for example you aren't allowed to spend 2 tokens and extend a deadline for 48 hours instead of 24, or assess three Learning targets in the same week.

I will update the number of remaining token per student every weekend. Any leftover token at the end of the course will be added to your PE credit (1 token = 1 credit).

### §C. How is my Semester Grade Determined?

**Your grade for the semester is not based on points because most items in the course don't carry point values.** Instead, your grade will be based on the quantity and quality of evidence you can provide of across-the-board fluency of Math 115 - the basic skills found in the Learning Targets, the applications found in AEPs, and your daily work and engagement.

#### DETERMINE YOUR BASE GRADE

To determine your course **base grade** (the letter A/B/C/D/F without plus/minus modifications), use the following table. To earn a grade, you must complete **all** the requirements in the column for that grade; your base grade is the **highest grade level for which all the requirements have been met or exceeded.**

Category:	D	C	B	A
Core LTs (7)	Proficient 4	Fluent 3, Proficient 4	Fluent 5, Proficient 2	Fluent 7
Supplemental LTs (5)	Proficient 2	Fluent 1, Proficient 2	Fluent 2, Proficient 1	Fluent 2, Proficient 2
PE	50%	70%	80%	90%

**Note:** Again, **all of the requirements in a grade column must be met or exceeded in order to earn that grade.** Otherwise your grade is the highest grade for which all the requirements are met or are exceeded. For example, if you only earn 75% PE credits during the semester, you are not eligible for a grade of B or A in the course. A grade of F is given if not all the requirements for a D are met.

### DETERMINING PLUS/MINUS MODIFIERS

‘**plus**’ and ‘**minus**’ letter grades will be assigned based on the proximity to the nearest full letter grade, and will be according to the instructor’s discretion. Note that you can only get the following letter grades: A, A–, B+, B, B–, C+, C, C–, D, or F.

### §D. Collaboration and Academic Honesty

I highly encourage you to collaborate with your classmates *whenever collaboration is allowed*. However, *realize that collaboration is not always allowed* and in all cases, there are limitations on how you can collaborate. In particular:

- On **Checkpoints**, your work must represent *your own understanding in your own words* and you may not use solutions, directly or indirectly, from other students or unapproved resources. There is a list of approved resources that you may use on Checkpoints, including [WolframAlpha](#), [Desmos](#), your textbook, and other items posted to Moodle. That list is included in the document titled [Information on Learning Targets and Checkpoints](#) found on Moodle in the Course Documents area. Items not on the approved list may be used only with prior permission from me.
- On **AEPs**, your work must represent *your own understanding in your own words*. You may not use solutions, directly or indirectly, from any sources - including other students, past students, online sources, or other textbooks. Violation of this policy is grounds for failure in the course.
- On **all other assignments**, including Edfinity and classwork, you may collaborate with others, but you must contribute significantly to the assignment.

The College’s understanding and expectations in regard to issues of academic honesty are fully articulated are listed in more details in the [Academic Policies, Procedures & Support Services](#) pdf.

*Violations of these policies will result, at minimum, in a mark of “X” or “No Credit” on the assignment. Serious or repeat violations of this policy will result in increasingly horrible consequences, including being barred from further submissions of the assignment or Learning Target, or failure of the class.*