North Shore Community College
Division of Sciences and Mathematics
Mathematics Department

MAT 251 Calculus 1
Fall 2020
Online (Sections O01 and O02)
4 credits
Syllabus

Table of Contents (clickable links to each section)

Prerequisite Courses and Skills

MAT 152 (PreCalculus 2) with a grade of C or better, or placement exam score.

Instructor Information

Instructor: Patricia Dube *Office:* ~~LE 321 McGee Building Lynn~~ virtual meeting only
Email: pdube@northshore.edu
Virtual Office Hours: Mon, Tues, Wed 11 am to 12pm **or** by appointment

Course Description

A study of differential calculus. Topics include: functions, limits, differentiation of algebraic, trigonometric, and inverse trigonometric, exponential, and logarithmic functions, applications including related rates, curve sketching, and optimization problems. Fulfills open, liberal arts, and mathematics electives. Four credits (4 hours of lecture per week).

Important Note on Time Commitment: Given that this is a 4 credit course taken in 15 weeks, it is expected that the student will spend about 12 to 15 hours a week (or more) on course activities (reading, taking notes, watching videos, completing homework assignments, practicing problem solving skills, and preparing for and taking course quizzes, tests, and final exam).

Required Materials

Computer and Internet Access

The student must have a computer with **reliable internet access**, **working audio (speakers/headphones and microphone) and video (camera).** It must have audio and video capability that allows the student to be observed during online test proctoring. This will also allow the student to participate in online appointments for help.

The computer must be able to use one of the following operating system and browser combinations. One of the following with **reliable internet access**, **working audio (microphone) and video (camera)**

- Windows 10 with Firefox or Chrome Browser
- Mac IOS 10.13 or higher with Firefox or Chrome Browser
- Chrome OS with Chrome browser

o To test if your computer is ready to access Blackboard Lean, go to:
https://help.blackboard.com/Learn/Instructor/Getting_Started/Browser_Support/Browser_Checker

o To test if your computer is ready to access MyMathLab, go to:
https://www.pearsonmylabandmastering.com/global/myresearchlab/system-requirements/index.html

Graphing Calculator

The use of calculators is strongly encouraged in this course. Each student should have full access to a TI-83, TI-83 Plus, TI-84, or TI-84 Plus graphing calculator for this course (used

calculators of this type can be purchased online). Obtain access to this type of calculator as soon as possible. You will need to have the ability to perform arithmetic, graph a function, and find the zeros of a function.

All course instruction will assume use of this type of calculator. If a student chooses to use a different graphing calculator, the student is responsible for learning how to use it. Course time will NOT be spent on the idiosyncrasies of various calculators.

Textbook/MyMathLab Access code

Calculus (Early Transcendentals - Single Variable) 3rd edition by Briggs & Cochran.

The textbook bundle (new) is (**ISBN:9780134996103**) while the Stand-alone MML (new) is (**ISBN:9780321199911**) The stand alone access code may be bought directly online. Temporary access is also available for a limited time. Email me any questions you have about buying the correct code. You do not need the printed text because an interactive electronic text is included in the access code. DO NOT BUY A USED TEXT because the access code may not work.

Enrolling in MyMathLab

When enrolling in MyMathLab you must go through a link in our Blackboard site. Instructions for enrolling are posted in Blackboard in the folder that contains the syllabus and are also on the last page of this document.

Interactive eBook

The interactive online (eBook) version of the textbook includes 'interactive figures' that illustrate important ideas about calculus. I recommend downloading and installing the free Mathematica Player on your computer so that you can refer to the eBook.

North Shore Community College Email

Your NSCC email is the official means of communication between professor and student for this course. It is possible to forward it to another email account you own. However, emails sent from accounts besides your northshore.edu account may not be seen by me as they sometimes go to my junk mail folder. Please use your northshore.edu email for this class and check it regularly.

Course Blackboard Site

We have a Blackboard site dedicated to this course. Gain access by navigating your browser to http:blackboard.northshore.edu (do not type "www") and use your MyNorthshore credentials to sign in. (You may also log into MyNorthShore and click on the Blackboard link.) Click on the link for our course. This is where all course materials will be posted or accessed. The course orientation video is also posted there in case you need to refer to it to find things. All class announcements will be posted in Blackboard and emailed to your northshore.edu email.

Other suggested items

Keep your syllabus, notes, homework solutions, quizzes, and tests in a 3-ring binder for easy reference to coursework. Quizzes and tests are open notes and timed, so organizing this is important. Even though the homework problems are on the computer you should fully write out each problem as you do it. You will also need to organize work for tests or quizzes as you will need to submit pictures of the work.

Student participation in course through learning activities (Virtual Attendance)

Each week there will be a set of instructions stating what must be done during the week and

where to find the materials. These instructions will be based upon the course schedule in this syllabus. The learning activities will include reading the text, watching videos while taking notes, doing homework problems, participating in online discussion forums, studying for quizzes and tests and taking quizzes and tests.

Some tests will have to be scheduled in advance with an online proctor for a specific time.

Your professor is available for online appointments for help in addition to regular office hours. Email her to make an appointment.

In order to succeed in an online math course, you must participate fully. This means:

- Reading and understanding announcements and emails.
- Make yourself scheduled times to do course work spread over several days.
- Do assignments on time.
- Seek assistance from the professor or online tutoring for any parts of assignments you do not understand as soon as possible.

All course work is accessible through Blackboard. It is expected that students will log into Blackboard at least several times a week to do course work. If you have not logged into Blackboard and worked on an assignment in over a week, I will assume you have stopped attending unless you have emailed me regarding your lack of participation.

Course Assignments and Activities

MyMathLab Homework (25% of course grade)

These assignments are found in the course through a link in Blackboard and require a MyMathLab access code as listed in the required materials section. They will be due mostly on Monday nights at a minute before midnight. Some assignments will be due on days besides Sunday and this will be clearly stated in MyMathLab or when the assignment is posted. Late assignments are given a 20% grade reduction. All homework access closes an hour before the beginning of the final exam.

Discussion boards and journal entries (5% of course grade) Most weeks you will be asked to write a response to a question in either a discussion board or as a journal entry. Discussion boards are visible to the whole class. Journal entries are only visible to the professor.

Midterm exam (20% of course grade)

There will be an open notes, timed midterm test. This will be online and may be proctored and done by appointment. Identification will be required for proctored assignments. You will be required to submit pictures of your work for the test. (See separate document on Instructions for Taking Tests.)

Tests must be taken before the deadline or the grade will be zero.

I may request a video conference with any student after any test and ask that you verbally explain several problems of my choosing that you got correct on the test. Failure to meet with me online or failure to properly explain your own answers results in a zero for that test.

Quizzes and other assignments (30% of course grade)

There will be multiple timed quizzes (also with a time limit and open notes) taken online. Quizzes must be taken before the deadline. I may request a video conference with any student after any quiz and ask that you verbally explain problems of my choosing that you got correct on the quiz. Failure to meet with me online or failure to properly explain your own answers results in a

zero for that quiz.

There may also be other written assignments you will scan or take a picture of and upload to Blackboard. Other types of assignments may include written problem sets or other short response items. The lowest grade in this category will be dropped.

Final Exam (20% of course grade)

There will be a timed, open notes comprehensive final exam administered by proctored appointment with identification required. You must pass the final exam to pass the course. (See separate document on Instructions for Taking Tests.) The final exam must be taken before the deadline or it will be a zero.

I may request a video conference with any student after any test and ask that you verbally explain several problems of my choosing that you got correct on the test. Failure to meet with me online or failure to properly explain your own answers results in a zero for that test.

Grading System

The final grade will be based on a weighted average of your grades on your MyMathLab homework, Tests, Quizzes and other assignments, and Final Exam.

You must pass (60% or higher) the Final Exam in order to pass the course.

No course assignments are optional - ALL must be completed.

Assignment Weight

MyMathLab assignments 25%
Discussion Board and Journal entries 5%
Midterm exam 20%
Quizzes and other Assignments 30%
Final Exam (must be passed with 60% or higher to pass course) 20%

Grades will be assigned in accordance with the academic policy specified in the college catalog, as shown below.

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
93-100	90-92	87-89	83-86	80-82	77-79	73-76	70-72	67-69	63-66	60-62	Below 60

Extra Help

All of us need assistance at one time or another. Here are some ways to get help:

- Log into virtual office hours or email me at pdube@northshore.edu for an online appointment in Blackboard Collaborate or Zoom. There is a virtual white board in the space that will allow us to do problems together.

- Additional videos are posted in Blackboard beyond those assigned. Viewing these may help you understand a concept or procedure better. There will also be examples of homework problems posted from time to time.

- MyMathLab offers many forms of help including examples and videos. You are allowed multiple attempts on each homework problem. You may go to the "Study Plan" section for the topic and try problems from there without it counting in your assignment. (You must still go to

the "homework" assignment to do the problems for credit.) You may also review old homework even when closed by going into the MyMathLab gradebook. If you click on the "Ask My Instructor" tab and type me a message, MML will send me the problem with your message and I can help by email. This is the best way to get help on a homework problem.

- ThinkingStorm online math tutoring or NSCC online math tutoring. More information about these services will be provided.

Notice of Reasonable Accommodation

As a student at North Shore Community College (NSCC), you are invited to engage in an interactive, collaborative partnership with Accessibility Services and your professor to meet any disability-related need for reasonable academic accommodations in this course.

•To begin this process, please visit http://www.northshore.edu/accessibility/ and follow the outlined procedure to request services.

•If you have already received approval for accommodations from AccessibilityServices at NSCC, please present your professor with your Faculty Notice of Academic Accommodations during the first week of the semester or as soon as possible. Accommodations go into effect once you deliver this notice to your professor.

•If you will require assistance during an emergency evacuation on campus, please notify your professor immediately. For your reference, evacuation procedures are posted in all classrooms.

Academic Honesty (see NSCC Student Handbook)

"Members of the North Shore Community College community are expected to act within the standards of academic honesty. Any willful dishonest behavior is subject to disciplinary action, which may range from that which the instructor imposes relative to the specific course to dismissal from the College, depending on the seriousness of the act. Dishonest academic behavior includes, but it not limited to, cheating and plagiarism."

Cheating in this course includes receiving unauthorized assistance, especially when taking tests, quizzes, and final exams. Assessments in this course are open notes but the work and answers must be your own. Accessing apps, internet sites or any technology that does problems for you is cheating. Having another person do your course work is cheating. It is important to do your own work in this course.

Students should retain a copy of this course syllabus for future reference and for transfer purposes.

Important Dates

Classes begin, day and evening September 8, 2020
Student add/drop period September 8-14, 2020
Deadline to withdraw and receive refund of tuition and fees is 5:00 pm September 14, 2020
Deadline to withdraw and receive tuition only is 5:00 pm September 21, 2020
Columbus Day, no classes October 12, 2020
Veterans Day, no classes November 11, 2020
Thanksgiving recess, evening or weekend classes November 25-27, 2020
Thanksgiving recess, no day classes November 26-27, 2020
Last day to withdraw from the College with a "W" grade for 15-week courses Nov 30, 2020
Classes end, day and evening December 18, 2020
Final Exam period, day classes December 21-22, 2020

Student Learning Objectives

Chapter 2 - Limits

The student will be able to:

1. Given a position function, compute average velocity of an object over a given interval of time.
2. Given a position function, compute the slope of a secant line.
3. Given a position function, compute the instantaneous velocity of an object at a specific point in time by evaluating a limit.
4. Compute the slope of a tangent line to a curve by evaluating a limit.
5. State an intuitive definition of limit.
6. Evaluate limits from a graph of a function.
7. Evaluate limits from a table of values.
8. State an intuitive definition of one-sided limits.
9. Examine limits graphically and numerically.
10. State the relationship between one-sided and two-sided limits.
11. State whether or not a limit exists at a point.
12. Compute limits by the application of limit laws.
13. Compute limits of polynomial and rational functions.
14. Compute one-sided limits.
15. Compute limits by canceling like factors from the numerator and denominator.
16. Compute limits by rationalizing the numerator or denominator.
17. Apply the Squeeze Theorem to compute limits.
18. Compute limits at infinity.
19. Compute infinite limits.
20. Use infinite limits to state the vertical asymptote(s) of a given function.
21. Evaluate infinite limits analytically.
22. State the end behavior of polynomial, rational, and transcendental functions.
23. State the definition of continuity of a function at a point.
24. Identify discontinuities of a function.
25. Apply theorems of continuity to state where a function is continuous and to evaluate limits of functions.
26. State intervals of continuity of a function.
27. Discuss the continuity of transcendental functions.
28. State and apply the Intermediate Value Theorem.
29. Discuss the formal definition of limit.

Chapter 3 - Derivatives

1. Compute average rate of change of a function on a given interval.
2. Compute the instantaneous rate of change of a function at a given point.
3. State the equation of a tangent line to a function at a given point.
4. State the definition of derivative.
5. State whether a function is differentiable at a given point or at on a given interval.
6. State and apply the rules for computing and evaluating derivatives.
7. Apply the product and quotient rules for computing derivatives.
8. Apply implicit differentiation to relationships defined implicitly.
9. Compute the derivatives of logarithmic and exponential functions.
10. Use logarithmic differentiation
11. Compute the derivatives of inverse trigonometric functions.

12. Solve problems involving related rates.

Chapter 4 - Applications of the Derivative
1. Locate maxima and minima of a function.
2. State and apply the Extreme Value Theorem.
3. Locate critical points of a function.
4. Use critical points to identify local maxima and minima of a function.
5. Apply the first derivative to state where a function is increasing and/or decreasing.
6. Apply the first derivative test to identify local extrema of a function.
7. Define concavity and inflection point.
8. Use the second derivative to identify where a function is concave up and/or concave down.
9. Apply the second derivative test to identify local extrema of a function.
10. Use analytical techniques to graph a function.
11. Use a graphing calculator to graph a function.
12. Graph a function that has a cusp.
13. Solve optimization problems.
14. Discuss linear approximation and differentials.
15. State and apply Rolle's Theorem.
16. State and apply the Mean Value Theorem.
17. State and apply L'H^opital's Rule to compute limits of functions.

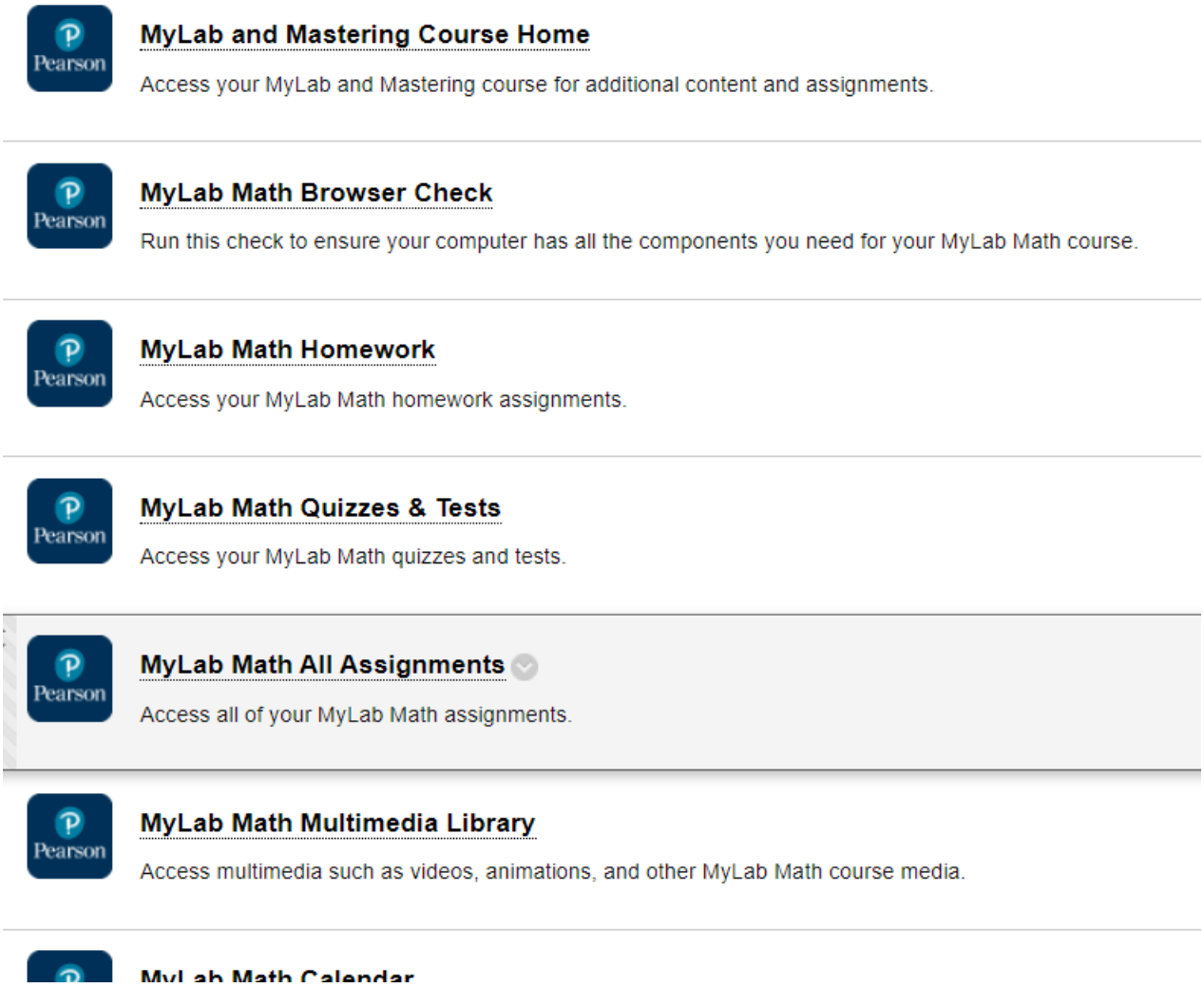
Calculus 1 Fall 2020 Tentative Calendar

Week starts on Tuesday	Topics	Section in text to read (Additional assignments for each week will be posted in Blackboard)
1 Sep 8	Course introduction Review of Functions The idea of limits	Watch course orientation. Read syllabus. **Take syllabus quiz in Blackboard (posted under syllabus) to allow access to course material.** Section 1.2 Section 2.1
2 Sep 15	Definitions of Limits Techniques for Computing Limits (review factoring)	Section 2.2 Section 2.3
3 Sep 22	Infinite Limits Limits at Infinity	Section 2.4 Section 2.5
4 Sep 29	Continuity Introducing the derivative (includes review finding equation of a line)	Section 2.6 Section 3.1, pages Appendix B-6,B-7
5 Oct 6	Working with derivatives as a function Rules of Differentiation	Section 3.2 Section 3.3
6 Oct 13	Product Rule Quotient Rule Derivatives of the Trigonometric Functions	Section 3.4 Section 3.4 Section 3.5
7 Oct 20	Derivatives as Rates of Change **Midterm Test** The Chain Rule	Section 3.6 Includes material from beginning through section 3.6 Will be proctored online with identification required Section 3.7
8 Oct 27	Implicit Differentiation	Section 3.8
9 Nov 3	Derivatives of Logarithmic and Exponential Functions	Section 3.9
10 Nov 10	Derivatives of Inverse Trig Functions	Section 3.10
11 Nov 17	Related Rates Maxima and Minima	Section 3.11 Section 4.1
12 Nov 24	Mean Value Theorem	Section 4.2
13	What Derivatives Tell Us	Section 4.3

Dec 1	Graphing Functions	Section 4.4
14 Dec 8	Optimization Problems Linear Approximation and Differentials	Section 4.5 Section 4.6
15 Dec 15	L'Hopital's Rule Final Exam	Section 4.7 Cumulative final exam will be proctored online with identification required.

Enrolling in MyMathLab Through Blackboard

1) Go online to our course Blackboard site.
2) Click on "**Links to MyMathlab homework and etext**" on left side of screen
3) See the screen similar to that shown below and choose the top link



4) Accept the licensing agreement.
5) Sign in with your Pearson account if you have one. (If you have used MyMathLab before you have one.)
    a. If you have used MyMathLab with our text in a previous course you will want to use the same account you used in the previous course. (It may allow you access without a new code.)
    b. If you have never used MyMathLab, or never used this text, you can create a new account (or use an existing one). Make sure you remember what email you sign in under and that you check that email for responses to Ask My Instructor questions.

6) You will be asked to type in the access code you purchased, buy access online or at the bottom of the page (in small print) there is a link that says something about temporary access. This is good for two weeks.