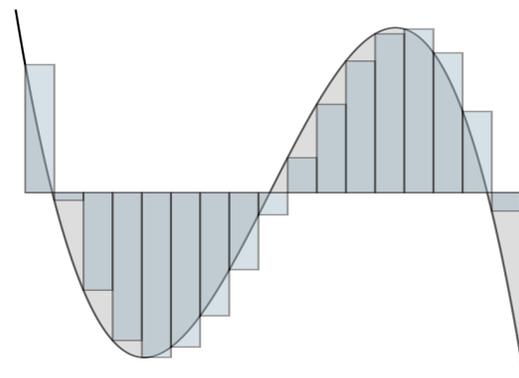


# MATH 170 Calculus I

## Fall 2016 · Syllabus



### Class Information

**Instructor:** Dr. Lauren Williams

**Class Meeting:** MTWF 8:00 - 8:50, Zurn 207

**Office:** Old Main 404 (Tower)

**Office Phone:** (814) 824-2226

**Office Hours:** Mon 9:15 - 10:45, Wed 12:15 - 1:45, Thur 12:30 - 3:00, Fri 9:15 - 10:45

**Email:** lwilliams2@mercyhurst.edu

**Website:** <http://math.mercyhurst.edu/~lwilliams/math170/index.html>

### Course Description

This is the initial course in a sequence of courses on the fundamental ideas of the calculus of one variable. It is here that truly significant applications of mathematics begin. Topics included are functions, continuity, limits, derivatives, maxima and minima and antiderivatives.

### Course Objectives

On successful completion of the course, students should be able to:

- recognize, define, and apply properties of functions, such as their domain and range, intercepts, and inverses.
- have an intuitive understanding of a limit, and be able to evaluate a variety of limits.
- identify discontinuities of a function presented either graphically or algebraically.
- find the derivative of functions using the limit definition.
- find the derivative of sums, products, and quotients of composite polynomial, trigonometric, exponential, and logarithmic functions.
- understand conceptual relationships between derivatives, rates of change, and tangent lines.
- use properties of functions and derivatives to graph polynomials and rational functions.
- apply differentiation procedures to solve related rates and extreme value problems.
- identify and evaluate limits involving indeterminate forms.
- compute definite and indefinite integrals using formulas and substitution.
- understand the relationship between the integral and the derivative.
- read and interpret mathematical theorems, including checking that hypotheses are satisfied and reaching correct conclusions.

### Textbook

*Calculus Early Transcendentals*, Tenth Edition, by Anton, Bivens, and Davis. We will be covering chapters 0-5 in the textbook. No other supplies are required for the course. You will not be expected to bring your textbook to class. If you prefer to purchase an electronic version of the text, you're welcome to do so.

Be sure to check the edition when purchasing your textbook; other editions have similar material, but the assigned problems may be different.

### Calculators

You are not required to purchase a calculator for this course, and **you will not be permitted to use a calculator or other electronic device on any quizzes or exams**. You are strongly encouraged to avoid using a calculator while working on homework.

## Homework

When we finish a section in the book, you should immediately begin working on the homework problems from the list attached.

Your work will not be collected. However, actually working through these problems is the key to your success in this class. Attending every class is not enough; mathematics can only be learned through practice. You should plan to spend a significant amount of time on the homework. It is expected that you spend approximately 8-12 hours per week studying the material outside our class meetings, according to the typical 2-3 hour per credit rule of thumb.

**Stay up to date with homework, and get help if you cannot understand a problem after trying it on your own.** Do not ignore a problem that you are struggling with. If you are having trouble with a topic, please come talk to me during office hours, ask questions in class, seek help from a classmate, or go to the department tutors for assistance. You are expected to try to work on all problems on your own first; when coming to my office, be prepared to show me what you've already tried.

## Quizzes

You will be given quizzes on the material regularly. Keeping up with the homework will ensure that you are prepared for the quizzes, which will feature problems very similar to those in the homework. The dates for quizzes is provided in the attached schedule; note that exact topics covered on a quiz is subject to change. Any changes will be announced in class.

Quiz grades will not be based strictly on whether or not you found the correct answer. Your work must also be written clearly, and with proper notation, to receive full credit. Make up quizzes will only be given for excused absences. **All make ups must be completed before the graded quiz is returned to the class; this will typically be the next class meeting.**

## Exams

There will be five midterm exams given throughout the semester, in addition to the final exam. The material on the exams will be similar to topics covered on quizzes and homework. You will be given review guides for each exam. All exams are cumulative; each exam will include some material from the previous exams. Mathematics is a cumulative effort, and mastering each topic is only possible if you have mastered earlier concepts.

Your lowest exam grade (including a missed exam) will be replaced by your final exam grade, if your final exam grade is better. A second missed exam will receive a grade of 0, so please check your schedules carefully and ensure that you can attend all exams. If you need to miss class during a scheduled exam for a documented, excused reason (illness, family emergency, athletics), you will be able to make up the exam. **You must schedule a time to retake any exam within one week of the day the exam was given in class.**

The five midterm exams are scheduled for

Friday, September 16

Friday, October 7

Wednesday, October 26

Friday, November 16

Wednesday, December 7

The final exam will also be cumulative, and is scheduled for **Wednesday, December 14, 8:00 - 10:00 am.**

## Final Grades

Grades will be calculated as follows:

60% - Average of exam grades (lowest replaced by final, if better)

20% - Average of quiz grades

20% - Final Exam

Quiz and exam grades will be posted on Blackboard, so you can keep track of your progress at any time. There are no opportunities for extra credit or additional points, and a curve will not be applied to the grades.

Grading scale:

F	D	D+	C	C+	B	B+	A
0-59	60-64	65-69	70-77	78-83	84-89	90-93	94-100

## Tutoring

The Department of Mathematics offers free tutoring for Math 170 students in Zurn 213. No appointments are needed, just drop by between 6 and 8 pm on Sunday, Monday, Tuesday, or Thursday. You are free to ask tutors questions on any assigned homework and exam review sheets.

## Support of the Mercy Mission

This course supports the mission of Mercyhurst University by creating students who are intellectually creative. Students will foster this creativity by: applying critical thinking and qualitative reasoning techniques to new disciplines; developing, analyzing, and synthesizing scientific ideas; and engaging in innovative problem solving strategies.

## Learning Differences

In keeping with college policy, any student with a disability who needs academic accommodations must call Learning Differences Program secretary at 824-3017, to arrange a confidential appointment with the director of the Learning Differences Program during the first week of classes.

## Additional (Free) Resources

- **Khan Academy Calculus**

<https://www.khanacademy.org/math/calculus-home>

*Includes videos and practice problems for all material covered in this course.*

- **MIT OpenCourseWare Calculus**

<http://ocw.mit.edu/courses/mathematics/18-01sc-single-variable-calculus-fall-2010/>

*Includes videos, lecture notes, practice problems and solutions for all material covered in this course.*

- **Wolfram Alpha**

<http://www.wolframalpha.com>

*A great way to check your work. Free, with subscription available to access step-by-step solutions to problems.*

- **Calculus in Context Textbook**

<http://www.math.smith.edu/Local/cicintro/>

*Free textbook by David Cox, Donal OShea, Harriet Pollatsek, and Lester Senechal*

- **Single Variable Calculus Textbook**

<https://www.whitman.edu/mathematics/calculus/calculus.pdf>

*Free textbook by David Guichard*

## Math 170 Calculus Homework List - Fall 2016

Sec.	Page	Problems
0.1	12	1, 3, 5, 7, 9, 15, 19, 23, 27, 31a-c
0.2	24	1, 3, 5, 11, 13, 17, 25, 27, 29, 31, 33, 35, 39, 41, 49
0.3	35	1, 3, 11, 15, 17, 19, 25, 29, 31
0.4	49	1, 9, 13, 17, 19, 25, 27, 31
0.5	61	1, 5, 9, 11, 13, 15, 17, 21, 23, 25, 27, 47
1.1	77	1, 3, 5, 7, 9, 21, 23, 25
1.2	87	1, 3, 7, 11, 13, 15, 19, 21, 25, 31
1.3	96	1, 3, 5, 9, 13, 15, 21, 31, 33, 37, 43
1.4	106	You are not responsible for this section (but try #17 and #21 anyway!)
1.5	118	1, 3, 5, 7, 11, 17, 21, 29, 35
1.6	125	1, 7, 9, 13, 21, 23, 27, 31, 37, 67
2.1	141	3, 11, 13, 15, 17, 13
2.2	152	1, 3, 7, 9, 11, 21, 23, 29
2.3	161	1, 3, 5, 7, 9, 13, 15, 17, 21, 41, 43
2.4	168	1, 3, 5, 7, 11, 13, 19, 31, 33
2.5	172	1, 5, 11, 15, 17, 21, 27
2.6	178	3, 7, 11, 15, 17, 19, 23, 35, 37, 39
3.1	190	3, 5, 7, 9, 11, 13, 15, 17
3.2	195	1, 3, 7, 13, 19, 23, 25, 35, 37, 41
3.3	201	15, 17, 19, 21, 23, 37, 43, 51, 65
3.4	208	1, 5, 13, 15, 17, 19
3.5	217	3, 5, 7, 23, 29
3.6	226	1, 7, 11, 13, 17, 21, 23, 47
4.1	241	1, 5, 7, 15, 19, 21, 29, 39
4.2	252	3, 5, 7, 9, 11, 19, 25, 29, 33, 37, 41, 45
4.3	264	1, 3, 9, 13, 25
4.4	272	3, 7, 9, 13, 21, 23, 25, 27
4.5	283	3, 5, 13, 19, 21, 31, 37
4.6	294	1, 3, 17, 19
4.8	308	1, 3, 5, 7, 15, 25
5.1	321	13, 15, 17
5.2	330	9, 11, 13, 15, 17, 19, 21, 23, 27, 43, 45
5.3	338	1, 3, 7, 9, 15, 17, 21, 23, 27, 31, 33, 41, 47
5.5	360	13, 15, 19, 21, 23
5.6	373	7, 9, 13, 17, 19, 23, 29, 31
5.7	381	5, 9, 13, 17
5.9	393	1, 5, 9, 15, 31, 33, 37, 43, 49

*Solutions to most questions are in the textbook. Try the even numbered problems for more practice.*

### Math 170 Calculus Course Schedule - Fall 2016

Monday	Tuesday	Wednesday	Friday
		<i>Aug 24</i> Class Intro	<i>Aug 26</i> Section 0.1, 0.2
<i>Aug 29</i> Section 0.3	<i>Aug 30</i> Section 0.4	<i>Aug 31</i> Section 0.5	<i>Sep 2</i> Section 1.1 / Quiz
<i>Sep 5</i> No Class: Labor Day	<i>Sep 6</i> Section 1.2	<i>Sep 7</i> Section 1.2	<i>Sep 9</i> Section 1.3 / Quiz
<i>Sep 12</i> Section 1.3	<i>Sep 13</i> Review	<i>Sep 14</i> Exam I	<i>Sep 16</i> Section 1.4
<i>Sep 19</i> Section 1.5	<i>Sep 20</i> Section 1.6	<i>Sep 21</i> Section 2.1	<i>Sep 23</i> Section 2.2 / Quiz
<i>Sep 26</i> Section 2.2	<i>Sep 27</i> Section 2.3	<i>Sep 28</i> Section 2.4	<i>Sep 30</i> Section 2.4 / Quiz
<i>Oct 3</i> Section 2.5	<i>Oct 4</i> Section 2.6	<i>Oct 5</i> Review	<i>Oct 7</i> Exam II
<i>Oct 10</i> Section 3.1	<i>Oct 11</i> Section 3.1	<i>Oct 12</i> Section 3.2	<i>Oct 14</i> No Class: Break
<i>Oct 17</i> Section 3.3	<i>Oct 18</i> Section 3.4	<i>Oct 19</i> Section 3.4	<i>Oct 21</i> Section 3.6 / Quiz
<i>Oct 24</i> Section 3.6	<i>Oct 25</i> Review	<i>Oct 26</i> Exam III	<i>Oct 28</i> Section 4.1
<i>Oct 31</i> Section 4.2	<i>Nov 1</i> No Class: Advising Day	<i>Nov 2</i> Section 4.3	<i>Nov 4</i> Section 4.3
<i>Nov 7</i> Section 4.4	<i>Nov 8</i> Section 4.5	<i>Nov 9</i> Section 4.5	<i>Nov 11</i> Section 4.6 / Quiz
<i>Nov 14</i> Section 4.8	<i>Nov 15</i> Review	<i>Nov 16</i> Exam IV	<i>Nov 18</i> Section 5.1
<i>Nov 21</i> Section 5.2	<i>Nov 22</i> Section 5.2	<i>Nov 23</i> No Class: Thanksgiving	<i>Nov 25</i> No Class: Thanksgiving
<i>Nov 28</i> Section 5.2	<i>Nov 29</i> Section 5.3 / Quiz	<i>Nov 30</i> Section 5.6	<i>Dec 2</i> Section 5.9
<i>Dec 5</i> Section 5.9	<i>Dec 6</i> Review	<i>Dec 7</i> Exam V	<i>Dec 9</i> Cumulative Review
<i>Dec 12</i> No Class: Reading Day		<i>Dec 14</i> Final Exam	