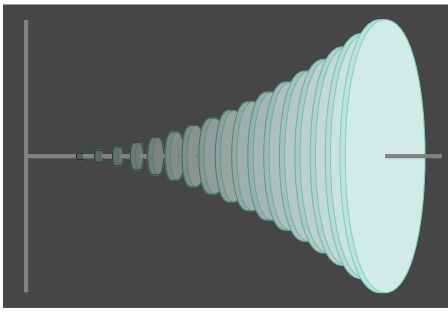


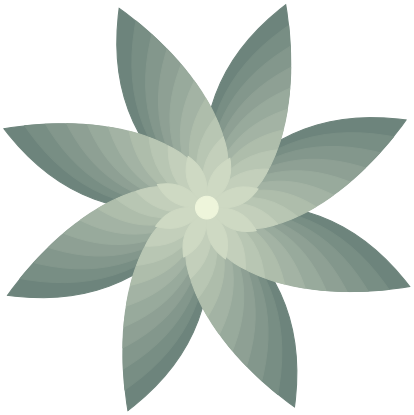
Math 171 Calculus II

Spring 2020

Section 01
MTWF
8:00 - 8:50 am
Hirt 213

Instructor

Dr. Lauren Williams
Old Main 404
lwilliams@mercyhurst.edu
(814) 824-2226



Office Hours

Monday 2:00 - 3:30
Tuesday 1:00 - 3:00
Wednesday 9:00 - 10:00
Thursday 8:00 - 9:30

and by appointment

Course Description

This is the second of a three course sequence in calculus. Topics follow the early transcendentals path; included are the integral, antiderivatives, the Fundamental Theorem, integration techniques, interesting applications of integration, an introduction to differential equations, series, sequences.

Course Objectives

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

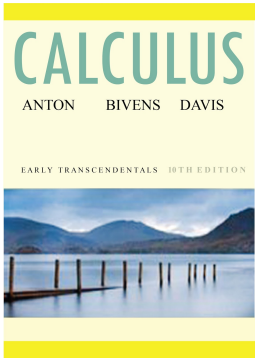
- use integration to find areas between curves, volumes of solids formed by revolution, lengths of plane curves;
- find derivatives and integrals involving exponential and logarithmic functions;
- find derivatives and integrals involving the inverse trigonometric functions;
- evaluate integrals using a variety of integration techniques;
- solve first-order separable differential equations;
- evaluate improper integrals;
- find the limit of a sequence;
- determine whether a given series converges or diverges;
- find the power series expansion of a function and its radius of convergence;
- further our understanding and ability to write mathematics.

Prerequisites

Successful completion of Math 170 Calculus I, or transferred equivalent.

Course Website: https://integral-domain.org/lwilliams/Math171/

Required Materials



Textbook

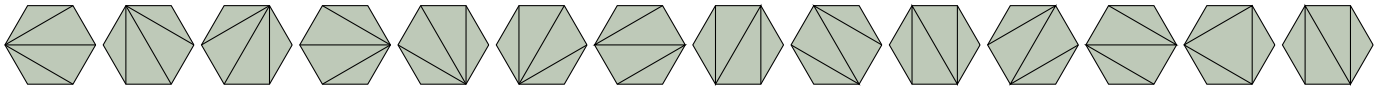
Calculus, Early Transcendentals by Anton, Bivens, and Davis, 10th Edition. We will be covering chapters 5-9 in the textbook. No other supplies are required for the course.

You will not be expected to bring your textbook to class. If you prefer to purchase or rent an electronic version of the text, you're welcome to do so.

ISBN-10: 0470647698 ISBN-13: 978-0470647691

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.



The nth term in the Catalan sequence gives us the number of ways to divide a polygon with $n+2$ sides into n triangles. The first few terms of this sequence are 1, 2, 5, 14, 42, 132, 429, ...
Shown here are the 14 ways to divide a hexagon into 4 triangles.

Other Course Information

- Please ask questions - in class, office hours, or tutoring - as soon as you feel stuck. Mathematics is a naturally cumulative subject. If you do not understand a particular topic, you will not understand topics that come after.
- There are other textbooks available in the library and in my office. Due to book prices, you may not want to invest in a second book, but it can be helpful to have alternate sources or see topics explained in other ways.
- I do not keep detailed lecture notes. It is highly recommended that you establish contacts among your classmates to get notes in case you miss class.
- I will attempt to answer email as quickly as possible, but please allow up to 24 hours for a response (particularly on weekends).
- Attendance is not required, but coming to class regularly will give you the best chance of earning your desired grade. You are responsible for any work material covered in your absence. Please contact me if you are absent for an extended period.
- You are neither expected nor required to purchase any materials for the course aside from the required textbook. Graphing calculators and mathematical software could be used to check your work, but should not be relied on to do the work for you.

Course Components

Quizzes

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. 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.

Your lowest quiz grade, including a missed quiz, will be dropped when calculating your final grade.

If you miss a quiz, **you must make arrangements to take it before the graded quizzes are returned to the class**; this will typically be the next class meeting.

Exams

There will be three 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 should be considered to be cumulative; each exam will include some material from the previous 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.

Your lowest exam grade (including a missed exam) will be replaced by your final exam grade, if your final exam grade is better. A grade of 0 on an exam due to academic dishonesty will *not* be replaced by the final exam grade.

Final Exam

The final exam is cumulative, including material from all sections covered in class. Most questions on the final will be taken (with minor modifications) from homework, quizzes, and previous exams.

You are required to take the final exam for this course regardless of your average on earlier exams or quizzes. If you will not be able to take the final exam at its scheduled time, please make alternate arrangements as soon as possible. Final exams may be made up for excused absences only.

The final exam is scheduled for
Wednesday May 6, 8-10 am.

Progress

Quiz and exam grades will be posted on Blackboard throughout the semester.

Grading

240 POINTS	**Midterm Exams** **Three exams, 80 points each** **Lowest replaced by final if better**
100 POINTS	**Quizzes** **Eleven quizzes, 10 points each** **0.5 point for attendance** **Lowest quiz grade dropped**
160 POINTS	**Final Exam**
500 POINTS	**Total Possible**

Grading Scale

D	D+	C	C+	B	B+	A
298	333	348	383	398	433	448
60%	67%	70%	77%	80%	87%	90%

Learning Differences

Mercyhurst University is committed to making reasonable accommodations to assist individuals with disabilities in reaching their academic potential. Students with disabilities requiring accommodations should consult with the Learning Differences Office to discuss eligibility for services or submit the online accommodation request to the Director of Equal Opportunity Programs (DEOP) at ada@mercyhurst.edu.

For students requiring accommodations for learning differences, it is the policy of Mercyhurst University that it is the student's responsibility to provide documentation of his/her disability to the DEOP.

Students are advised to request accommodations at the time of acceptance or prior to the start of the semester. Students may request accommodations at any time throughout the program, however accommodations are not retroactive.

Academic Honesty

Students are required to uphold academic integrity throughout the course. In particular, plagiarism of any sort, unauthorized collaboration on exams, quizzes and other assignments, and other incidences of academic dishonesty will be handled according to the policies set forth in the Student Handbook.

In this course, academic honesty means submitting quizzes and exams that are genuine reflections of your understanding of the material. A first attempt to unfairly increase your grade on a quiz or exam (by using restricted notes, calculators or any other electronic devices, by copying work from a classmate, etc) will result in a grade of 0 for that quiz or exam. This grade *will not* be dropped or replaced when determining your final grade. A second attempt will result in an Academic Dishonesty report and may affect your enrollment in the course and the University.

Course Evaluations

Near the end of the semester, you will be asked to complete an online course evaluation. The evaluation will be completed in class during the last two weeks of the semester using any laptop, tablet, or mobile device. The response tool allows you to note aspects of the course that helped you learn, as well as aspects that might be modified to help future students learn more effectively. You will receive an email letting you know when the evaluation window for our class is open. Please note that these course evaluations are anonymous and instructors do not see the results until after the grades for the course are submitted.

Additional Resources

- Wolfram Alpha (https://www.wolframalpha.com/) - Ask it just about anything, not just math questions. This free site will calculate integrals, derivatives, graphs of functions, and much more. Use it to check your homework and visualize problems.
- Khan Academy Calculus II (https://www.khanacademy.org/math/calculus-2) - Videos explanations of topics and examples from Calculus II, along with free quizzes to check your understanding.
- Paul's Online Math Notes (http://tutorial.math.lamar.edu/Classes/CalcII/CalcII.aspx) - Extensive lecture notes and examples from Calculus II, along with many other topics.

Semester Schedule

Monday	Tuesday	Wednesday	Friday
Jan 13 Class Intro, Overview	**Jan 14** Integration Review	**Jan 15** 5.9 Definite Integrals with Substitution	**Jan 17** *Add/Drop Deadline* 3.6 L'Hopital's Rule
Jan 20 *MLK Day*	**Jan 21** **Quiz** 5.4 Sigma Notation	**Jan 22** 5.4 Sigma Notation	**Jan 24** 6.1 Area Between Two Curves
Jan 27 6.2 Volumes by Slicing; Disks and Washers	**Jan 28** **Quiz** 6.3 Volumes by Cylindrical Shells	**Jan 29** 6.3 Volumes by Cylindrical Shells	**Jan 31** Volumes Review
Feb 3 6.6 Work	**Feb 4** **Quiz** 6.6 Work	**Feb 5** 7.1 An Overview of Integration Methods	**Feb 7** 7.2 Integration by Parts
Feb 10 7.2 Integration by Parts	**Feb 11** Review	**Feb 12** **Exam I**	**Feb 14** 7.3 Integrating Trigonometric Functions
Feb 17 7.4 Trigonometric Substitutions	**Feb 18** **Quiz** 7.4 Trigonometric Substitutions	**Feb 19** 7.5 Partial Fraction Decomposition	**Feb 21** 7.5 Partial Fraction Decomposition
Feb 24 7.6 Tables of Integrals, 7.7 Numerical Integration	**Feb 25** **Quiz** 7.8 Improper Integrals	**Feb 26** 7.8 Improper Integrals	**Feb 28** Integration Review
Mar 2 *Spring Break*	*Mar 3* *Spring Break*	*Mar 4* *Spring Break*	*Mar 6* *Spring Break*
Mar 9 8.1 Modeling with Differential Equations	**Mar 10** **Quiz** 8.1 Modeling with Differential Equations	**Mar 11** 8.2 Separation of Variables	**Mar 13** 8.3 Slope Fields
Mar 16 8.4 First-Order Differential Equations and Applications	**Mar 17** **Quiz** 8.4 First-Order Differential Equations and Applications	**Mar 18** Differential Equation Review	**Mar 20** 9.1 Sequences
Mar 23 9.2 Monotone Sequences	**Mar 24** Review	**Mar 25** **Exam II**	**Mar 27** 9.3 Infinite Series
Mar 30 9.3 Infinite Series	*Mar 31* *Advising Day*	**Apr 1** 9.4 Convergence Tests	**Apr 3** 9.4 Convergence Tests
Apr 6 9.5 The Comparison, Ratio, and Root Tests	**Apr 7** **Quiz** 9.5 The Comparison, Ratio, and Root Tests	**Apr 8** 9.5 The Comparison, Ratio, and Root Tests	*Apr 10* *Easter Break*
Apr 13 *Easter Break*	**Apr 14** *Last day to withdraw* 9.6 Alternating Series	**Apr 15** **Quiz** 9.6 Absolute and Conditional Convergence	**Apr 17** 9.6 Absolute and Conditional Convergence
Apr 20 Series Review	**Apr 21** **Quiz** 9.7 Maclaurin and Taylor Polynomials	**Apr 22** 9.8 Maclaurin and Taylor Series; Power Series	**Apr 24** 9.8 Maclaurin and Taylor Series; Power Series
Apr 27 **Quiz** 9.10 Differentiating and Integrating Power Series	**Apr 28** Review	**Apr 29** **Exam III**	**May 1** Review, Last Class Meeting
May 4 *Reading Day*	*May 5*	**May 6** **Final Exam**	*May 8*

Homework List

Your homework will not be collected, but these problems (and similar questions) are likely to appear on quizzes and exams. Working on additional problems is highly recommended.

Sec.	Page	Problems
5.2	330	44, 46
5.3	338	34, 37, 38, 50, 53, 70
5.5	360	15, 19, 23, 24, 27, 28, 34, 37
5.6	373	15, 17, 20, 21, 24, 26, 29
5.9	393	15, 20, 22, 33, 38, 39, 40, 41, 42, 44, 45, 49, 53
3.6	226	7, 12, 18, 20, 23, 25, 27, 32
5.4	350	1, 3, 5, 7, 8, 13, 15, 19, 27, 35
6.1	419	1, 3, 4, 6, 7, 11, 12, 13, 14, 15, 16, 35, 49
6.2	428	1, 2, 11, 13, 17, 18, 23, 24, 26, 34, 40, 41, 42, 43, 44
6.3	436	2, 4, 5, 9, 10, 11, 13, 16, 25, 29, 30
6.6	456	1, 2, 3, 5, 6, 8, 9, 14, 15, 16, 17, 18, 20, 21, 23
7.1	490	1, 3, 4, 6, 8, 9, 10, 11, 14, 18
7.2	498	1, 5, 7, 9, 10, 11, 13, 14, 15, 17, 18, 19, 21, 24, 25, 26, 29, 30, 35, 36, 38
7.3	506	9, 17, 25, 29, 30, 33, 34, 39, 43, 45, 48
7.4	513	3, 5, 7, 11, 13, 16, 17, 19, 21, 23, 25, 37, 39, 47
7.5	521	3, 5, 9, 13, 15, 16, 17, 21, 24, 25, 29, 33, 39
7.6	531	5, 7, 13, 19, 21, 23, 31, 37, 55, 60,61, 64, 71, 90, 93
7.7	544	1, 5 ($n = 10$ for all), 25, 41, 43, 45, 52
7.8	554	1, 3, 5, 7, 8, 10, 15, 16, 17, 19, 25, 28, 47
8.1	566	1, 3, 6, 7, 10, 13, 16, 19, 20, 35
8.2	575	2, 6, 7, 12, 13, 25, 29, 33, 35
8.3	584	1, 3, 4, 6, 17
8.4	592	1, 3, 5, 7, 8, 9, 21, 22, 23
9.1	605	1, 4, 7, 9, 12, 13, 15, 17, 23, 25, 27
9.2	613	3, 5, 7, 10, 11, 17, 19, 21, 23, 24
9.3	621	1, 2, 6, 7, 9, 10, 12, 14, 16, 17, 18, 19, 20, 28
9.4	629	3, 5, 7, 9, 11, 12, 14, 15, 17, 18, 19, 21, 22, 23, 31, 32, 33, 34
9.5	636	1, 3, 4, 5, 9, 14, 15, 25, 27, 28, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47
9.6	646	2, 7, 9, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 28
9.7	657	6, 7, 12, 19, 24, 25, 37
9.8	667	1, 3, 6, 13, 17, 18, 19, 21, 29, 31, 36, 42, 43, 44, 45, 47, 48, 49, 50
9.10	686	5, 7, 8, 9, 11, 13, 19, 21, 22, 26, 27, 32, 36, 37