SYLLABUS
MATH 162-03
Fall 2019

BLAKE FARMAN

Lafayette College

Contact Information

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Office Hours: Monday/Wednesday, 1:30 pm - 3:00 pm.
Additionally, I am available by appointment if these times are not suitable.

Course Information

Lectures: Monday/Wednesday/Friday, 11:00 am - 12:15 pm in Pardee Hall, room 227.

Pre-Requisites: A grade of C- or better in Mathematics 161 or 165.

Course Objectives: A continuation of Mathematics 161. Topics include techniques and applications of integration, introduction to differential equations, parametric curves and polar coordinates, infinite series and Taylor approximation.

Learnings Outcomes: The ideas to be discussed and skills to be acquired in this course include

- the differential and integral calculus of inverse trigonometric functions
- an exposure to L'Hôpital's Rule,
- applications of integration including, but not necessarily limited to, areas between curves and elementary volumes of revolution,
- integration techniques including, but not necessarily limited to, parts and partial fractions,
- numerical integration techniques (midpoint, trapezoid, and Simpson's rule)
- an introduction to differential equations, including but not necessarily limited to, direction fields, solutions of separable differential equations, and growth & decay problems,

Date: August 26, 2019.

- the ability to work with sequences,
- an exposure to series, including some tests for convergence,
- an exposure to power series including intervals of convergence, but not necessarily the testing of endpoints,
- the ability to compute Taylor and Maclaurin series,
- an understanding of approximate (versus exact) answers and the use of error bounds,
- the basic calculus of parametric curves and functions defined via polar coordinates.

Course Website: The URL for the course website is

`https://sites.lafayette.edu/farmanb/teaching/math-162-f19-03/`

Here you can find a digital copy of the syllabus and other important information.

Text: The required text for this course is

Calculus, 8th Edition, James Stewart, 2016. ISBN 978-1-285-74062-1.

However you choose to obtain a copy, be aware that it is **expected** that you will read the text outside of lecture. In particular, it is highly suggested that you take some time to read the section to be covered ahead of lecture. In making your choice, be sure that you choose an option that you will read.

Grading

This course will use **Standards-Based Grading**. This grading style emphasizes demonstration of subject mastery by students over accumulation of points. The course content is broken into 18 *standards* listed below.

Standards. The following is a list of standards that you are expected to master by the end of this semester.

1. Inverse Trig Functions
2. L'Hôpital's Rule
3. Area and Volumes
4. Integration by Parts
5. Partial Fractions
6. Approximate Integration
7. Improper Integrals
8. Differential Equations
9. Parametric Equations
10. Polar Coordinates
11. Sequences
12. Geometric Series
13. The Integral Test
14. The Comparison Test
15. Alternating Series
16. Ratio and Root Tests
17. Power Series
18. Taylor Series

Problem Scoring. Each problem that you encounter during this semester will be scored on the following scale:

Mastery	The given solution is correct with no content related errors. Appropriate justification is provided in a clear, easy to follow manner.
Proficiency	The given solution is mostly correct, with only minor content errors. Appropriate justification is provided.
Improving	The given solution is only partially correct or lacks justification.
Rookie	The given solution is incorrect, but correct techniques were identified.
Not assessable	The given solution was blank, illegible, or used inappropriate techniques.

Mastery. You can achieve mastery of a standard by receiving a score of **M** on in-class assessments and the final exam. Once you have achieved mastery, problems explicitly from that standard will no longer appear on your assessments. However, calculus builds upon itself, so the concepts in any given standard will certainly reappear in later standards.

It is important to note that, unlike a traditional grading scheme, you will be afforded multiple opportunities to display mastery and your past performance does not affect mastery.

Scale. Letter grades will be assigned based on the following table.

	# Standards mastered	# Homework sets mastered
A	17-18	90%-100%
B+	16	86%-89%
B	15	80%-85%
C+	14	76%-79%
C	13	70%-75%
D+	12	66%-69%
D	11	60% - 65%
F	≤ 10	$< 60\%$

In order to attain the letter grade in a given row, you must satisfy both criteria. If you have mastered the number of standards in a row, but you have not mastered the appropriate number of homework sets, then you will be bumped down one row.

Assessments

Homework. Regular homework will be assigned, collected, and scored. The problems are chosen to highlight the core concepts from the standards. Mastery of these homework sets serves as a good indicator for quiz and exam performance. As such, you should ensure that you fully understand the material on these homework sets; that is, upon completion of the homework set, you should be capable of completing similar problems without the aid of the text, a computer, a calculator, or any other tools not available during an exam.

Quizzes. Quizzes will be given during class time, at least once per week. You should expect to see a quiz shortly after completion of a homework set. Each quiz will contain problems from only one standard, and will generally be your first opportunity to demonstrate mastery. If you receive a score of **M** on each problem on a quiz, then you will have mastered that standard.

Exams. There will be three in-class exams and a final exam. Each exam will be comprised of questions corresponding to the standards that you have not yet mastered and labeled accordingly. Mastery of a standard depends **only** on attaining a score of **M** on the questions corresponding to that standard.

The in-class exams are tentatively scheduled as follows:

Exam 1: Monday, September 23, 2019,
Exam 2: Friday, October 11, 2019, and
Exam 3: Friday, November 22, 2019.

Re-Assessment. You will have the opportunity to have a single homework set that you have not mastered re-assessed once each week in my office, either during office hours or at another arranged time. I will provide you with at least one problem from the relevant standard which you will work out on the board. Your goal in this re-assessment is to convince me that you have mastered the homework set. If you are successful, then the score for that assignment will be changed to **M**.

Academic Support

Calculus Cavalry. Open peer tutoring is available in Pardee Hall room 218 with the following hours:

Sundays: 4-6 pm.
Mondays: 7-9 pm,
Tuesdays: 4-6 pm,
Wednesdays: 7-9 pm, and
Thursdays: 4-6 pm and 7-9 pm

Academic Resource Hub. The Academic Resource Hub (formerly ATTIC) provides academic services to enhance student success and is located on the third floor of Scott Hall.

Resources available to students include:

- Tutoring and Supplemental Instruction
- Academic Enrichment Resources
- Accessibility Services
- Services for Varsity Student Athletes

For more information, see the website at `http://hub.lafayette.edu`.

Disability statement: In compliance with Lafayette College policy and equal access laws, I am available to discuss appropriate academic accommodations that you may require as a student with a disability. Requests for academic accommodations need to be made during the first two weeks of the semester, except for unusual circumstances, so arrangements can be made. Students must register with the Office of the Dean of Advising and Co-Curricular Programs for disability verification and for determination of reasonable academic accommodations.

Expectations

Academic Integrity: To maintain the scholarly standards of the College and, equally important, the personal ethical standards of our students, it is essential that written assignments be a student's own work, just as is expected in examinations and class participation. A student who commits academic dishonesty is subject to a range of penalties, including suspension or expulsion. Finally, the underlying principle is one of intellectual honesty. If a person is to have self-respect and the respect of others, all work must be his/her own.

Any student found responsible of academic dishonesty **will receive a grade of F in the course** and disciplinary action according to the procedure outlined in Student Handbook.

Attendance: Lecture is the longest stretch of time each week in which you have access to an interactive learning resource (i.e. me). As such, lecture is arguably the most valuable aspect of the course and you are expected to not only attend class, but to also actively engage with the material (e.g. ask questions, contribute answers, etc.). Cell phones and other distractions should either be left at home or be silenced and remain stored your bag. If you find yourself unable to attend the lecture, please contact me in advance, if possible, to see what you will miss.

Federal Credit Hour Requirement

The student work in this course is in full compliance with the federal definition of a four credit hour course. Please see the Registrar's Office web site

`http://registrar.lafayette.edu/additional-resources/cep-course-proposal`

for the full policy and practice statement.

Schedule

Below is a tentative schedule for the course.

Date	Section(s)	Material
8/26	6.6	Inverse trigonometric functions
8/28	6.6, 6.8	Indeterminate forms and L'Hôpital's Rule
8/30	6.8	
9/2	5.1, 5.2	Areas and Volumes
9/4	5.1, 5.2	
9/6	7.1	Integration by Parts
9/9	7.4	Partial fractions
9/11	7.5	Strategy for Integrations
9/13	7.7	Approximate integration
9/16	7.7	Using error bounds
9/18	7.8	Improper integrals
9/20		Review for Exam 1
9/23		Exam 1
9/25	9.1	Introduction to differential equations
	9.2	Direction fields and Euler's method
	9.3	Separable differential equations
	6.5	Exponential growth and decay
9/27	10.1	Parametric equations
9/30	10.2	Tangents and arclength
10/2	10.3	Polar coordinates
10/4	10.4	Areas in polar coordinates
10/7	10.4	
10/9		Review for Exam 2
10/11		Exam 2
10/14 - 10/15		Fall Break
10/16	11.1	Sequences
10/18	11.2	Series
10/21	11.3	The integral test
10/23	11.4	The comparison test
10/25	11.5	Alternating series
10/28	11.6	Ratio and root tests
10/30	11.7	Strategy for testing series
11/1	11.8	Power series
11/4	11.8	
11/6	11.8	
11/8	11.9	Representing functions
11/11	11.9	
11/13	11.10	Taylor and Maclaurin series
11/15	11.10	
11/18	11.10	

11/20		Review for Exam 3
11/22		Exam 3
11/25	11.11	Applications of Taylor polynomials
11/27-11/29		Thanksgiving Break
12/2	11.11	
12/4		Final Exam Review
12/6		Final Exam Review