FLORIDA POLYTECHNIC UNIVERSITY

Syllabus: MAC 2312 Analytic Geometry and Calculus 2

Welcome to Calculus 2! This is a critical and foundational course for most of the degree programs at Florida Poly. This course primarily focuses on integration techniques, applications of integrals, sequences, series, and an introduction to differential equations.

Course Information

- **Course Number and Title:** MAC 2312 Analytic Geometry and Calculus 2
- **Section Number:** 03
- **Credit Hours:** 4 semester hours
- **Academic Term:** Spring 2026

Instructor Information

- **Instructor:** Dr. Manoj Lamichhane
- **Office Location:** IST 2004
- **Office Hours:** Monday, Wednesday, and Friday 12:00-12:50; Tuesday (1:00 – 2:00 pm) and by appointment
- **Email address:** mlamichhane@floridapoly.edu

Course Delivery and Course Description

- **Delivery Mode**: Face-to-face
- **Class Meetings**: MTWF 11:00-11:50 am in IST 1003
- **Course Website**: Canvas course site

- **Official Catalog Course Description**: An introduction to the theory and applications of integration. Topics include an introduction to differential equation models, techniques for finding antiderivatives, numerical integration, applications of integrals to real-world problems, vector-valued functions, Taylor polynomials, and a basic introduction to infinite series and power series.
    - **Prerequisite:** A grade of C or better in MAC 2311 - Analytic Geometry and Calculus 1

- **Required Texts and Materials:**
    - Textbooks: OpenStax Calculus, Volume 2: https://openstax.org/details/books/calculus-volume-2/ and OpenStax Calculus, Volume 3: https://openstax.org/details/books/calculus-volume-3/
    - Online homework will be required through Edfinity via a link in Canvas. Information about purchasing Edfinity access will be provided on Canvas and by your instructor.
    - Technology (such as a laptop or tablet) that can adequately run Desmos.com or Excel is required for the projects. Office 365 with Excel is available through the MyApps Florida Poly portal at https://apps.floridapoly.edu/.
    - Graphing calculators are not allowed.

- The required calculator for this class is the TI-30XIIS. No other calculators are allowed.

Course Objectives and Outcomes

- **Course Objective**:

  - This course will help students develop a solid foundation in mathematical reasoning related to concepts in integral calculus. Students will apply concepts and methods from the course to solve routine and non-routine problems with emphasis placed on solving applications by mathematical modeling.

- **Course Learning Outcomes**:

  1. Interpret a differential equation model to determine the behavior of the system it describes, either by solving the differential equation (exactly or numerically) or by qualitatively describing its solution's behavior (by applying a slope field, a phase line, or equilibrium analysis).
  2. Create and evaluate a Riemann sum or definite integral to approximate or exactly compute the value of a given geometric or physical measurement (e.g. area, volume, arc length, mass, force).
  3. Select and apply an appropriate numerical integration technique (e.g. left endpoint rule, right endpoint rule, midpoint rule, or trapezoidal rule) to approximate the value of a definite integral.
  4. Select and apply an appropriate strategy to evaluate a given indefinite integral using a combination of basic antidifferentiation rules, substitution, integration by parts, and partial fraction decomposition. Evaluate a given definite integral using the Fundamental Theorem of Calculus, properties of integrals, or basic geometry.
  5. Determine if an infinite series converges or diverges by directly applying the definition of convergence or by applying an appropriate convergence test (e.g. divergence test, ratio test, alternating series test). Compute or approximate the sums of selected types of infinite series (e.g. geometric series, alternating series).
  6. Find the power series representation or polynomial approximation for a given function, either from the definition of a Taylor series or by manipulating a closely related power series.
  7. Determine an appropriate error bound for a particular approximation (e.g. error bound for the midpoint rule, trapezoid rule, or a Taylor polynomial approximation).

Academic Support Resources

- **Library**: Students can access the Florida Polytechnic University Library through the University website and Canvas, on and off campus. Students may direct questions to library@floridapoly.edu.

- **Tutoring and Learning Center**: The Tutoring and Learning Center (The TLC) provides tutoring to all Florida Poly students who may need additional academic support. The TLC is staffed by students who have excelled in the courses they tutor. They offer support by reviewing concepts and materials from class, clarifying points of confusion and providing assistance with learning strategies. While the focus of TLC is to provide support to students in freshman-level courses, upper-level courses are also tutored at the Center. The TLC is located in the IST Commons (second floor).
  - **Knack Tutoring**: Students looking for additional assistance outside of the classroom are advised to consider working with a peer tutor through Knack. Florida Polytechnic University has partnered with Knack to provide students with access to verified peer tutors who have previously aced this course. To view available tutors, visit floridapoly.joinknack.com and sign in with your student account.

- **Academic Success Coaches**: All students at Florida Poly are assigned an Academic Success Coach. Your Academic Success Coach can assist you with academic success strategies. Please visit the Student Success Center on the second floor of the IST building to meet with an Academic Success Coach.

- **Writing Center**: Located on the second floor of the IST (2059/2061), the Writing Center helps students to develop their writing and presentation skills. Consultations are available in person and virtually. For more detail, visit https://floridapolytechnic.libguides.com/writingservices.

Grading Scale

Grade	A	B+	B	B-	C+	C	D	F
Percentage	90%	87%	83%	80%	77%	70%	60%	< 60%

Assignments / Evaluation Methods

Written homework	15%
Edfinity online homework	6%
Quizzes over the homework	14%
Group projects	6%
Attendance / participation	3%

Exam 1	12%
Exam 2	12%
Exam 3	12%
Comprehensive final exam	20%
Total	100%

- **Academic support:** *We want every student to be successful!* We encourage taking advantage of office hours and tutoring!
- **Attendance / participation:** To *optimize* your performance in calculus, it is *integral* to attend every class! Attendance will be tracked using the A+ Attendance system. Students are responsible for entering the A+ attendance code for each class before it expires. Failing to enter the code before it expires is treated as an absence. Students are expected to attend the entire class and participate fully. Coming to class to get the attendance code and then leaving or obtaining the code from another student and submitting it when not in class is a violation of the Academic Integrity Policy. Four absences will be dropped to allow for occasional extenuating circumstances such as student illness, family emergencies, transportation issues, technical difficulties, forgetting to enter the code even though you were in class, arriving late after the code expires, etc. Excused absences are not tracked—if you are sick or forgot to enter the code, that will just count as one of your four dropped absences. All drops are made at the end of the semester. You are strongly encouraged to attend every single class.
- **Written homework:** Written homework will be required to be submitted through Canvas (including weekly homework assignments and exam reflections/corrections). You are encouraged to start working on the written homework right away and ask any questions throughout the week. Guidelines for Written Homework Submission are on Canvas. Your one lowest written homework score will be dropped at the end of the semester to allow for occasional extenuating circumstances.
- **Edfinity online homework:** Online homework will be required approximately four times per week to be submitted through the Edfinity link in Canvas. You have unlimited attempts on open-ended Edfinity problems, and each problem is graded as it is completed, so partially completed assignments automatically receive partial credit. Do not hit "Turn in assignment" as this prevents additional attempts. Your four lowest Edfinity homework scores will be dropped at the end of the semester.
- **Quizzes:** Quizzes over HW material will be given in class approximately weekly. Your lowest quiz score will be dropped. If you go to the Tutoring and Learning Center (TLC), a second quiz score will be dropped (be sure to swipe your ID card).
- **Projects:** Three group projects will be required to be submitted through Canvas. Students are responsible for collaborating effectively. Each group member must be able to explain all aspects of the project.
- **Midterm exams:** There will be three evening midterm exams given per the common exam schedule. The dates are listed in the course schedule below. Exam dates are subject to change, and you should refer to the Academic Calendar website for the most up-to-date exam schedules. Your lowest midterm exam score may be replaced by your final exam score, if that would improve it, up to a maximum of 80%. The final may not be used to replace a missed exam or a score of zero. It may only be used to replace a score for an exam on which you made a legitimate effort.
- **Comprehensive final exam:** There will be a comprehensive common final exam given per the final exam schedule.

Late Work / Make-up work

- Written homework submitted up to 24 hours late will be accepted with a 30% penalty. Written homework submissions will not be accepted more than 24 hours late. Failing to submit by the deadline due to technical issues is still considered to be a late submission. It is your responsibility to ensure that you are sending the correct file. You will not be able to submit the correct file after the deadline passes regardless of the reason why you submitted the incorrect one in the first place.
- Edfinity online homework will not be accepted late. Edfinity homework is graded automatically as it is completed.
- Group projects submitted up to 24 hours late will be accepted with a 30% penalty. Group project submissions will not be accepted more than 24 hours late.
- Make-up exams and quizzes will be given only in case of an emergency or if requested in advance for an appropriate reason. Documentation will be required for all make-up exams and quizzes. (Example of an appropriate request: being too sick to take an exam, communicating with your instructor before the exam, and providing documentation. Example of an inappropriate request: oversleeping a quiz and expecting to be able to take a makeup.)
- Assignments and due dates are posted on Canvas. Students are responsible for checking Canvas regularly to be aware of assignment deadlines and other class information. Extensions without penalty may be granted on a case-by-case basis in extreme circumstances. Please communicate with your instructor.

Course Schedule (Subject to Change)

Week	Date			Section	HW/Project	Quiz	Exam/Reflections
1	M	Jan	12	4.1 Basics of Differential Equations (diff review handout)			
	T	Jan	13	4.1 Basics of Differential Equations (solving DEs handout)			
	W	Jan	14	4.1 Basics of Differential Equations (solving IVPs)			
	F	Jan	16	4.1 Basics of Differential Equations (verifying solutions)			
2	M	Jan	19	MLK Jr. Holiday—no classes	HW 1		
	T	Jan	20	4.2 Direction Fields		Quiz 1	
	W	Jan	21	4.4 The Logistic Equation (and phase lines)			
	F	Jan	23	4.4 The Logistic Equation (and phase lines)			
3	M	Jan	26	1.2 The Definite Integral / 1.3 Fundamental Theorem	HW 2		
	T	Jan	27	1.5 Substitution		Quiz 2	
	W	Jan	28	1.5 Substitution			
	F	Jan	30	1.6 Integrals Involving Exponential and Log Functions			
4	M	Feb	2	Review	HW 3		
	T	Feb	3	Project 1 Introduction		Quiz 3	
	W	Feb	4	Review			Exam 1
	F	Feb	6	Project 1 Group Work Day (no class)			
5	M	Feb	9	2.1 Areas Between Curves	Project 1		
	T	Feb	10	Career Day—no classes			
	W	Feb	11	2.1 Areas Between Curves			
	F	Feb	13	2.2 Determining Volumes by Slicing			
6	M	Feb	16	2.2 Determining Volumes by Slicing	HW 4		
	T	Feb	17	2.5 Physical Applications		Quiz 4	
	W	Feb	18	2.5 Physical Applications			Exam 1 Reflection
	F	Feb	20	2.5 Physical Applications			
7	M	Feb	23	3.4 Partial Fractions	HW 5		
	T	Feb	24	3.4 Partial Fractions		Quiz 5	
	W	Feb	25	3.1 Integration by Parts			
	F	Feb	27	3.1 Integration by Parts			
8	M	Mar	2	Review	HW 6		
	T	Mar	3	Project 2 Introduction		Quiz 6	
	W	Mar	4	Review			Exam 2
	F	Mar	6	Project 2 Group Work Day (no class)			
9	M	Mar	9	3.6 Numerical Integration	Project 2		
	T	Mar	10	3.7 Improper Integrals			
	W	Mar	11	5.1 Sequences (and L'Hôpital's rule)			Exam 2 Reflection
	F	Mar	13	5.2 Infinite Series (including geometric series)			
10	M	Mar	16	Spring Break—no classes			
	T	Mar	17	Spring Break—no classes			
	W	Mar	18	Spring Break—no classes			
	F	Mar	20	Spring Break—no classes			
11	M	Mar	23	5.2 Infinite Series (including geometric series)	HW 7		
	T	Mar	24	5.3 The Divergence and Integral Tests (and p-Test)		Quiz 7	
	W	Mar	25	5.3 The Divergence and Integral Tests (and p-Test)			
	F	Mar	27	5.5 Alternating Series			
12	M	Mar	30	5.6 Ratio and Root Tests (Ratio Test only)	HW 8		
	T	Mar	31	5.6 Ratio and Root Tests (Ratio Test only)		Quiz 8	
	W	Apr	1	6.1 Power Series and Functions			
	F	Apr	3	6.1 Power Series and Functions			
13	M	Apr	6	Review	HW 9		
	T	Apr	7	Project 3 Introduction		Quiz 9	
	W	Apr	8	Review			Exam 3
	F	Apr	10	Project 3 Group Work Day (no class)			
14	M	Apr	13	6.3 Taylor and Maclaurin Polynomials	Project 3		
	T	Apr	14	6.3 Taylor and Maclaurin Series			
	W	Apr	15	6.4 Working with Taylor Series			Exam 3 Reflection
	F	Apr	17	6.4 Working with Taylor Series			
15	M	Apr	20	3.1 Vector-Valued Functions and Space Curves	HW 10		
	T	Apr	21	3.1 Vector-Valued Functions and Space Curves		Quiz 10	
	W	Apr	22	3.2 Calculus of Vector-Valued Functions			
	F	Apr	24	3.3 Arc Length and Curvature			
16	M	Apr	27	Review	HW 11		
	T	Apr	28	Quiz covering all course material (50 minutes)		Quiz 11	

Course Policies

- **Civility and collegiality:** Faculty members and students come to the university to participate in a highly professional educational environment. To that end, both students and faculty members are expected to treat each other with mutual regard and civility. In more general terms, collegiality means respecting the right of both faculty members and students to participate fully and fairly in the educational enterprise**.**
- **Participation:** Students are expected to participate fully in the classroom experience. Questions are welcomed. Students are asked to turn off and put away their cell phones (noting exceptions for authorized accommodations) except when requested to use them for a class-related purpose. The use of earbuds or headphones during class is not allowed (noting exceptions for authorized accommodations).
- **Official email address:** Florida Polytechnic University email is the official method of communication for the University. Students are required to check their email frequently (at least once per day). We cannot reply to any email received from an address other than those that end in floridapoly.edu.
- **Questions and concerns:** Students with a concern or issue should feel free to email their instructor. Instructors will make every reasonable effort to respond by the end of the next class day. If, after sending the instructor a follow-up email, the issue is not resolved, the student may email the department chair, Dr. Mike Brilleslyper, at mbrilleslyper@floridapoly.edu. Students may request an appointment with the department chair for further discussion, if needed**.**
- **Changes to syllabus**: This syllabus is subject to changes posted to Canvas and announced in class.

University Policies

- **Reasonable Accommodations**
  The University is committed to ensuring equal access to all educational opportunities. The Office of Disability Services (ODS), facilitates reasonable accommodations for students with disabilities and documented eligibility. It is the student's responsibility to self-identify as a student with disabilities and register with ODS to request accommodations. If you have already registered with ODS, please ensure that you have requested an accommodation letter for this course through the ODS student portal, and communicate with your instructor about your approved accommodations as soon as possible. Arrangements for testing accommodations must be made in advance. Accommodations are not retroactive. If you are not registered with ODS but believe you have a temporary health condition or permanent disability requiring an accommodation, please contact ODS as soon as possible: DisabilityServices@floridapoly.edu; (863) 874-8770; or https://floridapoly.edu/studentlife/disability-services/.
- **Accommodations for Religious Observances, Practices and Beliefs**
  The University will reasonably accommodate the religious observances, practices, and beliefs of individuals in regard to admissions, class attendance, and the scheduling of examinations and work assignments. (See University Policy.)
- **Title IX**
  Florida Polytechnic University is committed to ensuring a safe, productive learning environment on our campus that prohibits sex discrimination and sexual misconduct, including sexual harassment, sexual assault, dating violence, domestic violence and stalking. Resources are available if you or someone you know needs assistance. Any faculty or staff member you speak to is required to report the incident to the Title IX Coordinator. Please know, however, that your information will be kept private to the greatest extent possible. You will not be required to share your experience. If you want to speak to someone who is permitted to keep your disclosure confidential, please seek assistance from the Florida Polytechnic University Ombuds Office, BayCare's Student Assistance Program, 1-800-878-5470 and locally within the community at Peace River Center, 863-413-2707 (24-hour hotline) or 863-413-2708 to schedule an appointment. The Title IX Coordinator is available for any questions to discuss resources and options available.
- **Academic Integrity**
  Violations of academic integrity regulation include actions such as cheating, plagiarism, use of unauthorized resources (including but not limited to use of Artificial Intelligence tools), illegal use of intellectual property, and inappropriately aiding other students. Such actions undermine the central mission of the university and negatively impact the value of your Florida Poly degree. Suspected violations will be fully investigated, possibly resulting in sanctions up to and including expulsion from the university.
- **Recording Lectures**
  Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal educational use. Recordings may not be used as a substitute for class participation or class attendance. Recordings may not be published or shared in any way, either intentionally or accidentally, without the written consent of the faculty member. Failure to adhere to these requirements is a violation of state law (subject to civil penalty) and the student code of conduct (subject to disciplinary action). *Recording class activities including, but not limited to, lab sessions, student presentations (whether individually or part of a group), class discussion (except when incidental to and incorporated within a class lecture), and invited guest speakers is* ***prohibited****.*