

MA 126 – Calculus II

Fall 2026; Sections 101 & 102

Instructor. Dr. Armin Straub

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Email is the best way to get in touch with me. I strive to reply as soon as possible and definitely within 24 hours; if you don't hear back within 24 hours, please check the email address and contact me again (most likely, something went wrong).

Online material.

<https://usaonline.southalabama.edu> — homework, exam grades (USAonline/Canvas)

<http://calc2.straub.link> — lecture notes, exam practice material

Office. MSPB 313

Office phone. (251) 460-7262 (please use e-mail whenever possible)

Graduate TA. Musab Tahiri, mut2521@jagmail.southalabama.edu

Class schedule.

MWF, 8:00-8:50am, in MSPB 370 (Section 101)

MWF, 9:05-9:55am, in MSPB 345 (Section 102)

Lab schedule. TA Sessions led by Graduate TA:

TR, 8:25-9:15am, in MSPB 370 (Section 101)

TR, 9:30-10:20am, in MSPB 345 (Section 102)

Office hours.

MWF 10-11am, 1:30-2:30pm, or by appointment (Dr. Straub, MSPB 313)

TR 10:30am-12:00pm (Musab Tahiri, MSPB 439)

Overview. This course is a continuation of MA 125 with emphasis on integral calculus. Topics include techniques of integration; applications of the definite integral to geometry, natural sciences, engineering, and economics; improper integrals; infinite sequences and series; Taylor polynomials and Taylor series; parametric equations and polar coordinates.

Learning objectives. Upon the successful completion of the course a student will:

- Apply Substitution Methods to Evaluate Integrals
- Calculate the Integral of Products of Functions Using Integration by Parts
- Compute Integrals which come out to Logarithmic and Inverse Trigonometric Functions
- Calculate the Integral of Powers of Trigonometric Functions
- Apply Trigonometric Substitution to Evaluate Integrals Involving Radicals
- Calculate the Integral of Rational Functions Using the Method of Partial Fractions
- Interpret the Area Between Two or More Curves as an Integral
- Interpret the Volume of a Solid of Revolution as an Integral
- Interpret the Length of a Curve as an Integral
- Compute the Limit of a Sequence
- Compute the Value of an Infinite Series Using Partial Sums
- Evaluate Definite Integrals Over Infinite Intervals
- Apply the Integral Test to Argue For or Against the Convergence of an Infinite Series
- Apply Comparison Tests to Argue For or Against the Convergence of an Infinite Series
- Classify Alternating Infinite Series as Absolutely Convergent, Conditionally Convergent, or Divergent
- Apply the Ratio and Root Tests to Determine if an Infinite Series Converges Absolutely
- Determine the Interval on Which a Power Series Converges
- Compute the Taylor/Maclaurin Series of an Analytic Function and Determine the Interval of Convergence

Secondary Learning Outcomes include:

- Compute Derivatives and Integrals of Hyperbolic Trigonometric Functions and Inverse Hyperbolic Trigonometric Functions
- Sketch the Graph of a Curve Given in Polar Coordinates
- Interpret the Area of a Region Given in Polar Coordinates as an Integral
- Sketch the Graph of a Curve Given in Parametric Coordinates
- Compute the First and Second Spatial Derivatives of a Curve Given in Parametric Coordinates
- Interpret the Surface Area of a Surface of Revolution as an Integral
- Approximate Infinite Series Using Integrals
- Approximate Alternating Series
- Compute the Error Associated to a Given Taylor Polynomial Approximation
- Apply Taylor Polynomials to Generate Approximations

Learning Outcomes for Quantitative Reasoning include:

- Convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words).
- Solve mathematical problems.

Textbook. *University Calculus: Early Transcendentals*, 4th edition, by J. Hass, C. Heil, P. Bogacki, M. Weir and G. Thomas (Pearson, 2020)

The textbook comes with access to MyLab Math which we will use for homework. You will have access to the online textbook and MyLab Math on Canvas through the JagPack Program (<https://www.southalabama.edu/programs/jagpack/>) unless you opted out. (If you opted out, you can purchase access to MyLab Math through Canvas. I suggest talking to me before doing so.)

Coverage.

- Integration (Sections 5.5–5.6)
- Application of Definite Integrals (Sections 6.1–6.4)
- Integrals and Transcendental Functions (Sections 7.1, 7.3)
- Techniques of Integration (Sections 8.1–8.4, 8.7)
- Infinite Sequences and Series (Sections 9.1–9.9)
- Parametric Equations and Polar Coordinates (Sections 10.1–10.3, 10.5)

Course format. Web-enhanced

Pre-requisite. C or better in MA 125 (Calculus I)

Grading

Exams. There will be three in-class midterm exams and a comprehensive final exam. Notes, books, or any tools besides the allowed calculator are not permitted during any of the exams. Our **tentative** exam schedule is:

- Midterm Exam 1: Thursday, September 24
- Midterm Exam 2: Thursday, October 22
- Midterm Exam 3: Thursday, November 19
- Final Exam:
 - Tuesday, December 8 — 8-10am (Section 101)
 - Wednesday, December 9 — 8-10am (Section 102)

Homework. Homework is assigned for each class. The problems are accessible through MyLab Math at USAonline/Canvas (select *Access Pearson*, then *Open Pearson*). You have unlimited attempts for each problem but problems need to be completed by the posted due dates. (Make sure to work on them early so that you can ask for help if needed!) The two homework sets with the lowest scores will be dropped at the end of the semester.

Quizzes. Each week, up to two announced or unannounced quizzes will be given in the TA sessions. The two lowest quiz scores will be dropped.

Grades. Your grade will be based on the total sum of your scores on the midterm exams, homework, quizzes and the final exam.

- Midterm Exams: 45% in total
- Homework: 15% in total
- Quizzes: 15% in total
- Final Exam: 25%

The resulting numerical score is then translated to your semester grade as follows:

[90, 100]: A, [80, 90): B, [70, 80): C, [60, 70): D, [0, 60): F.

Make-up policy. There will be no make-ups for missed quizzes or midterm exams. If an exam is missed and appropriate documentation (e.g. a doctor's note) is presented in a timely manner, then the corresponding exam score will be replaced with the final exam score. Otherwise, the score for the missed exam will be recorded as zero. If a quiz is missed for an acceptable reason, the corresponding score is dropped (i.e. replaced with the average of all other quizzes).

Dropping. The final drop date is Friday, October 30. Please speak with me (and/or your advisor) before making a final decision to drop. Ideally, talk to me as soon as you are getting behind, so I can help you complete the course successfully.

Course organization

Calculator. The use of a basic scientific calculator, equivalent to the TI-30XIIS, is allowed on quizzes and exams. More advanced calculators (with graphing ability, additional algebraic capabilities, etc.) are not permitted.

Attendance. Attendance of all lectures is mandatory and roll will be taken. If you are unable to attend a class because you don't feel well, or because of any other reason, please let me know by email so that the absence can count as excused. You are responsible for finding out what you missed on days when you were unable to attend.

Let X be the number of times you miss class without excuse throughout the semester.

- If $X \leq 3$, then your lowest exam score is replaced with the final exam (if beneficial).
- If $X > 6$, then your overall semester grade will be decreased by a full letter grade.

Students are expected to be on time in class. Frequent late arrivals of a student to the classroom will be considered a disruption and a penalty may be applied in this circumstance.

Academic misconduct. Any form of academic misconduct will be reported. The penalty for cheating on an exam will typically be an automatic "F" for the entire course.

Cell phones and other electronic devices. The use of cell phones and other electronic devices, such as laptops, is generally not acceptable during lecture due to its potential for distraction, and is reserved for emergencies. If use of an electronic device is helpful to your learning (for instance, for note-taking) please speak with me beforehand.

Changes. Not all classes progress at the same rate. Thus course requirements and policies might have to be modified as circumstances dictate. You will be given notice if the course policies need to be changed.

Use of Generative AI. The use of Generative Artificial Intelligence (GenAI) tools (e.g., ChatGPT, Gemini, etc.) in this course is permitted only as explicitly outlined below. GenAI is permitted throughout the course as an optional general study aid (for instance, to provide alternative explanations of topics covered in class). In addition, GenAI is permitted to be used for guidance and support while completing online homework. If the solution to a homework problem is produced with the help of GenAI, the student is expected to work through another instance of the same problem without assistance of any form. Independent mastery of the material covered by the homework is tested by the quizzes and exams. No tools of any kind (besides the permitted basic calculator) are allowed on any of the quizzes or exams.

Additional Academic Course Policies. Information on Student Disability Services, Academic Disruption Policy and Class Demeanor, Student Academic Conduct Policy, Operational Disruptions, and other university policies are posted on USAonline.

Welcome!

...please ask anytime if you have questions.