# COURSE DESCRIPTION
# CALCULUS III – MA 227 - 6B
# SPRING 2026

DEPARTMENT OF MATHEMATICS
UNIVERSITY OF ALABAMA AT BIRMINGHAM

**Course Instructor:** Professor M. N. Nkashama
**Office:** UH 4033
**Phone#:** (205) 934-2154
**E-mail:** nkashama@uab.edu
**Office Hours:** Monday 1:30 pm - 3:30 pm (or by appointment)

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**Meeting times:** MW 10:10 am - 12:00 pm
**Meeting location:** HHB 221
**Prerequisite:** Grade of C or better in MA 126, MA 226 or equivalent
**Credits:** 4 semester hours
**Textbook:** *Thomas' Calculus, 15th Edition*, by Hass, Heil, Bogacki and Weir, (2023). E-Book Comes with UAB Opt-In Through Pearson (you do not need the hard copy).
Topics to be covered can be found in Chapters 12 - 16.

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**Important dates:**

**First day of classes:** Monday, January 12, 2026
**Martin Luther King, Jr., Holiday:** Monday, January 19, 2026
**Last day to Drop/Add without paying full tuition:** Tuesday, January 20, 2026
**Extended Drop Period:** (Without paying Tuition, student is responsible for fees associated with the course(s)) January 21 – February 25, 2026
**Spring Break:** March 09 - March 15, 2026
**Last day to withdraw with a grade of "W":** Friday, March 27, 2026
**Last day of classes:** Friday, April 24, 2026
**Major exams:** Test 1: Wednesday, February 11, 2026;
Test 2: Wednesday, March 18, 2026;
Test 3: Wednesday, April 15, 2026.
These dates are approximate, and maybe slightly shifted due to unforeseen circumstances.
**Final exam:** Wednesday, April 29, 2026, **1:30 pm – 4:00 pm**; Room **(TBA)**

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**Course policies:**

- Please make sure that you are able to receive e-mail through your Blazer-ID account. Official course announcements may be sent to that address.

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*Date*: January 08, 2026.

- If you wish to request a disability accommodation please contact DSS at 934-4205 or at *dss@uab.edu*.
- The two lowest homework grades will be dropped to account for any missed assignments due to illness or any other circumstance.
- If a test is missed due to a serious verifiable circumstance or official university business, the test grade will be replaced with the properly rescaled final exam score. You have to advise the instructor of such circumstances at the earliest possibility.
- No books or notes will be allowed during any of the tests.
- Calculators without internet access will be allowed during tests or quizzes.
- A (more or less) $5'' \times 8''$ Quick Reference Card made by the student will also be allowed on all major exams (tests and final exam), but not on quizzes. (Both sides of the Card can be used.)

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**Methods of teaching and learning:**

- 27 class meetings of 100 minutes consisting of lectures and discussions of examples and homework problems. Time for three in-class tests is included.
- Students are expected to undertake at least 8 hours of private study and homework per week.
- There one online homework assignment corresponding to each section. The assignment is designed to take between 1-2 hours altogether. Please try the problem yourself before seeking help, if needed. See this link for more information on UAB First Day Access: https://www.uab.edu/elearning/academic-technologies/first-day-access

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**Aims of the course/Learning Outcomes:**

Upon successful completion of the course a student

- understands how coordinates and vectors are used in the treatment of three-space problems;
- can apply one-dimensional calculus techniques to vector-valued functions;
- can apply the calculus of vector-valued functions to treat motion problems;
- understands basic concepts and applications of multi-variable calculus;
- can solve standard optimization problems;
- can use different coordinate systems to solve two and three dimensional integration problems; and spherical coordinates
- knows when and how to apply important concepts from vector analysis.

The understanding of a concept is demonstrated by an ability to solve pertinent problems related to that concept.

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**Course content:**

- Vectors in two and three dimensions, their geometric and algebraic representation, dot product and cross product
- Vector functions: continuity, derivatives, and integrals
- Parametric curves and surfaces, polar coordinates
- Velocity, acceleration, arc length, and curvature
- Functions of several variables: continuity and partial derivatives, gradient, directional derivatives
- Linear approximation

- The chain rule
- Optimization
- Double and triple integrals
- Iterated integrals
- Integration using polar, cylindrical, and spherical coordinates
- Change of variables
- Line and surface integrals (including surface area)
- Curl and divergence
- The integral theorems of Green, Stokes and Gauss

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**Assessment procedures:**

- Student achievement will be assessed by the following measures:
  - Regular online homework. Typically, homework will be due one week after assignment. Feedback is provided when wrong answers are given. Students are encouraged to retake the homework problems (with randomly changed parameters) until they obtain correct answers. An unlimited number of takes is allowed during the week in which the set is available. 'Pencil and paper' homework (to be completed by hand and clearly showing all your steps) may also be assigned. A clearly marked due date to turn in in person in class will be indicated. Homework contributes 20% to the course average. Problems on tests are modeled after homework problems. Staying on top of homework is therefore extremely important.
  - Three 100-minute in-class tests. Each test contributes 16% to the course average.
  - A 150-minute **comprehensive** final examination. The final contributes 32% to the course average.
- Your course performance is the higher of your course average (including the final exam grade) and your final exam grade, each being a number between 0 and 100.
- Your final course grade is determined according to the following table:

| Course performance: | 88-100 | 75-87 | 62-74 | 50-61 | below 50 |
|---|---|---|---|---|---|
| Final Grade: | A | B | C | D | F |

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**Tips:**

- Help is available in the Math Learning Lab (HHB202). The exact hours of operation are posted on the math website https://www.uab.edu/cas/mathematics/mll. **Special tutoring hours for calculus** may be indicated.
- Samples of past/older exams are available at https://www.uab.edu/cas/mathematics/calculus-testbank
- By working steadily and regularly, you will increase your chances to succeed in this course.
- Remember, being a full-time student is a full-time job.

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**Artificial Intelligence Use.**

**Academic Integrity** Academic misconduct is present in an academic work wherever AI assistance has been used when unauthorized, or when authorized, has not been disclosed as required. Such behavior is considered deceit and a violation of UAB's shared commitment to truth and academic integrity. Deceit constitutes academic misconduct and is subject to review according to UAB's Academic Integrity Code.

**Expect Changes** The developments around generative AI are in flux and the rules that are expressed in this syllabus may need to change on short notice. This may affect the contents of assignments, as well as their evaluation.

**UAB DSS Accessibility Statement.** The University of Alabama at Birmingham is committed to providing an accessible learning experience for all students. If you are a student with a disability that qualifies under Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act, and you require accommodations, please contact Disability Support Services for information on accommodations, registration and procedures. Requests for reasonable accommodations involve an interactive process and consist of a collaborative effort among the student, DSS, faculty and staff. If you are registered with Disability Support Services, please contact DSS to discuss accommodations that may be necessary in this course. If you have a disability but have not contacted Disability Support Services, please call (205) 934-4205, visit their website, or their office located in Hill Student Center Suite 409.

**UAB Title IX Statement.** The University of Alabama at Birmingham is committed to providing an environment that is free from sexual misconduct, which includes gender-based assault, harassment, exploitation, dating and domestic violence, stalking, as well as discrimination based on sex, sexual orientation, gender identity, and gender expression.If you have experienced any of the aforementioned conduct we encourage you to report the incident. UAB provides several avenues for reporting. For more information about Title IX, policy, reporting, protections, resources and supports, please visit UAB Title IX web page for UAB's Title IX, UAB's Equal Opportunity, Anti-Harassment, Duty to Report, and Non-Retaliation policies.

**Divisive Concepts:** All University faculty, instructors and teaching staff have the academic freedom to explore, discuss, and provide instruction on a wide range of topics in an academic setting. This class may present difficult, objectionable, or controversial topics for consideration, but will do so through an objective, scholarly lens designed to encourage critical thinking. Though students may be asked to share their personal views in the academic setting, no student will ever be required to assent or agree with any concept considered "divisive" under Alabama law, nor penalized for refusing to support or endorse such a concept. All students are strongly encouraged to think independently and analytically about all material presented in class and may express their views in a time, place, and manner, consistent with class organization and structure, and in accordance with the University's commitment to free and open thought, inquiry, and expressions.

**Shared Values Statement:** Collaboration, integrity, respect, and excellence are core values of our institution and affirm what it means to be a UAB community member. A key foundation of UAB is diversity. At UAB, everybody counts every day. UAB is committed to fostering a respectful, accessible and open campus environment. We value every member of our campus and the richly different perspectives, characteristics and life experiences that contribute to UAB's unique environment. UAB values and cultivates access, engagement and opportunity in our research, learning, clinical, and work environments. Our [School] aims to create an open and welcoming environment and to support the success of all UAB community members.