

COURSE DESCRIPTION
CALCULUS III
MA 227–6D, FALL 2021

DEPARTMENT OF MATHEMATICS
UNIVERSITY OF ALABAMA AT BIRMINGHAM

Course Instructor: Dr. Roman Shterenberg
Office: UH 4035
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Office Hours: Before/after class, drop-in, or email for appointment.

Meeting times: MW 2:30pm - 4:20pm.
Meeting location: HHB221
Prerequisite: Grade of C or better in MA 126 or equivalent
Credits: 4 semester hours
Textbook: *Essential Calculus* by James Stewart, Thomson-Brooks/Cole, 2nd ed. 2013, Chapters 10 – 13.

Important dates:

First day of classes: Monday, August 23, 2021.
Labor Day: Monday, September 6, 2021.
Thanksgiving recess: November 22 - November 26, 2021.
Last day of classes: Wednesday, December 1, 2021.
 Test 1: Wednesday, September 22, 2021;
Major exams: Test 2: Wednesday, October 20, 2021;
 Test 3: Wednesday, November 17, 2021.

These dates are tentative.

Final exam: Wednesday, December 8 from 1:30–4:00pm; room to be announced later.

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.
- 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

Date: August 3, 2021.

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. If you need a basic formula, just ask me.

Methods of teaching and learning:

- 28 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.
- The online homework system WebAssign will be used (see below).

Aims of the course:

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
- 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.

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

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. Homework contributes 15% 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. Two best tests contribute 25% each to the course average.
- A 150-minute comprehensive final examination. The final contributes 35% to the course average.
- Your course performance is the maximum of your course average and your final exam grade, each being a number between 0 and 100.
- Your final 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

Tips:

- Help is available in the Math Learning Lab (HHB202), if you can't find me.
- 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.

How to get started on Enhanced WebAssign:

- (1) Go to *www.webassign.net* and click on LOGIN on the left on your screen, and then click on I HAVE A CLASS KEY.
- (2) Enter the following course key:

uab 5854 1929

and proceed; enter **uab** if prompted for your institution.
- (3) When prompted to purchase an access code, select “... **trial period**” (you do not need to purchase an access code at this time. However, you must purchase an access code within two weeks to continue using the system beyond the two-week trial period. The system will prompt you to enter your access code when the deadline approaches.)
- (4) After your first registration, you can sign in as a returning user.
- (5) Should you run into technical problems Enhanced WebAssign provides technical support online and by phone.