COURSE DESCRIPTION
CALCULUS III
MA 227–6B, SPRING 2024

DEPARTMENT OF MATHEMATICS
UNIVERSITY OF ALABAMA AT BIRMINGHAM

Course Instructor: Dr. Ian Knowles
Office: UH4024
Phone#: (205) 934-2154
E-mail: iknowles@uab.edu
Office Hours: Check with me after class; you may also phone or email to arrange for an appointment.

Meeting times: MW 10:10am-12 noon.
Meeting location: HHB221
Prerequisite: Grade of C or better in MA 126 or equivalent
Credits: 4 semester hours
Textbook: *Essential Calculus*, Second Edition by James Stewart, Thomson-Brooks/Cole, 2013.

Important dates:

First day of classes: Monday January 8, 2024.
Last day of classes: Friday April 19, 2024.
Martin Luther King Holiday: Monday January 15, 2024.
Spring Break: Monday March 10 – Friday March 16, 2024.
Exam Week: Monday April 22 – Friday April 26, 2024.
Major tests: Test 1: Wednesday February 14, 2024;
Test 2: Monday April 15, 2024.
These dates are tentative.
Final exam: Wednesday April 24, 2024, 1:30pm-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.
- For disability accommodations 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

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Date: January 3, 2024.

final exam score. You must advise the instructor of such circumstances at the earliest possibility.
- No books or notes or computers or phones will be allowed during any of the tests or the final, except for a non-internet-connected calculator if you so desire. You will be allowed to bring in one 8.5×11 sheet (both sides) of your own construction to each of the tests and the final. In any event, if you need a basic formula, just ask me.

Methods of teaching and learning:

- 27 class meetings of 110 minutes duration consisting of lectures and discussions of examples and homework problems. Time for two in-class tests is included.
- Students are expected to undertake at least 8 hours of private study and homework per week.

Aims of the course:

Upon successful completion of the course a student

- 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 multivariable 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:

- Review of vectors in two and three dimensions (§10.1-4).
- Review of parameterizations of curves, surfaces and solids (§10.5-6).
- Review of vector functions of one real variable: continuity, derivatives, and integrals; motion in space (§10.7 and §10.9).
- Multivariable functions: limits, continuity, partial derivatives (§11.1-3).
- Linear approximation (§11.4).
- The chain rule (§11.5).
- Gradient, directional derivatives (§11.6).
- Optimization (§11.7-8).
- Double and triple integrals (§12.1-2, and §12.4-5)
- Integration: polar, cylindrical, spherical coordinates (§12.3 and §12.6-7).
- Change of variables (§12.8).
- Vector fields and line integrals (§13.1-3).
- Green's theorem (§13.4).
- Curl and divergence (§13.5).
- Surfaces and surface integrals (§13.6-7).
- The integral theorems of Stokes and Gauss (13.8-9).

Assessment procedures:

- Student achievement will be assessed by the following measures:

  - Weekly (except for designated test/review weeks) written and graded homework assignments will be available on Canvas. Homework will be due as a *.pdf file submitted online on Canvas one week after assignment. Homework contributes 30% to the course average. Problems on tests are modeled after homework problems. Staying on top of homework is therefore extremely important.
  - Two test reviews submitted as group work; each contributes 10% to the course average.
  - Two 110-minute in-class tests. Each adds 10% to the course average.
  - A 150-minute comprehensive final examination. The final contributes 30% to your course average.
  - Class Project. You will work in groups to complete this with a due date of Wednesday January 31; a maximum of 5% will be added to your final exam grade for your project.
- 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

Class Schedule.

Week	Monday	Wednesday
01/08 – 01/12	First Class/HW1	Class Project
01/15 – 01/19	HW2/HW1 due	
01/22 – 01/26	HW3/HW2 due	
01/29 – 02/02	HW4/HW3 due	
02/05 – 02/09	Review 1/HW4 due	
02/12 – 02/16	Review 1 due	Test 1
02/19 – 02/23	HW5	
02/26 – 03/01	HW6/HW5 due	
03/04 – 03/08	HW6 due	Class Project due
03/11 – 03/15	Spring Break	
03/18 – 03/22	HW7	
03/25 – 03/29	HW8/HW7 due	
04/01 – 04/05	HW8 due	Review 2
04/08 – 04/12		Review 2 due
04/15 – 04/19	Test 2	Last Class
04/22 – 04/26		Final Exam 1:30-4pm

Tips:

- Help is available in the Math Learning Lab (HHB202), if you can't find me.
- By working steadily and regularly (math is hard to cram!), you will increase your chances to succeed.
- Remember, being a full-time student is a full-time job.
