# COURSE DESCRIPTION
# CALCULUS III – MA 227 - 6B
# SPRING 2023

DEPARTMENT OF MATHEMATICS
UNIVERSITY OF ALABAMA AT BIRMINGHAM

**Course Instructor:** Dr. Junfang Li
**Office:** UH 4006
**Phone#:** (205) 934-2154
**E-mail:** jfli@uab.edu
**Office Hours:** Monday/Wednesday 9am - 10am (or by appointment)

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**Meeting times:** MW 10:10 am - 12 pm
**Meeting location:** HHB 221
**Prerequisite:** Grade of C or better in MA 126, MA 226 or equivalent
**Credits:** 4 semester hours
**Textbook:** *Essential Calculus, 2nd Edition*, by James Stewart, Thomson-Brooks/Cole, 2nd ed. 2013. Topics to be covered can be found in Chapters 10 - 13.

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**Important dates:**

**First day of classes:** Monday, January 09, 2023
**Martin Luther King, Jr., Holiday:** Monday, January 16, 2023
**Last day to Drop/Add without paying full tuition:** Tuesday, January 17, 2023
**Spring Break:** March 13 - March 19, 2023
**Last day to withdraw with a grade of "W":** Tuesday, March 21, 2023
**Last day of classes:** Friday, April 21, 2023
**Major exams:** Test 1: Wednesday, February 08, 2023;
Test 2: Wednesday, March 08, 2023;
Test 3: Wednesday, April 12, 2023.
These dates are tentative, and maybe slightly shifted due to unforeseen circumstances.
**Final exam:** Wednesday, April 26, 2023 from 1:30–4:00 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.
- If you wish to request a disability accommodation please contact DSS at 934-4205 or at *dss@uab.edu*.

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*Date*: January 02, 2023.

- 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 $5'' \times 8''$ 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.
- The online homework system WebAssign will be used (see below).

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**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 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 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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**How to get started on Enhanced WebAssign:**

(1) You can find a youtube tutorial by clicking this link : How to Use WebAssign – Student Overview
(2) Go to *www.webassign.net* and click on LOGIN on the left on your screen, and then click on I HAVE A CLASS KEY.
(3) Enter the following course key:

**uab 9501 9251**

and proceed; enter **uab** if prompted for your institution.

(4) 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.)
(5) After your first registration, you can sign in as a returning user.
(6) Should you run into technical problems Enhanced WebAssign provides technical support online.

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**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.