COURSE DESCRIPTION
CALCULUS III, MA227–DW, FALL 2024

DEPARTMENT OF MATHEMATICS
UNIVERSITY OF ALABAMA AT BIRMINGHAM

Course Instructor: Dr. H. Zou
Office: UH 4047
Phone#: (205) 934-2154
E-mail: zou@uab.edu
Office Hours: MW 11:00 AM – 12:00 PM (or by appointment)

Course Information

Meeting times: MTWTh 2:30 pm-3:20 pm
Meeting location: HHB 221
Prerequisite: Grade of C or better in MA 126 or equivalent. *Any student who has not fulfilled the prerequisite will be dropped from the class.*
Credits: 4 semester hours
Textbook: *Essential Calculus* by James Stewart, 2nd edition, Brooks/Cole, 2013, Chapter 10-13.

First Day Access

This is an UAB First Day Access class. See this link for more information on UAB First Day Access:https://www.uab.edu/elearning/academic-technologies/first-day-access

Important dates

First day of classes: August 26, 2024
Labor Day Holiday: September 2, 2024
Last day to drop/add: September 3, 2024
Last day to withdraw with a "W": Oct 18, 2024
Fall/Thanksgiving Break: November 25–December 1, 2024
Last day to withdraw (Must withdraw from all courses): Dec 6, 2024
Last day of class: December 6, 2024

	Test 1: Monday, September 23, 2024;
Major exams (tests):	Test 2: Tuesday, October 22, 2024;
	Test 3: Thursday, November 21, 2024.

(Dates are approximate and may be shifted due to unforeseen circumstances.)

Final exam: December 11, Wednesday, 2024, 1:30–4pm; Location TBA

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 your are contacted by the Early Alert Program, you should consider taking advantage of the services it offers. Various services to assist you are also listed in the *Student Resources* section of the *Blazernet* web site.
- If you wish to request a disability accommodation please contact DSS at 934-4205 or at *dss@uab.edu*.
- If a test is missed due to a serious verifiable circumstance or official university business, the test grade will be replaced with the final exam score. Otherwise, if you miss an exam you will receive a zero score for this exam. In the unlikely event when two or more midterm tests are missed due to a serious verifiable circumstance or official university business, the matter will be resolved on the case by case basis in cooperation between the student, the instructor, and the coordinator of Calculus I classes. In any case you **must** inform your instructor of such circumstances **before** the exam takes place.
- Calculators (without internet access) will be allowed during any of the tests or quizzes. In addition, students can bring one quick reference card to tests, including the final exam (i.e., a standard size $5'' \times 8''$-index card; both sides can be used).

Methods of teaching and learning:

- Class meetings of 50 minutes consisting of lectures and discussions of examples and homework problems. Time also includes three in-class tests.
- Students are expected to undertake at least 10 hours of private study and homework per week.
- The online homework system WebAssign will be used (look for more information below).

Assessment procedures:

- Student achievement will be assessed by the following measures:
  - **Regular online homework.** 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.

- **(Unannounced) quizzes.** Quiz problems are similar to the homework problem sets. This allows students to gauge whether they are ready to work problems in a test situation. Quizzes contribute 15% to the course average.
  - **Three in class tests.** Partial credit is awarded where appropriate. Each test contributes 12% to the course average.
  - **A 150-minute comprehensive final examination.** The final contributes 34% to the course average.
- Your course performance is your course average (including the final exam score). This is 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

- In addition your grade maybe raised by a strong performance on the final exam (normally at most one letter grade).

Tips

- Past tests are available at `http://www.uab.edu/cas/mathematics/calculus-testbank`.
- Help is available in the Math Learning Lab (HH 202); M–Th 9–8, F 9–5.
- 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 *I HAVE A CLASS KEY* in the *signing* link.
(2) Enter the following course key:

uab 5720 8640

and proceed. (If prompted for your institution, enter *uab*)
(3) When prompted to purchase an access code, select "**. . . trial period**" (Do not purchase an access code at this time. However, you must purchase an access code within two weeks for you 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. Your book may have an access code bundled with it. You must use it. Considering buying options, you may also want to look at https://www.cengage.com/unlimited/
(4) After your first registration, you can sign in as returning user.
(5) Should you run into technical problems Enhanced WebAssign provides technical support online and/or by phone.

Learning Outcomes

After the completion of the course, students will have learnt

- Magnitude, direction, physical interpretation and math operations of vectors;
- Using component form of a vector and the vectors **i**, **j** and **k**;
- Properties of vectors; Angles between of vectors;
- Dot product, cross product, triple product, projection, unit vectors and their geometric interpretations/applications;
- Planes and straight lines in 3-dimensional space, Quadric surfaces;
- Definition, geometric interpretation and properties of vector functions, space curves;
- Calculus of vector functions;
- Arc length and curvature of vector functions, and geometric interpretations;
- Tangent lines, normal and osculating planes;
- Velocity and acceleration and their applications;
- Multi-variable functions, properties and geometric interpretations;
- Definition of limits/continuity of multi-variable functions, geometric interpretation of continuity, evaluation of limits;
- First/high order partial derivatives and their interpretations;
- Applications of partial derivatives;
- Chain rule and implicit differentiation for multi-variable functions;
- Directional derivative and its maximum value, the gradient vector;
- Tangent planes;
- Definition and interpretation of critical points, local/absolute extreme values;
- Second derivative test, procedure of finding local/absolute extreme values;
- Conditional extreme values, Lagrange Multipliers, using the Lagrange multiplier method to find conditional extreme values;
- Definition and approximation of double integration over rectangles;
- Riemann sum, definition of double integration over general domains;
- Iterated integrals, Fubini Theorem, evaluation of double integrals, polar coordinates;
- Triple integration, cylindrical and spherical coordinates;
- Applications of double and triple integrations;
- Change of variables, Jacobian;
- Vector fields and their interpretation;
- Type I and Type II line integrals, their evaluation using parametrization;
- Fundamental theorem of line integrals, independent of path, conservative vector field;
- Green's Theorem and its applications;
- Curl and divergence and applications, conservative vector fields, irrational and incompressible fluids;

Sections to be covered:

- Chapter 10: 10.1 − 10.6 (review), 10.7-10.9.
- Chapter 11: 11.1 − 11.8.
- Chapter 12: 12.1 − 12.8.
- Chapter 13: 13.1 − 13.5.