

# Math 2433

Section 12021

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The information contained in this class syllabus is subject to change without notice. Students are expected to be aware of any additional course policies presented by the instructor during the course.

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**Instructor:** Rebecca George, 639 PGH, [bekki@math.uh.edu](mailto:bekki@math.uh.edu).

**Office Hours:** See <http://www.math.uh.edu/~bekki/>

**Course Homepage:** <http://www.casa.uh.edu>

## Learning Objectives:

The student will master the following:

- Vectors and Vector Calculus
- Functions of Several Variables
- Gradients
- Extreme Values
- Differentials
- Double and Triple Integrals
- Line Integrals
- Surface Integrals
- Stoke's Theorem
- The Divergence Theorem

**Course Learning Materials:** The textbook, online quizzes, EMCF assignments, and additional help materials will be made available by logging into *CourseWare* at <http://www.casa.uh.edu>. These first portion of these materials are freely available for the first two weeks of class. All students must purchase a **Course Access Code** and enter it on *CourseWare* by the first day of the third week of class to continue accessing the course learning materials. A **Course Access Code** can be purchased for about \$55 from the University Bookstore.

**Text:** CALCULUS, 9th edition. Authors: Salas/Hille/Etgen. Publisher: John Wiley & Sons, Inc. Note: Students need to purchase an Access Code from the UH bookstore to access the text and additional electronic learning materials through *CourseWare* at <http://www.casa.uh.edu>. Students are required to purchase the Access Code even if they purchase their own physical copy of the text. Please do not think of this as optional, it is impossible to pass this class without purchasing an Access Code.

The material covered in the course is listed below:

**Chapter 12. VECTORS**

Section 12.1 Cartesian Space Coordinates

Section 12.2 Displacements and Forces

Section 12.3 Vectors

Section 12.4 The Dot Product

Section 12.5 The Cross Product

Section 12.6 Lines

Section 12.7 Planes

**Chapter 13. VECTOR CALCULUS**

Section 13.1 Vector Functions

Section 13.2 Differentiation Formulas

Section 13.3 Curves

Section 13.4 Arc Length

Section 13.5 Curvilinear Motion; Curvature

**Chapter 14. FUNCTIONS OF SEVERAL VARIABLES**

Section 14.1 Elementary Examples

Section 14.2 A Brief Catalogue of Quadric Surfaces; Projections

Section 14.3 Graphs; Level Curves and Level surfaces

Section 14.4 Partial Derivatives

Section 14.5 Open and Closed Sets

Section 14.6 Limits and Continuity; Equality of Mixed Partial

**Chapter 15. GRADIENTS; EXTREME VALUES; DIFFERENTIALS**

Section 15.1 Differentiability and Gradient

Section 15.2 Gradients and Directional Derivatives

Section 15.3 The Mean-Value Theorem; Chain Rules

Section 15.4 The Gradient as a Normal; Tangent Lines and Tangent Planes

Section 15.5 Local Extreme Values

Section 15.6 Absolute Extreme Values

Section 15.7 Maxima and Minima with Side Conditions

Section 15.8 Differentials

Section 15.9 Reconstructing a Function from its Gradient

**Chapter 16. DOUBLE AND TRIPLE INTEGRALS**

Section 16.2 The Double Integral

Section 16.3 The Evaluation of Double Integrals by Repeated Integrals

Section 16.4 Double Integrals in Polar Coordinates  
Section 16.6 Triple Integrals  
Section 16.7 Reduction to Repeated Integrals  
Section 16.8 Triple Integrals in Cylindrical Coordinates  
Section 16.9 The Triple Integral as a Limit of Riemann Sums; Spherical Coordinates  
Section 16.10 Jacobians; Changing Variables in Multiple Integration

## **Chapter 17. LINE INTEGRALS AND SURFACE INTEGRALS**

Section 17.1 Line Integrals  
Section 17.2 The Fundamental Theorem for Line Integrals  
Section 17.3 Work-Energy Formula; Conservation of Mechanical Energy  
Section 17.4 Line Integrals with Respect to Arc Length  
Section 17.5 Green's Theorem  
Section 17.6 Parameterized Surfaces; Surface Area  
Section 17.7 Surface Integrals  
Section 17.8 The Vector Differential Operator  
Section 17.9 The Divergence Theorem  
Section 17.10 Stokes's Theorem

**Daily Poppers:** Daily grades will be given in lecture beginning the first day of the third week of class. You need to purchase a course packet of Popper Forms for Math 2433 with your section number from the **BOOK STORE**. You must bring one of these forms to class every day beginning week 3. No other form will be accepted. Questions will be asked in lecture at random times. You will mark your answers on your form and drop the form in a box at the end of class. Your forms will not be returned. If you are caught filling out multiple popper forms, you will lose attendance credit for that day.

**Lab Quizzes and Written Homework:** 10% of your average will come from lab quizzes (given on during recitation) and weekly written homework. All of these grades are out of 10 points each. I will drop one lab quiz and one written homework at the end of the semester.

**EMCF Homework:** 5% of your average will come from EMCF homework. "EMCF" stands for "Electronic Multiple Choice Form" and are answered on *CourseWare* using the EMCF tab. No late homework is accepted. This homework is graded on accuracy. I will drop one EMCF homework grade at the end of the semester.

**Online Quizzes:** There will be 2-3 online quizzes given each week. You can attempt these quizzes up to 20 times, and the highest grade will be used for your score. You can access the quizzes by logging into *CourseWare* at <http://www.casa.uh.edu>. Quizzes will not reopen once they have closed. I will drop one online quiz grade at the end of the semester.

**Exams:** All sections of Math 2433 take common exams. Two midterm exams and a final exam will be given during the semester. The exams will be given in CASA (note the test location when you register). You can access the scheduler for these exams by logging into *CourseWare* at <http://www.casa.uh.edu>. The exams given in CASA will consist of both multiple choice and written questions. The multiple-choice questions will be machine graded. The written questions will be graded by the instructors and teaching assistants for all sections of Math 2433, and they will be returned in lab. The scheduler will be available 2 weeks prior to the start of the exam cycle. There are no make-ups for missed exams. Your final exam grade will replace your lowest test grade.

**Final Exam:** A comprehensive final exam will be given in CASA. You can access the scheduler for this exam by logging into *CourseWare* at <http://www.casa.uh.edu>. The final exam is MANDATORY for this class.

### **Grades:**

Tests 1 and 2 – 17.5% each

Final exam – 35%

Online Quizzes – 10%

Lab Quizzes and Written Homework – 10%

In-class Poppers and Attendance – 5%

EMCF Homework – 5%

**Note:** The percentage grade on the final exam can be used to replace your lowest test score.

90% and above - A

at least 80% and below 90% - B

at least 70% and below 80% - C

at least 60% and below 70% - D

below 60% - F

**Attendance is Mandatory!!** Attendance will be taken in lab, and the daily poppers will be used to determine your attendance in lecture. I will allow you a total of 3 unexcused absences from lecture and lab (total). Documented University of Houston excused absences will be permitted.

**Whenever possible, and in accordance with 504/ADA guidelines, we will attempt to provide reasonable academic accommodations to students who request and require them.**