Instructor: Dr. Abdallah Shuaibi  
Office #: 3816  
Email: ashuabi1@ccc.edu  
URL: http://faculty.ccc.edu/ashuaibi/  
Phone #: (773)907-4085  

Office Hours:  

<table>
<thead>
<tr>
<th>DAYS</th>
<th>ADVISEMENT OFFICE HOURS</th>
<th>WALK-IN OFFICE HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday &amp; Wednesday</td>
<td>8:30-9:00 AM &amp; 5:00-5:30 PM</td>
<td>9:00-9:30 AM &amp; 2:00-3:00 PM</td>
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<td>Thursday</td>
<td>2:45-3:45 PM</td>
<td>3:45-5:45 PM</td>
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Class Time and Place: Monday and Wednesday 9:30 - 11:55 AM, Room #: 3975.  
Prerequisite: A grade of C or better in Mathematics 208, or consent of department chairperson.  
Contact & Credit Hours: Five hours per week, for sixteen weeks for five(5) credit hours. The instructor is also available for consultation during conference hours.  
Length of Course: 16 weeks.  
Students the Course is Expected to Serve: This course is intended for students who are science and engineering majors and require multivariate calculus and vector analysis for their undergraduate degree.  
Other materials: Students are required to have a scientific or a graphing calculator. You are not allowed to use a cell phone as a calculator.  

Course Objectives:  
1. Understand the properties of vectors and apply vector operations in 2- and 3-dimensional space.  
2. Conceptualize graphs of surfaces and curves in 3-dimensional space.  
3. Understand the concept of differentiability of a function of several variables, including partial derivatives, the total differential and the Chain Rule.  
4. Understand the concept of multiple integrals and their applications.  
5. Understand the basic theorems of vector analysis such as the Fundamental Theorem of Line Integrals, Greens, Gauss, and Stokes Theorem.
**Student Learning Outcomes:**
Upon satisfactory completion of the course, students will be able to:

1. Perform vector operations, including dot product, cross product, and the projection of one vector onto another.
2. Determine the parametric and symmetric equations of a line.
3. Determine the equation of a plane.
4. Analyze the graphs of quadric surfaces.
5. Calculate derivatives of vector-valued functions.
6. Calculate unit tangent, unit normal, curvature, and arc length of a space curve.
7. Apply vector operations to motion problems in space.
8. Determine limits, domains and points of discontinuities of real-valued functions of two variables.
10. Apply the Chain Rule to multivariate functions.
11. Determine directional derivatives and gradient vectors.
12. Determine the tangent plane to a surface at a point.
13. Determine local extrema and saddle points for functions of two variables.
14. Calculate double and triple integrals, including the use of Fubini's Theorem.
15. Apply the Jacobian determinant to compute multiple integrals for polar, cylindrical, and spherical substitutions.
16. Compute the divergence and curl of a vector field.
17. Calculate the line integral and apply the Fundamental Theorem of Line Integrals to a gradient field.
18. Apply Greens Theorem to the calculation of a line integral.
19. Evaluate a surface integral of a vector field.
20. Apply Gauss Theorem to the calculation of a line integral.
21. Apply Stokes Theorem to the calculation of a surface integral.
General Education Goals:
This course addresses the following TR General Education Goals:

- The student performs effectively in the workplace and/or has the ability to work and make effective use of wide variety of current technologies. (Gen. Ed. Goal 2)
- The student demonstrates the ability to think critically, abstractly, and logically. (Gen. Ed. Goal 4)
- The student demonstrates the ability to work independently. (Gen. Ed. Goal 6)

Class Operation:

1. Homework: **Reading the relevant sections in your textbook is always expected.** Homework assignments will be collected every week. The quizzes will be based on the homework problems, additional worksheets, and problem sets. Students who keep up the daily work are generally those who do well on quizzes and tests.

2. Blackboard & Website: It is your responsibility to check the Blackboard & My Website regularly for announcements, homework assignments, and other important information regarding the course.

3. Quizzes: Throughout the semester, we will have at least 8 quizzes. Quizzes cannot be made up. **There are no exceptions.** As a result, I will drop the lowest quiz. We will not have quizzes on the weeks an exam is scheduled.

4. Tests: There will be two exams during the semester besides the final exam. The final exam is cumulative, and it will be given during the last week of the semester.

Policies:

- **Participation:** Class participation is mandatory. You are expected to come to all classes. If you have any question, be ready to ask it at the beginning of the class. The average student should plan two hours of out of class time for each hour of class. Some students need more time than this.

- **Make-up Policy:** No make-up exam is given without prior notification and documented acceptable excuse. The student must contact the instructor by telephone or e-mail on the day of the exam if there is any problem. If you know in advance of an unavoidable absence, arrangements can be made to take a test prior to the absence.

- **Attendance Policy:** Students must attend regularly every lecture. They are expected to be there ON TIME. Attendance will be taken daily. Every two late arrivals to the class will be counted as one complete absence. Too many absences without an official excuse will affect your grade. If you miss a class, it is your responsibility to obtain the assignment and find out what material was covered.

- **Mathematics Department Active Pursuit of Course Objectives & ADW Policy:** Students are not actively pursuing the course objectives and will be administratively withdrawn (ADW) at midterm if at least two of the following apply:
1. Less than 70% of assignments up to the midterm have been completed.
2. Less than 70% of quizzes and tests up to the midterm have been attempted.
3. Less than 50% of class sessions up to the midterm have been attended.

- **Cell Phones and Beepers:** Electronic devices cause disruption during class and are not permitted. In order to respect the learning environment, please turn off all such items prior to class.

**Academic Support & Computer Labs:**
- [http://www.trumancollege.cc/student-services/tutoring](http://www.trumancollege.cc/student-services/tutoring) (Tutoring Center)
- [http://www.trumancollege.cc/student-services/ssli](http://www.trumancollege.cc/student-services/ssli) (Student Services)
- [http://www.trumancollege.edu/trio/](http://www.trumancollege.edu/trio/) (Trio Program)

**Computer Labs:** Room 3817; Room 3186; Room 2247; Room L112; Room L933

**Students with Disabilities**
The Disability Access Center (DAC) is located in room 1428. This is the Center, responsible for verifying that students have a disability-related needs for academic, accommodations and for planning appropriates accommodations, in cooperation with the students themselves and their instructors. Students who need academic accommodations should request them from the DAC Center 773-907-4725 Linda Ford Director Office hours are from 9:00 a.m.-7:00 p.m. Monday-Thursday & Friday 9:00 a.m. 4:00 p.m.

**Truman College Academic Integrity Policy:** If the alleged violation of the Academic Integrity policy occurs in the classroom, the instructor will determine if a student has committed an act of academic dishonesty. The instructor may take action commensurate with the severity of the act. The instructor may:

1. Assign a grade ‘F’ or ‘0’ to the assignment or test or appropriate part of the assignment or test.
2. Make a proportional reduction in the grade for an entire assignment, if the assignment is a part of a large assignment.
3. Assign a grade ‘F’ for the course. “See the student Handbook for specifics”.

**Types of Activities:** There will be an emphasis on on active and cooperative learning strategies throughout this class. Active Learning is, in short, anything that students do in a classroom other than merely passively listening to an instructor’s lecture. This includes everything from listening practices which help students to absorb what they hear, to short writing exercises in which students react to lecture material, to complex group exercises in which students apply course material to "real life" situations and/or to new problems. Cooperative learning is a successful teaching strategy in which small teams, each with students of different levels of ability, use a variety of learning activities to improve their understanding of a subject. Some of the class Active/Cooperative learning strategies are listed below. Think-Pair-Share, Student Summaries, One-Minute Paper, Roundtable, Muddiest Point, Corners and Shared Brainstorming.
Weekly Schedule:

1. [Jan 17-Jan 21]: Vectors In the Plane(13.1), Vectors in Space(13.2).  
   [January 17: Martin Luther King Jr. Day (Holiday)]
2. [Jan 24-Jan 28]: Lines and Distances(13.3), The Dot Product(13.4).
3. [Jan 31-Feb 04]: The Cross Product(13.5), Matrices and Determinants(13.6).
4. [Feb 07-Feb 11]: The Conic Sections(14.1), Translation and Rotation of Axes(14.2).
5. [Feb 14-Feb 18]: Functions, Graphs, and Level Surfaces(14.3), Quadratic Surfaces(14.4).
6. [Feb 21-Feb 25]: Cylindrical and Spherical Coordinates(14.5), [Review & Exam I].
8. [Mar 07-Mar 11]: Introduction to Partial Derivatives(15.1), Linear Approximations and Tangent Planes(15.2).
9. [Mar 14-Mar 18]: The Chain Rule(15.3), Matrix Multiplication and the Chain Rule(15.4), Gradients and Directional Derivatives(16.1).
11. [Mar 28-Apr 01]: Constrained Extrema and Lagrange Multipliers(16.4), The Double Integral and Iterated Integral(17.1).
12. [Apr 04-Apr 08]: The Double Integral Over General Regions(17.2), Applications of the Double Integral(17.3).
13. [Apr 11-Apr 15]: Triple Integrals(17.4)[Optional], Integrals in Polar, Cylindrical, and Spherical Coordinates(17.5), Applications of Triple Integrals(17.6)[Optional] [Review & Exam II].
14. [Apr 18-Apr 22]: [Spring Break (Holiday)]
15. [Apr 25-Apr 29]: Line Integrals(18.1), Path Independence(18.2), Exact Differentials(18.3).
16. [May 02-May 06]: Green’s Theorem(18.4), Circulation and Stoke’s Theorem(18.5), Flux and Divergence Theorem(18.6).
17. [May 09-May 13]: [Review & Final Exam].
Grading Policy:

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<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Exam I</td>
<td>20 %</td>
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<tr>
<td>Exam II</td>
<td>20 %</td>
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<tr>
<td>Final Exam</td>
<td>30 %</td>
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<tr>
<td>Quizzes</td>
<td>15 %</td>
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<tr>
<td>Homework Assignments</td>
<td>10 %</td>
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<tr>
<td>Attendance &amp; Class Participation</td>
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Grading Scale:

<table>
<thead>
<tr>
<th>Percentage Range</th>
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<tbody>
<tr>
<td>90-100</td>
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<td>80-89</td>
<td>B</td>
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<tr>
<td>70-79</td>
<td>C</td>
</tr>
<tr>
<td>60-69</td>
<td>D</td>
</tr>
<tr>
<td>0-59</td>
<td>F</td>
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Extra Help!: Many students find that they need extra help in addition to that available in class. Help is available from the instructor at the times indicated or by appointment. Also, recognize that others in the class can and are willing to help. You are encouraged to keep in touch with classmates who have similar schedules. Tutoring is also available at Truman college.

Good Luck

Shuaibi, A.