Prerequisite: Math 2202 (Calculus II) with a grade of “C” or better

Textbook: Calculus, 1st Edition, by Michael Sullivan and Kathleen Miranda, with WebAssign is required. The class key to enroll in WebAssign is kennesaw 8849 3302.

Supplemental Instruction: The Supplemental Instruction (SI) program of KSU supports this class, and the SI leader is Patrick Glenn (pglenn@students.kennesaw.edu).

Course Description: This course is the third in the calculus curriculum and is concerned with functions defined on regions in two or three-dimensional space and that have values in one, two, or three-dimensional space. Topics include partial derivatives, vector fields, multiple integrals, and applications of these topics.

Tentative material to be covered:

Chapter 10: Vectors; Lines, Planes, and Quadric Surfaces in Space
10.1 Rectangular Coordinates in Space
10.2 Introduction to Vectors
10.3 Vectors in the Plane and in Space
10.4 The Dot Product
10.5 The Cross Product
10.6 Equations of Lines and Planes in Space
10.7 Quadric Surfaces

Chapter 11: Vector Functions
11.1 Vector Functions and Their Derivatives
11.2 Unit Tangent and Principal Unit Normal Vectors; Arc Length
11.3 Arc Length as Parameter; Curvature
11.4 Motion along a Curve
11.5 Integrals of Vector Functions; Projectile Motion

Chapter 12: Functions of Several Variables
12.1 Functions of Two or More Variables and Their Graphs
12.2 Limits and Continuity
12.3 Partial Derivatives
12.4 Differentiability and the Differential
12.5 Chain Rules
Chapter 13: Directional Derivatives, Gradients, and Extrema
13.1 Directional Derivatives; Gradients
13.2 Tangent Planes
13.3 Extrema of Functions of Two Variables
13.4 Lagrange Multipliers
Chapter 14: Multiple Integrals
14.1 The Double Integral over a Rectangular Region
14.2 The Double Integral over Nonrectangular Regions
14.3 Double Integrals Using Polar Coordinates
14.4 Center of Mass; Moment of Inertia
14.5 Surface Area
14.6 The Triple Integral
14.7 Triple Integrals Using Cylindrical Coordinates
14.8 Triple Integrals Using Spherical Coordinates

Technology Statement: A TI-83/84 calculator is permitted to use throughout the course. Please get an approval from the instructor to use other calculator types during midterm tests and final exam. Use of calculators (such as TI-89) with symbolic computation capabilities will not be permitted on exams.

Learning Outcomes: Upon successfully completing this course, students will be able to:
- work with the arithmetic of points in two and three dimensional space, including the dot and cross products and derive the geometric interpretations of the arithmetical operations;
- be familiar with parametric curves and be able to work with the unit tangent, principal normal, curvature, velocity, speed, and acceleration of a parametric curve;
- be familiar with real functions of several variables and their partial derivatives and directional derivatives, the gradient of a real function, the divergence and curl of a vector field, and the notion of a conservative vector field;
- be familiar with parametric surfaces and be able to work with the principal normal to a surface and the tangent plane to a surface; and
- define and evaluate double/triple integrals of functions of two/three variables and to transform such integrals to polar, spherical, and cylindrical coordinates.

Homework: Homework is 15% of your final grade. Typically, there will be one homework assigned each week, except on the test weeks. Homework will be assigned on WebAssign and will be due in one week. It is your responsibility to check out homework due dates by
visiting your WebAssign account for the course. Completion of homework assignments in a timely fashion shows that you are engaged in the learning essential to your success; however, a mere completion of homework does not warrant your success. Your continuous involvement in the thought processes that happen inside and outside classroom for developing concepts and skills needed to be successful in the course.

Grading and Evaluation/Makeup Policy:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Homework</td>
<td>15%</td>
</tr>
<tr>
<td>Test 1</td>
<td>20%</td>
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<tr>
<td>Test 2</td>
<td>20%</td>
</tr>
<tr>
<td>Test 3</td>
<td>20%</td>
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<tr>
<td>Comprehensive Final Exam</td>
<td>25%</td>
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</tbody>
</table>

There will be no make-up homework. Make-up midterm tests will only be given for a university-approved excuse in writing or for an emergent health problem. In the latter case, a note from a doctor’s office must be presented as soon as your returning to KSU. Wherever possible, you should inform the instructor prior to missing a test.

All tests and final exam are closed book and closed notes. Everyone must take Final Exam. The Final Exam percentage score will be used to replace your one lowest midterm test score if it helps your average. **There will be no extra credit in this course, and therefore please do not ask for one.**

Grading Scheme:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Score Range</th>
</tr>
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<tbody>
<tr>
<td>A</td>
<td>[90%, 100%]</td>
</tr>
<tr>
<td>B</td>
<td>[80%, 90%)</td>
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<tr>
<td>C</td>
<td>[70%, 80%)</td>
</tr>
<tr>
<td>D</td>
<td>[60%, 70%)</td>
</tr>
<tr>
<td>F</td>
<td>[0, 60%)</td>
</tr>
</tbody>
</table>

Notice on Course Withdrawal: Students are responsible for maintaining and managing their enrollment status in their classes. A persistent nonattendance does not imply a withdrawal. Per university policy, I will assign a grade of WF to all students who cease to attend the class and do not participate in graded items during or prior to the last two weeks of the semester. The last date of attendance is required to be reported when assigning a grade of WF. Note that my compliance with this policy may affect your financial aid.

Student Disability Services: Students with disabilities needing academic adjustments are responsible to notify the instructor as early in the semester as possible. Verification from KSU Student Disability Services is required. All discussions will remain confidential.

Class Attendance: Regular attendance is expected and will be recorded. There will be a class roll going around in class every day, and it is your responsibility to sign in. Missing a
class can leave you a lot behind in the course, and in this case, you will be responsible for all announcements, class assignments as well as material presented in class. The instructor will need to report the last day of attendance when submitting final grades to KSU.

**Classroom Behavior:** All electronic devices must be put silent for the duration of each class. The usages of music players and headsets is not allowed for the duration of class, tests or final exam. You are expected to arrive in class on time, be prepared for active learning, and not be disruptive during the class. You may be asked to leave the classroom for any misconduct or inappropriate behavior.

**Academic Integrity:** Every KSU student is responsible for upholding the provisions of the Student Code of Conduct, as published in the Undergraduate and Graduate Catalogs. Section II of the Student Code of Conduct addresses the university’s policy on academic honesty, including provisions regarding plagiarism and cheating, unauthorized access to university materials, misrepresentation/falsification of university records or academic work, malicious removal, retention, or destruction of library materials, malicious/intentional misuse of computer facilities and/or services, and misuse of student identification cards. Incidents of alleged academic misconduct will be handled through the established procedures of the Department of Student Conduct and Academic Integrity (SCAI), which includes either an “informal” resolution by a faculty member, resulting in a grade adjustment, or a formal hearing procedure, which may subject a student to the Code of Conduct’s minimum one semester suspension requirement. See also [http://scai.kennesaw.edu/codes.php](http://scai.kennesaw.edu/codes.php)

**Important Dates:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Aug. 13</td>
<td>First Day of Fall Term</td>
</tr>
<tr>
<td>Sept. 3</td>
<td>Labor Day Holiday</td>
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<tr>
<td>Oct. 3</td>
<td>Withdrawal Deadline</td>
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<tr>
<td>Nov. 19–25</td>
<td>Fall Break</td>
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<tr>
<td>Dec. 3</td>
<td>Last Day of Classes</td>
</tr>
<tr>
<td>Sept. 11</td>
<td>Test 1</td>
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<tr>
<td>Oct. 16</td>
<td>Test 2</td>
</tr>
<tr>
<td>Nov. 15</td>
<td>Test 3</td>
</tr>
<tr>
<td>Dec. 4</td>
<td>Final Exam (1:00–3:00pm)</td>
</tr>
</tbody>
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The instructor of the course reserves the right to make changes on pages 1-4 of this syllabus if it is necessary to account for ineluctable circumstances. In such events, the instructor will notify students of any changes at their students.kennesaw.edu address at least one week prior to the dates the changes take effect.