

Course Description: Functions of several variables, partial derivatives, vector functions, multiple integrals in different coordinate systems, line and surface integrals of both functions and vector fields, some basic 1st and 2nd order differential equations.

Prerequisites: Grade of C or better in MATH 2414 or its equivalent

Prepares for: MATH 4302, 4310

Text: Calculus I, II, & III: A Problem-Based Approach with Early Transcendentals by W. Ted Mahavier.

We will use Mahavier's notes in place of a textbook. The notes are available on Blackboard under the Contents section. The title of the pdf file is "Problem Sequence," and you are welcome to download the file.

Dr. J. W. Montgomery

Office : Lucas 111B

Office Hours: TR 11:20-12:20 am and 2:30-3:30 pm.

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409-880-7847

Learning Outcomes: Upon completion of the course, student will:

1. Perform calculus operations on vector-valued functions, including derivatives, integrals, curvature, displacement, velocity, acceleration, and torsion.
2. Perform calculus operations on functions of several variables, including partial derivatives, directional derivatives, and multiple integrals.
3. Find extrema and tangent planes.
4. Solve problems using the Fundamental Theorem of Line Integrals, Green's Theorem, the Divergence Theorem, and Stokes' Theorem.
5. Apply the computational and conceptual principles of calculus to the solutions of real-world problems.
6. Convert and graph basic equations in Cartesian, cylindrical, or spherical coordinates;
7. Describe 3-D motion using vector functions;
8. Compute limits of functions of several variables;
9. Apply the chain rule to finding derivatives;
10. Apply Lagrange Multipliers to find extrema subject to constraints;
11. Change variables in multiple integrals;
12. Define a vector field and sketch a simple vector field;
13. Compute a line integral with respect to arc length, x , y , and z ;
14. Compute a line integral over a vector field;
15. Identify a conservative vector field and compute a potential function for a conservative vector field;
16. Parameterize a surface.

Classroom Environment: The daily routine will consist primarily of discussions and board presentations on problems from Mahavier's notes.

Rules for Presentations: Students will volunteer for presentations. When multiple students volunteer for the same problem, the student with the fewest presentation points will be allowed to present. In the case of a tie on points, a student will be selected at random by way of Matlab's randi function. The student will write their solution on the board and present it to the class. The student must use complete sentences and be able to explain every step in order to receive credit. It is the duty of the audience to question every step. Lastly, and most importantly, we will be respectful in our discussions.

Rules for Homework: One problem is due per week, and the deadline is Thursday. The only restriction on problem choice is the student must choose a problem that has not been presented. Students must use complete sentences and skip a line between every statement. Any incorrect solutions may be revised and resubmitted the following week.

Grading Policies: There will be three tests, including the final exam. The average of the test scores will account for 60% of the final grade. Tests will be announced in class at least one week in advance. Classroom participation, which includes presentations and attendance, is worth 30% of the final grade. Note that productive members of the audience can earn participation points. Homework will provide the other 10% of the final grade. Final grades will be based on the following scale.
 $F < 60\% \leq D < 70\% \leq C < 80\% \leq B < 90\% \leq A$.

Make-up Policy: No make-ups will be offered. In the case of a excused absence, the final exam grade may be used as a grade replacement.

Attendance Policy: Failure to attend class will significantly affect your participation grade.

Final Exam: Wednesday, December 6, 2017, 5:00 pm – 7:30 pm.

Disclaimer: While I have made a sincere effort to ensure that this syllabus is correct, changes may be required. I will announce any substantive changes during a regularly scheduled class. If you find an error or omission, please notify me immediately so that the other members of the class may be advised.

Lamar University
Department of Mathematics
Important Information for Students

Lamar University expressly prohibits intimidation and harassment of students, faculty, staff, or applicants.
<http://students.lamar.edu/academic-support/code-of-conduct.html>

Drop Policy: Please make note of the three dates indicated in this drop policy. Any drop will be your responsibility; I will not drop a student from the course.

September 13, 2017: (Census Date-Six Drop Rule does not apply) A student may drop or withdraw without consulting with the instructor. The Six Drop Rule does not apply to a drop before 5:00 PM.

September 29, 2017: (Six Drop Rule applies) A student may drop or withdraw from the course without academic penalty and receive a Q, however, the Six Drop Rule applies. The student will consult with the instructor and the Records Office to initiate a drop.

November 3, 2017: (Six Drop Rule applies) Last day to drop or withdraw with academic penalty; the student must be passing the course at the time of the requested drop in order to receive a Q. The drop form, including all required signatures, must arrive in the Records Office by no later than 4:00 PM. No drop is allowed after this date except in extreme extenuating circumstances. Any “late drop” must be approved by the instructor, department chair, college dean, and provost.

Academic Integrity: Students are expected to maintain complete honesty and integrity in their academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. Students are specifically warned against all forms of cheating and plagiarism. The *Lamar University Student Handbook* clearly reads: “Any student found guilty of academic dishonesty in any phase of academic work will be subjected to disciplinary action. Punishable offenses include, but are not limited to, cheating on an examination or academic work which is to be submitted, plagiarism, collusion, and the abuse of source materials.” One aspect of the *Handbook*’s definition of cheating includes “purchasing or otherwise acquiring and submitting as one’s own work any research paper or other writing assignment prepared by an individual or firm.” Plagiarism is defined as “the appropriation and the

unacknowledged incorporation of another's work or ideas into one's own and submitted for credit." Faculty members in the College of arts and Sciences investigate all cases of suspected plagiarism. Any student who is found cheating in this course will receive a course grade of F. <http://students.lamar.edu/student-handbook.html>

Accommodations: Lamar University is committed to providing equitable access to learning opportunities for all students. The Disability Resource Center (DRC) is located in the Communications building room 105. Office staff collaborate with students who have disabilities to provide and/or arrange reasonable accommodations. If you have, or think you may have, a disability (e.g., mental health, attentional, learning, chronic health, sensory, or physical), please contact the DRC at [409-880-8347](tel:409-880-8347) or drc@lamar.edu to arrange a confidential appointment with the Director of the DRC to explore possible options regarding equitable access and reasonable accommodations. If you are registered with DRC and have a current letter requesting reasonable accommodations, we encourage you to contact your instructor early in the semester to review how the accommodations will be applied in the course.
<http://www.lamar.edu/disability-resource-center/>

Campus Closure: In the event of an announced campus closure in excess of four days due to a hurricane or other disaster, students are expected to login to Lamar University's website's homepage for instructions about continuing courses remotely. <http://lamar.edu>

Emergency Procedures: Many types of emergencies can occur on campus; instructions for severe weather or violence/active shooter, fire, or chemical release can be found at:
<http://www.lamar.edu/about-lu/administration/risk-management/index.html>

Following are procedures for the first two:

Severe Weather:

- Follow the directions of the instructor or emergency personnel.
- Seek shelter in an interior room or hallway on the lowest floor, putting as many walls as possible between you and the outside.
- If you are in a multi-story building, and you cannot get to the lowest floor, pick a hallway in the center of the building.
- Stay in the center of the room, away from exterior walls, windows, and doors.

Violence/Active Shooter:

- **CALL** - 8-3-1-1 from a campus phone (880-8311 from a cell phone). Note: Calling 9-1-1 from either a campus phone or cell phone will contact Beaumont City Police Dispatch rather than University Police.
- **AVOID**- If possible, self-evacuate to a safe area outside the building. Follow directions of police officers.
- **DENY**- Barricade the door with desks, chairs, bookcases or any other items. Move to a place inside the room where you are not visible. Turn off the lights and remain quiet. Remain there until told by police it is safe.
- **DEFEND**- Use chairs, desks, cell phones or whatever is immediately available to distract and/or defend yourself and others from attack.

Course Evaluations: You will have an opportunity to evaluate all aspects of this course in a formal process to be completed online near the end of the term. You will receive an email reminder through your LU account.