

Math 2210-01 (#47167)
Multivariable Calculus (3)
Fall 2015 (Monday, 24 August – Friday, 11 December 2015)
MWF 11:00 - 11:50 AM SNOW 150

Instructor: Dr. Brent D. Albrecht
Office: SNOW 137
Office Hours: MW 1:00-1:50 PM
 & By Appointment
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Prerequisites: Math 1220 Grade of C or Higher.

Course Description: Fulfills General Education Mathematics requirement. A continuation of Math 1220 including partial derivatives, gradient vectors, Lagrange multipliers, multiple integrals, Green's theorem, surface integrals, Stokes' theorem, and the divergence theorem.

Objectives: To convey to the students the beauty and utility of mathematics, and to illustrate some of its applications in modern society.

To convey, to the extent possible using the content of this course, the quantitative literacy skill set adopted by Dixie State University:

All mathematics courses at Dixie State University support the general education goal of the university, and will require students to:

1. Employ mathematical techniques in solving computational problems.
2. Interpret mathematical models.
3. Construct quantitative and logical arguments.
4. Apply mathematical knowledge to solve real-world problems.
5. Communicate in the mathematical language through the proper use of notation and terminology.
6. Explore and analyze mathematical concepts, using technology to the appropriate extent.

Upon successful completion of this course, the students will demonstrate through testing the ability to:

1. Solve application problems in geometry and physics via the use of plane and space vectors.
2. Analyze the motion of an object via the use of space curves.
3. Understand the behavior of functions of several variables via the implementation of contour diagrams.

4. Use partial derivatives to solve optimization problems.
5. Setup and compute double integrals, both in rectangular and polar coordinates.
6. Setup and compute triple integrals in each of rectangular, cylindrical, and spherical coordinates.
7. Compute the work done by a vector field along a curve via the use of line integrals.
8. Calculate the flux of a vector field through a surface via the use of surface integrals.
9. Reinterpret certain line and surface integrals as multiple integrals.

“Philosophy is written in this grand book – the Universe – which stands continually open to our gaze, but it cannot be understood unless one first learns to comprehend the language and interpret the characters in which it is written. It is written in the language of mathematics, and its characters are triangles, circles, and other geometrical figures, without which it is humanly impossible to understand a single word of it.”

- Galileo Galilei

Text: Calculus: Concepts & Contexts, 4th Ed. by James Stewart.

Attendance: It is essential that students attend class, and roll is taken on randomly selected days in order to ensure student attendance. Tardiness is strongly discouraged. Attendance records may be used in determining borderline grades. Absences due to university-sponsored activities are handled as stated in Dixie State University Policy #5-23 (located at <http://www.dixie.edu/humanres/policy/sec5/523.html>).

Homework: Homework assignments are collected on a weekly basis and are graded predominately by completion. Students must show all of their work in order to receive credit, and they are encouraged to check their answers in the back of the text whenever possible. Students are required both to write neatly and to organize their work with chapter, section, and problem numbers. If desired, students may also purchase the associated Student Solution Manual.

Exams: All exams are administered in person either during class or in the Dixie State University Testing Center (located in the North Plaza Building). There will be three midterm exams and one comprehensive final exam. Exams are administered according to the following (tentative) schedule:

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|--------------|---|
| Midterm I: | 11:00 - 11:50 AM on Monday, 21 September 2015 |
| Midterm II: | 11:00 - 11:50 AM on Monday, 26 October 2015 |
| Midterm III: | 11:00 - 11:50 AM on Wednesday, 2 December 2015 |
| Final: | 11:00 AM - 1:00 PM on Wednesday, 16 December 2014 |

Make-up exams are given only in extenuating circumstances, and only if prior arrangements are made. The instructor reserves the right to make evaluations on a case-by-case basis.

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| Grading: | Homework | 15% | 94 – 100% | A |
| | Midterm I | 20% | 90 – 93% | A- |
| | Midterm II | 20% | 87 – 89% | B+ |
| | Midterm III | 20% | 83 – 86% | B |
| | Final | 25% | 80 – 82% | B- |
| | | | 75 – 79% | C+ |
| | | | 70 – 74% | C |
| | | | 65 – 69% | C- |
| | | | 60 – 64% | D+ |
| | | | 55 – 59% | D |
| | | | 50 – 54% | D- |
| | | 0 – 49% | F | |

Academic Integrity: Students are expected to uphold the highest standards of academic integrity. Section 4, Article XI of Dixie State University Policy #5-33 (located at <http://www.dixie.edu/humanres/policy/sec5/533.html>) outlines the standards of student academic conduct. While students are encouraged to collaborate on homework assignments, their submitted work should accurately reflect the results of their individual efforts. Students must do their own work during exams. Talking, having discussions, comparing papers, copying, and collaborating are not allowed on exams. The use of notes, unapproved calculators, and communication devices such as cell phones is also prohibited during exams. Academic dishonesty will result in the failure of written work and may lead to failure of the course and/or university disciplinary action.

Classroom Etiquette: Students are responsible for helping to maintain a respectful classroom learning environment. Academic discipline for instances of disruptive behavior are handled as stated in Dixie State University Policy #5-33 (located at <http://www.dixie.edu/humanres/policy/sec5/533.html>).

Title IX Statement: DSU seeks to provide an environment that is free of bias, discrimination, and harassment. Any member of the campus community who has been the victim of sexual harassment/misconduct/assault is encouraged to make a report to the university's Title IX Director, Cindy Cole. Students may call Cindy at (435) 652-7731 or send an email to cindy.cole@dixie.edu. Faculty members are required to notify the Title IX Director of the basic facts of any incident reported to them.

Accommodations: Any student seeking accommodations or services due to a disability must contact the Disability Resource Center (located in the North Plaza Building). Students may call the center at (435) 652-7516 or send an email to drc@dixie.edu. The Disability Resource Center determines eligibility for and authorizes the provision of accommodations and services. The center can arrange to provide materials (including this syllabus) in alternate formats if necessary.

Dmail: Important class and university information is sent to students' Dmail accounts. All Dixie State University students are automatically assigned a Dmail account. Students are responsible for knowing the information sent to their Dmail accounts.

Class Schedule: The Dixie State University Fall 2015 Semester Schedule is located online at <http://new.dixie.edu/reg/?page=fall2015>. The (tentative) schedule for the class is as follows:

| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY |
|---|-------------|-------------------|--|--|
| August 24 11.1 | 25 | 26 11.1 & 11.2 | 27 | 28 11.2 |
| 31 11.5 | September 1 | 2 11.3 | 3 | 4 11.4 |
| 7 <i>Labor Day No Class</i> | 8 | 9 11.5 & 11.6 | 10 | 11 11.6 |
| 14 11.7 | 15 | 16 11.8 | 17 | 18 Review |
| 21 Midterm I (Chapter 11) | 22 | 23 12.1 | 24 | 25 12.2 |
| 28 12.3 | 29 | 30 12.3 & 12.4 | October 1 | 2 12.4 |
| 5 12.5 | 6 | 7 12.5 & 12.6 | 8 | 9 12.6 |
| 12 12.7 | 13 | 14 12.7 & 12.8 | 15 <i>Semester Break No Class</i> | 16 <i>Semester Break No Class</i> |
| 19 12.8 & 12.9 | 20 | 21 12.9 | 22 | 23 Review |

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|------------------------------------|------------|--|----------------------------------|----------------------------------|
| 26 | 27 | 28 | 29 | 30 |
| Midterm II (Chapter 12) | | 13.1 | | 13.1 & 13.2 |
| November 2 | 3 | 4 | 5 | 6 |
| 13.2 | | 13.3 | | 13.3 & 13.4 |
| 9 | 10 | 11 | 12 | 13 |
| 13.4 | | 13.5 | | 13.5 & 13.6 |
| 16 | 17 | 18 | 19 | 20 |
| 13.6 | | 13.7 | | 13.7 & 13.8 |
| 23 | 24 | 25 | 26 | 27 |
| 13.8 | | <i>Thanksgiving No Class</i> | <i>Thanksgiving No Class</i> | <i>Thanksgiving No Class</i> |
| 30 | December 1 | 2 | 3 | 4 |
| Review | | Midterm III (Chapter 13) | | Review |
| 7 | 8 | 9 | 10 | 11 |
| Review | | Review | | Review |
| 14 | 15 | 16 | 17 | 18 |
| | | Final Exam 11:00 AM - 1:00 PM | | |

Tentative Homework Schedule:

| Section | Homework Exercises |
|---------|--|
| 11.1 | 1, 2, 4, 6, 9, 12, 13, 19, 21, 35-40 |
| 11.2 | 1, 2, 5, 7, 11-19 (odds), 27-30, 32 |
| 11.3 | 1, 2, 4, 6, 11, 21, 23, 27, 29, 35, 39, 41, 51-63 (odds), 70, 71 |
| 11.4 | 1, 4, 11, 12, 17, 19, 23, 29, 31, 32, 33, 35, 36, 39, 40 |
| 11.5 | 1-19 (odds), 22, 24-34, 36-39, 45 |
| 11.6 | 1, 5, 7, 16, 21, 26, 27, 29, 32-34, 41, 47 |
| 11.7 | 1-9 (odds), 12, 15, 23, 27, 35, 36, 39, 43, 44, 47 |
| 11.8 | 5, 13, 15, 25, 31, 35, 36 |
| 12.1 | 1, 6, 10 |

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| 12.2 | 1, 3, 5, 9, 13, 17, 20, 23, 25, 30, 31 |
| 12.3 | 1, 3, 7, 13-31 (odds), 35, 41-49 (odds), 60 |
| 12.4 | 1-4, 9, 12, 21, 23, 27, 29, 32 |
| 12.5 | 1, 5, 9, 11, 12, 18, 20 |
| 12.6 | 1, 5, 6, 7, 10, 15 |
| 12.7 | 2, 3, 11, 12, 13-21 (odds), 22, 27, 28, 33, 40, 41 |
| 12.8 | 1-7, 9, 11, 17, 18, 21, 25, 31 |
| 12.9 | 1-7 (odds), 8, 9, 15-19 (odds), 23, 25 |
| 13.1 | 3, 7, 11-18, 23, 29-33 |
| 13.2 | 1-43 (odds) |
| 13.3 | 3-25 (odds), 31, 33 |
| 13.4 | 1-19 (odds) |
| 13.5 | 1-5 (odds), 9-12, 13-21 (odds) |
| 13.6 | 5-33 (odds), 37, 38 |
| 13.7 | 1-17 (odds) |
| 13.8 | 1-17 (odds) |