MATH 2443 Syllabus
Calculus and Analytic Geometry IV

Purpose of the Course
This course is designed as the fourth of four courses in the Calculus and Analytical Geometry sequence. Students will understand calculus and analytical geometry concepts through visualization, numerical, and graphical experimentation.

Course Description
Topics covered include:

- Functions of several variables, limits, partial derivatives, directional derivatives, and gradients;
- LaGrange multipliers, double and triple integrals, including polar and spherical coordinates;
- Vector fields, line integrals, curl and divergence;
- Stokes' Theorem;
- Green's Theorem;
- The Fundamental Theorem of Calculus for Line Integrals.

Course Objectives
Upon completion of this course, students will be able to do the following:

1. Solve problems involving functions of several variables.
2. Calculate partial derivatives.
3. Calculate double and triple integrals.
4. Describe and find vector fields and line integrals.
5. Explain Stokes' theorem, Green's theorem, the divergence theorem, and the Fundamental Theorem of Calculus for line integrals.

Required Text and Materials
Enhanced WebAssign. A code must be purchased to gain access to course materials.

You will find the course code inside the course in Canvas.

This code only allows you into the course. You will lose access to the materials within 30 days unless you get an access code for the textbook and resources.

You will need to purchase an access code for your WebAssign course. To purchase your access code, you will need to log into WebAssign and enter your course code and then purchase the textbook access code once you access the course. You want to purchase the LIFETIME OF EDITION version, which will allow you to have access to the text for all the WebAssign courses that use the text.

The last item required for this course is a graphing utility. The most convenient graphing utility is a graphing calculator, such as the TI-84 or TI-86. Note that you may use a graphing calculator on your
exams, but it cannot have the ability to perform symbolic manipulation (TI-89 and higher are not allowed).

You will need access to a computer equipped with high-speed internet access and a program that opens and reads PDF files.

Optional Materials


*Note*: The text is included in its entirety (same page references, etc.) and viewable inside a web browser from your Enhanced WebAssign account. Since you have the textbook in electronic form, you do not need to purchase the textbook in physical form unless you specifically choose to.


Prerequisites

MATH 2433 at OU or equivalent.

Lesson Assignments

To start a lesson, begin with reading the corresponding section(s) from the textbook. The contents of each lesson can be found on the following page. The reading can be done from the physical text or from the eBook via your Enhanced WebAssign (EWA) account. **This is the most important part of this course.** Skimming through the pages will not suffice. It is imperative that you read every word and understand every word. Often, when there is a paragraph with a long equation stuck in the middle of it, people tend to skip over the equation. Even I catch myself doing this, and I love math! Force yourself to read each equation through slowly. In between textbook readings, you should view the PowerPoint file for the lesson, also accessible from your EWA account. These are notes written to accompany (not replace) the text.

Remember that you aren't expected to understand everything the first time you see it. It is normal to have to read some things two or three times before it starts making sense. Don't worry if you have to read something five or six times. Moreover, don't despair if one concept, like epsilon-delta proofs, never gels. The effort you put forth now will be fruitful eventually.

Homework

The homework is assigned on the Enhanced WebAssign (EWA) platform, which you access through the Canvas page for the course. If you have not used an online course management system before, it may take a little bit of time before you feel comfortable with the interface. Try to be patient. EWA contains a variety of resources for you, and you should take advantage of them (or at least try them out). These include links to the textbook, multimedia content such as instructional video clips, tutorial exercises, plus helps and hints. You can work the problems multiple times, so it is possible to get 100% on every HW by being persistent.
About the Grading

Exams
There are three exams for this course. Exam 1 covers Lessons 1–8, Exam 2 covers Lessons 9–16, and Exam 3 covers Lessons 17–24. All exams are done on paper so that you can show your work.

Course Grade
Your grade will be calculated by two different methods, and the higher of the two results will determine your course grade.

• Method #1: Average your three exam scores, weighting each equally.
• Method #2: Weight each exam 30% and weight your homework average 10%.

The first method allows students to be selective about working homework in a way that is useful to them without being penalized for not doing assigned problems over topics that they may already have mastered. The second method deals with borderline grades, as a strong homework score can raise your score to the next letter grade if your exam average doesn't quite get you there.

Problems or Questions
If you have course content-related questions, please email your instructor. If something isn’t working right in Canvas, email cidldev@ou.edu with a description of the problem and the course you are in.

Academic Integrity
As a student taking a course at the University of Oklahoma, you are expected to uphold the academic integrity code. Please visit the Academic Integrity website at http://www.ou.edu/integrity and familiarize yourself with the standards you will be held to while taking your course.

Religious Observance
It is the policy of the University to excuse the absences of students that result from religious observances and to reschedule examinations and additional required classwork that may fall on religious holidays without penalty.

Reasonable Accommodation Policy
Students requiring academic accommodation should contact the Accessibility and Disability Resource Center for assistance at (405) 325-3852 or TDD: (405) 325-4173. For more information, please see the Accessibility and Disability Resource Center website at http://www.ou.edu/drc. Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact the instructor personally as soon as possible to discuss accommodations necessary to ensure full participation and facilitate educational opportunities.

Adjustments for Pregnancy-Related and Childbirth-Related Issues
Should you need modifications or adjustments to your course requirements because of documented pregnancy-related or childbirth-related issues, please contact me as soon as possible to discuss. Generally, modifications will be made where medically necessary and similar in scope to
accommodations based on temporary disability. Please visit the Institutional Equity Office website at http://www.ou.edu/eoo/faqs/pregnancy-faqs for commonly asked questions.

Title IX Resources and Reporting Requirement
For any concerns regarding gender-based discrimination, sexual harassment, sexual misconduct, stalking, or intimate partner violence, the University offers a variety of resources, including advocates on call 24/7, counseling services, mutual no-contact orders, scheduling adjustments, and disciplinary sanctions against perpetrators. Please contact the Sexual Misconduct Office at 405-325-2215 (8 to 5, M–F) or OU Advocates at 405-615-0013 (24/7) to learn more or to report an incident. In addition, please be advised that a professor/GA/TA is required to report instances of sexual harassment, sexual assault, or discrimination to the Sexual Misconduct Office. For more information, please visit the Institutional Equity Office website at http://www.ou.edu/eoo/.
Course Plan for MATH 2443

Lesson 1
1. Review Section 12.1: Three-Dimensional Coordinate System and read Section 14.1: Functions of Several Variables in your *Calculus* text.
2. View Lesson 1 PowerPoint
3. Complete MATH 2443 Lesson 1 Assignment

Lesson 2
1. Read Section 14.2: Limits and Continuity in your *Calculus* text.
2. View Lesson 2 PowerPoint
3. Complete MATH 2443 Lesson 2 Assignment

Lesson 3
1. Read Section 14.3: Partial Derivatives in your *Calculus* text.
2. View Lesson 3 PowerPoint
3. Complete MATH 2443 Lesson 3 Assignment

Lesson 4
1. Read Section 14.4: Tangent Planes and Linear Approximations in your *Calculus* text.
2. View Lesson 4 PowerPoint
3. Complete MATH 2443 Lesson 4 Assignment

Lesson 5
1. Read Section 14.5: The Chain Rule in your *Calculus* text.
2. View Lesson 5 PowerPoint
3. Complete MATH 2443 Lesson 5 Assignment

Lesson 6
1. Read Section 14.6: Directional Derivatives and the Gradient Vector in your *Calculus* text.
2. View Lesson 6 PowerPoint
3. Complete MATH 2443 Lesson 6 Assignment

Lesson 7
1. Read Section 14.7: Maximum and Minimum Values in your *Calculus* text.
2. View Lesson 7 PowerPoint
3. Complete MATH 2443 Lesson 7 Assignment
Lesson 8
1. Read Section 14.8: Lagrange Multipliers in your *Calculus* text.
2. View Lesson 8 PowerPoint
3. Complete MATH 2443 Lesson 8 Assignment

Exam 1
1. Schedule Exam 1
2. Take Exam 1 on paper

Lesson 9
1. Read Section 15.1: Double Integrals over Rectangles in your *Calculus* text.
2. View Lesson 9 PowerPoint
3. Complete MATH 2443 Lesson 9 Assignment

Lesson 10
1. Read Section 15.2: Iterated Integrals in your *Calculus* text.
2. View Lesson 10 PowerPoint
3. Complete MATH 2443 Lesson 10 Assignment

Lesson 11
1. Read Section 15.3: Curves Defined by Parametric Equations in your *Calculus* text.
2. View Lesson 11 PowerPoint
3. Complete MATH 2443 Lesson 11 Assignment

Lesson 12
1. Read Section 15.4: Double Integrals in Polar Coordinates in your *Calculus* text.
2. View Lesson 12 PowerPoint
3. Complete MATH 2443 Lesson 12 Assignment

Lesson 13
1. Read Section 15.3: Application of Double Integrals in your *Calculus* text.
2. View Lesson 13 PowerPoint
3. Complete MATH 2443 Lesson 13 Assignment

Lesson 14
1. Read Section 15.7: Triple Integrals in your *Calculus* text.
2. View Lesson 14 PowerPoint
3. Complete MATH 2443 Lesson 14 Assignment
Lesson 15
1. Read Section 15.8: Triple Integrals in Cylindrical Coordinates and Section 15.9: 8 Triple Integrals in Spherical Coordinates in your Calculus text.
2. View Lesson 15 PowerPoint
3. Complete MATH 2443 Lesson 15 Assignment

Lesson 16
1. Read Section 15.10: Change of Variables in Multiple Integrals in your Calculus text.
2. View Lesson 16 PowerPoint
3. Complete MATH 2443 Lesson 16 Assignment

Exam 2
1. Schedule Exam 2
2. Take Exam 2 on paper

Lesson 17
1. Read Section 16.1: Vector Fields in your Calculus text.
2. View Lesson 17 PowerPoint
3. Complete MATH 2443 Lesson 17 Assignment

Lesson 18
1. Read Section 16.2: Line Integrals in your Calculus text.
2. View Lesson 18 PowerPoint
3. Complete MATH 2443 Lesson 18 Assignment

Lesson 19
1. Read Section 16.3: The Fundamental Theorem for Line Integrals in your Calculus text.
2. View Lesson 19 PowerPoint
3. Complete MATH 2443 Lesson 19 Assignment

Lesson 20
1. Read Section 16.4: Green's Theorem in your Calculus text.
2. View Lesson 20 PowerPoint
3. Complete MATH 2443 Lesson 20 Assignment

Lesson 21
1. Read Section 16.5: Curl and Divergence in your Calculus text.
2. View Lesson 21 PowerPoint
3. Complete MATH 2443 Lesson 21 Assignment
Lesson 22
1. Read Section 16.6: Parametric Surfaces and Their Areas in your Calculus text.
2. View Lesson 22 PowerPoint
3. Complete MATH 2443 Lesson 22 Assignment

Lesson 23
1. Read Section 16.7: Surface Area of Vector Functions in your Calculus text.
2. View Lesson 23 PowerPoint
3. Complete MATH 2443 Lesson 23 Assignment

Lesson 24
1. Read Section 16.8: Stokes' Theorem and Section 16.9: The Divergence Theorem in your Calculus text.
2. View Lesson 24 PowerPoint
3. Complete MATH 2443 Lesson 24 Assignment

Exam 3
1. Schedule Exam 3
2. Take Exam 3 on paper