Master Course Syllabus

For additional course information, including prerequisites, corequisites, and course fees, please refer to the Catalog: https://catalog.uvu.edu/

Semester: Spring
Year: 2025
Course Prefix: MATH
Course and Section #: 2210-001
Course Title: Calculus 3
Credits: 4

Course Description

Includes vectors in 3-space, quadric surfaces, partial derivatives, gradient, Lagrange multipliers, multiple integrals, line integrals, Green's Theorem, surface integrals, the Divergence Theorem, and Stokes' Theorem.

Course Attributes

This course has the following attributes:
☐ General Education Requirements
☐ Global/Intercultural Graduation Requirements
☐ Writing Enriched Graduation Requirements
x Discipline Core Requirements in Program
x Elective Core Requirements in Program
☐ Open Elective
Other: *Click here to enter text.*

Instructor Information

Instructor Name: Dr. Wiktor Mogilski

Student Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Find dot and cross products of vectors, projections, equations of lines and planes in 3D-space, and graphs of quadric surfaces.
2. Compute the rectangular, cylindrical, and spherical coordinates of points in space, tangent vectors and tangent lines to curves in space, arc length, velocity, acceleration, and distance traveled of objects moving in space.
3. Find partial derivatives of functions of several variables, the gradient, directional derivative, and linear approximations.
4. Find critical points, extreme values, and saddle points of functions of two variables using methods such as the Second Partial Derivative Test, the Extreme Value Theorem, and Lagrange multipliers.
5. Compute double integrals in rectangular or polar coordinates or via change of variables.
6. Compute triple integrals in rectangular, cylindrical, or spherical coordinates or via change of variables.

7. Determine parametric representations of curves or surfaces with orientation and compute line and surface integrals of scalar functions and vector fields.
8. Find the curl and divergence of a vector field.
9. Apply the Fundamental Theorem of Line Integrals, Green's theorem, Stokes' theorem, and the Divergence theorem to compute appropriate double, triple, line, or surface integrals.

Course Materials and Texts

This course uses a free open source textbook from OpenStax. Here is the link: https://openstax.org/details/books/calculus-volume-3

Course Requirements

Calculator Policy

No calculators are allowed for quizzes or exams. Feel free to use calculators for homework problems, but I highly recommend you avoid doing so in preparation for the in-class assessments. Please keep in mind that you need to show any relevant work on written assignments to receive full credit.

Although it is important to know how to use a calculator, the emphasis in this course is not on calculator or computer use but rather on concepts and what you should be able to (reasonably) do by hand. You will be expected to carry out simple arithmetic, work with fractions and radicals, evaluate trigonometric functions at standard angles, etc., *without* the aid of a calculator.

Textbook Problems

I will never collect any of the problems you do out of the book, so it is entirely up to you to gauge whether or not you need to do more. Completing the suggested textbook practice problems and review quizzes is your personal responsibility. It is not always necessary to complete every practice problem to master the concepts of this course: you may do as many or as few as you feel helps you the most. However, to ensure your success in this and future math classes, it is to your benefit to complete all practice problems. Each module overview has a list of suggested textbook problems.

A good standard for judging what you need is this: if you seem to be understanding a group of problems really well and continue to get the correct answers (the answers to the odd problems are the end of the book), jump to the next group of problems. However, if you complete all of the odd problems and still feel like you need more practice in that problem group, start working the evens.

Homework Worksheets

For every week of covered topics there will be a posted homework worksheet on Canvas. There are 15 homework worksheets in total. You may either print them off or write down each problem on your own paper.

Each worksheet is worth 30 points. Your worksheets will be graded only for completeness. If you complete all four steps as directed in the **Homework Worksheet Instructions,** you will receive the full 30 points.

These worksheets are the only homework that I will collect and grade. You will have one week to complete each worksheet. Each worksheet will contain problems similar to ones that might appear on an exam as well as some more challenging problems. I will also post the solutions key to the worksheet on Canvas. Homework must be done exactly as explained in the **Homework Worksheet Instructions**.

Participation

You are required to engage in a number of discussions throughout the course for participation points. Please read through the instructions and description of each type of discussion on the **Participation Instructions** page.

You will earn 5 participation points for each week you post a reply in the appropriate discussion room.

Exams

There will be a total of four exams, the last being partially cumulative. No notes or textbooks are allowed on exams. No exam scores will be dropped and make-up exams are only allowed with an instructor approved excuse.

Midterm exams will be taken on Canvas using Proctorio. No midterm scores will be dropped. Make-up exams are allowed only with an instructor-approved excuse. Instructions for exams are found on the **Exam Instructions** page.

The final exam for this course is in person and takes place on **Monday, April 28, 9:00am-10:50am**. Failure to take the final exam will result in a grade of UW or E (based on last date of attendance) for the course, regardless of other grades. It is University policy that no one be permitted to take a final exam early.

Exam Grading

Your work will be graded for clarity of presentation, neatness, and accuracy. **Correct answers without justification earn no credit, unless otherwise indicated.** All work required to solve a problem must be shown. Partial credit will be given when substantive progress towards the solution is detected. If you feel your paper was graded incorrectly, point it out to the instructor the day your exam is returned to you.

Grade Scale

A = 100-93	B - = 82-80	D+ = 69-67
A - = 92-90	C+ = 79-77	D = 66-63
B+ = 89-87	C = 76-73	D - = 62-60
B = 86-83	C - = 72-70	F = 59-0

Grade Breakdown

Your grade for this class will consist of the following:

- Written Homework: 15%
- Participation: 5%
- Midterms (total of 3): 57%

- Final Exam: 23%

Required or Recommended Reading Assignments
All textbook chapters.

General Description of the Subject Matter of Each Lecture or Discussion

Week	Topics
Week 1	Three-Dimensional Coordinate Systems Vectors The Dot Product
Week 2	The Cross Product Equations of Lines and Planes Cylinders and Quadric Surfaces
Week 3	No Class Monday (Holiday) Vector Functions and Space Curves Derivatives and Integrals of Vector Functions
Week 4	Arc Length and Curvature Motion in Space EXAM 1: Modules 1-4
Week 5	Functions of Several Variables Limits and Continuity
Week 6	Partial Derivatives Tangent Planes and Linear Approximation The Chain Rule
Week 7	No Class Monday (Holiday) Directional Derivatives and the Gradient Vector Minimum and Maximum Values
Week 8	The Extreme Value Theorem Lagrange Multipliers

Week	Topics
Week 9	EXAM 2: Modules 5-8 Double Integrals Over Rectangles Double Integrals Over General Regions Double Integrals in Polar Coordinates
Week 10	Spring Break!
Week 11	Triple Integrals Triple Integrals in Cylindrical Coordinates Triple Integrals in Spherical Coordinates
Week 12	Transformations Change of Variables EXAM 3: Modules 9-11
Week 13	Vector Fields Curl and Divergence Line Integrals Line Integrals of Vector Fields
Week 14	The Fundamental Theorem of Line Integrals Finding Potential Functions Independence of Path Green's Theorem Interpreting Curl
Week 15	Parametric Surfaces Surface Area Surface Integrals Surface Integrals of Vector Fields
Week 16	Stokes' Theorem The Divergence Theorem

Week	Topics
	Interpreting Divergence
Week 17	FINAL EXAM: Modules 1-15 IN PERSON Monday, April 28, 9:00-10:50am

Required Course Syllabus Statements

Generative AI
This course requires you to complete assignments that assess your understanding, application, and problem-solving ability applied to chemistry. You are expected to do your own work. Problem solving and scientific thinking are tools that are necessary for students to learn in this course. The use of artificial intelligence (AI) tools, such as chatbots, text generators, paraphrasers, summarizers, or solvers, is strictly prohibited for any part of your assignments. Using these tools will be considered academic dishonesty and will be handled according to the university's academic honesty policy. If you have questions about acceptable use of AI tools, please consult the instructor before submitting your work.

Using Remote Testing Software
☐ This course does not use remote testing software.

x This course uses remote testing software. Remote test-takers may choose their remote testing locations. Please note, however, that the testing software used for this may conduct a brief scan of remote test-takers' immediate surroundings, may require use of a webcam while taking an exam, may require the microphone be on while taking an exam, or may require other practices to confirm academic honesty. Test-takers therefore shall have no expectation of privacy in their test-taking location during, or immediately preceding, remote testing. If a student strongly objects to using test-taking software, the student should contact the instructor at the beginning of the semester to determine whether alternative testing arrangements are feasible. Alternatives are not guaranteed.

Required University Syllabus Statements

Accommodations/Students with Disabilities
Students needing accommodations due to a permanent or temporary disability, pregnancy or pregnancy-related conditions may contact UVU Accessibility Services at accessibilityservices@uvu.edu or 801-863-8747.

Accessibility Services is located on the Orem Campus in BA 110.

Deaf/Hard of Hearing students requesting ASL interpreters or transcribers can contact Accessibility Services to set up accommodations. Deaf/Hard of Hearing services can be contacted at DHHservices@uvu.edu

DHH is located on the Orem Campus in BA 112.

Academic Integrity
At Utah Valley University, faculty and students operate in an atmosphere of mutual trust. Maintaining an atmosphere of academic integrity allows for free exchange of ideas and enables all members of the community to achieve their highest potential. Our goal is to foster an intellectual atmosphere that produces scholars of integrity and imaginative thought. In all academic work, the ideas and contributions of others must be appropriately acknowledged and UVU students are expected to produce their own original academic work.

Faculty and students share the responsibility of ensuring the honesty and fairness of the intellectual environment at UVU. Students have a responsibility to promote academic integrity at the university by not participating in or facilitating others' participation in any act of academic dishonesty. As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, assessments, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Likewise, instructors are responsible to clearly state expectations and model best practices.

Further information on what constitutes academic dishonesty is detailed in UVU Policy 541: *Student Code of Conduct*.

Equity and Title IX
Utah Valley University does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, age (40 and over), disability, veteran status, pregnancy, childbirth, or pregnancy-related conditions, citizenship, genetic information, or other basis protected by applicable law, including Title IX and 34 C.F.R. Part 106, in employment, treatment, admission, access to educational programs and activities, or other University benefits or services. Inquiries about nondiscrimination at UVU may be directed to the U.S. Department of Education's Office for Civil Rights or UVU's Title IX Coordinator at 801-863-7999 – TitleIX@uvu.edu – 800 W University Pkwy, Orem, 84058, Suite BA 203.

Religious Accommodation
UVU values and acknowledges the array of worldviews, faiths, and religions represented in our student body, and as such provides supportive accommodations for students. Religious belief or conscience broadly includes religious, non-religious, theistic, or non-theistic moral or ethical beliefs as well as participation in religious holidays, observances, or activities. Accommodations may include scheduling or due-date modifications or make-up assignments for missed class work.
To seek a religious accommodation, a student must provide written notice to the instructor and the Director of Accessibility Services at accessibilityservices@uvu.edu. If the accommodation relates to a scheduling conflict, the notice should include the date, time, and brief description of the difficulty posed by the conflict. Such requests should be made as soon as the student is aware of the prospective scheduling conflict.

While religious expression is welcome throughout campus, UVU also has a specially dedicated space for meditation, prayer, reflection, or other forms of religious expression.