



Math 241: Calculus III

Offered through **NetMath**[®]

Academic Year 2026-2027 Term, 16-week course

Instructor Information

Instructor – Dr. Stefanie Klajbor-Goderich

- Office hours are by appointment, scheduling link on Campuswire

Course Information

Credit Hours

4 credit hours

Course Description

This is a third course in Calculus and Analytical Geometry. Topics for this course include vector analysis, Euclidean space, partial differentiation, multiple integrals, line and surface integrals, and the integral theorems of vector calculus.

Prerequisite

MATH 231

Course Objectives:

1. Develop competency working with vectors in Euclidean space, parametrizations, and calculus for parametrized curves.
2. Build familiarity working with multi-variable functions, partial differentiation, directional derivatives, gradients, multiple variable integration, change of coordinates, calculus-based optimization, and other aspects of multivariable calculus for functions.
3. Compute and understand the meaning of line integrals and surface integrals, as well as the computation and interpretation of the related concepts of work and flux.
4. Understand and apply the integral vector theorems (Green's, Stokes', and Divergence Theorem).

Course Content:

1. **Euclidean 3-space and vector geometry:** Cartesian coordinates, vector basics, dot product, projections, orthogonal complements, cross product, scalar triple product.
2. **Calculus of curves:** Vector-valued functions, curve parametrizations, differentiating and integrating vector-valued functions and curve parametrizations, arclength, curvature, torsion, Frenet TNB frame, motion in space.
3. **Intro functions of several variables:** Basics of functions of several variables, level sets, contour plots, limits, continuity, partial derivatives, tangent planes, linear approximations, chain rule, directional derivatives, gradient vector, tangent planes for level surfaces.
4. **Basic multivariable optimization:** Local max/min, saddle points, absolute max/min, unconstrained optimization, 2nd derivative test, Extreme Value Theorem, constrained optimization, Lagrange multipliers.
5. **Double/triple integrals and change of coordinates:** Double integrals over rectangular regions, double integrals over non-rectangular regions, double integrals in polar coordinates, applications of double integrals: volume, mass, centroids, triple Integrals, triple integrals in cylindrical coordinates, triple integrals in spherical coordinates, change of variables in multiple integrals.
6. **Line integrals:** Line integrals of scalar-valued functions, vector fields, vector field integrals along curves: work, vector field integrals across curves: flux.
7. **Gradient vector fields:** Gradient vector fields definition and criteria, fundamental Theorem of Line Integrals (FTLI), path independence, gradient test, finding potential functions.
8. **Green's Theorem and Planar Divergence Theorem:** Local rotation of a vector field, Green's Theorem, divergence, Divergence Theorem in the plane.

9. **Surfaces and surface integrals:** Surface parametrizations, surface integrals of scalar-valued functions, surface area, surface integrals of vector fields.
10. **Stokes' Theorem and Divergence Theorem:** Curl, Stokes' Theorem, divergence, Divergence Theorem.

Course Structure:

This course is fully online and asynchronous. Students have 16 weeks from their course start date to complete the course. The course is self-paced, and students may complete their coursework prior to the assigned end date. However, students are encouraged to follow the guided structure provided by the instructor with suggested deadlines for assignments and exams. As this is a 4-credit hour course, students are expected to dedicate 12 hours per week to learning course content.

The course is divided into three parts with a weekly structure. Each part ends with an exam. Despite the weekly structure, the course is self-paced. This means you can complete the course at your own pace. However, you are strongly encouraged to stay as close as possible to this schedule to maintain a reasonable workload.

Weekly Tasks: Each week, follow the course schedule to complete the readings from Stewart, watch the videos, and complete the homework set.

Together, the readings, videos, and homework are designed to cover all essential concepts.

You can also look ahead at the review problems found in the exam week info pages and work on these as you go through each part's content.

A detailed schedule spreadsheet is available on the Canvas home page.

Exams:

Information	Exam 1	Exam 2	Final Exam
Coverage:	Weeks 1-6	Weeks 8-12	Comprehensive
Time Limit	90 Minutes + 30 minutes for access/upload	90 Minutes + 30 minutes for access/upload	2 Hours + 30 minutes for access/upload

All exams will be administered online, free of charge to students. Exams are administered using ProctorU Record+. [More information on taking exams.](#)

Calculators, AI assistants, computational software, or similar are not permitted or required for NetMath exams.

The use of outside sources is prohibited.

Refer to the Academic Integrity policies below in the syllabus for more details.

Scratch paper is allowed during exams.

Exams must be taken in course order, and students should not take more than 1 exam within a 24-hour period.

Instructions for taking exams and more details on the exam policies can be found in the Orientation in Canvas.

Grading:

Grading Breakdown:

Component	Weight
Homework Sets	20%
Exam 1	25%
Exam 2	25%
Final Exam	30%

Letter Grade Scale:

Percentage	Letter Grade
97 - 100	A+
93 - 96	A
90 - 92	A-
87 - 89	B+
83 - 86	B
80 - 82	B-
77 - 79	C+
73 - 76	C
70 - 72	C-
67 - 69	D+
63 - 66	D
60 - 62	D-
59 and below	F

Final grades are rounded to the nearest integer before applying the scale above.

Grades are not curved.

Once you complete your exam, you will receive a 0 on any homework leading up to that exam that has not been submitted. Under special circumstances, students may request that they be allowed to submit these assignments. This is left to the discretion of the course instructor.

Students are encouraged to follow the guided deadlines in their course. However, as our courses are self-paced, students may occasionally submit several assignments in a short period of time. Please note that instructors are only expected to grade one exam per five-business-day week, and instructors are only expected to grade up to two submitted assignments per five-business-day week. Under special circumstances, students may request that additional assignments be graded. This is left to the discretion of the course instructor.

Due to the rolling enrollment structure of the NetMath program, instructor workloads vary throughout the year. During peak periods, response times and grading turnaround may be longer than usual. Students should expect significant delays in grading and instructor responses between June and August.

Communication:

Students are encouraged to reach out to the instructor via Campuswire. The link and join code can be found in the Orientation in Canvas.

Office hours are held via Zoom by appointment, and the scheduling link can be found on Campuswire.

If you experience consistent and significant delays in reaching your instructor, please contact instruction@netmath.illinois.edu with your concerns.

If you have non-course specific questions, you may reach out to the NetMath office. It is recommended to [review the NetMath website](#) first as it often has the answers you need.

General Inquiries: netmath@illinois.edu

Proctoring Questions: proctor@netmath.illinois.edu

Technology Questions: tech-staff@netmath.illinois.edu

Main Office Phone: [\(217\) 265-0439](tel:(217)265-0439)

Phone hours: Monday - Friday, 9am - 12pm & 1pm - 4pm CST

Textbook:

Main Required Textbook: Stewart, James, et al. *Calculus: Early Transcendentals*. 9th ed., Cengage Learning, 2020.

WebAssign: Purchase of the ebook and WebAssign access is required for the homework sets.

Details for obtaining access to the textbook and WebAssign can be found in the Orientation in Canvas.

Optional Secondary Reference:

Lax, Peter D., and Maria Shea Terrell. *Multivariable Calculus with Applications*. Springer, 2017.

Important: This optional textbook does NOT replace the main textbook. You still need access to Stewart and WebAssign. As a UIUC student, a free PDF of the secondary reference is available via SpringerLink through the university library:
<https://www.library.illinois.edu/>

Technical Requirements:

Students are expected to have a device with an up-to-date operating system to access their course materials, reliable internet access, and must meet the requirements set by ProctorU for exam proctoring. [NetMath IT - Frequently Asked Questions](#).

Other Information:

Course content is drawn from Vector Calculus written by Bill Davis, Horacio Porta and Jerry Uhl ©2006-2010.Policies:

Accommodations:

The University of Illinois Champaign-Urbana, is committed to ensuring that all students, including students with disabilities, do not experience barriers to learning and participating fully in class. Students who have a letter of accommodation from DRES are advised to share that with their instructor and NetMath staff at instruction@netmath.illinois.edu as soon as possible to ensure accommodation needs can be discussed and met.

Students enrolled in a degree program at another institution may refer to their home institution's student services or disability office for accommodations. Current, non-expired documentation from other institutions listing the specifics of an accommodation is acceptable and should be sent to instruction@netmath.illinois.edu.

To obtain disability-related academic accommodations, disabled students must contact Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, please visit 1207 S. Oak Street, Champaign, call [\(217\) 333-1970](tel:(217)333-1970), email disability@illinois.edu, or [visit the DRES website](#).

Academic Integrity:

The University of Illinois Urbana-Champaign [Student Code](#) (<https://studentcode.illinois.edu/>) should also be considered as a part of this syllabus. Students should pay particular attention to Article 1, Part 4: Academic Integrity.

Academic dishonesty may result in a failing grade. Every student is expected to review and abide by the [Academic Integrity Policy](https://studentcode.illinois.edu/article1/part4/1-401/) (<https://studentcode.illinois.edu/article1/part4/1-401/>). Ignorance is not an excuse for any academic dishonesty. It is your responsibility to read this policy to avoid any misunderstanding. Do not hesitate to ask the instructor(s) if you are ever in doubt about what constitutes plagiarism, cheating, or any other breach of academic integrity.

AI Large Language Models (such as ChatGPT, Claude, Gemini, etc.) are prohibited during exams. Using these during the exam will be considered a violation of academic integrity and may incur sanctions as outlined in the Illinois Student Code. Students should be aware the exam proctoring process involves screen recording of the computer. While AI will not be strictly prohibited for homework as they can be useful tools for studying and brainstorming, students are strongly encouraged to work on the homework themselves or collaborate with peers when appropriate. Students are required to submit their own work and answers. This improves learning outcomes and best prepares students for exams. Homework is designed to help students understand the content and develop skills. Students may be unprepared for exams if there is heavy reliance on AI.

Students are expected to follow the [University guidance on intellectual property](#). Students are not to share course content outside of the course.

Campus Holidays:

Instructors are expected to respond to student communications and grade homework assignments in a timely manner. Observed Campus Holidays, illness, personal obligations, or other circumstances outside the instructor's control may affect normal grading and response time. If you experience consistent and significant delays, please contact instruction@netmath.illinois.edu with your concerns.

Extensions:

Students in this course are eligible for up to two 1-month course extensions. There is a non-refundable \$350 fee for each approved extension. [Students should review the extension guidelines for more information.](#)

FERPA:

See [FERPA – Office of the Registrar](https://registrar.illinois.edu/academic-records/ferpa/) (<https://registrar.illinois.edu/academic-records/ferpa/>) for more information on the Family Educational Rights and Privacy Act (FERPA).

Any student who has suppressed their directory information pursuant to FERPA should self-identify to the instructor to ensure protection of the privacy of their attendance in this course.

Mental Health:

Significant stress, mood changes, excessive worry, substance/alcohol misuse or interferences in eating or sleep can have an impact on academic performance, social development, and emotional wellbeing. The University of Illinois offers a variety of confidential services including individual and group counseling, crisis intervention, psychiatric services, and specialized screenings which are covered through the Health Service Fee. If you or someone you know experiences any of the above mental health concerns, it is strongly encouraged to contact or visit any of the University's resources provided below. Getting help is a smart and courageous thing to do for yourself and for those who care about you.

[Counseling Center](#) or [\(217\) 333-3704](#)

[McKinley Health Center](#) or [\(217\) 333-2700](#)

[National Suicide Prevention Lifeline](#) or [\(800\) 273-8255](#)

[Rosecrance Crisis Line](#) or [\(217\) 359-4141](#) (available 24/7, 365 days a year)

If you are in immediate danger, call [911](#).

*This statement is approved by the [University of Illinois Counseling Center](#)

Sexual Misconduct Reporting Obligation:

The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX Office. In turn, an individual with the [Title IX Office](#) will provide information about rights and options, including supportive measures, resources, the campus disciplinary process, and law enforcement options.

[Designated Confidential Employees](#): A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality.

Other information about [resources and incident reporting](#).