

UNIVERSITY OF DELAWARE
DEPARTMENT OF MATHEMATICAL SCIENCES

MATH 243-012 – Analytic Geometry and Calculus C, Fall 2025

updated: Sep 19, 2025

General Course Information

Instructor: **Arnab Roy**

Office : **328 Ewing Hall**

Office Hours : **M(12:45-1:45 PM), F(12:45-1:45 PM) or by appointment**

Email : **arnabroy@udel.edu** (the best way to reach me)

(Note: **Please provide your name and discussion number with every email message.** As my schedule permits, I may respond to course questions by email. Please send the text of the problem with your work on the solution in the body of the email or in a picture attachment. Please allow me up to 48 hours for the response. I will try my best to respond as soon as possible.)

Teaching Assistants:

Steppan Konoplev

Office : Ewing 212

Office Hours : 1:45-3:15 Tuesday or 1:15-2:15 Thursday

Email : euler@udel.edu

Lecture Section 012 Meets: MWF 11:30 AM – 12:25 PM in Kirkbride Hall 100 (KRB100)

Discussion sections meet:

040D: Tuesday 12:45 PM – 1:40 PM in Purnell Hall 236

041D: Thursday 2:20 PM – 3:15 PM in Ewing Hall 210

042D: Thursday 3:55 PM – 4:50 PM in Purnell Hall 229

Please remember that you are not alone in learning the material of this course. We, the instructor and the TAs will be always happy to guide you, to help you, to appreciate your efforts along the way, and to listen to your suggestions.

Course Description: Vectors, operations on vectors, velocity and acceleration, partial derivatives, directional derivatives, optimization of functions of two or more variables, integration over two and three-dimensional regions, line integrals, Green's Theorem, surface integrals, the Divergence theorem. Includes use of computers to perform symbolic, numerical and graphical analysis.

PREREQ: MATH242. **Credit Hours:** Four.

Text and Materials Required:

1. **A version of “Calculus – Early Transcendentals”, by J. Stewart, D. Clegg, S. Watson, the 9th edition.** The bookstore has **“241/242/243 MATH PRINT UPGRADE”**, ISBN: 2818440155710. If you prefer all information in electronic format, WebAssign includes the e-book.
2. **WebAssign** – the online homework system for assigning and grading homework problems. You get access to an e-book version of the textbook through WebAssign. The bookstore has **“243 MATH DIGITAL DELIVERY”**, ISBN 2818440156823, which includes the access to WebAssign and the e-book for the price of \$6.26
"One or more of the materials required for this course are being automatically delivered to you in a digital format. The week following September 10th, you will receive a charge in the amount of \$6.26 on your University account to cover the cost of these materials."
The WebAssign is linked to Canvas, but you still need to register. Watch this:
<https://startstrong.cengage.com/webassign-canvas-ia-yes/>
Note: *Please remember to use your official UD email account when you sign up.*

Course Tools:

- A computer, tablet or smartphone.
- Download the apps for **WebAssign, Canvas, Zoom, Genius Scan.**
- For Zoom, and Poll Everywhere, **sign in** with the SSO “udel” and register for the class meetings.
- For WebAssign, you may use the sign in credentials from MATH 242.

Canvas Webpage: In this class, Canvas, UD's online learning management system, will be used for all course activities and communication channels.

I will use **Canvas@UD** to post the plan for the week, announcements, assignments, resources, reviews and grades. The content is structured in Modules that are to be covered in order. You may access Canvas using your UDeNet ID at <https://udel.instructure.com/> Canvas can also be accessed via [MyUD](#).

Canvas is now the primary point of engagement for our class and you should expect to log in to the site a few times a week to access the weekly modules, and to check for new content, assignments, and discussions. **Please ensure that you have notifications set up so that you receive an email every time there is an announcement posted.** This will help ensure that everyone has the most up-to-date information about our class. Information on how to use Canvas is available through the [Canvas Student Guide](#). You may also download the Canvas Student App on your mobile.

UDCapture: The lectures will be recorded so that you can review them later. The recording will capture what is projected as well as any class discussion. The recording can be found in Canvas – Media Gallery.

Poll Everywhere: We will use this online polling platform to collect real-time responses from everyone attending class. Access to Poll Everywhere is possible by using any computer or mobile device with internet access. Poll Everywhere is a UD licensed tool and there is no cost to you to use this tool. Please read over the [UD student guide](#) that will demonstrate how to log in and how to respond to polls. As a reminder, the [UD academic honesty policy](#) applies to the use of educational technology tools such as Poll Everywhere.

Course Assessments and Activities

Exams	Day/Date	Start Time	Material	% course grade
Midterm 1	Monday, Sep 29, 2025	6.30 PM	12.1-6, 13.1-4	19%
Midterm 2	Monday, Nov 3, 2025	6.30 PM	14.1-8, 15.1-15.3, 15.6	19%
Final Exam	Monday, Dec 15, 2025	7 – 9 PM	Cumulative	22%

Lecture Quizzes: There will be 4 announced lecture quizzes. The quiz questions will come from topics covered in lecture, recitation, and homework (WebAssign and the recommended list on the syllabus). The purpose of these quizzes is to encourage students to keep up with the course material before and between exams, and to better help students prepare for the paper and pencil format of the midterms and final exam. The lecture quizzes will be given by the instructor during the lecture and will take 30 minutes. Note that in the case of returning to the online class format, the lecture quizzes will be formatted to prepare students for the online exam format. The dates of the announced quizzes are listed below, and the material for each such quiz will be announced in class and on Canvas.

Tentative schedule of lecture quizzes (subject to change at any time):

Lecture Quiz 1: Friday, September 5, 2025.

Lecture Quiz 2: Friday, September 19, 2025.

Lecture Quiz 3: Friday, October 17, 2025.

Lecture Quiz 4: Friday, November 14, 2025.

Pop quizzes will be given during the lecture, the lab or the discussion as needed, so they will be unannounced – expect them to be given weekly. Some will be given on paper in class and some pop quizzes will be given through Poll Everywhere®. The purpose of these quizzes is to encourage students to keep up with the course material, to help students identify the important ideas and concept details, and to give points for participation in class.

Please check the score and the deducted points immediately after the graded paper was returned to students in class. You may appeal your grade by sending an email to your instructor at arnabroy@udel.edu in within a week from when the grade was posted on Canvas. No points will be given after that deadline.

Homework: A list of all recommended practice problems in the textbook is provided below. Homework done on paper will not be collected. The graded homework assignments will be delivered and graded online through WebAssign only. You may set the WebAssign account to send you reminders for when the homework is due, but the earliest notification time by WebAssign is 48 hours before the due date. Your assignments need more than 48 hours to be completed successfully, so please check Canvas often for all announcements.

Homework extension: an automatic extension of 24 hours has been set up on WebAssign. You can request it **once** after the due date. No extension will be given after that. Please refer to the

WebAssign instruction document and the WebAssign Student Support website for details on how to use WebAssign. The purpose of the online homework is to help you practice important aspects of the course material, to keep up with the pace of the course and to give you credit for some of your work. *Note:* The WebAssign homework assignments DO NOT cover all the material you need to know for this class. You need to do many of the other problems on the recommended homework list if aiming for a grade of A in this class.

Course Attendance Policy: Class attendance is recommended in all lectures, lab and discussion classes. I encourage you to attend every lecture, lab and discussion class. In the lecture, we introduce the concepts, prove important results, make theoretical connections among topics and present special cases and examples. The discussion class is designated for applications and reviewing homework type problems, taking quizzes and working on group assignments. In the lab, you will use the computers to perform symbolic, numerical and graphical analysis through Mathematica. In borderline cases, attendance will be taken into consideration. University Attendance Policies as outlined in the [2025-2026 Undergraduate Catalog](#) will be followed. [University Attendance Policies - University of Delaware - Modern Campus Catalog™](#)

“Absences on religious holidays not listed in University calendars, as well as absences due to athletic participation or other extracurricular activities in which students are official representatives of the University, shall be recognized as excused absences when the student informs the instructor **in writing during the first two weeks of the semester** of these planned absences for the semester. Absences due to similar events which could not have been anticipated earlier in the semester will be recognized as excused absences upon advance notification of the instructor by an appropriate faculty adviser or athletic coach.”

If you must be absent, you are still responsible for the work due. If you know that you will be absent ahead of time, let your instructor and your TA know, and make arrangements to get the work done in a timely manner. Excused absences must be confirmed in writing. For example, if serious illness, family emergencies, or other crises occur during the term, you should contact the Dean of your college (Arts and Sciences, Business, Engineering, etc.) as soon as possible, who can assist you in notifying faculty and in validating for your instructors what has happened. If you have more than a few unexcused absences, I will meet with you to discuss the situation.

Students who enroll in the class at the end of the drop/add period are responsible for the missed work. No grade will be associated with attendance, but completion of some assessments depends on being physically present in class.

Make-ups: *No make-up exams, quizzes, homework, or class work assignments will be given without university excuse. Instead, we will drop one lecture quiz out of the four lecture quizzes, will grant extensions on homework, and give early submission extra points on homework.*

Grades: Grades are **not negotiable** and cannot be discussed through email. Final course grade will be calculated using the following components:

Course Component	Percentage of Total
WebAssign Homework	10
Written Homework	5
Midterm Exams (2 @19%)	38
Lecture Quizzes (4 @ 4%)	16
Final Exam (comprehensive, cumulative)	22
Pop Quizzes	5
Course Participation and Feedback	4

All quiz, lab and exam grades are to be posted on Canvas. The accuracy of the grade posted is the responsibility of each student. If any discrepancy is found, then please send an email notification to your instructor at arnabroy@udel.edu within 48 hours of the grade posting.

Grading Scale :

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
≥92 %	≥88 %	≥84 %	≥80 %	≥77 %	≥74 %	≥71 %	≥68 %	≥65 %	≥62 %	≥59 %	<59 %

Scholastic Dishonesty Policy: All University of Delaware Policies regarding ethics and honorable behavior apply to this course. Please see The Chapter on Academic Honesty of the Student Guide to University Policies: Code of Conduct on the web at <http://www.udel.edu/stuguide/25-26/code.html> **Cheating receives a failing grade.**

Accommodations for Students with Disabilities

Any student who may need accommodation based on a disability should contact the Office of Disability Support Services (DSS) office as soon as possible. For more information, please visit [Getting Registered at DSS](#). Contact DSS by phone: 302-831-4643; fax: 302-831-3261; website: www.udel.edu/dss; email: dssoffice@udel.edu; or visit 240 Academy Street, Alison Hall Suite 130 during business hours (8-5 M-F).

Suggested List of Textbook Problems from “Calculus – Early Transcendentals” by J. Stewart, 9th edition.

The following list of problems includes problems that address students’ needs for both mastering the calculus material and solving a variety of applied problems using several problem

solving techniques. The student aiming for an A grade in the course should master problems from all clusters in a homework set.

12.1	1-42, 44-46
12.2	1-13, 15-19, 21, 23-32, 35, 37-41, 43-45, 47
12.3	1-13,17,19,23,25,27,28,33,40, 41, 43,45,47-52
12.4	1-20, 27-29, 31, 33-39, 41, 43-45, 53
12.5	1-13,15,19-41, 45,48-51,53,57-59,61,63,65-69, 71,73,76-79
12.6	1-8, 11-14, 16-19, 21-34, 45, 46
Chapter 12 Concept Check	1-19
Chapter 12 True-False Quiz	1-22
Chapter 12 Review	1, 4-13, 17, 20, 23, 25

13.1	1-6, 9, 11-13, 17, 19, 21-32, 41-46, 49-50
13.2	3, 4, 8, 9, 13, 15, 18, 19, 21, 22, 24-28, 33-42
13.3	3-5, 7-9, 11, 13, 17, 19, 23, 24, 27, 29-33, 43, 47, 49, 50
13.4	3, 5, 8, 9, 11, 15, 17-21, 23, 25, 28, 31, 32, 37, 39, 41
Chapter 13 Concept check	1-8
Chapter 13 True-False	1-14
Chapter 13 Review	2, 6, 8, 9, 11, 12, 15, 17

14.1	9-22, 25, 27, 29, 30, 32-34, 36, 47, 49, 61-66
14.2	5-22, 29, 33
14.3	15-41, 47, 51-53, 56, 59, 63, 68, 73, 82, 83, 90
14.4	1-6, 11, 17
14.5	1-13, 15, 17, 18, 21-23, 25, 27-35, 39-43, 45, 50
14.6	5, 7-17, 19-26, 28-35, 41-46, 54-61, 63, 64a
14.7	1-5, 7, 11, 13, 25, 27, 30, 31, 33-36, 41, 43, 45, 46, 51-53
14.8	3, 9, 11-17, 19-21, 31, 34, 36, 39, 42, 43
Chapter 14 Concept check	1, 2, 4, 6, 7, 9, 11, 12, 14, 15, 16, 17
Chapter 14 True-False	1-4, 6, 7, 9
Chapter 14 Review	19, 22, 25, 28, 31, 35, 36, 43, 45, 46, 51

15.1	1a, 3, 9-43, 47
15.2	1-10, 13-32, 39-40, 45-57, 65, 68
15.3	1-6, 11, 13-27, 29-32
15.6	3-22, 27, 28, 31-38, 41
15.7	1-13, 17-25a, 29, 30
15.8	1-13, 15, 17-30, 35, 36, 41-43
Chapter 15 Concept Check	2, 3, 6, 9
Chapter 15 True-False	1-5, 7, 9
Chapter 15 Review	3-10, 17-40, 47, 48

16.1	1, 5-9, 11-18, 15, 21-24, 26
16.2	1-22, 29, 39-45
16.3	3-20, 23, 24, 29, 30, 35
16.4	1-14, 17, 18
16.5	1-20, 23-31
16.6	1-5, 13-26, 33-36, 39-49, 62
16.7	5-27
16.9	1-12, 17-19
Chapter 16 Concept Check	1-13, 15, 16
Chapter 16 True-False	1-7, 11, 12
Chapter 16 Review	2-18, 27-30, 34, 35

Student Mental Health & Wellbeing

In addition to impacting your overall well-being, diminished mental health can interfere with optimal academic performance. If this course is causing or contributing significant mental or emotional stress, then please reach out to me directly. However, problems with other parts of your life can also contribute to decreased academic performance. UD's Center for Counseling & Student Development (CCSD) provides cost-free and confidential mental health services to help you manage personal challenges that threaten your emotional or academic well-being. Remember, getting help is a smart and courageous thing to do -- for yourself and for those who care about you.

- Contact me
 - If you are struggling with this class, please check-in during office hours or contact me by email at arnabroy@udel.edu
- Check-in with your academic advisor
 - If you are struggling in multiple classes, unsure whether you are making the most of your time at UD, or unsure what academic resources are available at UD.
- UD's Center for Counseling & Student Development and UD Helpline
 - CCSD is open and available remotely, and 24/7 mental health support remains available on the UD Helpline at 302-831-1001 for any student in need of someone to talk to. Visit [CCSD's website](#) for additional information and resources.
- UD's Crisis Text Line
 - Text "UDTEXT" or "STEVE" at 741741 for students of color to connect with confidential text message support.
- Division of Student Life
 - Explore the Student Life's [Wellbeing webpage](#) for a comprehensive listing of well-being resources, activities and services available to all students.

UD Policies

The Safety of Our Learning Environment

Student learning can only occur when students and their instructors feel safe, respected, and supported by each other. To ensure that our learning environment is as safe as possible, you are expected to abide by the most up-to-date [University of Delaware's COVID-19 Guidelines](#). Also,

in our class, we will adhere to the practice of wearing face masks when showing symptoms that can make those around us believe that we are sick.

Academic Integrity

Please familiarize yourself with UD policies regarding academic dishonesty. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, to re-submit the same assignment for different classes, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither give nor receive unauthorized assistance. Complete details of the university's academic integrity policies and procedures can be found at sites.udel.edu/studentconduct/sgup/ Office of Student Conduct, 218 Hullihen Hall, (302) 831-2117. E-mail: student-conduct@udel.edu

Harassment and Discrimination

The University of Delaware works to promote an academic and work environment that is free from all forms of discrimination, including harassment and sexual misconduct. As a member of the community, your rights, resource and responsibilities are reflected in the Non-Discrimination, Sexual Misconduct, and Title IX policy. Please familiarize yourself with this policy at the [University's Office of Equity & Inclusion website](#). You can report any concerns to the University's Office of Equity & Inclusion, at 305 Hullihen Hall, (302) 831-8063 or you can report anonymously through UD Police (302) 831-2222 or the [EthicsPoint Compliance Hotline](#).

- Read the [full policy](#)
- [File a report](#)

Faculty Statement on Disclosures of Instances of Sexual Misconduct

If, at any time during this course, I happen to be made aware that a student may have been the victim of sexual misconduct (including sexual harassment, sexual violence, domestic/dating violence, or stalking), I am obligated by federal law to inform the university's Title IX Coordinator. The university needs to know information about such incidents to, not only offer resources, but to ensure a safe campus environment. The Title IX Coordinator will decide if the incident should be examined further. If such a situation is disclosed to me in class, in a paper assignment, or in office hours, I promise to protect your privacy--I will not disclose the incident to anyone but the Title IX Coordinator.

For more information on Sexual Misconduct policies, where to get help, and reporting information, please refer to www.udel.edu/sexualmisconduct. At UD, we provide 24/7/365 crisis assistance and victim advocacy and counseling. Contact 302-831-1001 to get in touch with a sexual offense support advocate, as well as confidential and anonymous counseling services for other concerns.

Non-Discrimination

The University of Delaware does not discriminate against any person on the basis of race, color, national origin, sex, gender identity or expression, sexual orientation, genetic information, marital status, disability, religion, age, veteran status or any other characteristic protected by applicable law in its employment, educational programs and activities, admissions policies, and scholarship and loan programs as required by Title IX of the Educational Amendments of 1972, the Americans with Disabilities Act of 1990, Section 504 of the Rehabilitation Act of 1973, Title VII of the Civil Rights Act of 1964, and other applicable statutes and University policies. The University of Delaware also prohibits unlawful harassment including sexual harassment and sexual violence.

For inquiries or complaints related to non-discrimination policies, please contact: Office of Equity & Inclusion- oei@udel.edu, 305 Hullihen Hall Newark, DE 19716 (302) 831-8063

For complaints related to Section 504 of the Rehabilitation Act of 1973 and/or the Americans with Disabilities Act, please contact: Office of Disability Support Services, dssoffice@udel.edu, Alison Hall, Suite 130, Newark, DE 19716 (302) 831-4643 OR contact the [U.S. Department of Education - Office for Civil Rights](#)

NOTICE: *The University of Delaware owns a non-exclusive right to faculty materials that will be given to you during the course. These materials include ideas and comments provided by the instructor during class; test questions; handouts and course materials; and other materials representing the copyright-protected intellectual property of the course instructors. You are prohibited from entering into relationships with websites such as Course Hero, Notehall, or similar sites under which you agree, in exchange for the payment of a fee or salary, to post these materials online.*

This syllabus is subject to change.

Academic Calendar Dates for Fall 2025

A complete academic calendar is available at:

<https://www1.udel.edu/registrar/cal/calendars/2025-2026.pdf>

Here are some important dates:

Day	Date	Description
Tuesday	Aug 26, 2025	Fall Semester starts
Monday	Sep 1, 2025	Labor Day Holiday
Tuesday	Sep 9, 2025	Last day to register or add class without fee; Last day to drop without W on transcript; Deadline for completion of incomplete work from Spring and Summer 2025 classes.
Sunday	Sep 22, 2025	Rosh Hoshanah begins at sundown, continues for 2 days
Wed - Thu	Oct 1-2, 2025	Yom Kippur begins at sundown, continues the following day

Friday	Oct 10, 2025	Mid-semester grades for Freshmen are due to UDSIS Re-Coop Day; Class suspended
Monday	Oct 20, 2025	Registration begins for Winter Session 2026
Monday	Nov 3, 2025	Registration begins for Spring Semester 2026
Monday	Nov 10, 2025	The last day to withdraw or change registration status without penalty
Friday	Nov 21, 2025	Thanksgiving break starts after last class (10 PM)
Mon – Fri	Nov 24-28, 2025	Classes suspended for Thanksgiving break
Monday	Dec 1, 2025	Classes resume following Thanksgiving break
Tuesday	Dec 9, 2025	Last day of classes
Wednesday	Dec 10, 2025	Reading Day
Thu-Mon	Dec 11-15, 2025	The Final Exam Days for Fall 2025
Thursday	Dec 18, 2025	Deadline for 2025 Fall semester grades to be posted to UDSIS