

MATH 2326 – 004 Calculus III

Fall 2018

Instructor: Q. Mark Adams, MD, MS, MBA, BS ChE
Office: Lecture room, COBA 243
Phone: Math Department, (817) 272-3261
Email address: qadams@uta.edu
Office hours: 8:20 – 9:20 PM, Monday and Wednesday
Classroom: COBA 243
Class schedule: Monday/Wednesday, 7:00 – 8:20 PM

Course Content: Introductory course on vector functions in two or three dimensions, functions of two or more variables, their partial derivatives and extrema, the chain rules, directional derivatives, multiple integration, line integrals, surface integrals, Green's theorem, Stokes' theorem and the Divergence theorem.

Student Learning Outcomes: Upon completion of MATH 2326:

1. Students will be able to use the concepts of continuity, differentiation and integration of vector-valued functions to determine unit tangent and unit normal vectors in the process of modeling objects in three dimensions.
2. Students will be able to parameterize piecewise-smooth curves using arc length, and compute the curvature of a space curve.
3. Students will be able to compute and sketch level curves and level surfaces for functions of several variables and sketch the graphs of functions of two variables. Analyzing limits, determining continuity and computing partial derivatives of multivariate functions is also expected. Students will be able to use tangent planes, directional derivatives, gradients, the second partials test and Lagrange multipliers to approximate and solve optimization problems.
4. Students will be able to demonstrate techniques of multiple integration and compute iterated integrals over rectangular regions, non-rectangular regions and in other coordinate systems. They will be able to apply multiple integrals in problem situations involving area, volume, surface area, center of mass, moments of inertia, etc.
5. Students will be able to compute line integrals and surface integrals by applying the Fundamental Theorem for Line Integrals, Green's Theorem, Stokes' Theorem and the Divergence Theorem. Applying these integrals to solve applications such as mass and work problems is also expected.

Required Textbook: Calculus: Early Transcendentals, 3rd Edition, by William Briggs, Lyle Cochran and Bernard Gillett, with MyLabsPlus access to homework.

Textbook and Materials:

This course is part of the UTA Mathematics Department Affordability Campaign, making state-

of-the-art online mathematics resources available to our students at the lowest possible price when compared to purchasing elsewhere. To receive the discounted price, purchase course materials through the UTA Bookstore. Search by course or use this site: <http://bit.ly/2tQ090S>

1. E-text and Direct Access (Required): Your course materials include the e-version of the course text as well as MyLab course access which is designed to enrich student success by providing instant feedback on your assignments plus on-demand access to personalized study plans, a multimedia library, practice tests, and more. The e-texts may be downloaded on multiple devices with long-term access for each student. Every student has trial access to MyLab course materials as soon as the course is available in Blackboard, so you can start working on your course even before you purchase the course materials! That said, students will need a verified purchase within the first two weeks of classes, otherwise, the access to your digital materials will freeze and your account will stay deactivated until the purchase is confirmed. During the purchasing process, please ensure you enter your name as shown on your UTA records along with your MAVS email address for proper processing.

2. Loose-leaf Textbook (Optional): You may choose to enhance your digital purchase and select a loose-leaf textbook for only \$25 from the bookstore. Full details are available in Blackboard. Calculus – Early Transcendentals, 3rd Ed., Briggs, Cochran, Gillett & Schulz, Pearson Ed. Inc., 2019. ISBN: 9780134770512

Optional Textbooks: Calculus Volume 3, Gilbert Strang et al. Available for free online. Calculus Volume 3 from OpenStax, ISBN 1938168070, www.openstax.org/details/calculus-volume-3. Another is by H. M. Schey “div grad curl and all that, an informal text on vector calculus”, 4th edition.

Major assignments and exams: Homework will be assigned periodically; there will be two in-class exams (midterms) and a departmental final exam. You will be required to bring a scantron (form 882-E) for multiple choice questions.

Grading Policy: Homework is worth 20%, each midterm exam is worth 25% and the final exam will have a weight of 30%. Course grades are assigned based on the following scale: F 0-59, D 60-69, C 70-79, B 80-89 and A 90-100. Other grades, such as W or X, will be assigned in accordance with the guidelines in the catalog.

Attendance Policy: Regular attendance is highly recommended.

Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

Expectations for Out-of-Class Study: Between lectures, you are expected to review your notes, go through the appropriate section(s) in the book, understand all relevant examples in the book and attempt all homework problems assigned for the section. Beyond the time required to attend each class meeting, students enrolled in this course who intend to earn a grade of C or higher should expect to spend at least an additional 12 focused hours each week of their own time in course-related activities, including reading required materials, completing assignments and preparing for exams.

Exam Make-up Policy: You will need a university valid excuse in order to have a make-up exam arranged for you.

Exam Calculator Policy: On the midterms and final, you will be allowed to use only the TI-30XA or TI-30XIIS. Calculators with data storage capacity, differentiation or integration keys are not permitted, and will be confiscated at the beginning of exams, no exceptions. Students caught with any electronic devices (lap top, watch, I-pad, cell phone) or a disallowed calculator will be considered as cheating, with resultant consequences.

Exam Picture ID Policy: You will be asked to present your UTA picture ID at all exams. Bring your UTA picture ID to all exams.

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. The last day to drop this semester is November 2, 2018 by 4:00 PM.

Students will not be automatically dropped for non-attendance. Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://www.uta.edu/aao/fao/>).

Disability Accommodations: UT Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including *The Americans with Disabilities Act (ADA)*, *The Americans with Disabilities Amendments Act (ADAA)* and *Section 504 of the Rehabilitation Act*. All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of a letter certified by the **Office for Students with Disabilities (OSD)**. Students experiencing a range of conditions (physical, learning, chronic health, mental health and sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting: **The Office for Students with Disabilities, OSD** at www.uta.edu/disability or calling 817-272-3364.

Counseling and Psychological Services (CAPS) at www.uta.edu/caps or call 817-272-3671. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at 817-272-3364.

Non-Discrimination Policy: *The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit www.uta.edu/eos.*

Title IX Policy: The University of Texas at Arlington (“University”) is committed to maintaining a learning and working environment that is free from discrimination based on sex in accordance with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits discrimination on the basis of sex in educational programs and activities; Title VII of the Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and the Campus Sexual Violence Elimination Act (SaVE Act). Sexual misconduct is a form of sex discrimination and will not be tolerated. *For information regarding Title IX, visit www.uta.edu/titleIX or contact Ms. Jean Hood, Vice President and Title IX Coordinator at 817-272-7091 or jmhood@uta.edu.*

Academic Integrity: Students enrolled in UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington’s tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents’ Rule 50101, Section 2.2*, suspected violations of University’s standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student’s suspension or expulsion from the University. Work determined to be copied will not be graded. Additional information is available at <https://www.uta.edu/conduct/>.

Campus Carry: Effective August 1, 2016, the Campus Carry Law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying

handguns is not allowed on college campuses. For more information, visit <http://www.uta.edu/news/info/campus-carry/>.

Student Feedback Survey: At the end of each term, students enrolled in classes categorized as “lecture”, “seminar”, or “laboratory” shall be directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student’s feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington’s effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit <http://www.uta.edu/sfs>.

Final Review Week: A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week unless specified in the class syllabus. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

Emergency Exit Procedures: Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

Student Support Services: UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), all the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu or view the information at <http://www.uta.edu/universitycollege/resources/index.php>.

The IDEAS Center (2nd Floor of Central Library) offers free tutoring to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. To schedule an appointment with a peer tutor or mentor, email IDEAS@uta.edu or call 817-272-6593. The Library’s 2nd floor Academic Plaza offers students a central hub of support services, including IDEAS Center, University Advising Services, Transfer UTA and various

college/school advising hours. Services are available during the library's hours of operation. See <http://library.uta.edu/academic-plaza>.

Math Clinic Tutoring Available: The Math Department operates the Math Clinic, a tutoring service staffed by upper level undergraduate students. You will need to show your Mav ID to use the Math Clinic. There are tables where you may study on your own or quietly with other students. Each table has a flag that you can raise to indicate that you need help from a tutor. The Math Clinic is on the 3rd floor of Pickard Hall. Go to the Math Clinic webpage <http://www.uta.edu/math/clinic/> to get more information or to access assignment sheets for the courses for which tutoring is offered. Private tutoring: The Math Department maintains a list of people who have expressed an interest in tutoring. These persons are not necessarily recommended by the Math Department and they set their own fees. You may obtain a copy of the tutor list in the Math Office.

Student Disruption: The University reserves the right to impose disciplinary action for an infraction of University policies. For example, engagement in conduct, alone or with others, intended to obstruct, disrupt or interfere with, or which in fact obstructs, disrupts or interferes with, any function or activity sponsored, authorized by or participated in by the University.

Security information, made available by UT Arlington Police, can be found at: <https://police.uta.edu/crime-prevention/active-shooter-resources.php>

Grade Exclusion and Grade Replacement Policies: These policies are described in detail in the University catalog and can also be found online. Further questions should be directed to your academic advisor and not the instructor of this course.

EMERGENCY PHONE NUMBERS: IN CASE OF AN ON-CAMPUS EMERGENCY, CALL THE UT ARLINGTON POLICE DEPARTMENT AT 817-272-3003 (NON-CAMPUS PHONE) OR 2-3003 (CAMPUS PHONE). YOU MAY ALSO DIAL 911. NON-EMERGENCY NUMBER 817-272-3381.

Course Schedule: We will cover the following sections from the text:

Weeks 1 and 2:	Sections 11.1, 11.2, 11.3, 11.4, 11.5, 11.6, 11.7, 11.8 (Vectors and Vector-Valued Functions)
Weeks 3 and 4:	Sections 11.9, 12.1, 12.2, 12.3, 12.4 (Curvature, Functions of Several Variables, Limits and Partial Derivatives)
Weeks 5 and 6:	Sections 12.5, 12.6, 12.7, 12.8 (Chain Rule, Gradient, Tangent Plane, Extrema of Functions)
Weeks 7 and 8:	Sections 12.9, 13.1, 13.2, 13.3, 13.4 (Lagrange Multipliers, Multiple Integrals)
Weeks 9 and 10:	Sections 13.5, 13.6, 13.7 (Triple Integrals in Cylindrical and Spherical Coordinates, Change of Variables)
Weeks 11 and 12:	Sections 14.1, 14.2, 14.3, 14.4 (Vector Fields, Line Integrals, Green's Theorem)
Weeks 13 and 14:	Sections 14.5, 14.6, 14.7, 14.8 (Divergence and Curl, Surface Integrals, Stokes' Theorem, Divergence Theorem)
Midterm I:	11.1-11.9, 12.1-12.5 (September 26, 2018, tentative)
Midterm II:	12.6-12.9, 13.1-13.5 (October 24, 2018, tentative)
Final Exam:	Cumulative, 13.6-13.7, 14.1-14.8, plus all above sections

Important Dates: (Fall 2018)

First day of class:	8-22-18
Census Date:	9-7-18 (Deadline for makeup requests for ALL exams)
Midterm I (tentative):	Sept. 26, 2018 (tentative), In-Class
Midterm II (tentative):	Oct. 24, 2018 (tentative) , In-Class
Holidays:	9-3-18 (Labor Day); 11/21-23/18 (Thanksgiving)
Last day to drop:	by 4:00 pm on 11-2-18 (submit to advisor)
Last day of classes:	12-4-18
Final exam (departmental):	12-8-18 at 3:30 – 6:00 PM (tentative), room TBA

As instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course.

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