

# MATH 1426 Calculus I

## Summer I 2017 06/05 – 07/10

**Instructor:** G. Liao, PhD

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**Faculty Profile:** <https://www.uta.edu/ra/>

**Office Hours:** Mo 2 - 3 pm; We 4-5 pm;

**Section Information:** MATH 1426-100; Lab 401

**Time and Place of Class Meetings:** Lecture MoTuWeTh 10:30-12:30 pm in PKH 111; Lab MoWeTh 1:00-2:00 in PKH 321.

**Description of Course Content:** Concepts of limit, continuity, differentiation and integration; applications of these concepts.

**Student Learning Outcomes:** Upon completion of Math 1426, the students will be able to perform various tasks including (but not limited to) those outlined below with algebraic, trigonometric and transcendental functions.

1. Students will be able to compute the limit of various functions without the aid of a calculator.
2. Students will be able to compute the derivatives and differentials of various functions without the aid of a calculator, and interpret certain limits as derivatives. In particular, they will be able to compute derivatives and differentials using differentiation techniques such as chain rule, implicit differentiation and logarithmic differentiation.
3. Students will be able to find the equation of the tangent line to the graph of a function at a point by using the derivative of the function. They will be able to estimate the value of a function at a point using a tangent line near that point.
4. Students will be able to sketch the graphs of functions by finding and using first-order and second-order critical points, extrema, and inflection points.
5. Students will be able to solve word problems involving the rate of change of a quantity or of related quantities. Students will be able to solve optimization problems in the context of real-life situations by using differentiation and critical points of functions. The problem topics include (but are not limited to) population dynamics, finance, physics, biology, chemistry and sociology.
6. Students will compute the area below the graph of a function by using a limit of a Riemann sum and/or by using a definite integral.
7. Students will be able to compute certain antiderivatives using various antidifferentiation techniques such as integration by substitution. They will be able to apply the Fundamental Theorems of Calculus to compute derivatives, antiderivatives, definite integrals and area.
8. Students will be able to justify and explain their steps in problem solving. In particular, students will be able to construct correct and detailed mathematical arguments to justify their claimed solutions to problems.

### Textbook and Other Course Materials:

**[BUYING OPTIONS ARE LISTED AT THE UTA BOOKSTORE WEBSITE UNDER MATH 1426]**

**CALCULUS, EARLY TRANSCENDENTALS**, BY BRIGGS, COCHRAN, AND GILLETT **OR**

**CALCULUS, EARLY TRANSCENDENTALS (VOLUME ONE, CUSTOM EDITION FOR UT-ARLINGTON)**, BY BRIGGS, COCHRAN, AND GILLETT\*

Register\*\* for MyLabsPlus at: [www.uta.mylabsplus.com](http://www.uta.mylabsplus.com) Questions about MyLabsPlus? 1-855-875-1797

\*The "Volume One" textbook is a cheaper option for those who only take one semester of Calculus.

\*\* If you purchased your book new, you receive an access code for MyLabsPlus. Otherwise, you will need to purchase this. There is a 14-day trial period before action is needed regarding purchasing access.

**Grade Components: Midterms and the final exam are 60% (20% each). No make ups. Exceptions can be made on the instructor's discretion when documents such as police reports or doctors' notes are provided.**

Midterm 1	Thursday, June 15, 2017 from 10:30 - 12:30 pm
Midterm 2	Thursday, June 29, 2017 from 10:30 - 12:30 pm
Final	Monday, July 10, 2017 from 10:30 - 12:30 pm
Lab	40% (20% lab activities, 20% on-line HW)

Grading Scale:	90-100	A
	80-89	B
	70-79	C

60-69	D
0-59	F

**Midterms and Finals:** These are comprehensive. Each exam will be a mix of multiple choice problems and show-your-work problems.

**Any student who scores below 50 on the final exam cannot receive a grade higher than D in the course.**

**Any student who does not take the Final Exam cannot receive a grade higher than F in the course.**

You may access recent previous midterms and some of the finals online. Go to

[https://mavspace.uta.edu/xythoswfs/webview/xy-697804\\_1](https://mavspace.uta.edu/xythoswfs/webview/xy-697804_1).

Solutions to the multiple choice questions are available at

[https://mavspace.uta.edu/xythoswfs/webui/xy-1083634\\_1-t\\_jbpAg0IM](https://mavspace.uta.edu/xythoswfs/webui/xy-1083634_1-t_jbpAg0IM).

**HW:** HW will be assigned and completed by students on-line.

**No make-ups on HW and Labs, except in extreme circumstances (hospitalization, e.g.)**

**Calculators:** The calculators allowed for the midterms and final are TI-30XA and TI-30XIIS.

**For labs the same calculators are allowed.**

**Attendance:** At The University of Texas at Arlington, taking attendance is not required. Rather, each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. As the instructor of this section, I will not take attendance during lectures, but attendance will be taken at all lab sessions and factored into your Lab grade.

**Lab Attendance Policy:** Attendance is required. A student will receive no credit for a lab session they do not attend.

**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. **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/>).

**DROP Date:** Any student who drops this course on or before **Monday, June 26 at 4pm** will receive a W.

**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 (ADAAA)*, 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)** [www.uta.edu/disability](http://www.uta.edu/disability) or calling 817-272-3364.

**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](http://www.uta.edu/disability) or by calling the Office for Students with Disabilities at (817) 272-3364.

If you require an accommodation based on disability, I would like to meet with you in the privacy of my office, during the first week of the semester, to make sure you are appropriately accommodated.

**Counseling and Psychological Services, (CAPS)** [www.uta.edu/caps/](http://www.uta.edu/caps/) or calling 817-272-3671 is also available to all students to help increase their understanding of personal issues, address mental and behavioral health problems and make positive changes in their lives.

**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 [uta.edu/eos](http://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 or 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](http://www.uta.edu/titleIX) or contact Ms. Jean Hood, Vice President and Title IX Coordinator at (817) 272-7091 or [jmhood@uta.edu](mailto:jmhood@uta.edu).*

**Academic Integrity:** Students enrolled in this course 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 in their courses by 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, §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. Additional information is available at <https://www.uta.edu/conduct/>.

**START STRONG Freshman Tutoring Program**  
**University Tutorial and Supplemental Instruction (UTSI)/University College**

All first time freshmen can receive six FREE hours of tutoring for this course and other selected subjects for this semester. To get more information, visit UTSI in 205 Ransom Hall/University College.

The Math Department operates the **Math Clinic**, a tutoring service staffed by upper level undergraduate students. The Math Clinic is on the 3<sup>rd</sup> floor of Pickard Hall; the phone number is 817-272-5674.

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.

All **previous midterm exams and some previous final exams** are available to students in the **Science Education and Career Center (SECC)**, 106 Life Science Building.

You need a Mav ID Card to check out these exams. A copy machine is available for you to make copies. There are also video tapes of lectures on calculus topics that can be viewed in the SECC. For more information, go to <https://www.uta.edu/cos/SECC/login.php>.

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, 478 PKH.

**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>.

**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/>

**Emergency Exit Procedures:** Should we experience an emergency event that requires us to vacate the building, students should **exit the room and take an immediate right or left, and walk toward the corner of the building.** 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. (<https://www.uta.edu/policy/procedure/7-6>).

Students are encouraged to subscribe to the MavAlert system that will send information in case of an emergency to their cell phones or email accounts. Anyone can subscribe at <https://mavalert.uta.edu/> or <https://mavalert.uta.edu/register.php>

**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), call the Maverick Resource Hotline at 817-272-6107, send a message to [resources@uta.edu](mailto:resources@uta.edu), or view the information at <http://www.uta.edu/universitycollege/resources/index.php>.

**The IDEAS Center** (2<sup>nd</sup> 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](mailto:IDEAS@uta.edu) or call (817) 272-6593.

**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.

**Course Schedule:**

(Goal is to be done with the given sections in the textbook by the dates listed)

6/5 2.1 Idea of Limits  
6/5 2.2 Definitions of Limits  
6/5 2.3 Techniques for Computing Limits  
6/6 2.4 Infinite Limits  
6/6 2.5 Limits at Infinity  
6/6 2.6 Continuity  
6/7 3.1 Introduction to Derivatives  
6/7 3.2 Working with Derivatives  
6/8 3.3 Rules of Differentiation  
6/8 3.4 Product and Quotient Rules  
6/12 3.5 Derivatives of Trigonometric Functions  
6/12 3.6 Derivatives as Rates of Change  
6/13 3.7 Chain Rule  
6/13 3.8 Implicit Differentiation  
6/14 Review for Exam #1  
6/14 3.9 Derivatives of Logarithmic and Exponential Functions  
[6/15 Exam #1: 2.1 - 3.8]

6/19 3.10 Derivatives of Inverse Trigonometric Functions  
6/19 3.11 Related Rates  
6/20 4.1 Maxima and Minima  
6/20 4.2 What Derivatives Tell Us  
6/20 4.3 Graphing Functions  
6/21 4.4 Optimization Problems  
6/21 4.5 Linear Approximation and Differentials  
6/22 4.6 Mean Value Theorem  
6/22 4.7 L'Hopital's Rule  
6/22 4.9 Antiderivatives  
6/26 5.1 Approximating Areas under Curves  
6/26 5.2 Definite Integrals  
6/27 5.3 Fundamental Theorem of Calculus  
6/27 5.4 Working with Integrals  
6/28 Review for Exam #2;  
[6/29 Exam #2: comprehensive with emphasis on 3.9 – 5.4]

7/3 5.5 Substitution Rule  
7/3 6.1 Velocity and Net Change  
7/5 6.2 Regions between Curves  
7/5 7.7 Numerical Integration  
7/6 Review for Final Exam  
[7/10 Final Exam: Comprehensive]

*"As the 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."* – [G. Liao](#)

<b>Emergency Phone Numbers:</b> In case of an on-campus emergency, call the UT Arlington Police Department at <b>817-272-3003</b> (non-campus phone), <b>2-3003</b> (campus phone). You may also dial 911. Non-emergency number 817-272-3381
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