Syllabus

(UTA) Math 1426 Spring 2015

Calculus One

1. Instructor/Course Information

1.1. **Instructor.** David A. Smith

1.2. **Email.** davidsmith@uta.edu

1.3. **Office.** Pickard Hall 443

1.4. **Office Hours.** Mondays: noon-1 pm. Wednesdays and Fridays: 1-2 pm. Please have your questions prepared *before you arrive* in my office. If you are not able to see me at that time, please send an email to me to schedule an appointment.

1.5. **Office Phone.** 817-272-7203

1.6. **Webpage/Profile.** `http://www.uta.edu/faculty/dsmith/`

1.7. **Course Name.** Math 1426, Calculus One

1.8. **Section Number.** Section 050

1.9. **Course Location.** University of Texas at Arlington, Pickard Hall. Room 321

1.10. **Course Meeting Times.** MoWeFr 2:00PM - 2:50PM

1.11. **Prerequisites.** A grade of C or above in Math 1323 (Precalculus II) or a sufficient score on the Math Aptitude Test or sufficient SAT/ACT math scores.

1.12. **Required Texts.** Calculus, Early Transcendentals, custom edition for UT-Arlington, by Soo T. Tan

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

1.14. **Calculator Policy.** The only calculators allowed for quizzes, midterms, and then final are TI-30XA and TI-30XIIS.

1.15. **Notecard Policy.** Notecards are not allowed on quizzes and exams.

1.16. **Emergency Phone Numbers.** In case of an on-campus emergency, call the UT Arlington Police Department at 817-272-3003 (non-campus phone), 2-3003 (campus phone). You may also dial 911.

1.17. **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.

2. Student Evaluation

I anticipate that a student passing this course will spend at least 12 focused hours each week outside the classroom.

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

2.1. **Classroom Performance/Attendance Policy.** Attendance is required. You are expected to be on time for all class meetings. You are responsible for any and all announcements I make in class. You are responsible for any material missed during missed classes.

2.2. **Homework.** It is your responsibility to make sure your homework is finished, on time, checked for correctness and rigor, and reviewed. Homework will be assigned and completed by students online:
Register for WebAssign at:

`http://webassign.net/`

Class Key for 1426-050: uta 5793 2637

2.3. **Quizzes.** Throughout the semester quizzes will be given routinely in the form of multiple choice. Quizzes are cumulative and are unannounced.

No makeups for quizzes for any reason.

The lowest quiz score will be dropped. You must bring a scantron form to every class in case of a multiple choice quiz. The scantron form is 882-E.

2.4. **Problems-Solving Labs.** The labs (sometimes called problem solving activities) must be done in groups of size 3 or 4 students. I or my GTA will be available in the lab to answer questions, but the provided help will be more in the nature of hints or suggestions, rather than detailed explanation. These activities will require some independent thought on the part of the students. Each group will turn in only one (joint) report for a given assignment to be graded. All students must sign their name to this joint report in order to receive credit. A report turned in by a group of students of the wrong size will not be graded.

No makeups for labs for any reason.

Your lowest lab grade will be dropped.

2.5. **Midterms and Final.** These exams are departmental, i.e., all sections of Math 1426 will take the same exam and the grades will have the same weight in each section. All of these exams are comprehensive. Each exam will be a mix of multiple choice problems and show-your-work problems.

You are expected to review all quizzes, homework assignments, textbook reading notes, class lecture notes, and previous exams before taking an exam. Every exam will be cumulative. Your work on the exams will be graded on *correctness, completeness, and clarity.* Exams during the semester will measure your progress in mastering the learning outcomes.

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

2.6. **Grade Components.**

- Quiz Average is 10% of final grade.
- Lab Average is 10% of final grade.
- Exam 1 is 20% of final grade.
- Exam 2 is 25% of final grade.
- Final Exam is 35% of final grade.

2.7. **Grading Scale.** A cumulative score of 90% or above guarantees an A, 80% or above, at least a B, 70% or above, at least a C, and 60% or above, at least a D.

2.8. **Make-up Policy.** If you have a conflict with either midterm or final, you must contact your instructor no later than Census Date, by using a form provided to you at your request by your instructor and submitting it together with necessary documentation as indicated on the form. If a conflict arises after the Census Date, contact your instructor immediately. Delays in submitting a make-up request may mean that your request cannot be approved by the course coordinator.

No makeups for labs for any reason.

No makeups for quizzes for any reason.

3. Student Information

3.1. **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://wweb.uta.edu/aao/fao/).

3.2. **Electronic Communication.** You should have an activated MyMav account and check it regularly during the semester. You are responsible for all the information I will be sending out to your MyMav account and the announcements I make on my Web Page.

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.

3.3. **Americans with Disabilities Act.** The University of Texas at 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). 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 that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. 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.

3.4. **Title IX.** The University of Texas at Arlington is committed to upholding U.S. Federal Law "Title IX" such that no member of the UT Arlington community shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity. For more information, visit www.uta.edu/titleIX.

3.5. **Academic Integrity.** Students enrolled all 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, §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.

3.6. **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.

3.7. **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.

3.8. **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, which is located at the front of the classroom. 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.

3.9. **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, or view the information at www.uta.edu/resources.

3.10. **Grade Replacement and Grade Exclusion Policies.** These policies are described in detail in the University catalog and can also be founded online at `wweb.uta.edu/catalog/content/general/academic_regulations.aspx`. The deadline for filing a grade replacement request is the Census Date.

3.11. **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.

4. Important Dates

- Jan 20: First Day of Classes
- Feb 4: Census Date
- Mar 9-14: Spring Break
- Feb 13: Midterm 1
- Mar 27: Midterm 2
- Apr 3: Last Day to Drop Classes
- May 8: Last Day of Classes
- May 9: Final Exam 12:30-3:00 p.m.

4.1. **Assignment Sheet & Course Schedule.** The goal is to complete the following listed sections in the required textbook by the dates listed.

(1) §1.1: Intuitive Introduction to Limits 1, 2, 3, 4, 5, 6, 7, 8, 11, 17, 18, 20, 21, 22, 31, 33

(2) §1.2: Techniques for Finding Limits 23, 24, 25, 26, 27, 28, 31, 32, 33, 34, 35, 36, 37, 38, 48, 49, 55, 56, 60, 65, 68, 70, 75, 77, 86, 93, 99,100, 101

(3) §1.4: Continuous Functions 3, 4, 8, 10, 15, 16, 23, 27, 29, 34, 35, 41, 42, 49, 50, 54, 56, 59, 63, 96

(4) §1.5: Tangent Lines & Rates of Change 1, 5, 6, 9, 14, 18, 20, 22, 29, 41-44

(5) §2.1: The Derivative 4, 6, 9, 13, 17, 20, 25, 26, 27, 28, 29, 30, 33, 34, 35, 39, 44, 45, 46, 50, 51, 57, 60

(6) §2.2: Basic Rules of Differentiation 2, 7, 19, 26, 30, 32, 34, 35a, 38a, 39, 42, 57, 58, 74

(7) §2.3: The Product and Quotient Rules 1, 4, 8, 9, 14, 18, 23, 24, 28, 32, 33, 37, 45, 48, 50, 57, 61, 63, 69

Midterm One (Feb 13)

(8) §2.4: The Role of the Derivative in the Real World 3, 7, 12, 16, 17, 22, 26, 33, 34

(9) §2.5: Derivatives of Trigonometric Functions 3, 6, 9, 15, 18, 19, 22, 26, 28, 32a, 33, 36, 37, 40, 43, 52

(10) §2.6: The Chain Rule 1, 3, 5, 10, 12, 17, 19, 20, 30, 43, 48, 61, 62, 63, 64, 71a, 73, 74, 78, 80, 85, 87a, 94, 111

(11) §2.7: Implicit Differentiation 5, 8, 16, 21, 26, 28, 36, 37, 42, 46, 47, 59, 65, 75, 76, 91

(12) §2.8: Derivatives of Logarithmic Functions 6, 7, 13, 18, 26, 31, 33, 34, 40, 43, 48, 54

(13) §2.9: Related Rates 3, 6, 8, 9, 14, 16, 18, 24, 25, 26, 28, 29

(14) §2.10: Differentials and Linear Approximation 2, 3, 8, 10, 13, 19, 22, 25, 27, 30, 33, 42, 45

(15) §3.1: Extrema of Functions 1, 2, 4, 13, 16, 17, 21, 23, 26, 30, 37, 39, 42, 48, 51, 52, 59, 66, 67, 70, 79

(16) §3.2: The Mean Value Theorem: 4, 8, 11, 12, 16, 18, 20, 21, 24, 26, 27, 36, 50, 51

(17) §3.3: Increasing & Decreasing Functions & the First Derivative Test 3, 4, 6, 7, 8, 9, 14, 15, 17, 22, 27, 32, 35, 42, 43, 47, 56, 58, 59, 63, 75

Midterm Two (Mar 27)

(18) §3.4: Concavity and Inflection Points 2, 4, 7, 8, 9, 10, 13, 22, 27, 38, 42, 52, 53, 56, 61, 64, 66, 75

(19) §3.5: Limits Involving Infinity; Asymptotes 2, 11, 14, 21, 23, 24, 30, 35, 39, 51, 54, 56, 57, 60, 62, 68, 89

(20) §3.6: Curve Sketching 4, 9, 15, 18, 24, 26, 41, 42, 46, 50

(21) §3.7: Optimization Problems 3, 4, 8, 13, 15, 21, 28, 33, 34, 46, 57, 67

(22) §3.8: Indeterminate Forms and L?Hpital?s Rule 2, 3, 5, 6, 10, 14, 15, 24, 31, 32, 38, 39, 49, 50, 51, 57, 58

(23) §4.1: Indefinite Integrals 7, 9, 14, 19, 21, 24, 29, 40, 41, 46, 48, 54, 58, 65, 67, 68, 70, 71, 75

(24) §4.2: Integration by Substitution 3, 4, 6, 11, 13, 17, 18, 19, 24, 29, 33, 36, 41, 47, 52, 65, 67, 76, 77, 86, 87

(25) §4.3: Area 2, 8, 15, 20, 22, 25, 29, 39, 42, 50, 52, 59

(26) §4.4: The Definite Integral 1, 4, 8, 9, 13, 16, 18, 20, 24, 27, 31, 32, 63, 64, 65, 66, 67, 70

(27) §4.5: The Fundamental Theorem of Calculus 1, 3, 7, 9, 14, 18, 19, 21, 22, 24, 31, 32, 34, 35, 43, 46, 51, 54, 57, 58, 60, 62, 69, 76, 79, 85, 93, 97, 99

(28) §4.6: Numerical Integration 1, 4, 6, 7, 21, 27, 44, 45

(29) §5.1. Areas between Curves 2, 4, 6, 9, 15, 23, 24, 26, 28, 32, 33, 34, 35, 38, 40

Final Exam (May 9, 12:30-3:00 p.m.)

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. *– D.A. Smith*