Math 1316.001: Mathematics for Economics and Business Analysis

Spring 2019

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Section Information: MATH 1316.001 Mathematics for Economics and Business Analysis
Time and Place of Class Meetings: M/W/F 10:00 – 10:50am in PKH 110

Description of Course Content: This course is the basic study of limits and continuity, differentiation, optimization and graphing, and integration of elementary functions, with emphasis on mathematical tools and applications in business, economics, and social sciences. Chapters 11, 12, 13 will be covered.

Course Prerequisites: C or better in MATH 1315 or MATH 1302. This course is not a substitute for MATH 1426 .

Student Learning Outcomes: To develop mathematical tools that are useful in analysis of business and economics problems. After this course, the students should have an understanding of Differential and Integral calculus sufficient to apply to real problems in Business and Finance. After completing the course, students should be able to demonstrate the following competencies:

- Be able to use derivative formulas such as product rule, quotient rule and chain rule to calculate derivatives.
- Be able to use the properties of limits to find the limits [if they exist]of polynomial, rational, and piece-wise functions.
- Be able to evaluate the limit of a function as x approaches infinity or negative infinity and thus be able to locate horizontal asymptotes of a function.
- Given the graph of a function or given a piece-wise function be able to find:

  i.) $\lim_{x \to c^-} f(x)$ ii.) $\lim_{x \to c^+} f(x)$ and iii.) $\lim_{x \to c} f(x)$ ...

- Be able to tell where polynomial, rational, and piece-wise functions are continuous.
- Be able to compute the slope of the tangent line.
- Be able to use derivatives to solve business related questions involving marginals. Given the demand equation be able to utilize it to come up with the revenue equation.
- Be able to take the derivative of natural log and exponential functions.
- Given the elasticity # associated with a product you need to be able to use it to classify the type of demand present and determine the effect on revenue of raising or lowering the price.
- Be able to use the first derivative and 1st derivative sign diagram to identify local maximum and local minimum points of a function . You also need to be able to use it to identify intervals where the function is increasing and decreasing.
- Be able to use the second derivative and 2nd derivative sign diagram to identify inflection points where the concavity changes from up to down and from down to up. You also need to be able to use it to identify intervals where a function is concave up and concave down.
- Be able to use derivatives to find the absolute maximum and absolute minimum obtainable values for a given function.
- Be able to evaluate assorted indefinite integral problems including u-substitution problems, problems involving lns and exponentials, problems involving radicals or negative exponents, and application problems where given MC and a cost point or MR you are asked to calculate C(x) and R(x).
- Be able to evaluate assorted definite Integral problems including application problems where you need to find the area between a positive curve and the x-axis between two given x values or where you need to calculate the area between two curves.
- Given the demand and supply curve you need to be able to find the equilibrium point and use it to compute the consumer or producer surplus.
- You need to be able to use integration by parts to calculate the value of a given integral.

Required Textbooks/Course Material:

(a) **Workbook by Shanna Banda**: The MATH 1316 edition entitled: **Calculus for Economics & Business; ISBN # 978-61740-660-7**. It is loose-leaf and sold in the UTA bookstore for about $29. **All students are required to buy this workbook.**

(b) **Direct Access (REQUIRED):** As part of the UTA Mathematics Department Affordability Campaign, we have negotiated a reduced price bundle which includes lifetime access to the eText and direct course access which will give you access to this text and all online assignments immediately. To receive the discounted price, items must be purchased through the UTA

Bookstore by clicking on the link provided under the **Start Here** tab on **Blackboard**. Once class begins, you will have immediate access to your course even before you make your purchase. However, if the purchase is not verified within the first two weeks of classes, the access to your course 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.

(c) **Loose-Leaf Textbook Upgrade (OPTIONAL):** Students who have previously purchased the online direct access described above may choose to upgrade their online purchase to include a loose-leaf version of the textbook for about an extra $25 from the same bookstore site. The textbook will be shipped directly to an address of your choosing or you may pick one up at the UTA bookstore. Alternatively, you may purchase a loose-leaf version of the textbook at minimal cost directly from the publisher using the link to the publisher provided on Blackboard . The publisher site will prompt you to enter the username: arlington and password: math 1315/1316. This reduced price loose leaf textbook is only available as an upgrade to students who have purchased the direct access described in part (b)-- it cannot be purchased by itself.

(d) **Hardback Edition of Textbook (OPTIONAL):** In addition to to the above options students can elect to purchase a hardback edition of the textbook. The textbook to be purchased is **Mathematics with Applications in the Management Natural, and Social Sciences, 12th Ed. Lial, Hungerford, Holcomb, and Mullins Pearson Ed. Inc. , ISBN: 978-0-13-476762-8**.

Descriptions of major assignments and examinations:

- **Homework:** Homework will be assigned, administered, and graded through the MyLabs online system and is worth 13% of your overall grade. Homework will be due each week. Late homework will not be accepted, except with written documentation of a UTA recognized excused absence for the day the content was due.

- **Signature Assignment:** The purpose of this assignment is to fulfill the SACS and institutional requirement that all CORE courses contain a clearly marked "Signature Assignment" within the course that covers the following three areas:
  - Critical Thinking Skills - to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information.
  - Communication Skills - to include effective development, interpretation and expression of ideas through written, oral and visual communication.
  - Empirical and Quantitative Skills - to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions

  It will consist of a homework assignment of 5 questions that is to be completed by all Math 1316 classes. This assignment will be handed out in class after the relevant content has been covered and is worth 5% of the overall grade. A copy of the assignment will be located on Blackboard.

- **Quizzes**: I reserve the right to administer pop-quizzes if necessary. These will be weighted the same as a homework assignment and will be included in your homework average.

- **Exams:** We will have three (3) in-class exams during the course of the semester, each exam will count as 15% of your final grade. Your lowest exam will be replaced by your final exam's grade, if the final exam grade is higher. NOTE: The final exam cannot be replaced by a midterm exam. Therefore, all students wishing to pass the course must take the final exam. I intend to review for each exam during the class period preceding the exam.

  02/13/2019: covering sections 11.1 – 11.7 & 11.9
  03/05/2019: covering sections 11.8, & 12.1 – 12.3, and 12.6
  04/26/2019: covering sections 7.1, & 13.1-13.3, 13.5, and 13.6

  All exams will be of a multiple choice format. Students are required to bring an 882-E compatible scantron for each exam. Exams will be closed book but most calculator will be allowed (see below) along with a one (1) double sided 3 by 5 note card. A detailed review sheet will be provided on Blackboard for each major exam including the final exam.

- **Final Exam:** The Final Exam is a departmental final exam and will be given on **Saturday May 4th** from **9 – 11:30 am**. **Makeups for the final will only be granted only with a UTA recognized excused absence and written documentation**. Students who do not have a documented justifiable reason for missing the final **will receive a grade of 0** on the final exam. **The exact location for the final exam will be announced in class at a later date** The final counts 30% of your final course grade and everyone is required to take it

Grading Policy:

Daily Grade (Attendance and Participation) ……..……..... 7%
Signature Assignment …..... 5%
Homework and Quizzes ……..... 13%
3 Exams ……..…… 45%
Final Exam …….. 30%
+
100%

Grade: A = 90-100%, B = 80-89.99%, C = 70-79.99%, D = 60-69.99%, F = 59.99% or below

Attendance: Attendance will be taken each class period. This course meets three (3) times a week. Your attendance portion of the grade will be calculated by the # of times attended / # of total class periods. That being said, attendance is categorized as both attendance AND participation. Therefore, attending class but leaving early, being inattentive, or otherwise not engaged in the classroom activities could result in an absence for that day.

Calculators: A graphing calculator is highly recommended, such as a TI-84 Plus ideally. However, I encourage my students to work without the aid of a calculator. My intentions throughout the course will be to demonstrate methods that can done by hand, primarily. **You will not be allowed to use a TI-30X Pro, TI Inspire, your cell phone, laptop, or any other calculator that has a qwerty or alphanumeric keyboard on an exam.**

Make-up Exams: Similar to the homework, make-up exams will not be given except with **written documentation** of a UTA recognized excused absence. Examples of a UTA recognized excused absence include medical reasons, athletic events / scholastic activities, and a religious holy day.

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. The last day to drop for the fall 2018 semester is Friday 03/29/ 2019. 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/).

Grade Grievances: Any appeal of a grade in this course must follow the procedures and deadlines for grade-related grievances as published in the current University Catalog:
http://catalog.uta.edu/academicregulations/grades/#undergraduatetext

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). Only those students who have officially documented a need for an accommodation will have their request honored. 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 or calling 817-272-3364. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability.

Counseling and Psychological Services, (CAPS) : 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.***

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 or contact Ms. Jean Hood, Vice President and Title IX Coordinator at (817) 272-7091 or jmhood@uta.edu.

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 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/.

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/

Student Feedback Survey: At the end of each term, students enrolled in face-to-face and online classes categorized as "lecture," "seminar," or "laboratory" are 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 via the SFS database is aggregated with that of other students enrolled in the course. Students' anonymity will be protected to the extent that the law allows. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law and aggregate results are posted online. Data from SFS is also used for faculty and program evaluations. For more information, visit http://www.uta.edu/sfs.

Final Review Week: for semester-long courses**,** 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, which is located immediately to the right upon exiting 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. Evacuation plans may be found at http://www.yta.edu/campus-ops/ehss/fire/EvacMapsBuildings.php and http://www.uta.edu/police/EvacuationProcedures.pdf

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 referrrals, students may visit the reception desk at University College (Ransom Hall, call the Maverick Resource Hotline at 817-272-2617, send a message to resource@uta.edu, or view the information at http://www.uta.edu/universitycollege/resources/index.php.

- **Universal Tutorial & Supplemental Instruction: (Ransom Hall 205):** UTSI offers a variety of academic support services for undergraduate students including: 60 minute one-on-one tutoring sessions, StartStrong Freshman tutoring program, and Supplemental Instruction.
  Office Hours are Monday – Friday 8:00 am – 5:00pm.
  For more information visit www.uta.edu/utsi or call 817-272-2617.
- **The IDEAS Center (2nd Floor of Central Library):** The IDEAS Center offers FREE tutoring to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. Students can drop in, or check the schedule of available peer tutors at www.uta.edu/IDEAS, or call (817)272-6593.
- **The Library's 2nd floor Academic Plaza:** The 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. http://library.uta.edu/academic-plaza

1316 MWF Schedule Spring 2019:

	Date	Events	Notes
M	**01/14/19**	Syllabus 11.1 – Limits	**Classes Begin**
W	**01/16/19**	11.1 – (Continued) Limits	
F	**01/18/19**	11.2 – One-sided Limits and Limits Involving Infinity	
M	**01/21/19**	**NO CLASSES:** Martin Luther King Jr. Day holiday	
W	**01/23/19**	11.9 – Continuity	
F	**01/25/19**	11.3 – Rates of Change	
M	**01/28/19**	11.4 – Tangent Lines and Derivatives	**Census Date**
W	**01/30/19**	11.5 – Techniques for Finding Derivatives	
F	**02/01/19**	11.6 – Derivatives of Products and Quotients	
M	**02/04/19**	11.7 – Chain Rule	
W	**02/06/19**	11.7 – (Continued) Chain Rule	
F	**02/08/19**	11.7 – (Continued) Derivative Applications	
M	**02/11/19**	**Review for Exam 1**	**Study for Exam 1**
W	**02/13/19**	**Exam 1**	
F	**02/15/19**	11.8 – Derivatives of Logarithmic Functions	
M	**02/18/19**	11.8 – (Continued) Derivatives of Exponential Functions	
W	**02/20/19**	14.3 – Case Study - Price Elasticity of Demand	
F	**02/22/19**	12.1 – Local Extrema	
M	**02/25/19**	12.2 – The Second Derivative	
W	**02/27/19**	12.6 – Curve Sketching	
F	**03/01/19**	12.3 – Optimization Applications	
M	**03/03/19**	**Review for Exam 2**	
W	**03/05/19**	**Exam 2**	
S-S	**3/11-3/17**	**SPRING BREAK, NO CLASSES**	
M	**03/18/19**	13.1 – Antiderivatives	
W	**03/20/19**	13.1 – (Continued) Antiderivatives	
F	**03/22/19**	13.2 – Integration by Substitution	
M	**03/25/19**	13.2 – (Continued) Integration by Substitution	
W	**03/27/19**	13.2 – (Continued) Integration by Substitution	
F	**03/29/19**	13.1 & 13.2 – Applications of Indefinite Integrals	**Last Day to Drop by 4pm**
M	**04/01/19**	13.3 – Integration by Parts	
W	**04/03/19**	13.3 – (Continued) Integration by Parts	
F	**04/05/19**	13.3 – (Continued) Integration by Parts	
M	**04/08/19**	7.1 – Series and Summation Notation	
W	**04/10/19**	13.4 – Area and the Definite Integral	
F	**04/12/19**	13.4 – (Continued) Area and the Definite Integral	
M	**04/15/19**	13.4 – (Continued) Area and the Definite Integral	
W	**04/17/19**	13.5 – Fundamental Theorem of Calculus	
F	**04/19/19**	13.6 – Applications of Definite Integrals	
M	**04/22/19**	13.6 – (Continued) Applications of Definite Integrals	
W	**04/24/19**	**Review for Exam 3**	**Study for Exam 3**
F	**04/26/19**	**Exam 3**	
M	**04/29/19**	**REVIEW FOR FINAL EXAM**	
W	**05/01/19**	**REVIEW FOR FINAL EXAM**	**Study for Final**
F	**05/03/19**	**REVIEW FOR FINAL EXAM**	**Study for Final / Last Class Day**
Sat	**05/04/19**	**FINAL EXAM @ 9:00am-11:30am**	**NOTE SPECIAL TIME!!**

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. –Joshua Patterson