

MATH 1316-002 Mathematics for Economics and Business Analysis Spring 2019

Location: PKH 110	Days and Time: MoWe 5:30 – 6:50pm
Instructor: Dwight A. Williams II	Instructor's Office: PKH 406
Web page: http://bit.ly/DwightUTA	E-mail: dwight.williams@uta.edu
Office Hours: T: 3:00 – 5:00pm (or by appointment)	Telephone: 817.272.3261

note: words “exam”, “test”, “midterm” used interchangeably—“final exam” or “final” is a particular exam

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 (e.g. product rule quotient rule, chain rule) to calculate derivatives
- * Be able to use the properties of limits to find the limits (if they exist) of polynomial, rational, and piecewise functions
- * Be able to evaluate $\lim_{x \rightarrow \infty} f(x)$ and $\lim_{x \rightarrow -\infty} f(x)$; thus, be able to locate horizontal asymptotes of a function
- * Be able to find $\lim_{x \rightarrow c^-} f(x)$, $\lim_{x \rightarrow c^+} f(x)$, and $\lim_{x \rightarrow c} f(x)$ given the graph of a function or given a piecewise function $f(x)$
- * Be able to tell where polynomial, rational, and piecewise 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 (e.g. marginal cost)
- * Be able to utilize a given demand equation to come up with the revenue equation
- * Be able to take the derivative of natural log and exponential functions
- * Be able to classify the type of demand present given the elasticity number associated with a product and determine the effect on revenue of raising or lowering the price
- * Be able to use the 1st derivative and 1st derivative sign diagram to identify local maximum and local minimum points of a function
- * Be able to use the 1st derivative to identify intervals where the function is increasing and decreasing
- * Be able to use the 2nd derivative and 2nd derivative sign diagram to identify inflection points where the concavity changes from up to down and from down to up

- * Be able to use the 2nd derivative 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 of a given function
- * Be able to evaluate assorted indefinite integral problems, including u-substitution problems, problems involving natural log and exponentials, problems involving radicals or negative exponents, and application problems calculating cost $C(x)$ from marginal cost and a cost point or revenue $R(x)$ from marginal revenue
- * Be able to evaluate assorted definite integral problems, including application problems finding the area between a positive curve and the x-axis, given two x values, or calculating the area between two curves
- * Be able to find the equilibrium point given demand and supply curves and use it to compute the consumer or producer surplus
- * Be able to use integration by parts to calculate the value of a given integral

Required Textbooks/Course Material: <http://bit.ly/spring19math1316bookstore>

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 \$29.50 (as of 01/13/2019). **All students are required to buy this workbook in addition to purchasing the following:**

1) Direct Access (Strongly Recommended): 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. You may purchase your access at any time once your class's Blackboard shell is made available. 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, then access to your course will freeze. Furthermore, 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. The online homework problems include many varied online helps to assist students in working the problems and mastering the material.

2) 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 1316*. This reduced price loose leaf textbook is only available as an upgrade to students who have purchased the direct access described in part 1 – it cannot be purchased by itself.

3) Hardback Edition of Text: As an alternative 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. This textbook is available at various online bookstore sites. It does not include access to the online homework problems, the graded problems. Homework problems from the book will be assigned for learning through doing.

Descriptions of major assignments and examinations:

- **Homework:** Homework will be assigned via MyLab as a graded component of the course. While the calendar will present tentative assignment dates, it is the responsibility of the student to check the calendar of due dates on Blackboard. Problems from the text are for learning and review; only online homework will be graded.
- **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 discussed on the first day of class and students will complete it gradually throughout the semester as the needed skills to complete the assignment are acquired. **The assignment will need to be turned in on or before Monday, 3/25/2019.** A copy of the assignment will be located on Blackboard for your convenience.

- **Tests:** There will be **3 midterms** given in this class. The approximate dates for these assessments are listed here:

Day of the Week	Tentative Dates	Sections
Monday	February 18, 2019	11.1 – 11.7 & 11.9
Monday	March 25, 2019	11.8 & 12.1 – 12.3 & 12.6
Wednesday	April 17, 2019	13.1-13.3

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.

All tests will be of a multiple choice format, and a Scantron form 882-E will be required for all tests. Students need to provide their own Scantron form 882-E for tests. Tests will be individual assessments: closed book, no assistance from peers. Students will be allowed use of approved calculators and a handwritten 4-by-6 note card. Also, a detailed review sheet will be provided on Blackboard for each midterm as well as the final exam. This review sheet will include a practice test and solutions will be provided for the practice test. **If you have been able to work the homework problems, explain your solutions, and solve the problems on the given practice test, then the midterm should be familiar.** The highest midterm grade *from any midterm* will count for 25% of the course grade; the second highest midterm grade will count for 20% of the course grade; and, the lowest midterm score will count for 15% of the course grade. If a student scores higher than 0 on two or more exams, and if the final exam score is higher than any midterm score, then the final exam score will replace the lowest non-zero score—a single exam replacement. Midterms will not replace a final exam.

- **Final Exam:** The final exam is a departmental final exam and will be given on **Saturday, May 4th, 2019**, from 9:00am – 11:30am. **Makeups for the final will only be granted on a limited basis and only when written documentation verifying the need for the makeup is provided—do not expect a make-up of any exam, especially the final exam.** 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 the final course grade; everyone is required to take the final exam.**

- **Grade Calculation:**

Category	Percent of Grade
Homework	5%
Midterms	25-20-15% (by highest score)
Signature Assignment	5%
Comprehensive Final Exam	30%
Total:	100%

Students are expected to keep track of their performance throughout the semester and seek guidance from available sources (including the instructor), in particular, if their performance drops below satisfactory levels; see “Student Support Services,” below.

Attendance: At The University of Texas at Arlington, taking attendance is not required but attendance is a critical indicator in student success. 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, attendance will not be taken each day but good attendance is necessary if you want to succeed in this course. You must make sure you are in class on test days and it is up to you to keep up with when these dates are. Tentative dates for these are given at the first of the semester but these dates sometimes change. Changes in schedule will be posted on Blackboard. If a student has any question about when a test is they should email me. However, while UT Arlington does not require instructors to take attendance in their courses, the U.S. Department of Education requires that the University have a mechanism in place to mark when Federal Student Aid recipients “begin attendance in a course.” UT Arlington instructors will report when students begin attendance in a course as part of the final grading process. Specifically, when assigning a student a grade of F, faculty report the last date a student attended their class based on evidence such as a test, participation in a class project or presentation, or an engagement online via Blackboard. This date is reported to the Department of Education for federal financial aid recipients.

Calculators: A good scientific calculator or a graphing calculator is needed for this class—keep reading. Graphing calculators can be useful for learning, especially in terms of *OBSERVING* and *EXPLAINING* mathematics—keep reading. You will not be allowed use of a TI-30X Pro, TI Inspire, cell phone, laptop, any graphing calculator (e.g. TI-83), or any calculator that has a qwerty or alphanumeric keyboard on a test Alphanumeric or QWERTY keys are the keys on a calculator’s keyboard that consist of the alphabet letters A to Z which can be used for texting. The following are the approved calculators for exams:

- Texas Instruments 30X series: TI-30Xa, TI-30XIIS, TI-30XIIB, TI-30XS(Multiview)
- Casio FX series: FX-82MS, FX-85M-S, FX-260SLR, FX-260SLRPK, FX-260SLRSCH
- Sharp EL series: EL-501X, EL-501XBGR, EL-501XBWH, EL-531X, EL-531XBGR, EL-531XBWH
- Canon F series: F-604, F-710

No variation of model will be accepted. This includes but is not limited to plus and pro models.

Make-up Exam Policy: No make-up exams will be allowed unless there is a verifiable excuse such as a medical emergency or participation in a sport or other campus activity. In such a case you should contact the instructor (via email, in-person, formal note, etc...) before the exam. Make-up exams will be not be the original test. If you have a conflict with any of the Midterms or the Final Exam, you must contact me in writing no later than the Census Date, January 30, 2019.

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 Spring 2019 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>

Expectations for Out-of-Class Study: Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend, on average, at least 9 hours/week outside class in course-related activities, including reading materials, completing assignments, preparing for tests, etc. The best way to guarantee a good grade in this course is to take good lecture notes and to read them over after class before starting the homework, and to do ALL the assignments on a regular basis and to discuss the material with each other. After completing any one assignment, put together a list of the ideas you learned in doing that assignment; keep your list to help in studying for the tests. It is very important that you know how to work out the homework problems correctly. If you use a solutions manual, be sure to use it in a way that helps you understand & remember the concepts and arguments. As well, the instructor expects and encourages each student to **SHOWER**:

SPEAK mathematics

HEAR mathematics

OBSERVE mathematics

WRITE mathematics

EXPLAIN mathematics

READ mathematics

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>.

Email: dwight.williams@uta.edu directly from MavMail—use your @mavs.uta.edu.

Subject lines should begin "MATH 1316-002" and contain a relevant statement/question/comment.

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: 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; **instructors 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. 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 referrals, 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)** 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** 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>.

The instructor (Dwight A. Williams II) reserves the right to make changes to the syllabus/schedule, including Midterm dates (excluding the officially scheduled final examination) found in the Important Dates section, when unforeseen circumstances occur or to the discerned benefit of the class membership (students and instructor). These changes will be announced as early as possible so that students can adjust their schedules.

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), or **911**.
 (For non-emergency, call the UTA police at 817-272-3381.)

Some Library Resources:

- Library Home Page..... <http://library.uta.edu>
- Academic Plaza Consultation Services..... <http://library.uta.edu/academic-plaza>
- Subject Guides..... <http://libguides.uta.edu>
- Subject Librarians..... <http://library.uta.edu/subject-librarians>
- Database List..... <http://libguides.uta.edu/az.php>
- Course Reserves..... <http://pulse.uta.edu/vwebv/enterCourseReserve.do>
- Library Tutorials..... <http://library.uta.edu/how-to>
- Connecting to the library from Off-Campus..... <http://libguides.uta.edu/offcampus>
- Ask a librarian..... <http://ask.uta.edu>
- FabLab..... <http://fablab.uta.edu>
- Study Room Reservations..... <http://openroom.uta.edu>
- Scholarly Communications..... <http://library.uta.edu/scholcomm>

Important Dates:

- | | |
|-----------------------|---|
| Wednesday, January 30 | Census Date, Deadline for makeup exam requests |
| Monday, February 18 | MIDTERM 1 |
| March 11 – March 16 | Spring Break |

Monday, March 25
 Friday, March 29
 Wednesday, April 17
 Wednesday, May 1
 Friday, May 3
 Saturday, May 4

MIDTERM 2
 Official last day to drop, W awarded
 MIDTERM 3
 Last MATH 1316-002 lecture
 Last day of classes University-wide
 Final Exam for MATH 1316 (9:00am – 11:30am)

SPR 19

MATH 1316-002

Instructor: Dwight A. Williams II

MONDAY		WEDNESDAY		
14-Jan	11.1	16-Jan	11.1, 11.2	Week 1
21-Jan	MLK DAY	23-Jan	11.9	Week 2
28-Jan	11.2	30-Jan	11.3 - 11.4	Week 3
04-Feb	11.5 - 11.7	06-Feb	11.5 - 11.7	Week 4
11-Feb	11.5 - 11.7	13-Feb	Review	Week 5
18-Feb	Midterm I	20-Feb	11.8	Week 6
25-Feb	11.8	27-Feb	12.1	Week 7
04-Mar	12.2	06-Mar	12.2, 12.6	Week 8
11-Mar	SPRING BREAK	13-Mar	SPRING BREAK	Week 9
18-Mar	12.3	20-Mar	Review	Week 10
25-Mar	Midterm II	27-Mar	13.2	Week 11
		29-Mar		
01-Apr	13.1	03-Apr	13.1, 13.2	Week 12
08-Apr	13.3	10-Apr	13.3	Week 13
15-Apr	Review	17-Apr	Midterm III	Week 14
22-Apr	13.5	24-Apr	13.6	Week 15
29-Apr	Review	01-May	Review	Week 16
04-May	Departmental Final Exam			Finals

Finals Week: May 06 – 19, 2019

Drop Deadline (submissions by 4:00pm)

Census Date

Grades due: 14 May 2019