MATH 1315 - SEMESTER  YEAR  TIME AND ROOM

INSTRUCTOR:  

OFFICE:  OFFICE HOURS: 

E-MAIL:  PHONE: 

TEXTBOOK:  Mathematical Applications for Management, Life, and Social Sciences, Harshbarger/Reynolds, 10th ed., BROOKS/COLE 

?Faculty Profile: [Insert your Profile URL, e.g. https://www.uta.edu/mentis/public/#profile/profile/view/id/1554/.] [If you elect to include this URL, be sure that the last four digits of the address are associated with your profile, and not somebody else’s.]

NOTE OF CAUTION:
According to the UTA catalog credit may be received for only one of Math 1301, 1315 and 1302. Talk to the mathematics advisor or your own advisor if you have any questions concerning this.

PREREQUISITES:
According to the UTA catalog the only prerequisite for Math 1315 is an appropriate score on the MAT test. However if you have an SAT score of 600 or greater or you have credit for a course more advanced than this one, and it is your understanding that you still need this course, see the math advisor if you have questions. See http://www.uta.edu/math/pages/main/mpt.htm for MAT test details.

Quick Description of Course Content: Presents material covered in a traditional algebra course but with emphasis toward business applications. Linear equations, systems of linear equations, systems of linear inequalities, elements of matrix algebra and probability.

Information concerning major assignments/examinations and makeup policy: [Add to any information given: This is a course which satisfies the mathematics core requirement for the State of Texas and as such you will be ask to submit a "signature" assignment which addresses the core objectives of the course]

Attendance Policy:

Calculation of Grade:

COURSE PURPOSE, LEARNING OUTCOMES AND OBJECTIVES(SEE ATTACHED ASSIGNMENT SHEET):

PURPOSE

(1) Most importantly this course satisfies the UTA (and state) core curriculum requirement in mathematics- note however that degree plans in various disciplines at UTA may call for additional math.

(2) It, or a course roughly equivalent to it (example, Math 1302 College Algebra), is required on all degree plans in the College of Business. It also serves as a prerequisite for Math 1316 - also on all degree plans in Business.

(3) It is also occasionally used as a substitute for college algebra in various other programs and certification plans. For all of these non-core curriculum, non-Business
purposes consult the departmental or certification entity involved before making a decision concerning the course.

OBJECTIVES

The main objectives in a mathematics core curriculum course such as this one are to enhance the student’s

(1) ability to communicate effectively,

(2) ability to apply critical thinking skills, particularly to the types of real world problems encountered in the course, and

(3) skills in handling problems that are highly quantitative in nature or that require an empirical mode of thought to be successful.

Details of the ways these objectives are attained by the various learning outcomes in the course immediately follows the following description of those outcomes.

LEARNING OUTCOMES

After successfully completing the course, the student

(1) Will be competent in traditional basic algebraic skills and the language and notations of sets and the real number system. The skills referred to here include those associated with quick and accurate manipulation of radicals, factoring, exponents, and fractions—in other words with facile handling of traditional algebraic expressions. These basic skills are reviewed and enforced in assignments 1-6, all from Chapter 0.

(2) Will understand and be able to work with linear functions, systems of linear equations in two or three variables, linear inequalities, the graphs of linear functions and the associated ideas of slope, parallel and perpendicular lines, intercepts of lines. The student will be able to set up linear models for real world situations and use the techniques mentioned above to answer meaningful questions concerning those situations. This material is in Chapter 1, assignments 7-11.

(3) Will be able to solve quadratic equations several ways, graph second degree functions, identify key geometric components of these graphs and solve optimization ("max-min") problems making use of this knowledge. Many of these optimization problems—such as maximizing profit, minimizing average cost, finding break-even and market equilibrium points—are from the world of business. This material is in Chapter 2 and is covered in assignments 12-14. Additionally, from this chapter (assignment 15, section 2.4), the student will understand and be able to handle a few elementary real world problems associated with the basics of polynomials, rational functions, piecewise defined functions, curve shifting (left and right), and vertical and horizontal asymptotes.

(4) Will be proficient in matrix algebra (especially multiplication), matrix nomenclature, the Gauss-Jordan process, and will be able to find the inverse of a matrix. The student will also be able to setup numerous real world problems in matrix language and solve the resulting problem. This material occurs in Chapter 3, assignments 16-19.

(5) Will be able to set up and solve systems of linear inequalities, and then by introducing an objective function solve the associated linear programming problems (by graphing techniques only—the simplex method is not covered). This material and the understanding it brings to certain business problems is perhaps the most important part of the course for some students. This material is in Chapter 4, assignments 20 and 21.

(6) Will understand the basic rules and language of probability, how to find the probability of the union and intersection of events, how to detect and treat conditional
probability situations, how to determine whether events are independent or dependent and the ensuing formulas to apply, how to use Bayes Formula (usually in a tree diagram setting). Applications from the real world abound in this material. It is covered in sections 7.1 through 7.4, assignments 22-25.

(7) Will be able to employ a few basic counting techniques common in mathematics, most notably the formulas and definitions concerning combinations and permutations. The student will subsequently be able to use these counting techniques to work more involved problems in probability than possible heretofore.

Students who have acquired the capabilities and knowledge described above (at an acceptable level!) will find the skills mentioned in the course objectives above greatly enhanced, to wit:

Communication Skills

The students will be creating solutions to real world word problems throughout the course ("word problems"), and the presentations of those solutions will require strong communication skills. These skills are most carefully honed however in all of the problems in the applications sections for Chapter 1 (assignment 11) and Chapter 2 (assignment 14), and in the Gauss Jordan, linear inequality, and linear programming problems: #51, #55, p.219; #27, p. 265; #27, #29, p. 275. All of the problems listed involve the ability to translate real world problems into mathematical models and then explain to a teacher, grader, or other student the solution and how it was obtained.

Critical Thinking Skills

As above for communication skills, critical thinking skills are called for throughout the course and in particular in the word problems. Critical thinking skills however, as opposed to communication skills above, are particularly involved when the student is asked to perceive in his or her own mind the relation between the words on paper in a problem and the symbolic math model which he or she uses to solve the problem. Nowhere in elementary mathematics are these skills called upon more than in problems involving probability and counting techniques. The jump here from the words on paper to what is often a relatively simple mathematical model is sometimes mystifying and bizarre to the student. These skills are called upon in the majority of the problems in assignments 22-27, Chapter 7, Introduction to Probability.

Empirical and Quantitative Skills

Being a basic algebra type of course these skills are obviously called upon and developed throughout the course. However the sections of the course that are devoted almost entirely to the reaffirmation or further development of these skills are: Assignments 1-6 concerning the basic rules of algebra, and, assignments 17-19 which concern matrix multiplication, the Gauss Jordan elimination method, and finding the inverse of a matrix. These all involve fairly lengthy "number crunching" processes which are new to the student. Mastering these techniques requires, as well as re-enforces, understanding of the quantitative nature of the symbols involved. Nothing helps a student develop quantitative skills better than "checking out" the rules of algebra, and nothing helps develop highly efficient such skills more than knowing well the rules of algebra.
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/aaofao/](http://wweb.uta.edu/aaofao/)).

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

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 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.

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](http://www.uta.edu/resources).

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](http://www.uta.edu/oit/cs/email/mavmail.php).
**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](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:** [NEW and REQUIRED] 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 [insert a description of the nearest exit/emergency 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 handicapped individuals.

As you see, this new section requires faculty members to be fully aware of the exits nearest their classrooms, even before the semester begins. In the case that you are unable to ascertain this information in time for your syllabus, you must be sure to explain to your students on day one how best to exit the building. Inclusion of this verbiage as well as a brief discussion on the matter with your students at the beginning of the term is mandated by UT Arlington Procedure 7-6: Emergency/Fire Evacuation Procedures ([https://www.uta.edu/policy/procedure/7-6](https://www.uta.edu/policy/procedure/7-6)).

**Course Schedule.** [Required]
You must provide students with a schedule / timetable for the course. Furthermore, per House Bill 2504, your course schedule must “[provide] a general description of the subject matter of each lecture or discussion.”

In your course schedule, you should strive to indicate (to the extent possible) dates for all major work to be completed. (The definition of “major” is left to the discretion of each instructor.)

Immediately before or after the course schedule, you are encouraged to include the following verbiage (or something similar): “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. —First M. Last.” Should you find such adjustments to be necessary, please do your best to advise students in a timely manner. (The definition of “timely” is left to the discretion of each instructor.)

If you plan to include important administrative dates (e.g., the officially-scheduled time slot for your course’s final examination, the last day to drop), please be sure to double-check the relevant information published by the Office of Records and Registration. Particularly useful are the pages for Faculty and Staff Services and for the Academic Calendar.
SIGNATURE ASSIGNMENT FOR MATH 1315:

1. #26 p. 45 Chapter 0
2. #28 p. 48 Chapter 0
3. #83 p. 49 Chapter 0
4. #10 p. 206 Chapter 3.2
5. #16 p. 234 Chapter 3.4
6. #28 p. 267 Chapter 4.1
7. #14 p. 456 Chapter 7.3
8. #4 p. 456 Chapter 7.3
9. #44 p. 75 Chapter 1.2
10. #36 p. 206 Chapter 3.2

Quantitative skills are tested thoroughly in problems 1-5. Problems 1-3 involve the traditional algebraic skills of simplifying complex fractions, factoring and handling both positive and negative exponents. Problems 4 and 5 involve the newer(to the student) quantitative skills of multiplying matrices, finding the inverse of a matrix and working with the transpose of a matrix. Quantitative skills are also clearly involved to some extent in the other problems.

Critical thinking skills are thoroughly called for in problem 6. It is a rather lengthy real world problem involving various possible laboratory procedures which the student is expected to transform into a system of linear inequalities. The student is not asked to solve the corresponding linear programming problem, which involves finding the maximum number of animals that can be used in an experiment. However, setting up the linear inequalities and finding the end points which are called for, comprises almost all of the critical thinking part of the corresponding linear programming problem. Problems 7 and 8 are probability problems which quantitatively involve only basic arithmetic, but do demand careful critical thinking.

Since the problems are all show-your-work type of problems, problems 6, 7, and 8 clearly test communication skills somewhat. Problems 9 and 10 however explicitly call for written explanations of the students answers. Since neither problem is very difficult from a mathematical point of view, communication skills are paramount.