Mathematics for Business & Social Sciences
COURSE OUTLINE FOR MATH 1324
(Revised August 2019)
3 hour lecture course / 48 hours per semester


The ISBN for hard bound text with MML is: 978-0135335215
Note: Please use this ISBN when creating your MyMathLab course shell; students will get the reduced rate for MyMathLab purchase.

Catalog Description: MATH 1324 Mathematics for Business & Social Sciences. The application of common algebraic functions, including polynomial, exponential, logarithmic, and rational, to problems in business, economics, and the social sciences are addressed. The applications include mathematics of finance, including simple and compound interest and annuities; systems of linear equations; matrices; linear programming; and probability, including expected value. 3 credit (3 lecture).

Prerequisites: A grade of C or better in Math 0310 or a grade of C or better in MATH 0314 (or its equivalent) or meet TSI college-readiness standard for college-level mathematics.

Co-requisite: MATH 0310 is a co-requisite to MATH 1324. Since MATH 0310 is co-requisite with MATH 1324, withdrawing from MATH 0310 will necessitate withdrawal from MATH 1324 as well.

HCC MATH PATHWAYS
Corequisite Pathway
Prerequisite Pathway

Course Intent: This course is intended for students majoring in liberal arts and secondary education.

Audience: Students who are enrolled in the business area may take this course as an elective in order to obtain a broader background in the technique of linear programming and to further expand their mathematical knowledge.

Course Student Learning Outcomes (SLO):
1. Apply elementary functions, including linear, quadratic, polynomial, rational, logarithmic, and exponential functions to solving real-world problems.
2. Solve mathematics of finance problems, including the computation of interest, annuities, and amortization of loans.
3. Apply basic matrix operations, including linear programming methods, to solve application problems.
4. Demonstrate fundamental probability techniques and application of those techniques, including expected value, to solve problems.
5. Apply matrix skills and probability analyses to model applications to solve real-world problems.

Objectives:
Students will:
1. Be able to graph systems of linear equations in two variables.
2. Be able to solve systems of linear equations using Gauss-Jordan elimination.
3. Be able to add, subtract, and multiply matrices.
4. Be able to find the inverse of a square matrix.
5. Find simple and compound interest.
6. Find the future value of a given annuity.
7. Find the monthly payment and the total interest for a given simple interest amortized loan.
8. Be able to graph systems of linear inequalities in two variables.
9. Use the graphical method for solving a linear programming problem.
10. Use the simplex method for solving standard maximization and standard minimization problems.
11. Be able to perform the basic set operations.
12. Be able to use the multiplication principle, permutations and combinations in counting arguments.
13. Calculate basic probabilities using classical methods.
15. Calculate expected values in real-world applications.
16. Use expected values in real-world applications.
17. Use the binomial distribution to model and analyze probability experiments.
**Course Outline:** Instructors may find it preferable to cover the course topics in the order listed below. However, the instructor may choose to organize topics in any order, but all material must be covered.

**APPROXIMATE TIME** | **TEXT REFERENCE**
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**UNIT I** Mathematics of Finance (5.5 hours)  
1 hour | 5.1 Simple Interest and Discount  
1 hour | 5.2 Compound Interest  
1.5 hours | 5.3 Annuities, Future Value, and Sinking Funds  
2 hours | 5.4 Annuities, Present Value, and Amortization

**UNIT II** Sets and Probability (5.5 hours)  
1 hour | 8.1 Sets  
1.5 hours | 8.2 Applications of Venn Diagrams and Contingency Tables (**Optional**)  
1.5 hours | 8.3 Introduction to Probability  
1.5 hours | 8.4 Basic Concepts of Probability  
2 hours | 8.5 Conditional Probability and Independent Events

**UNIT III** Counting, Probability Distributions, and Further Topics in Probability (5.5 hours)  
1.5 hours | 9.1 Probability Distributions and Expected Value  
1.5 hours | 9.2 The Multiplication Principle, Permutations, and Combinations  
1.5 hours | 9.3 Applications of Counting  
1.5 hours | 9.4 Binomial Probability

**UNIT IV** Review (2 hours)  
1 hour | 2.1 Graphs  
1 hour | 2.2 Equations of Lines

**UNIT V** Systems of Linear Equations (7 hours)  
1.5 hours | 6.1 Systems of Two Linear Equations in Two Variables  
2 hours | 6.2 Larger Systems of Linear Equations  
2 hours | 6.3 Applications of Systems of Linear Equations  
1 hour | 6.4 Basic Matrix Operations  
1.5 hours | 6.5 Matrix Products and Inverses

**UNIT VI** Linear Programming (8 hours)  
1 hour | 7.1 Graphing Linear Inequalities in Two Variables  
1.5 hours | 7.2 Linear Programming: The Graphical Method  
2 hours | 7.3 Applications of Linear Programming  
2 hours | 7.4 The Simplex Method: Maximization  
2 hours | 7.5 Maximization Applications
UNIT VII  Nonlinear Functions (10 hours)

2 hours  3.4 Quadratic Functions and Applications
2 hours  3.6 Rational Functions
2.5 hours  4.1 Exponential Functions
2.5 hours  4.3 Logarithmic Functions
3 hours   4.4 Logarithmic and Exponential Equations

Departmental Policies:
1. Each instructor must cover all course topics by the end of the semester. The final exam is comprehensive and questions on it can deal with any of the course objectives.
2. Each student should receive a copy of the instructor’s student syllabus for the course during the first week of class.
3. A minimum of three in class tests and a comprehensive final departmental examination must be given. The final examination must be taken by all students.
4. All major tests should be announced at least one week or the equivalent in advance.
5. The final exam must count for at least 25 to 40 percent of the final grade.
6. The final course average will be used in the usual manner (90-100 “A”; 80-89 “B”; 70-79 “C”; 60-69 “D”; Below 60 “F”).
7. Either an open book or a take home major test may be given at the discretion of the instructor.
8. Any review sheet should be comprehensive and the student should not feel that classroom notes, homework, and tests may be ignored in favor of the review sheet for any examination.
9. For distance Ed (Online courses):
   i. At least 45% of your course grade must consist of scores from in-person proctored exams in the Testing Center.
   ii. At least two exams in your online Math 1324 course must be proctored in the Testing Center.

Resource Materials: Any student enrolled in Math 1324 at HCCS has access to the Academic Support Center where they may get additional help in understanding the theory or in improving their skills. The Center is staffed with mathematics faculty and student assistants, and offers tutorial help, video tapes and computer-assisted drills. Also available is a student’s Solutions manual which may be obtained from the Bookstore.

Suggested Methods: It is helpful to begin each class with questions concerning the material discussed and the assigned homework problems. In presenting new material, it is suggested that an explanation be followed by students working examples in class. Students should be encouraged to work the review exercises at the end of each chapter. Also, they should be encouraged to visit the Academic Support Center at their respective colleges.

Academic Honesty: All students are required to exercise academic honesty in completion of all tests and assignments. Penalties for academic dishonesty (cheating on a test, collusion on an assignment, etc.) include, but are not limited to, a reduced grade, a “0” on that test or assignment, a “W” in the course, or an “F” in the course. The use of recording devices, including camera phones and tape recorders, is prohibited in all locations where instruction, tutoring, or testing occurs. Students with disabilities who need to use a recording device as a reasonable accommodation should contact the Disability Services Office for information.

Withdrawal policy:
If your name is on the roll at the end of the term, you WILL receive a grade. If you wish to drop the class, then it is your responsibility to do that before the final drop date. Neither you nor your instructor will be able to perform the drop after the final drop date. Please refer to the following notice before dropping the class.

NOTICE: Students who take a course three or more times will face significant tuition or fee increases at HCC and other Texas public colleges and universities. In addition, state law dictates that students are allowed a maximum of 6 course withdrawals during their entire college career. Starting in the fall of 2007, students with more than 6 drops will be required to pay additional fees. Prior to course withdrawal, you must confer with your professor or counselor about your study habits, homework, test-taking skills, attendance, course participation, and tutoring or other assistance that is available.
Americans With Disabilities Act (ADA): Any student with a documented disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the Disability Services Office at their college at the beginning of each semester. Faculty members are authorized to provide only the accommodations requested by the Disability Support Services Office.

Sexual Harassment: It is a violation of HCCS policy for an employee, agent, or student of the college to engage in sexual harassment as defined in the EEOC guidelines (EEO/AA Compliance Handbook 47).