

# Course ID (department and course number) MAT 116

II. Course Name: Precalculus for Business

III. Number of Credits Awarded for Course: 4 credits

IV. Prerequisite or Co-requisite Courses or Academic Standing (if applicable):

Co-requisite = MAT 100 College Algebra

V. Indicate if New or Modified Course (if modified course, list old course ID)

New course

VI. Semester and Year Course Will First Be Offered (or, if a modified course, semester and year when revised course will be offered):

Fall 2009

VII. Name and Telephone Number and/or e-mail Address of Department Chair or Other Appropriate Contact Person

Catherine Sirangelo-Elbadawy ❖ (201) 360-4261

Ahmed Rakki, Math/Algebra Coordinator ❖ 360-4269

VII. Detailed Course Description

The course is designed primarily for students majoring in accounting, business, economic and finance. The course relates mathematical concepts to economic and finance applications. These concepts includes but not limited to linear, quadratic, exponential and logarithmic business applications involving supply, demand, revenue, cost, profit and break-even points, Leontief Input-Output model, compound and simple interest, present and future value of annuities, and mortgage payment and amortization. Classroom instructions will be presented using a TI-83 Plus graphic calculator.

IX. Outline of Course Objectives

Upon successful completion of this course, students will be able to:

1. solve linear and quadratic equations.

2. solve systems of linear equations.

3. graph linear and quadratic functions.

4. analyze basic linear and quadratic business and economic applications “total revenue, total cost, and total profit functions”.

5. find break-even points for linear and quadratic function applications.

6. find market equilibrium, given linear or quadratic supply and demand functions.

7. graph linear and quadratic supply, demand, cost, revenue and profit functions.

8. perform the basic operations of addition, subtraction, scalar multiplication, and multiplication of matrices.

9. use Gauss-Jordan elimination to solve a system of linear equations without a calculator and with the calculator using “rref”.

10. write a system of equations as a matrix equation and solve the system by using the inverse of a matrix.

11. solve both an open and closed Leontief Input-Output model.

12. graph exponential and logarithmic functions.

13. solve logarithmic and exponential equations in business and economic using logarithmic properties; growth and decay, supply, demand, total cost, total revenue, total profit and compound interest.

14. calculate simple and compound interests.

15. compute the future and present values of annuities.

16. compute mortgage payments and make a mortgage amortization table using the calculator.

X. Texts, Journals, and Other Materials Used In Course

**Proposed student texts.**

*Mathematical Applications for the Management, Life, and Social Sciences*, 8th edition, Ronald J. Harshbarger/James J. Reynolds, Houghton-Mifflin Co., 2007.

**Background readings for students and other materials for faculty teaching the course**.

✓ Blackboard/WebCT - Mathematical Applications: For the Management, Life, and Social Sciences, 8th

ISBN-10: 0618676996 | ISBN-13: 9780618676996

✓ Eduspace Multimedia eBook

ISBN-10: 0618755640 | ISBN-13: 9780618755646

✓ Eduspace on Blackboard

ISBN-10: 0618676953 | ISBN-13: 9780618676958

✓ Online Instructor's Resource Manual

ISBN-10: 0618676937 | ISBN-13: 9780618676934

✓ Online Keystroke Guide

ISBN-10: 0618677003 | ISBN-13: 9780618677009

✓ eBook: Mathematical Applications: For the Management, Life, and Social Sciences

ISBN-10: 0495712256 | ISBN-13: 9780495712251

**General Resources**

Visit the following web address to access resources for students and faculty:  
<http://college.cengage.com/mathematics/harshbarger/mathematical/8e/resources.html>

* [**Student Solutions Manual**](http://college.cengage.com/mathematics/harshbarger/mathematical/8e/resources/ssm.html)
* [**Digital Lessons**](http://college.cengage.com/mathematics/harshbarger/mathematical/8e/resources/dl.html)  
  Use these clear and concise PowerPoint slides to enhance your understanding of the topics covered in this course. Print them out for reference or view them on your computer.
* [**Graphing Calculator Guide: Easy Steps to Success**](JavaScript:%20ow('/mathematics/harshbarger/mathematical/8e/assets/calcguide.pdf',0))  
  Easy Steps to Success gives step-by-step keystrokes and instructions for the TI-series calculators, along with examples using these keystrokes and instructions to solve problems.
* [**Online Graphing Calculator**](JavaScript:%20ow('/mathematics/blackboard/shared/general_resources/calculator/index.html',0))

XI. Grade Determinants

Students grades will be based on: four tests, homework, attendance & class participation and a comprehensive final exam. Should the students miss a test due to an emergency, he/she must notify the instructor and schedule a make up test upon his/her return to school.

Four tests (15 % each) 60%

Final Exam 30%

HW, attendance and class participation 10%

# XII. Number of Papers and Examinations

Four tests and a final exam

## XIII Schedule of Topics to Be Covered

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| **Week** | **TOPIC** |
| 1 | Solution of Linear Equations in One Variable  Applications of Linear Equations in One Variable Functions, Applications of Linear Functions |
| 2 | Parallel & Perpendicular Lines Solutions of Systems of Linear Functions Cost, Revenue & Profit Functions, Breakeven Analysis |
| 3 | Supply & Demand Functions, Market Equilibrium  Review for Test #1 |
| 4 | **Test #1** Quadratic Equations & Functions |
| 5 | Business Applications of Quadratic Functions “*Supply, Demand, Market Equilibrium, and Break-Even Points*” Matrices, Multiplication of Matrices |
| 6 | Solving Systems by Gauss-Jordan Elimination Solving Systems with non-Unique Solutions & Applications |
| 7 | Review for Test 2 **Test #2** |
| 8 | Inverses of 2x2 and Diagonal Matrices  Inverses of Any Square Matrix Matrix Equations |
| 9 | Leontief Input-Output Open Model Leontief Closed Model Exponential Functions |
| 10 | Application of Exponential Functions Review for Test #3 **Test #3** |
| 11 | Logarithmic Functions Logarithm Properties, Change of Base Applications of Exponential & Logarithmic Functions |
| 12 | Simple and Compound Interest Future Value of Annuities |
| 13 | Present Value of Annuities Loans And Amortization Review for Test #4 |
| 14 | **Test #4** Review for Final Exam |
| 15 | **Final Exam** |