

## Linfield College Syllabus

**Department:** Continuing Education (DCE)

**Course Number:** MAT 150

**Course Title:** Finite Mathematics With Calculus

**Credits:** Five (5) Credits

**Instructor:** M. Malek Daaboul

**Instructor Contact:** Address: 17558 SW Kemmer View Ct.  
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**Term:** Summer 2007

**Dates/Time/Location:** Saturday: 6/23, 7/7, 21; 8/4, 11. / Walker 220; 9am- 5pm.  
Sunday: 6/24, 7/8, 22; 8/5, 12. / Walker 220; 9am- 5pm.

**Department Approval:** \_\_\_\_\_

### **I. Course Description:**

A major objective of this course is to give the student substantial experience in modeling and solving real-world problems.

The first part of the course begins with the development of a library of elementary algebraic functions (Chapters 1 and 2), including their properties and uses. Students are expected to investigate mathematical ideas and processes graphically and numerically, as well as algebraically. This development lays a firm foundation for studying mathematics both in this course and in future endeavors. Then the course will introduce the student to the subject of Finite Mathematics which can be thought of as three units: Mathematics of Finance (Chapter 3); Linear Algebra, including matrices, linear systems, and linear programming (Chapters 4 and 5).

Chapter 3 presents a thorough treatment of simple and compound interest and present and future value of ordinary annuities. Chapter 4 covers linear systems and matrices with an emphasis on using row operations and Gauss-Jordan elimination to solve systems and to find matrix inverses. This chapter will cover applications of mathematical modeling utilizing systems and matrices. Chapter 5 provides broad and flexible coverage of linear programming. Graphing technique will be covered to solve linear programming problems.

The second part of the course consists of differential calculus (Chapters 9 - 11). Emphasis is given to the uses of calculus as a problem-solving tool. Special effort will be made to present the basic concepts in an intuitive fashion, and examples and problems have been chosen from a broad spectrum of management applications.

Chapter 9 introduces the derivative, covers the limit properties essential to understanding the definition of the derivative, develops the rules of differentiation (including the chain rule for power forms), and introduces applications of derivatives in business and economics. Chapter 10 focuses on graphing and optimization. Continuity and first derivative and second derivative graph properties are covered while emphasizing polynomial graphing. Also Rational function graphing is covered. Optimization is covered including examples and problems involving end-point solutions.

Chapter 11 extends the derivative concepts discussed in chapters 9 & 10 to exponential and logarithmic functions (including the general form of the chain rule). Implicit differentiation is covered and applied to related rate problems.

## **II. Prerequisites, Helpful Knowledge and skills:**

The student should have a sound knowledge of College Intermediate Algebra (MAT 115) or equivalent.

## **III. Learning Objectives/Outcomes:**

After completing this course the student should have the knowledge of the principles, concepts and applications of finite mathematics. Many of these principles and concepts are applicable to solving problems in business and economics, life science, and social science as well as other aspects of the student's professional and personal life. Consequently, the student should expect the benefits of studying Finite Mathematics to serve him/her in those areas as well.

## **IV. Methodology:**

The mode of delivery for learning are lectures, homework, quizzes, and four examinations. Class discussion of the subject matter concepts and interactive dialogue among students and the instructor is expected/encouraged to ensure clear understanding of finite mathematics concepts and its applications to problem-solving, decision making in business and economics, life science and social science areas.

## **V. Resources:**

**Text:** College Mathematics for Business, Economics, Life Sciences, and Social Sciences.

By: Raymond Barnett, Michael Ziegler, and Karl Byleen. 10<sup>th</sup> edition.  
ISBN: 0-13-143209-5, Prentice Hall.

## **VI. Evaluation & Grading:**

The student's learning is evaluated continuously through class interactions, assignments, quizzes, and four examinations. The course grade is based on the student performance on the quizzes and the exams.

<b>Class Participation:</b>	<b>20%</b>	
<b>Exam 1:</b>	<b>20%</b>	<b>Chapters 1, 2, &amp; 3</b>
<b>Exam 2:</b>	<b>20%</b>	<b>Chapters 4 &amp; 5</b>
<b>Exam 3:</b>	<b>20%</b>	<b>Chapters 9,</b>
<b>Exam 4</b>	<b>20%</b>	<b>Chapters 10 &amp; 11</b>

## **VII. Course Outline:**

### **Week 01**

- |                                  |                           |
|----------------------------------|---------------------------|
| <b>1. Elementary Functions</b>   | <b>Chapters 1 &amp; 2</b> |
| <b>2. Mathematics of Finance</b> | <b>Chapter 3</b>          |

### **Week 02:**

**EXAM I (50 minutes, 100 points), Chapters 1, 2, & 3, 20% of grade.**

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|--|------------------|
| <b>3. Systems of Linear Equations: Matrices</b>      | <b>Chapter 4</b> |
| <b>4. Linear Inequalities and Linear Programming</b> | <b>Chapter 5</b> |

### **Week 03:**

**EXAM II (50 minutes, 100 points), Chapters 4 & 5 20% of grade.**

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|--------------------------|------------------|
| <b>5. The Derivative</b> | <b>Chapter 9</b> |
|--------------------------|------------------|

### **Week 04:**

**Exam III (50 minutes, 100 points), Chapter 9 20% of grade.**

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|---|-------------------|
| <b>6. Graphing and Optimization</b>     | <b>Chapter 10</b> |
| <b>7. Additional Derivatives Topics</b> | <b>Chapter 11</b> |

### **Week 05:**

Review Chapters 10 & 11

Exam IV(50 minutes, 100 points), Chapters 10 & 11

20% of grade.

**Biography:** Malek Daaboul has a broad industrial background with a record of contribution in marketing, sales, customer support, engineering, manufacturing, information technology, and business management. Strong planning and management skills complemented with a thorough technical and analytical background. Worked at Owens Illinois in Toledo, Ohio for about nine years in different capacities: Manufacturing Engineer, Senior Operations Research Analyst, and Systems Software & Technical Supervisor. He then worked for Tektronix in Beaverton, Oregon for about Six years as Technical Services Manager before joining Sequent Inc. in Beaverton, Oregon for about four years as Computer Resources Group Manager and Later as Rightsizing Marketing Manager. Then He worked for IBM Global Services in Portland, Oregon for about four years as a Senior Business Management Consultant/Solutions Manager and for Oracle Corporation in Portland, Oregon for about two years as Consulting Services Practice Manager. Responsibilities at IBM and Oracle included business development in Oregon, marketing, and selling consulting services as well as overall management of consulting engagements and executive relationships. Malek has been teaching undergraduate and graduate (MBA) courses since 1974. Courses taught include Strategic Marketing Management, Industrial Marketing, Services Marketing, International Marketing, Management Decisions Making, Decision and Executive support Systems, Economic Decision Making, Managerial Forecasting, Operations Research, Operations Management, Information Technology and Mathematics. He has masters degrees in electrical and industrial engineering and done Ph.D. work (two years) in systems engineering.