

UNIVERSIDAD DEL SAGRADO CORAZÓN
DEPARTAMENTO DE ADMINISTRACIÓN DE
EMPRESAS

COURSE SYLLABUS

COURSE TITLE:	Quantitative methods in business management
COURSECODE:	MCO 150
PREREQUISITE:	Level in CEEB 600
COURSE CREDITS:	Three (3) credits, three (3) hours per week, one (1) semester

DESCRIPTION

Introduction to quantitative techniques needed by the manager for decision making. Study of the growth rates, marginal analysis and decreasing return in production. Estimation of sales, costs, and income trends; Income and sales projections; calculated consumer and producer income and surplus.

JUSTIFICATION

There is a tendency in business disciplines towards the use of technology in the administrative phase of business. This implies mastering the analytical tools for effective business management. Every student of business administration needs to develop the conceptual framework and the analytical basis on which decisions are made in organizations in order to increase the probability of achieving the expected results.

OBJECTIVES

At the end of the course, students will be trained to:

1. Apply the fundamentals of algebra and calculation to business problems.
2. Identify and relate marginal and total magnitudes.
3. Build and solve optimization problems.
4. Apply the rules of derivation for the solution of problems of managerial nature.
5. Apply the rules of integration for the solution of problems of a managerial nature.

CONTENT

I. Equations

A. Linear equations and quadratic functions

1. Concept of equation

2. Equations with an unknown
3. System of linear equations
4. Equation graphs
5. Functions
6. Verbal problems of managerial application
 - a. One unknown
 - b. Cost-benefit analysis
 - c. Supply-demand analysis

B. Quadratic equations

1. Quadratic equations with an unknown
2. Solution of quadratic equations
3. Application of quadratic equations to managerial problems.

II. Introduction to differential calculus

A. Functions

1. Slope concept
2. Rates of change
3. Tangent lines
4. General equation of the slope

B. The derivative

1. Concept of the limit
2. The derivative
3. Instantaneous change rate
4. Problems of application to the concepts of cost, income and marginal profit

C. Differential calculation rules for functions

D. Derivative of higher order

1. First derivative
2. Second derivative
3. Other derivatives

III. Specific applications of differential calculation to business management

A. Optimization

1. Intervals
2. Local and absolute maximums and minimums
3. Critical points
4. Inflection points
5. Maximization and minimization

6. Maximization of total income and marginal income
7. Profit maximization
8. Cost minimization
9. Cost of inventories

B. Partial derivatives

1. Concept of partial derivative
2. Multivariable functions

IV. Introduction of integral calculus and its application to business management

A. Indefinite and definite integration

1. Antiderivatives
2. Integration constant
3. Indefinite integration
4. Definite integration
5. Area under the curve
6. Fundamental Theorem of Calculus

B. Applications to business management

1. Consumer and producer surplus

INSTRUCTIONAL STRATEGIES

Conferences, discussion of problems of managerial application and solution of exercises.

EVALUATION

Three (3) partial exams	75
Final exam	<u>25</u>
Total	100 %

TEXT

Sullivan, M. & Mizrahi, A. (2004). *Mathematics: An Applied Approach*. 8th Edition. Wiley

BIBLIOGRAPHY

Anton, H. (2012). *Calculus*, 10th Edition. Wiley & Sons

Barnet, R. A. (2008). *Applied Mathematics For Business, Economics, Life Sciences and Social Sciences*, 11th Edition. Prentice Hall

Barnet, R. A. (2010). *Calculus For Business, Economics, Life Sciences and Social Sciences*, 12th Edition. Prentice Hall

Bettinger, M. L. (2015). *Calculus and Its Applications*, 11th Edition. Pearson

Goldstein, L. J. (2014). *Calculus and Its Applications*, 11th Edition. Pearson

Haeussler, E. F. (2010). *Introductory Mathematical Analysis for Business, Economics and the Life and Social Science*, 13th Edition. Prentice Hall/Pearson

Haughes-Hallet, D. (2014). *Applied Calculus*, 5th Edition. Wiley & Sons. Inc.

Hoffman, L. D. & Bradley, G. L. (2009). *Applied Calculus For Business, Economics and the Social and Life Sciences*, 10th Edition. McGraw-Hill

Larson, R. (2009). *Calculus of a Single Variable*, 9th Edition. Houghton Mifflin Company

CYBERNETIC LINKS

<http://archives.math.utk.edu/visual.calculus/>

<http://www.calc101.com/>

<http://www.calculus.org/>

<http://www.calculus-help.com/>

<http://www.distancecalculus.com/>

<http://www.ma.utexas.edu/users/Kawasaki/mathPages.dir/>

<http://cow.math.temple.edu/~cow/>

<http://mathforum.org/dr.math/>

REASONABLE ACCOMMODATION

Any student needing auxiliary services or special assistance must request it from the Vice President of Student Affairs at the beginning of the course or as soon as he / she acquires knowledge of them, but no later than the third week of classes.

ACADEMIC HONESTY, FRAUD AND PLAGIARISM

Any student who lacks the honesty, fraud and plagiarism policy is subject to the following sanctions: will receive a grade of zero in the evaluation and / or repetition of the work in the course, note of F (*) in the course: suspension or expulsion as established in the Academic Honesty Policy document, number: DAEE 205-001 with effective date of August 2005.

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