



Chandaria
School of
Business

BUS4020	BUSINESS MATHEMATICS AND STATISTICS
LECTURER	Dr. Mary Opondo
CREDITS	3 Units
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Consultation hours: Wednesday - 2.00 to 4.00 pm

2.12.2 Purpose of the Course

This course aims at equipping students with an elementary statistical base in solving decision-making problems especially those which involve numerical data. It also provides students with basic skills and knowledge in the fundamental business mathematics calculations that include the operation in banking: borrowing, financial analysis, retail, insurance, interest, discount, depreciation and elementary statistics.

2.12.3 Course Learning Outcomes:

By the end of this course, the students will be able to:

1. Explain how the functional areas of a business are interrelated.
2. Collect and analyze data to provide business solutions.
3. Identify various probability distributions and how/where to make use of them.
4. Analyze statistical data and make valid conclusions.
5. Apply theoretical mathematical principles to solve business problems.

2.12.4 Course Content

- **Elementary statistics.** Diagrammatic representation: Histograms; Pie-Charts; Lorenz Curve, Frequency Polygons, Ogives, Measures of Central Tendency, Mean; Mode; Median; Geometric Mean and Harmonic Mean.
- **Measures of dispersion:** Range; Mean Deviation; Standard Deviation and Coefficient of Variation.
- **Limits and continuity of functions.**
 1. Interpret a function from an algebraic, numerical, graphical and verbal perspective and extract information relevant to the phenomenon modeled by the function.
 2. Verify the value of the limit of a function at a point using the definition of the limit
 3. Calculate the limit of a function at a point numerically and algebraically using appropriate techniques.
- **Differentiation concepts / Calculus**
 1. Approximate the slope of a tangent line to a graph at a point
 2. Interpret the slope of a graph
 3. Use the limit definition to find the derivative of a function and the slope of a graph at a point.
 4. Use the derivative to find the slope of a graph at a point.
 5. Find the derivative using the constant rule, the power rule, the constant multiple rule, and sum and difference rules.
 6. Find the marginal revenue, marginal cost, and marginal profit for a product
 7. Find the derivative using the product rule, quotient rule and chain rule
 8. Find higher order derivatives
- **Application of calculus to business problem solving.**
 1. Solve related-rate problem
- **Integration**

Objectives

By the time you have worked through this unit, you should:

1. Be familiar with the definition of an indefinite integral as the result of reversing the process of differentiation.
2. Understand how rules for integration are worked out using the rules for differentiation (in reverse).
3. Be able to find indefinite integrals of sums, differences and constant multiples of certain elementary functions.
4. Be able to use the chain rule (in reverse) to find indefinite integrals of certain expressions involving composite functions.
5. Be able to apply these techniques to problems in which the rate of change of a function is known and the function has to be found.

MID SEMESTER EXAM

- **Matrices and their application in solving equations.** Cramer's rule, equilibrium point and break – even point. Input – Output market analysis.
- **Financial Mathematics:** Interest concepts and application in business – FV and PV. Loans and installment payments, annuities, bidding and insurance.
- Investment appraisal (survey).
- Depreciation methods and applications.
- Discount: trade and cash discounts concepts, mark up, mark down and applications.

Learning Outcomes

1. Single Trade Discounts

- a) Find the trade discount using a single trade discount rate; find the net price using the trade discount
- b) Find the net price using the complement of the single trade discount rate.

2. Trade Discount Series

- a) Find the net price applying a trade discount series and using the net decimal equivalent.
- b) Find the trade discount applying a trade discount series using the single discount equivalent.

3. Cash Discounts and Sales Terms

- a) Find the cash discount and the net amount using ordinary dating terms.
- b) Interpret and apply end-of-month (EOM) terms.
- c) Interpret and apply receipt- of-goods (ROG) terms.
- d) Find the amount credited and the outstanding balance from partial payments.
- e) Interpret freight terms.

Reference: Cleaves, C, Hobbs, M. & Noble, J. (2014): Chapter 8

2.12.5 Mode of Delivery

This unit is covered by lectures, group discussions and solving problems. It also involves individual assignments, quizzes and exams

2.12.6 Instructional materials and /or equipment

Scientific calculator, e-learning platform

2.12.7 Course Assessment

Class participation and attendance 10%

Assignments and/or class tests	30%
Group work	10%
Mid-Semester examination	20%
Final examination	30%

2.12.8 Course text

Cleaves, C. (2005). *Business Mathematics – Practical Applications*. New York: Prentice Hall.

2.12.9 Other recommended readings

Wonnacott J. J. & Wonnacott T. H. *Introduction to Statistics for Business and Economics*. New York: John Wiley & Sons

GRADING

90	-	100	A
87	-	89	A-
84	-	86	B+
80	-	83	B
77	-	79	B-
74	-	76	C+
70	-	73	C
67	-	69	C-
64	-	66	D+
62	-	63	D
60	-	61	D-
	Below	59	F