

## **MAT121 Mathematics for Business Outline**

### **I. Basic Skills**

- A. Fractions
  - 1. Perform operations on fractions
  - 2. Reduce/Simplify fractions
- B. Formulas
  - 1. Write formulas to model a problem
  - 2. Evaluate formulas
- C. Linear Equations and Proportions
  - 1. Solve basic linear equations
  - 2. Solve proportions
  - 3. Solve linear equation applications

### **II. Percents**

- A. Conversions between Fractions, Decimals and Percents
  - 1. Convert between fractions and decimals
  - 2. Convert between decimals and percents
  - 3. Convert between fractions and percents
- B. Percentage Formula
  - 1. Use the percentage formula to solve for percentage, base or rate
  - 2. Solve applications using the percentage formula
  - 3. Determine percent increase or decrease in applications

### **III. Purchasing**

- A. Trade Discounts and Discount Series
  - 1. Calculate trade discounts and net price with a single trade discount
  - 2. Calculate net price with a discount series
  - 3. Find single decimal equivalent for a discount series
- B. Cash Discounts and Partial Cash Discounts
  - 1. Find discount period and last date to receive cash discount
  - 2. Calculate cash discount and net amount
  - 3. Calculate cash discount, outstanding balance & amount credited for a partial payment
- C. Invoices
  - 1. Read and interpret an invoice
  - 2. Complete an invoice including trade and cash discounts

### **IV. Merchandising**

- A. Markup Based on Cost (B.O.C.) and Markup Based on Selling Price (B.O.S.)
  - 1. Use the markup B.O.C. relationship to calculate markup, cost and/or selling price
  - 2. Use the markup B.O.S. relationship to calculate markup, cost and/or selling price
  - 3. Calculate the rate of markup B.O. S. & B. O. C. when given cost and selling price
- B. Markdown and Markdown series
  - 1. Calculate markdown and final selling price when given markdown rate
  - 2. Calculate markdown and final selling price when given a markdown series
- C. Determine Selling Price to Achieve a Desired Profit
  - 1. Calculate selling price to achieve a desired profit with perishable goods
  - 2. Calculate selling price to achieve a desired profit when irregulars are also sold

## **V. Simple Interest**

- A. Simple Interest Formula
  - 1. Use simple interest formula to calculate simple interest and maturity value
  - 2. Use the simple interest formula to calculate principal, time and rate
  - 3. Solve applications of simple interest
- B. Ordinary and Exact Interest
  - 1. Find loan periods and due dates using ordinary and exact time
  - 2. Calculate ordinary interest using ordinary time
  - 3. Calculate ordinary interest using exact time (Banker's Rule)
  - 4. Calculate exact interest using exact time
- C. Promissory Notes
  - 1. Define and identify parts of a promissory note
  - 2. Calculate interest and maturity value of simple interest notes
  - 3. Calculate the bank discount and proceeds of simple discount notes
  - 4. Find the proceeds for third – party discount notes

## **VI. Time – Value of Money (TVM) (utilizing a Business Calculator)**

- A. Compound Interest
  - 1. Using principles of TVM, calculate compound interest and compound amount.
  - 2. Using principles of TVM, calculate present value, time and/or annual rate.
- B. Effective Rate
  - 1. Convert between nominal interest rates and effective interest rates
  - 2. Use effective rates to compare investment opportunities
- C. Annuities
  - 1. Solve for future value of an ordinary annuity using the simple interest formula
  - 2. Solve for future value of an ordinary annuity using the business calculator.
  - 3. Solve for future value of an ordinary annuity when periodic withdrawals are made
- D. Leasing and Expenditures
  - 1. Using investment opportunity rate, decide when to lease versus when to buy
  - 2. Using investment opportunity rate, decide which of two machines to purchase
- E. Retirement Accounts
  - 1. Calculate monthly payments necessary to achieve a desired retirement withdrawal
  - 2. Compare monthly payments when retirement annuity is started at different ages

## **VII. Extinction of Debt (utilizing a Business Calculator)**

- A. Installment Loans
  - 1. Calculate monthly payment for an installment loan
  - 2. Find total & total interest paid for an installment loan with and without a down payment
- B. Amortization
  - 1. Calculate monthly payment for a mortgage loan
  - 2. Create an amortization schedule
  - 3. Calculate interest and principle paid during specific periods of the mortgage
  - 4. Calculate total cost and total interest paid for the mortgage
- C. Sinking Funds
  - 1. Calculate sinking fund payments with no initial deposit
  - 2. Calculate sinking fund payments with an initial deposit

**VIII. Basic Statistics**

- A. Calculate the mean of a given data set
- B. Calculate the median of a given data set
- C. Calculate the mode of a given data set
- D. Calculate the range of a given data set

**IX. Depreciation**

- A. Straight – Line Method
  - 1. Calculate total cost, depreciable value, and annual depreciation
  - 2. Create a depreciation schedule
- B. Units – of – Production Method
  - 1. Calculate depreciable value and unit depreciation rate
  - 2. Create a depreciation schedule
- C. Sum – of – the – Years – Digits Method
  - 1. Calculate depreciable value and annual rate of depreciation
  - 2. Create a depreciation schedule
- D. Declining – Balance Method
  - 1. Calculate the annual rate of depreciation
  - 2. Create a depreciation schedule
- E. Compare and contrast the depreciation methods

**X. Payroll**

- A. Gross Pay
  - 1. Calculate Gross pay for various payment schedules
  - 2. Calculate gross pay when overtime is earned
  - 3. Calculate gross pay using a differential pay scale
  - 4. Calculate gross pay with salary plus commission
- B. Payroll Deductions and Net Pay
  - 1. Calculate FICA and Medicare deductions
  - 2. Calculate federal withholding tax with and without tax – deferred deductions
  - 3. Find net pay