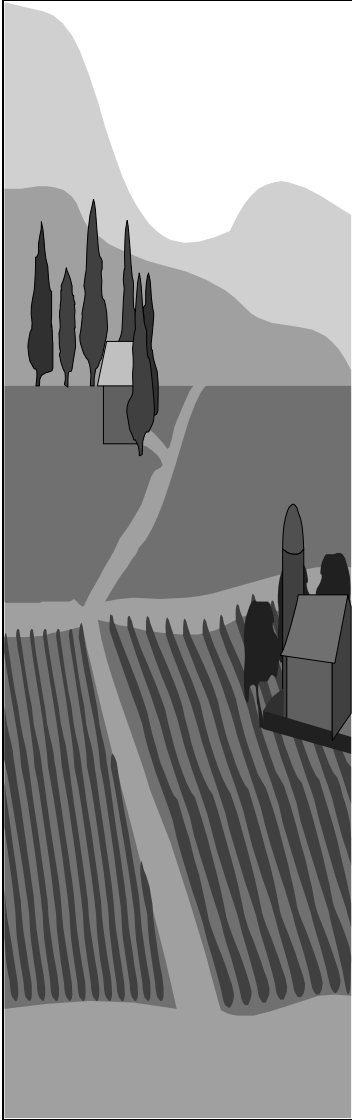




Tech Prep In Business & Office Technology

A consortium of High School,
Community College and
University Departments

This document contains student competency requirements for the specialized area of:

BUSINESS MATH BA 112 5 Credits

To receive college credit, a student must successfully complete at least 80% of the identified competencies. The high school instructor should initial each competency area that is completed by the student. By initialing these competencies, the instructor is verifying the student has successfully completed college level competencies and been awarded a local grade of A or B.

With prior approval by the College, the high school instructor may create an additional competency section for substitution for one of the existing ten competency sections

Revision Date: January 2008

SURVEY OF BUSINESS MATH

COMPETENCY AREAS:	Credit Earned
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Business Math Review	☐
Percentages	☐
Trade and Cash Discounts	☐
Markups and Markdowns	☐
Simple Interest.....	☐
Promissory Notes, Simple Discount Notes, and the Discount Process.....	☐
Compound Interest and Present Value	☐
Annuities and Sinking Funds.....	☐
Bank Reconciliation	☐
Excel Formulas.....	☐

Student Name: _____

High School: _____

Student SS#: _____ / SID Number _____

By signing this document I am verifying the student has successfully completed a minimum of 80% of the identified competencies and has been awarded a local grade of A or B.

(Instructor signature)

Date: _____

BUSINESS MATH / BA 112

Rating Scale for Performance Tasks:

4 – Highly Skilled

Performs the task independently and with high proficiency
Score of 90% or above

3 – Skilled

Performs the task independently with adequate proficiency
Score of 80% or above

2 – Limited Skills

Needs improvement in independently and satisfactorily complete tasks
Score of 70% or above

1 – Exposure

Received instruction but has not developed skill
Score of 60% or above

0 – No exposure

BUSINESS MATH / BA 112

UNIT 1: BUSINESS MATH REVIEW

The student will be able to perform the following with a minimum of 85% accuracy

Competency Rating Scale

☐

Mastered for college
credit

- 1.1 Convert quickly and accurately between fractions, decimals, and percentages.

Example: $2 = 200\%$, $\frac{1}{4} = 25\%$ or 025

4	3	2	1	0

- 1.2 Consistently recognize an illogical answer (which indicates an error) by understanding what the numbers represent.

Example: 430 is 13% of 55.9 Illogical answer

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- 1.3 Round numbers to a required place value.

Example: Nearest thousand, nearest hundredth, nearest dollar or cents, "all the way"

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- 1.4 Estimate answers without a calculator by rounding all the way and using shortcuts.

*Example: Cost of 514 yards at \$5.88 a yard.
 $500 \times 6 = 30 + 00 = \$3,000$.*

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- 1.5 Write numeric and verbal numbers in the correct form for business documents.

Example: 6,587,504. Six million, five hundred eighty-seven thousand, five hundred four

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UNIT 2: PERCENTAGES

The student will be able to match portions and rates so they represent the same amount of the base and then solve for a missing element of the portion formula with a minimum of 75% accuracy.

Competency Rating Scale

☐

Mastered for college
credit

- 2.1 Solve problems involving a missing base.

*Example: In 2001, the price rose to \$1,200, which is 8%, more than the 2000 price. What was the original selling price?
 $\$1,200 \div 1.08$*

4	3	2	1	0

- 2.2 Solve problems involving a missing portion.

Example: Lange Co. has a gross income of \$85,000. If 36% of the company's income goes to taxes, how much will Lange Co. have left? \$85,000. X 64%

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- 2.3 Solve problems involving a missing rate.

Example: Petco ordered 115 dog calendars but received 60. What percent of the order was missing? $55 \div 100$

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- 2.4 Given problems involving a comparison between two sets of numbers, solve for a percent of increase or decrease.

Example: The cost of a ticket rose from \$18 in 1975 to \$75 dollars in 2000. What was the percent of increase? $\$57 \div \18

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UNIT 3: TRADE AND CASH DISCOUNTS

Competency Rating Scale

☐

Mastered for college

credit

4	3	2	1	0

The student shall complete with a minimum of 75% accuracy.

- 3.1 Explain the following terms: list price, trade discount, chain discount, net price, net price equivalent rate, single equivalent discount rate, cash discount, credit periods, discount period, and FOB.

Example: Chain discount: trade discounts in a series to provide greater flexibility in discount offerings.

- 3.2 Explain how trade and cash discounts are used by both manufacturers/wholesalers and retailers to manage their cash flow.

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- 3.3 Calculate single trade discounts and net prices.

Example: A camera lists for \$499 with a trade discount of 15%. What is the trade discount amount and net price? \$499 x 15% and \$499 x 85%

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- 3.4 Find list price when net price and trade discount rate are known.

Example: A computer has a \$1,620 net price and a 40% trade discount, what is its list price? \$1,600 ÷ 60%

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- 3.5 Calculate chain discounts with the net price equivalent rate and single equivalent discount rate.

Example: The list price of office equipment is \$15,000 X .8 X .85 X .9

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- 3.6 Given an invoice date and ordinary, ROG or EOM terms, calculate the end of the credit period and the end of the discount period using a calendar.

Example: What is the last day to take advantage of a cash discount on an invoice dated January 22 with terms of 2/10, n/30? What is the last day payment can be made without penalty? Day 22 + 10 and Day 22 + 30

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- 3.7 Given a net amount, an invoice date and ordinary, ROG or EOM terms, calculate the amount of cash discount, if any, which should be deducted from the net price.

Example: Maplewood supply received a \$5,250 invoice dated 4/15/02. The \$5,250 included \$250 freight. Terms were 4/10 EOM. If Maplewood pays the invoice on May 1, how much, if any will be the cash discount? \$5,000 X 4%

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- 3.8 Given problems involving a list price and both trade and cash discount terms, compute the correct invoice total including any freight.

Example: Heartland Mfg. Sent Sully Copt. an invoice dated July 23 for machinery with a \$9,000 list price and 2/10 ROG terms. Freight of \$225 was FOB Sully and Sully received a trade discount of 20/5. The goods were received on Aug. 29. What does Sully pay Heartland on September 5? \$9,000 x .8 x .95 x .98

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- 3.9 Given a partial payment within the discount period, calculate the amount of credit and outstanding balance.

Ex: Vail Ski Shop received a \$1,201 invoice dated July 8 with 2/10, 1/15, n60 terms. On July 22 Vail sent a \$458 partial payment. What credit should Vail receive? What is Vail's outstanding balance? $458 \div .99$

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UNIT 4: MARKUPS AND MARKDOWNS

The student shall complete with a minimum of 75% accuracy.

Competency Rating Scale

☐

Mastered for college

credit

4	3	2	1	0

- 4.1 Given any two of the following components of a markup based on cost, solve for the remaining two elements: cost, mark up amount, markup percent, and selling price.

Example: Jeans, Inc. sells jeans for \$42.99 that cost \$19.75. What is the percent markup on cost? $\$23.24 \div \19.75

- 4.2 Given any two of the following components of a markup based on selling price, solve for the remaining two elements: cost, markup amount, percent markup, and selling price.

Example: Mish knows his customers will pay no more than \$120 for a comforter. Mish wants a 30% markup on selling price. What is the most that Mish can pay for a comforter? $\$120 \times 70\%$

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- 4.3 Given a problem involving perishables/theft, calculate the selling price that will cover the loss and still provide the markup rate desired.

Example: Wheatland's Bakery makes nut loaves that cost \$1.50 each. They expect 15% of the loaves to get stale and be discarded. What should Wheatland price each loaf? $\$1.50 \times 120 \times \1.45

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- 4.4 Given the percent of markup on cost, convert to percent of markup on selling price and vice versa.

Example: Laurel Company markup its merchandise 60% on cost. What is Laurel's equivalent markup on selling price? $6 \div 1.6$

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- 4.5 Given the original selling price and a series of markdowns and/or markups, calculate the total change in selling price and the new selling price.

Example: An item originally priced at \$450 is marked down 15% on June 5. On June 25 it is marked down another 10%. When it doesn't sell, the item is marked back up 20% and is then eventually placed on the clearance table where it is marked 50% off of the last price. $\$450 \times .85 \times .9 \times 1.2 \times .5 = \206.55

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- 4.6 Given any two of the following components of a markdown, solve for the remaining elements: Original selling price, percent of markdown, dollar markdown, and final sale price.

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Example: An item with a regular selling price of \$109.45 is marked down to \$69.50. What is the percent of markdown?
 $(109.45 - 69.50) \div 109.45$

UNIT 5: SIMPLE INTEREST

Competency Rating Scale

☐	Mastered for college credit
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The student shall complete with a minimum of 75% accuracy.

4	3	2	1	0

- 5.1 Given the principal, the annual percentage rate, and the amount of time (I months, days, or years) calculate the amount of interest and maturity value.

Example: Jan Corly borrowed \$30,000 to purchase office furniture for 6 months at 8% annually. What are Jan's interest and maturity value? $\$30,000 \times .08 \times 6 \div 12$

- 5.2 Given the loan origination date and the repayment date, calculate the length of the loan in days and use this information to solve a simple interest problem.

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Example: Betty Santoro borrowed \$3,000 on September 18, 2007, from Resse Bank at a rate of 12 ½ percent. The loan is to be repaid on March 18, 2008. Assuming the loan is based on exact time, exact interest, what is the total interest cost to Betty? $365 - 261 = 104 + 77 = 181$ days –So- $\$3,000 \times .125 \times 181 \div 365 = \185.95

- 5.3 Given two of the three elements of the interest formula, calculate the unknown element (principal, rate, or time).

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Example: Tim Jarvis paid the bank \$19.48 interest at 9.5% for 90 days. How much did Tim borrow?
 $\$19.48 \div (.095 \times 90 \div 360)$

- 5.4 Calculate interest credits and amount of principal reduction on partial payments following the U. S. Rule.

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Example: David ring borrowed \$6,000 on a 13% 60-day note. After 10 days, David paid \$500. On day 40, David paid \$900 on the note. What is ending balance due by the U.S. Rule using ordinary interest?
 $\$6,000 \times .13 \times 10/360 = 21.67$ Interest $500 - 21.67 = 478.33 = 5,521.67$
 $5,521.67 \times .13 \times 30/360 = 59.82$ Interest $900 - 59.82 = 840.18$
 $5,521.67 - 840.18 = 4,681.49$
 $4,681.49 \times .13 \times 20/360 = 33.81$ Interest
 $4,681.49 + 33.81 = \$4,715.30$

- 5.5 Given the original price, terms of cash discount and bank loan information; calculate the amount of savings if money is borrowed from the bank to take advantage of a cash discount.

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Example: Foster Inc. is buying 10 new computers from Computerland for \$1,900 net price each after trade discount. Terms of the sale are 4/10 n/60. Foster does not have the cash to pay for the computers and is considering using their bank credit line at 12% to borrow the money. Foster anticipates having the money to pay for the computers in 60 days. How much would Foster save or lose by borrowing the money to take advantage of the cash discount? $10 \times 1,900 = 19,000$ $4\% = \$760$ cash discount. $19,000 - 760 = 18,240$ $12\% \times 50/360 = 304$ Interest charge, \$406 saved

UNIT 6: Promissory Notes, Simple Discount Notes, And The Discount Process

Competency Rating Scale

The student shall perform the following with a minimum of 85% accuracy

☐

Mastered for college credit

- 6.1 Calculate the bank discount and proceeds for simple discount notes.

4	3	2	1	0

Example: The face value of a simple discount note is \$6,000. The discount is 11% for 80 days, what is the amount of bank discount and proceeds? $\$6000 \times .11 \times 80/360 = \146.67
 $6,000 - 146.67 = \$5,853.33$

- 6.2 Calculate and compare the interest, maturity value, proceeds, and effective rate of a simple interest note with a simple discount note.

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Example: Pete Runnels has a choice of two different notes that both have a face value of \$14,000 for 60 days. One note has a simple interest rate of 8%

- 6.3 Calculate the maturity value, bank discount, and proceeds of discounting an interest-bearing note before maturity.

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Example: On June 2, Ron Smith accepted an \$8,000, 9% 160 day note from Dick Shea. On September 6, Ron discounted the note at Tower Bank at 10%. What proceeds did Ron receive?
 $8,000 \times .09 \times 160/360 = 320$ $8,000 + 320 = 8,320$ $10\% \times 64/360 = 147.91$
 $8,320 - 147.91 = \$8,172.09$
 (Disc Per: $153 + 160 = 313 - 249 = 64$)

- 6.4 Explain how discounting a note may be used to manage cash flow.

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- 6.5 Determine whether or not a note should be discounted at the bank in order to take advantage of a cash discount.

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Example: Ryan Furniture wants to buy office equipment for \$8,000 from a store offering a 5% discount. Ryan does not have the cash unless he discounts a note he is holding. Ryan is considering discounting a 130-day note dated May 4 with a maturity value of \$7,000 at Security bank at a discount rate of 9%. Today is July 8. How much, if any, would Ryan save by discounting the note to take the cash discount?

UNIT 7 COMPOUND INTEREST AND PRESENT VALUE

The student shall perform the following with a minimum of 80% accuracy

Competency Rating Scale

☐

Mastered for college
credit

4	3	2	1	0

- 7.1 Given the principal of a loan, the annual rate of interest, and the number of compounding periods per year, calculate the compound interest earned and the future value without the use of a lookup table.

Example: What is the future value of 5,000 at 7% quarterly for 2 years? $5,000 \times 1.0175 \times 1.0175 \times 1.0175 \times 1.0175 \times 1.0175 \times 1.0175 \times 1.0175$

- 7.2 Given the principal of a loan, the annual rate of interest, and the number of compounding periods per year, calculate the compound interest earned and the future value using a table lookup value.

Example: What is the future value and amount of compound interest earned on 5,000 at 7% semiannually for 2 years? $5,000 \times$ (lookup value for 4 periods at 3.5%)

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- 7.3 Given the future value, the annual rate of interest, and the number of compounding periods per year, calculate the present value and the amount of compound interest earned using a table lookup value.

Example: How much must Miller Garage invest today at 12% compounded semiannually to have \$18,000 in 20 years? $\$18,000 \times$ (Present Value lookup for 40 periods at 6%)

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- 7.4 Given various loan or investment options with varying rate and compounding schedules, determine which option would be the best choice by calculating and comparing the effective rates or interest.

Example: Which bank would offer the best rate for a loan? Bank A: 12% Semiannually; Bank B: $12\frac{1}{4}\%$ Annually; or Bank C: $11\frac{3}{4}\%$ Daily?

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- 7.5 Calculate new balances throughout the life of loan whenever periodic deposits or withdrawals are made.

Example: Brian Costa deposited \$20,000 in a new savings account at 12% interest compounded semiannually. At the beginning of year 4, Brian deposits an additional \$30,000 at 12% interest compounded semiannually. At the end of year 6, what is the balance in Brian's account?

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UNIT 8: ANNUITIES AND SINKING FUNDS

The student shall perform the following with a minimum of 80% accuracy

Competency Rating Scale

☐

Mastered for college
credit

4	3	2	1	0

- 8.1 Calculate the FV of an Ordinary Annuity and an Annuity Due by table lookup. What is the value of Santos' annuity at the end of 6 years?

Example: Leroy made deposits of \$800 at the end of each year for 6 years. Interest is 9% compounded Semiannually.

- 8.2 Calculate the present value of an ordinary annuity by table lookup

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Example: *The divorce settlement stipulates that Joe pay \$525 a month for their daughter Suzanne until she turns 18 in 4 years. How much must Joe set aside today to meet the settlement? Interest is 6% a year.*

- 8.3 Calculate the sinking fund payment made at the end of each payment by table lookup.

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Example: *In 6 years Lowell Company will have to repay a \$60,000 loan. Assume an 8% interest rate compounded quarterly. How much must Lowell pay each period to have \$60,000 at the end of 6 years?*

- 8.4 Be able to solve problems involving a combination of calculations from Competencies sections 7 and 8.

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Example: *Mel Rich decided to retire in 8 years to New Mexico. What amount should Mel invest today so he will be able to withdraw \$40,000 at the end of each year for 25 years after he retires/ Assume Mel can invest money at 5% interest compounded annually? (Combines PV of annuity and PV of compound interest)*

UNIT 9: BANK RECONCILIATION

The student shall perform the following with a minimum of 80% accuracy

Competency Rating Scale

☐

Mastered for college
credit

4	3	2	1	0

- 9.1 Given a simulated bank statement and checkbook, reconcile the two accounts for outstanding checks, deposits in transit, NSF checks, credit and debit memos, service charges, possible errors, interest earned, etc.

UNIT 10: EXCEL FORMULAS

The student shall perform the following with a minimum of 80% accuracy

Competency Rating Scale

☐

Mastered for college
credit

4	3	2	1	0

- 10.1 Given a sample table and formulas, demonstrate knowledge of the order of operations to determine what value Excel would produce for each formula.

Example: *What answer would excel produce for:
 $= (A1+C1) / D1$ (show table w/values)*

- 10.2 Given problems from each chapter of the text, design spreadsheets and create formulas that solve each problem.

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Example: *Create a spreadsheet for Arley's Bakery (Chpt. 8, problem 8-32) that will tell them how much to price their bake goods with mark-up based on the given cost.*