

Vanguard University
School for Professional Studies
Degree Program

“BUSINESS MATH”
MATH #106

Student Guide

TF 10/10

COURSE DESCRIPTION

This course applies the principles and practices of mathematics to everyday business problems and situations. The course prepares students to understand the mathematical and business concepts in number sets, problem solving, ratios and proportions, percentages, business measurements, insurance, simple and compound interest, installment loans, consumer credit, depreciation, graphing linear functions, and linear programming. The course includes a brief overview of number sense and algebra concepts in its overall design to introduce students to common mathematical skills necessary for courses in business. (meets Natural Science/Math requirement)

LEARNING OUTCOMES

At the conclusion of this class, students will learn to:

1. become more enlightened consumers and investors in working with several financial formulas that are used for borrowing and investing money,
2. understand mathematical principals involving business measurements, insurance, and depreciation,
3. use inductive and deductive reasoning to draw logical conclusions,
4. categorize and manipulate large quantities of data, providing the essential tools to organize, interpret and analyze such data,
5. experience how different variables can be brought together to make optimal solutions,
6. participate in a variety of mathematical topics and problem solving skills that relate to aspects of everyday life,
7. acquire a solid understanding of number sense and critical algebra concepts, and
8. develop and use critical thinking skills through finding solutions to real-world situations.
9. comprehend and manipulate problems in proportion, percentage and linear graphing exercises,

TEXTS AND MATERIALS

Required text and calculator:

*Tuttle, M.D. (2001). *Practical Business Math: An Applications Approach* Brief Edition (8th Edition). Upper Saddle

River, New Jersey: Prentice Hall. ISBN: 0130256609.

***Calculator** with basic mathematical functions (addition, subtraction, multiplication, division, square root and memory/storage key)

COURSE POLICIES

ATTENDANCE POLICY

Because each course meets only five to eight times, it is important that students not miss class unless it is unavoidable. To receive the full participation points students must arrive on time to class with a working knowledge of each sessions assignments and they must actively engage in class discussions.

Students who miss more than five class hours in any given course will automatically receive a failing grade and need to retake the course to obtain a passing grade. If an instructor deems that a student's absence, beyond the 5 hours was under extremely unavoidable and unusual circumstances (i.e. hospitalization, death in the family, major auto accident), the professor may file an academic petition on behalf of the student to the Program Chair. If the academic petition is approved, the instructor may give the student a "W" (Withdrawal) grade in place of a failing grade. The student will be required to re-take the course.

Students who miss the first two class sessions, or the first five hours of a course, will automatically be dropped and be required to retake the course.

ACADEMIC DISHONESTY (incl. Plagiarism)

Academic dishonesty, either cheating or plagiarism (presenting the words or opinions of others as one's own work), is regarded as a serious violation of both the academic and moral standards of Vanguard University. Dishonesty in any class assignment can result in: loss of credit for the assignment, loss of credit for the entire course, and referral to the Director and/or Provost. It is the prerogative and responsibility of the instructor to determine if academic dishonesty has occurred and the seriousness of the infraction. The Office of the Provost is to be notified of instances of academic dishonesty.

A student commits plagiarism if he/she submits as his/her own work:

1. Part or all of an assignment copied from another person's assignments, notes, or computer file.
2. Part or all of an assignment copied or paraphrased from a book, magazine, pamphlet, or website.
3. A sequence of ideas transferred from another source which the student has digested, integrated, and reorganized, and for which he/she fails to give proper acknowledgement.

A student is an accomplice in plagiarism if he/she

1. Allows his/her paper or other assignments, in outline or finished form, to be copied and submitted as the work of another.
2. Lends his/her computer disk to another student or otherwise allows his/her computer files to be copied for the purposes of plagiarism.
3. Prepares a written assignment for another student and allows it to be submitted as another's work.

DISABILITY SERVICES

For students with documented medical or psychological disabilities, please contact the Coordinator of Disability Services to request reasonable accommodations. The Coordinator of Disability Services is located in the Counseling Center on the second floor of the Scott Academic Center and can be reached at extension 4489 or by email at disabilityservices@vanguard.edu

For students with a documented learning disability who would like to request appropriate accommodations, please contact the Director of Learning Skills, located upstairs in Scott Academic Center at extension 2540 or by email at disabilityservices@vanguard.edu

DIVERSITY STATEMENT

The School for Professional Studies intends to foster a Christ-centered community that promotes appreciation and respect for individuals, enhances the potential of all members, and values differences in gender, race, abilities, and generation. As such, we endeavor to communicate with honesty, to speak with encouraging and edifying words, and to create a safe environment in our classes and interactions.

GRADED HOMEWORK/ASSIGNMENTS

If an instructor chooses to submit graded papers or assignments to the SPS office, students may pick-up their work at the SPS Office Front Desk. Graded work is not kept 5 weeks beyond the last class session. Please note: the SPS office is not responsible for unclaimed or lost papers or assignments.

If a student chooses to submit their paper or assignment to the SPS office, this must be arranged between the instructor and student prior to submission. The SPS Office will gladly forward the completed paper or assignment to the instructor, however the SPS office is not responsible for unclaimed or lost papers or assignments.

LATE WORK

No late work is accepted. Exceptions may be made between the instructor and student.

STUDENT EVALUATION

Assignments are listed in the weekly outline. Students are expected to read the listed definitions, terms, laws, formulas, theorems and/or properties in each of the required sections **before** coming to class. The text contains several “Challenge” questions and problems. When appropriate, students should attempt to understand and answer these on their own. If students have questions of any of these items, time will be given in class for discussion. Class time will provide opportunities to discuss in detail any questions that may arise from the reading or assignments. Completed assignments are due on the week that they are assigned.

Assignments/homework: Students must read through each specified assignment and complete the assigned problems prior to the start of each class. Students will be graded both on accuracy and completion of each assignment. All homework assignments must be done in *“pencil”* only.

Weekly quizzes: Regular review of mathematical, logical, and business concepts is critical in the development and understanding of the subject matter. Chapter or sectional quizzes will be given throughout the course.

Exams: A mid-term exam will be given Week Four and a Final Exam on Week Seven.

You should refer to the University’s Student Handbook for details on the grading system. The following criteria will be used in determining the student’s grade:

<u>Assignment/Grading</u>	<u>Points</u>	<u>Date Due</u>
Assignments/Homework	25%	Weeks 1-7
Attendance/Participation	10%	Weeks 1-7
Weekly Quizzes	15%	Weeks 2, 3, 5, 6
Mid-term Exam	25%	Week 4
Final Exam	25%	Week 7
TOTAL:	100%	

<u>Percentages</u>	<u>Points</u>	<u>Grade</u>	<u>Significance</u>	<u>GPA</u>
93-100%	930-1000	A	Exceptional	4.00
90-92.9%	900-929	A-		3.67
87-89.9%	870-899	B+	Above Average	3.33
83-86.9%	830-869	B		3.00
80-82.9%	800-829	B-		2.67
77-79.9%	770-799	C+	Average	2.33
73-76.9%	730-769	C		2.00
70-72.9%	700-729	C-		1.67
67-69.9%	670-699	D+	Below Average	1.33
63-66.9%	630-669	D		1.00
60-62.9%	600-629	D-		0.67
00-59.9%	000-599	F	Failure	0.0

LOGISTICS CHART

Week	Hour 1	Hour 2	Hour 3	Hour 4
1	Introductions Course expectations <i>Review:</i> Preliminary Skills Assessment Exam	<u><i>Chapter 7</i></u> OBJECTIVE 7.1 through OBJECTIVE 7.3	<i>BREAK</i> OBJECTIVE 7.4 through OBJECTIVE 7.5	OBJECTIVE 7.6 through OBJECTIVE 7.7
2	Correct and review Chapter 7 QUIZ #1 Chapter Seven	<u><i>Chapter 9 & 10</i></u> OBJECTIVE 9.1 through OBJECTIVE 9.2	<i>BREAK</i> OBJECTIVE 9.3 through OBJECTIVE 9.4	OBJECTIVE 10.1 through OBJECTIVE 10.3
3	Correct and review Chapter 9 & 10 QUIZ #2 Chapter 9 & 10	<u><i>Chapter 13</i></u> OBJECTIVE 13.1 through OBJECTIVE 13.2	<i>BREAK</i> OBJECTIVE 13.3 through OBJECTIVE 13.4	OBJECTIVE 13.5
4	Correct and review Chapter 13 MID-TERM EXAM	<u><i>Chapter 14</i></u> OBJECTIVE 14.1	<i>BREAK</i> OBJECTIVE 14.2	OBJECTIVE 14.3
5	Correct and review Chapter 14 QUIZ #3 Chapter Fourteen	<u><i>Chapter 15</i></u> OBJECTIVE 15.1	<i>BREAK</i> OBJECTIVE 15.2 through OBJECTIVE 15.3	OBJECTIVE 15.4
6	Correct and review Chapter 15 QUIZ #4 Chapter Fifteen	<u><i>Chapter 16</i></u> OBJECTIVE 16.1	<i>BREAK</i> OBJECTIVE 16.2a	OBJECTIVE 16.2b
7	Correct and review Chapter 16. Review: CHAPTER 7,9,10	Review: CHAPTER 13-14 Review: CHAPTER 15-16	<i>BREAK</i> FINAL EXAM	FINAL EXAM

WEEK ONE: -----STUDENT ASSIGNMENTS-----

ASSIGNMENT: DUE CLASS SESSION #1. Complete each of the problems (#1-33 all) on the following *Preliminary Skills Assessment assignment* **prior** to coming to the first class session (Week 1). Complete the problems on a separate sheet of paper. Since this review is an assessment exercise, please attempt each problem on your own without help from any outside source or person. These problems will be reviewed and discussed during the first class session.

DO NOT work any of the problems from the following individual sections identified below – **work only the *Preliminary Skills Assessment* problems (#1-33)** assigned for the first class session (the Assessment assignment is located on the following pages of this guide).

Week One In-Class:

Review Preliminary Skills Assessment

Discuss Chapter 7

Objectives 7.1-7.3 What Percent Means, pages 128-129

Percent to a fraction; Percent to a decimal; Decimal to a fraction; Decimal to a percent; Fractional percent

In-Class Work: page 129: *Exercise A (#1-5), Exercise B (#1-5), and Exercise C (#1-5)*

Objectives 7.4-7.5 Percent Problems, pages 130-131

Base, Rate, and Amount

Objective 7.6 a Solving for the Unknown, pages 131-133

Four steps in problem solving; Finding what is missing; Finding what is unnecessary; Solving a problem by making lists; Solving a problem by using diagrams; Solving problems with more than one solution

In-Class Work: page 132: *Exercise D (#1-10)*

Objective 7.6 b Four-Step Process, pages 133-134

Identify the factors; Select the formulas; Substitute the values for the factors; Complete the fundamental process called for in the problem

In-Class Work: page 133: *Exercise E (#1-6)* and page 134: *Exercise F (#1-6)*

Objective 7.7 Increases and Decreases, pages 134-136

Finding the increase; Finding the decrease

In-Class Work: page 136: *Exercise G (#1-10)*

MATH 106 Week One Assignment Preliminary Skills Assessment

Directions: Complete the following problems on a separate sheet of paper **prior** to the first class session. Since this review is an assessment exercise, please attempt each problem on your own without help from any outside source or person. DO NOT USE A CALCULATOR!

A. Symbols and Order of Operation

1.) $2 + 5 \times 7 = ?$

2.) $(2 + 5) \times 7 = ?$

3.) $3 \times 4 + 2 \times 5 = ?$

4.) $3 \times (4 + 2) \times 5 = ?$

5.) $4 + 2^2 - 1 = ?$

6.) $(4 + 2)^2 - 1 = ?$

7.) $12 \div 3 + 1 = ?$

8.) $12 \div (3 + 1) = ?$

Proportions, Fractions, Decimals, and Percentages

9.) Express $\frac{14}{80}$ as a decimal.

10.) Convert $\frac{14}{40}$ to a percentage.

11.) Convert 18% to a fraction.

12.) $\frac{4}{5} \times \frac{2}{3} = ?$

13.) $\frac{7}{12} \times \frac{5}{6} = ?$

14.) $\frac{1}{8} + \frac{4}{6} = ?$

15.) $7.833 + 0.67 = ?$

16.) A company reports that three-eighths of its employees are women. If there are 56 employees, how many are women?

Negative and Positive Numbers

17.) $5 \times (-4) = ?$

18.) $4 + (-2) - 5 - (-3) = ?$

19.) $-5 - (-4) = ?$

20.) $(-7) \times (-6) = ?$

21.) $-75 \div (-5) = ?$

22.) $-7(5)(-1) = ?$

Basic Algebra and Equations

Solve for X .

$$23.) X + 7 = 13$$

$$24.) 11 = X + 3$$

$$25.) \frac{X}{4} = 36$$

$$26.) 3X - 6 = -18$$

$$27.) \frac{X + 3}{2} = 14$$

Exponents and Square Roots

$$28.) 4^3 = ?$$

$$29.) (-2)^4$$

$$30.) \text{ If } a = 4 \text{ and } b = -2, \text{ then } a^2 b^3 = ?$$

$$31.) \frac{49}{\sqrt{49}} = ?$$

$$32.) \text{ If } a = 9 \text{ and } b = 25, \text{ then } \sqrt{a + b} = ?$$

$$33.) (4 + 5)^2 - \sqrt{81} = ?$$

HINTS FOR MATH SUCCESS

1. *Mathematics is different from other subjects.*

One topic builds on another, and you need to make sure that you understand each topic before progressing to the next one.

2. *You must make a commitment to attend each class.*

Obviously, unforeseen circumstances can come up, but you must plan to attend class regularly. Pay attention to what your teacher says and does, and take notes. If you must miss class, write an outline of the text corresponding to the missed material, including working out each text example on your notebook paper.

3. *You must make a commitment to daily work.*

Do not expect to save up and do your mathematics work once or twice a week. It will take a daily commitment on your part, and you will find mathematics difficult if you try to "get it done" in spurts. You could not expect to become proficient in tennis, soccer, or playing the piano by practicing once a week, and the same is true of mathematics. Try to schedule a regular time to study mathematics each day.

4. *You must read the text carefully.*

Many students expect to get through a mathematics course by beginning with the homework problems, then reading some examples, and reading the text only as a desperate attempt to find an answer. This procedure is backward; do your homework only *after* reading the text.

5. *You must ask questions.*

Learning mathematics may involve frustration. Do not put off asking questions when you don't understand something, or if you feel an anxiety attack coming. Stop and put this book aside for a while. Talk to your instructor or a fellow student.

Derived From *Mathematics: Its Power and Utility* by K.J. Smith, pp. 5-6

WEEK TWO: -----STUDENT ASSIGNMENTS-----

The following assignments indicated below are **DUE** for this class session (Week 2).

ASSIGNMENT DUE WEEK TWO: Pages 137-140

Chapter 7

1. Skill Problems: #1-55 (*ALL*)
2. Business Application Problems: #3-30 (*multiples of 3*) [3,6,9,12, etc.]

Quiz

3. Prepare for in-class quiz on homework sections due this week.

WEEK TWO IN-CLASS:

Quiz Week 2: Chapter 7

This quiz will cover sections of the homework due this week.

Discuss Chapter Nine: Simple Interest *and* Chapter Ten: Promissory Notes

Objectives 9.1-9.2 What Interest Means/The Calendar, pages 161-166

Interest; Principal; Rate; Time; Calendar; Time calculation model; Computing time factor; Computing with leap year; Time tables

In-Class Work: pages 165-166: Exercise A (#1-5) and Exercise B (#1-5)

Objective 9.3 The Interest Formula, pages 166-168

Ordinary interest; Exact interest; Rate; Principal

In-Class Work: pages 167-168: Exercise C (#1-6) and Exercise D (#1-6)

Objective 9.4 Other Interest Problems, pages 168-169

Computing principal; Computing Rate; Computing Time

In-Class Work: page 169: Exercise E (#1-20)

Objectives 10.1-10.2 Legal Environment/Promissory Notes, pages 179-181

Legal Environment; Promissory note; Maker; Payee; Face value; Term of note; Maturity value; Noninterest-bearing note; Interest-bearing note

In-Class Work: page 181: Exercise A (#1-10)

Objective 10.3 Discounting, pages 181-185

Discount rate; Term of discount; Computing discount; Computing proceeds

In-Class Work: pages 183-185: Exercise B (#1-8) and Exercise C (#1-10)

WEEK THREE: -----STUDENT ASSIGNMENTS-----

The following assignments indicated below are **DUE** for this class session (Week 3).

ASSIGNMENT DUE WEEK THREE: Pages 171-191

Chapter 9 (pages 171-176)

1. Skill Problems: #1-61 *odd*
2. Business Application Problems: #3-24 (*multiples of 3*)

Chapter 10 (pages 187-191)

3. Skill Problems: #1-25 (*ALL*) and 42-50 (*even*)
4. Business Application Problems: #3-21 (*multiples of 3*)

Quiz

5. Prepare for in-class quiz on homework sections due this week.

WEEK THREE IN-CLASS:

Quiz Week 3: Chapters 9 and 10

This quiz will cover sections of the homework due this week.

Discuss Chapter Thirteen: Compound Interest and Present Value

Objective 13.1-13.2 Compound Interest, pages 235-240

Compound interest; Compound amount; Savings accounts; Interest charts

In-Class Work: page 240: Exercise A (#1-10)

Objective 13.3 Present Value, page 240-244

Present value; Compound interest and present value model; Present value charts

In-Class Work: page 244: Exercise B (#1-10)

Objective 13.4 Annuities, pages 244-250

Annuity; Ordinary annuity; Annuity due; Growth of an annuity; Ordinary annuity table rate per-interest-period chart

In-Class Work: page 250: Exercise C (#1-10)

Objective 13.5 Sinking Funds, pages 250-251

Sinking funds; future amount desired; interest rate; frequency that the investment is to be compounded; length of time before the desired amount is required

In-Class Work: page 251: Exercise D (#1-10)

WEEK FOUR: ----STUDENT ASSIGNMENTS----

The following assignments indicated below are **DUE** for this class session (Week 4).

ASSIGNMENT DUE WEEK FOUR: Pages 255-259

Chapter 13

1. Skill Problems: #1-45 (ALL) and #47-83 odd
2. Business Application Problems: #3-21 (multiples of 3)

Midterm Exam

3. Prepare for in-class midterm exam on chapters 7, 9, 10, and 13.

Suggested Mid-Term Review Exercises (Optional): Ch. 7 Mastery Test, page 141 (#1-15); Ch. 9 Mastery Test, page 177 (#1-12); Ch. 10 Mastery Test, page 193 (#1-11); Ch. 13 Mastery Test, page 261 (#1-10)

WEEK FOUR IN-CLASS:

Mid-Term Exam on chapters 7, 9, 10, and 13

Discuss Chapter Fourteen: Discounts

Quiz #3: Chapter 14

This quiz will cover sections of the homework due this week (see assignments below).

Objective 14.1 Trade Discounts and Direct Method, pages 263-265

Trade discounts; List price; Selling price; Finding the selling price; Series of trade discounts; Direct method

In-Class Work: page 265: Exercise A (#1-10)

Objective 14.2 Equivalent Trade Discount, page 266

In-Class Work: page 266: Exercise B (#1-10)

Objective 14.3(a) Cash Discount, pages 266-269

Cash discounts; Terms of trade; Finding the net price

In-Class Work: page 268-269: Exercise C (#1-10)

Objective 14.3(b) End of the Month & Receipt of Goods, pages 269-270

End of the Month (E.O.M.) stipulation; Receipt of Goods (R.O.G.) stipulation

In-Class Work: page 269: Exercise D (#1-10) **and** page 270: Exercise E (#1-10)

Objective 14.3(c) Combination of Cash and Trade Discounts, pages 270-271

In-Class Work: page 271: Exercise F (#1-5)

WEEK FIVE: -----STUDENT ASSIGNMENTS-----

The following assignments indicated below are **DUE** for this class session (Week 5).

ASSIGNMENT DUE WEEK FIVE: Pages 277-280

Chapter 14

1. Skill Problems: #1-44 all
2. Business Application Problems: #1-9 all

Quiz

3. Prepare for in-class quiz on homework sections due this week.

WEEK FIVE IN-CLASS:

Quiz Week 5: Chapter 14

This quiz will cover sections of the homework due this week.

Discuss Chapter Fifteen: Markup

Objective 15.1 Markup on Cost, pages 285-288

Markup; Cost price; Selling price; Markup on sales

In-Class Work: page 287: Exercise A (#1-5), Exercise B (#1-5), and Exercise C (#1-10)

Objectives 15.2-15.3 Finding Cost, Sales, Markup, or Markdown, pp. 288-290

Finding the cost price and markup when the markup is on cost; Finding the cost price and markup when the markup is on sales

In-Class Work: page 290: Exercise D (#1-15)

Objective 15.4 Markdown or Loss, pages 290-291

In-Class Work: page 291: Exercise E (#1-8)

WEEK SIX: -----STUDENT ASSIGNMENTS-----

The following assignments indicated below are **DUE** for this class session (Week 6).

ASSIGNMENT DUE WEEK SIX: Pages 295-297

Chapter 15

1. Skill Problems: #1-65 all
2. Business Application Problems: #1-4, 6, 9

Quiz

3. Prepare for in-class quiz on homework sections due this week.

WEEK SIX IN-CLASS:

Quiz Week 6: Chapter 15

This quiz will cover sections of the homework due this week.

Discuss Chapter Sixteen: Inventory and Turnover

Lesson 16.1 Inventory Methods and Valuation, pages 303-310

Beginning inventory; Purchases; Goods available for sale; Ending inventory; Cost of goods sold; Inventory valuation; Last in-first out (L.I.F.O.); First in-first out (F.I.F.O.); First in-still there (F.I.ST.)

In-Class Work: page 310: Exercise A (#1-4)

Lesson 16.2(a) Average Cost, pages 310-312

In-Class Work: page 311-312: Exercise B (#1-4)

Lesson 16.2(b) Retail Inventory Estimating Method, pages 312-313

In-Class Work: page 313: Exercise C (#1-4)

WEEK SEVEN: -----STUDENT ASSIGNMENTS-----

The following assignments indicated below are **DUE** for this class session (Week 7).

ASSIGNMENT DUE WEEK SEVEN: Pages 315-320

Chapter 16

1. Skill Problems: #1-50 *all*
2. Business Application Problems: #13-17 *all*

Quiz

3. Prepare for final exam.

Suggested Final Exam Review Exercises (Optional): Ch. 7 Mastery Test, *page 141 (#1-15)* ; Ch. 9 Mastery Test, *page 177 (#1-12)*; Ch. 10 Mastery Test, *page 193 (#1-11)*; Ch. 13 Mastery Test, *page 261 (#1-10)*; Ch. 14 Mastery Test, *pages 283-284 (#1-23)*; Ch. 15 Mastery Test, *page 301 (#1-15)*; Ch. 16 Mastery Test, *pages 321-322 (#1-14)*

WEEK SEVEN IN-CLASS:

Review assignment due week 7 and review for final exam.

Final Exam (Chapters 7, 9, 10, 13, 14, 15, and 16)

The final exam will cover material from chapters 7, 9, 10, and 13-16.