



Virginia State University  
School of Engineering, Science, and Technology  
Department of Mathematics

Course Syllabus -- Spring 2009

## GEMA 112 BASIC MATHEMATICS I - 3 Semester Hours

**Instructor's Name:** \_\_\_\_\_ **Office Location:** \_\_\_\_\_

**Phone:** \_\_\_\_\_ **Email Address:** \_\_\_\_\_

**Office Hours:** (Additional office hours are available by appointment.)

| Monday | Tuesday | Wednesday | Thursday | Friday |
|--------|---------|-----------|----------|--------|
|        |         |           |          |        |

**Course Description:**

GEMA 112, Basic Mathematics I, is a course designed for students who plan to pursue college majors in the social sciences and humanities. This course cannot be used as an elective for mathematics majors. The course content has been carefully selected to include basic mathematical concepts, ideas, and procedures which characterize modern elementary mathematics. Topics include problem solving, irrational numbers, real numbers, polynomials, solving linear equations, ratios, proportions, variation, geometry, graphs of linear functions, systems of linear equations and mathematics of finance.

**Textbook and Software:**

Each student MUST purchase the following textbook:  
Blitzer, Robert. **THINKING MATHEMATICALLY**, 4<sup>th</sup> edition. Upper Saddle River, New Jersey: Pearson Education/Prentice Hall, Inc. 2008. (NOTE: The same textbook will be required again for GEMA 113.)

In addition, each student MUST purchase the following:

**MY MATH LAB, Student Access Kit** (available from the bookstore and pre-packaged with new textbooks or sold separately online with a credit card or debit card at [www.mymathlab.com](http://www.mymathlab.com)). **MY MATH LAB** is the online resource for completing and submitting assignments. Each individual instructor will determine the amount of usage and weights of grades obtained through **MY MATH LAB** and its relationship to other course requirements and assignments. Students will not need to purchase a new **MYMATHLAB Student Access Kit** for GEMA 113 next semester.

**Calculator:**

It is also REQUIRED that each student purchase a **scientific calculator**. Any brand or manufacturer (e.g., CASIO, Texas Instruments, Sharp, etc.) will be sufficient as long as the word "scientific" appears on the calculator. (A graphing calculator such as TI-83 or TI-84 is acceptable and preferable **but not required** in this course.) Calculators may be used but **may not be shared** on tests, quizzes, or examinations. Cell phone calculator usage **WILL NOT** be allowed on during class or on tests.

**Attendance:**

Classroom attendance is **MANDATORY**. Instructors may penalize any student who is chronically late or who exceeds three unexcused absences from a Mon/Wed/Fri class or two unexcused absences from a Tue/Thu or Mon/Wed class. Instructors may also give bonuses or special opportunities for students who do not exceed the maximum absence limit. An "**EXCUSED ABSENCE**" is one in which the student brings an official written medical,

legal or professional excuse to the instructor from an authorized source. All other absences are “**unexcused**”.

Students who are covered under the **American Disability Act** should privately inform the teacher of this fact and provide supporting documentation so that appropriate instructional and testing arrangements can be made.

### **Classroom Management:**

1. Set all cell phones and pagers to “**OFF**” or “**SILENT**” upon entering the class. (DO NOT set the phone to “**VIBRATE**”.) No cell phone communication of any kind will be allowed during class for any reason. Text messaging during class is NOT ALLOWED. You ARE NOT to leave the classroom to answer a cell phone call. (NOTE: Cell phone calculator usage IS NOT allowed on tests.)
2. Homework WILL NOT be accepted after the due date. **There are NO EXCEPTIONS.**
3. You should use the restroom **PRIOR TO** entering the classroom. Once class has begun, you should only leave the classroom for an emergency.
4. Class will begin and end as scheduled. If on a rare occasion you happen to be late, you must enter the classroom and take your seat silently and without distraction. After **10 minutes**, instructors - at their discretion - may lock the classroom door and not allow anyone who is late to enter. Packing up or leaving class early is also rude and disruptive and will not be permitted.

### **KNOWLEDGE, SKILLS, and ABILITIES (KSAs)**

**Knowledge.** Upon successful completion of the course students will:

Know Polya’s Steps to Problem Solving and differentiate between inductive and deductive reasoning  
Know the order of mathematical operations and the laws of exponents and square roots  
Differentiate natural and whole numbers, integers, rational, irrational numbers and real numbers; differentiate prime and composite numbers  
Identify point, line, plane, line segment, ray, angle and vertex and different types of angles and triangles  
Define perpendicular, parallel, horizontal, and vertical and relationships of angles within parallel lines and define congruent and similar triangles  
Know the standard and slope-intercept forms for the equation of a line and the Cartesian plane  
Identify some of the individuals responsible for the development of mathematics and accomplishments in the history of mathematics: Euclid, Rene Des Cartes, Pythagoras, Georg Polya  
Know basic terminology of simple and compound interest

**Skills.** Upon successful completion of the course students will:

Convert decimal numbers to scientific notation and vice-versa and simplify mathematical expressions using the correct order of operations  
Write the prime factorization of a natural number and find the GCF and LCM of a set of natural numbers  
Simplify a square root expression and solve a proportion  
Use the Pythagorean Theorem to find the missing side of a right triangle and to solve word problems  
Evaluate algebraic expressions with and without a scientific calculator, multiply two binomials and factor quadratic trinomials  
Solve a quadratic equation by factoring and by using the quadratic formula  
Solve and graph linear inequalities in one variable on a number line  
Use appropriate angle definitions to evaluate angle measures  
Find missing sides of similar triangles and the perimeter, area, and circumference of geometric figures  
Graph straight lines  $ax + by = c$  or  $x = a$  and  $y = b$  and solve systems of linear equations graphically and by the addition method  
Calculate simple and compound interest present and future values and effective yields

**Abilities.** Upon successful completion of the course students will be able to:

Set up and solve algebraic and geometric word problems  
Show proficiency in inductive reasoning and mathematical problem solving

Compose a written paper on a mathematical topic using library and internet references

Evaluation strategies: All knowledge, skill and abilities criteria will be evaluated by tests, quizzes, in-class activities, assigned papers, home assignments and other activities determined by the instructor.

### **Additional Course Activities and Requirements:**

The number of class hours listed for each of the following topics is approximate and flexible. These hours include teaching, review and testing time as well as time for classroom instruction of **MyMathLab**. At the discretion of the professor, each student may be REQUIRED to write essays, develop math newsletters or to type library research assignments. The grading procedure and weight of the grades of the writing assignments will be determined by the professor. Each report must include a bibliography of at least three library and two internet references. The length of the assignments is left to the discretion of the professor; but 3-4 typed (12 pt) pages are recommended. All work should be paraphrased in your own words and not plagiarized from references. Sketches, photos, graphs, and diagrams are encouraged but do not count toward the length requirement. No handwritten papers will be accepted under any circumstances. Some examples of possible topics that may be assigned are as follows:

#### **INDIVIDUAL LIBRARY/INTERNET RESEARCH TOPICS**

1. Pythagoras and the Pythagorean Theorem
2. Euclid and Euclidean Geometry
3. Pi: It's History and Applications
4. The History of Algebra
5. Women in Mathematics
6. Probability and its Uses
7. Sets and Set Theory
8. Statistics and its Uses
9. Logic (Symbolic or Mathematical)
10. The History of Computers
11. The Golden Ratio and Golden Rectangles
12. Special Numbers: Prime, Perfect, Triangular, Amicable or Friendly, Irrational and Transcendental
13. Rene Descartes and Blaise Pascal
14. The Fundamental Counting Principle, Permutation, and Combination
15. African Americans in Mathematics
16. Transformations and Symmetry: Rotation, Translation, Reflection, Contraction, Inversion and Dilation
17. Mathematics Newsletter

### **Topical Outline:**

**All topics from sections 1.1, 1.3, 5.1, 5.2, 5.4, 5.6, 6.1 and 6.2 are to be completed by midterm.** The midterm examination will be a cumulative test of these topics.

#### **MyMathLab** Instruction

----- 1 Class Hour

Chapter 1: 1.1 Inductive and Deductive Reasoning, 1.3 Problem Solving

----- 5 Class Hours

Chapter 5: 5.1 Number Theory, 5.2 Integers and Order of Operations, 5.4 Irrational Numbers, and 5.6 Exponents and Scientific Notation

----- 8 Class Hours

Chapter 6: 6.1 Algebraic Expressions and Formulas and 6.2 Linear Equations in One Variable

----- 6 Class Hours

Midterm Exam Review - 1 Class Hour

## **Cumulative Midterm Examination - Maximum time 55 minutes (for all MWF and TR sections)**

Following midterm the subsequent course content will be completed:

Chapter 6: 6.3 Applications of Linear Equations and 6.4 Ratio, Proportion and Variation

----- 3 Class Hours

Chapter 7: 7.2 Linear Functions and Their Graphs and 7.3 Systems of Linear Equations in Two Variables

----- 6 Class Hours

Chapter 8: 8.2 Simple Interest and 8.3 Compound Interest

----- 4 Class Hours

Chapter 10: 10.1 Points, Lines, Planes and Angles, 10.2 Triangles, 10.3 Polygons and Perimeter (OMIT Tessellations) and 10.4 Area and Circumference

----- 7 Class Hours

Final Examination Review - 2 Class Hours

### **Final Examination:**

**The final examination is cumulative of the entire course and MUST be administered in accordance with the VSU final examination schedule. Any exceptions must be approved by the Chair of the Mathematics Department.**

----- Maximum time - 2 Hours

### **Grading Standards:**

Each student's grade will be determined by the following criteria:

1. Grading Scale

A: 90-100 B: 80-89 C: 70-79 D: 60-69 F: below 60

2. Midterm Grade

The midterm examination will comprise 1/3 of the midterm grade. The average of all other work required by the professor (including tests, quizzes, home assignments, essays, and research papers) determines the other 2/3.

3. Final Grade

The midterm average will be weighted as 40%. The average of all work after midterm (including tests, quizzes, home assignments, essays, and research papers) will be weighted as 40%. The final examination will make up the other 20%.

### **Bibliography:**

The following books are recommended references for use at various times throughout the course. Professors may assign readings from these or other books for book reports as required or for extra credit.

The Nature of Mathematics, 11th edition, Karl Smith (Brooks/Cole, 2007)

Mathematical Ideas, 10th edition, Charles Miller, et al (Boston: Addison Wesley 2006)

Mathematics – A Practical Odyssey, 6th edition, Johnson & Mowry (Pacific Grove, CA: Brooks/Cole 2007)

All comments and suggestions should be sent in writing to GEMA 112 Course Coordinator, **Dr. G.L. Burton** by email at [gburton@vsu.edu](mailto:gburton@vsu.edu) .