

**VIRGINIA STATE UNIVERSITY**  
**DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE**  
**SCHOOL OF AGRICULTURE, SCIENCE AND TECHNOLOGY**  
**MATH 113 – Basic Mathematics II - 3 sem. hours**  
**COURSE SYLLABUS: SPRING 2004**

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

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

**Instructor's Office Phone:** \_\_\_\_\_

**Instructor's E-mail:** \_\_\_\_\_

**Departmental Fax Number: (804) 524-5746**

**Instructor's Office Hours:**

Monday	Tuesday	Wednesday	Thursday	Friday

**Course Description:**

GEMA 113, Basic Mathematics II, is the second part of a basic mathematics sequence. Sets, deductive reasoning, computer literacy, probability, statistics and mathematics of finance are the topics included in this course.

**Textbook:** Each student MUST purchase the following textbook:

Blitzer, Robert. THINKING MATHEMATICALLY, 2nd edition. Upper Saddle River, New Jersey: Prentice-Hall Inc. 2003.

IMPORTANT NOTE: This is same textbook that was required for GEMA 112.  
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 graphic calculator is acceptable and *preferable but not required* in this course.)

All students MUST have both the textbook and scientific calculator by the third day of class. In-class, open book quizzes or other graded activities may be given by the professor, and sharing of textbooks and calculators **WILL NOT** be allowed. Calculator use is encouraged on all in-class and out-of-class activities. Calculators may be used but may not be shared on tests, quizzes, or examinations.

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

### **Knowledge:**

Upon successful completion of the course students will:

- Know basic terminology, symbols and notation related to sets
- Know basic terminology and operations related to logic
- Know the basic forms of a valid logical argument
- Know basic counting terminology and formulas
- Know basic probability terminology
- Identify different types of statistical graphs
- Differentiate the measures of central tendency
- Distinguish a population from a sample
- Know basic terminology of simple and compound interest

**Evaluation strategies:** All knowledge criteria will be evaluated by tests, quizzes, and home assignments.

### **Skills:**

Upon successful completion of the course students will:

- Use the symbols and notation of sets
- Understand and manipulate set operations
- Understand relationships between sets
- Draw Venn diagrams and use them for survey problems
- Determine whether a sentence is a statement
- Determine the truth-value of a compound statement Form  
the negation of a statement
- Construct truth tables
- Write the converse, inverse and contra-positive of a conditional statement
- Determine whether an argument is valid and form valid conclusions
- Translate numbers from base 10 to other bases and vice-versa
- Evaluate factorial notation
- Distinguish between different counting techniques
- Solve counting problems
- Compute probabilities and odds
- Construct and interpret statistical graphs
- Find mean, median, mode, range, variance and standard deviation
- Calculate simple and compound interest

**Evaluation strategies:** All skill criteria will be evaluated by tests, quizzes, in-class activities, and home assignments.

**Abilities:**

Upon successful completion of the course students will:

Evaluate gambling games and decision-making options  
Use the laws of logic or fallacy to determine validity of an argument  
Compose a written paper on a mathematical topic-using library and  
Internet references

**Evaluation strategies:** Ability criteria for the preceding objectives will be measured by tests, quizzes, in-class activities, and home assignments.

**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. At the discretion of the professor, each student may be REQUIRED to write in-class essay assignments and to type out-of-class library research assignments as graded activities. 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 listed below.

**SAMPLE INDIVIDUAL LIBRARY/ INTERNET RESEARCH TOPICS**

1. George Cantor and Set Theory
2. Word Processor, Data Base and Spreadsheet
3. Installment buying, APR, and Revolving Credit
4. The Mathematics of Buying a Home
5. The Mathematics of Buying a Car
6. Gottfried Leibniz and Logic
7. Annuities
8. Mathematical Expectation
9. The Normal Distribution
10. Internet, LAN, Email, Instant Messenger
11. Computer Ethics and Viruses
12. Discrete Mathematics

**Topical Outline:**

All topics from sections 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5, and 3.6 are to be completed by midterm. The midterm examination will be a cumulative test of these topics.

**Chapter 2:** 2.1 Terminology of Sets, 2.2 Venn Diagrams and Subsets, 2.3 Venn Diagrams and Set Operations, 2.4 Set Operations and Venn Diagrams with Three Sets, 2.5 Surveys and Cardinal Numbers

----- 10 Class Hours

**Chapter 3:** 3.1 Statements, Negations, and Quantified Statements; 3.2 Compound Statements and Connectives, 3.3 Truth Tables for Negation, Conjunction, and Disjunction; 3.4 Truth Tables for Conditional and Biconditional, 3.5 Equivalent Statements, Conditional Statements, and De Morgan's Laws; 3.6 Arguments and Truth Tables

----- 11 Class Hours

**Midterm Exam Review** - 1 Class Hour

**Cumulative Midterm Examination** - Maximum time 55 minutes

**Chapter 4:** Number Bases ----- 2 Class Hours

**Chapter 8:** 8.2 Interest ----- 3 Class Hours

**Chapter 11:** 11.1 Fundamental Counting Principle, 11.2 Permutations, 11.3 Combinations, 11.4 Probability, 11.6 NOT, OR, ODDS; 11.7 AND, Conditional Probability

----- 9 Class Hours

**Chapter 12:** 12.1 Sampling, Frequency Distributions and Graphs; 12.2 Measures of Central Tendency, 12.3 Measures of Dispersion

----- 6 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. The Chair of the Mathematics Department must approve any exceptions.

----- Maximum time - 2 Hours

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

**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%.

Extra-Credit incentive: All students in this course are encouraged to participate in a pilot exit assessment test during the week of April 7-11, 2003. This will be a comprehensive exam covering both courses GEMA 112 and GEMA 113 to be administered during that week for extra-credit. There is no penalty for not taking the exam, however, based on your score on the exam, your instructor will determine the number of extra points.

### **Attendance:**

Classroom attendance is MANDATORY for freshman students. Grades will be reduced by one letter grade for any freshman who exceeds three unexcused absences from a Mon/Wed/Fri class or two unexcused absences from a Tue/Thu or Mon/Wed class. (See VSU Catalog.)

For all students, regardless of classification, absence (including excused absence) does not relieve you of completing or making up all missed assignments. It is your responsibility (not the professor's) to make certain that you have made up all required academic content.

### **Classroom Management**

1. Turn off all cell phones and pagers BEFORE entering the class. No cell phone communication will be allowed during class for any reason.
2. Homework WILL NOT be accepted after the due date. In exceptional circumstances, arrangements must be made with the professor in advance. If you are going to be absent when an assignment is due, have a classmate submit the assignment for you.
3. All male students are to remove hats, caps, scarves, or any other head cover garments BEFORE entering the classroom. There are NO EXCEPTIONS.
4. Class will begin and end as scheduled. DO NOT enter any class for which you are **more than 10 minutes late**. Lateness is both rude and

disruptive to the class and WILL NOT be tolerated by the professor. Students who are chronically late may be penalized. Packing up or leaving class early is also rude and disruptive and WILL NOT be permitted.

### **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, 9th edition, Karl Smith (Brooks/Cole, 2001)  
Overcoming Math Anxiety, Sheila Tobias (Boston: Houghton-Mifflin Company, 1978)

How to Solve It, George Polya (New Jersey: Princeton University Press, 1973)

Escalante, The Best Teacher in America, Jay Matthews (New York: Holt, 1988)

Mathematical Recreations and Essays, W.W.R. Ball and H.S.M. Coxeter (New York: McMillan, 1962)

Innumeracy, John Allen Paulos (New York: Hill and Wang, 1988)

The Mathematical Experience, Phillip Davis and Reuben Hersh (Boston: Houghton Mifflin Company, 1981)

Mathematical Ideas, 9th edition, Charles Miller, et al (Boston: Addison Wesley 2001)

On the Shoulders of Giants: New Approaches to Numeracy, Lynn Authur Steen, Editor (Washington, D.C.: National Academy Press, 1990)

Mathematics - A Practical Odyssey, 4th edition, Johnson & Mowry (Pacific Grove, CA: Brooks/Cole 2001)