

SPRINGFIELD COLLEGE IN ILLINOIS

SYLLABUS - MAT 106-70 – NUMERACY

**Session A begins on January 9-March 5, 2006**

Place/Time: Wednesday, 6:00-10:00, Dawson 103

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Course Description

A course for students whose major field of study is not in engineering or the sciences; emphasizes understanding of mathematical aspects of real-world applications. Topics include logical thinking, counting techniques and probability, statistical reasoning, problem solving strategies, and mathematical modeling. Prerequisite: one and one-half years of high school algebra or MAT 096 or MAT 099; and one year of plane geometry. IAI MI 904

Textbook and Materials

Required text: *Mathematical Ideas*, tenth edition, by Miller, Heeren, and Homsby  
You will also need a scientific calculator (one that can do exponents, logarithms, etc.)

Mission Statement

The mission of Springfield College in Illinois is to provide students the best liberal arts education in the Ursuline tradition of a nurturing faith-based environment. We prepare students for a life of learning, leadership, and service in a diverse world.

Goals, Objectives, and Outcomes

**Goals:** Students should gain experience in solving problems, thinking logically, and using the language and tools of mathematics to understand and deal with real life problems and situations.

**Common Student Learning Objectives:** Adopted Dec. 9, 2004.

Know and apply the central concepts of the subject matter. (CK-1)

Use technology to enhance learning. (CK-3)

Use inquiry and collaboration to solve problems. (PS-1)

Develop a sense of intellectual curiosity. (SP-1)

**Course-Based Student Learning Objectives:** Upon completion of the course:

CBSLO-1. Students should be able to understand and interpret concepts and terminology of mathematical reasoning, set theory, and logic, and use them in problem-solving. (CK-1, PS-1)

CBSLO-2. Students should be able to use formulas, equations, and the techniques of algebra to mathematically model situations and solve problems. (CK-1)

CBSLO-3. Students should be able to read, draw, and interpret graphs. (CK-1, CK-3)

CBSLO-4. Students should understand counting techniques and basic concepts of probability theory, and use them to solve problems. (CK-1)

CBSLO-5. Students should understand statistical terms and concepts. (CK-1)

**Academic Honesty Policy:**

*Plagiarism.* Plagiarism is defined as follows: "The deliberate and knowing presentation of another person's original ideas or creative expressions as one's own. Generally, plagiarism is immoral but not illegal. If the expression's creator gives unrestricted permission for its use and the user claims the expression as original, the user commits plagiarism but does not violate copyright laws. If the original expression is copied without permission, the plagiarist may violate copyright laws, even if credit goes to the creator. And if the plagiarism results in material gain, it may be deemed a passing-off activity that violates the Lanham Act." Black's Law Dictionary, 8th ed. (2004), p. 1187. [The Lanham Act, 15 U.S.C., is the federal law regulating, and protecting, trademarks.] Also useful to establish guidelines for delineating plagiarism is Diana Hacker's definition: "Three different acts are considered plagiarism: (1) failing to cite quotations and borrowed ideas, (2) failing to enclose borrowed language in quotation marks, and (3) failing to put summaries and paraphrases in your own words." (*A Writer's Reference*, by Diana Hacker, Bedford St. Martin's Press, 2003, page 331.)

Some instances of plagiarism may, in fact, be violations of copyright law and subject to prosecution. The SCI Student Handbook lists plagiarism as a serious breach of conduct standards and will result in disciplinary action.

**Teaching Methods:**

Teaching methods used will vary depending on the material presented. Each class period will start off with solving problems that have caused problems for the students. This will require your participation. After this is complete, new material will be presented in a brief introduction and problem solving exercise. Then the students will be asked to attempt a portion of their homework assignment in order to make sure that understanding is successful.

**Course requirements:**

**Attendance policy:** An attendance sheet will be provided for you to sign in when attending class. This is a method for me to know who is there and who needs that day's work. I have found that there is a direct correlation between class attendance and success in all courses. I will expect you to attend class.

**Homework:** The student will need to turn in the homework for each testing section on the test day. Assignments will be discussed in class so that questions can be answered. In this type of course, much of the homework will be completed in class so that the student can experience the problem solving.

**Chapter Tests:** Chapter tests will be given as seen on the first class schedule. A review sheet will be provided to the test in order for the student to know what topics will be included on the test. For each chapter, there will be one take-home test (50 points) and one in-class test (50 points).

**Final Exam:** The final exam may be comprehensive and will be discussed with the class. The exam will be given during finals week and date and time will set at a later date.

**Means of evaluation:** Here is the grading scale and basis of overall course grade:

Grading Scale: 100 to 90 A  
89 to 80 B

79 to 70 C  
69 to 60 D  
Below 60 E

Quizzes 35% of total grade.

Homework 10% of total grade.

Chapter tests 35% of total grade.

Final exam 20% of total grade.

Course Outline (see schedule for details)

**Chapters 1,2, & 3:** problem solving; inductive and deductive reasoning; estimation and calculation; sets and cardinality; logic; valid and invalid arguments. (CBSLO 1)

**Chapters 7 & 8:** linear and quadratic equations and applications; ratio and proportion; functions and modeling, including linear, quadratic, exponential, and logarithmic functions (CBSLO 2, 3)

**Chapters 10,11, & 12:** counting; permutations and combinations; expected value; statistics; distributions and graphs; measures of central tendency, dispersion, and position (CBSLO 3,4,5)

Americans with Disabilities Act (ADA)

Springfield College in Illinois provides individuals with disabilities reasonable accommodations to participate in educational programs, activities, and services. Students with disabilities requiring accommodations to participate in class activities or meet course requirements should contact the instructor as early as possible.

Assessment

In addition to using homework and in-class graded work to assess teaching effectiveness and student learning, I will use minute papers, three-question surveys, and/or other classroom assessment techniques as deemed necessary in order to provide continuous improvement of instruction. Students are required to take part in all assessment measures.

IAI Statement

MAT 106 has been approved by the Illinois Articulation Initiative as meeting the criteria stipulated for **M1 904: General Education Mathematics**: *Focuses on mathematical reasoning and the solving of real-life problems, rather than on routine skills and appreciation. Three or 4 topics are studied in depth, with at least 3 chosen from the following list: geometry, counting techniques and probability, graph theory, logic/set theory, mathematical modeling, mathematics of finance, game theory, linear programming and statistics. The use of calculators and computers is strongly encouraged. Prerequisite: C or better in intermediate algebra and geometry.*

Teaching Methodology

Lecture, discussion, demonstration, individual and group work

Preparation for first session:

Read pages 1-46 and study examples.

**Syllabus Changes:**

Though this syllabus is meant to be a guide throughout the course, changes may be made because of events that occur throughout the semester. These changes will be announced in class if they are necessary. Additionally, changes that adversely affect students will be avoided if possible. If a change does adversely affect a minority of students and was unavoidable, exception to earlier rules will be made when appropriate.