 GN M 1125-002  
 Algebraic Problem Solving  
 W. Geremew  
 MWF 11:20 AM – 12:35 PM  
 Spring 2006  
 (W2), (Q1)

Objectives: This course is intended for students who are interested in learning how to become better problem solvers. Throughout the term, we will examine a series of situations and systems, mostly from the sciences, which allow for the posing of questions. These questions may be vaguely defined at first. After refining the questions, we will generate and testy hypotheses, selecting suitable mathematical models to represent these situations. The ability of these models to accurately represent ‘real-life’ systems will be examined critically. Algebraic concepts and procedures will be introduced as they are needed in developing, selecting and working through these mathematical models.

Prerequisites: C or better in BASK 1203 or GNM 1124, or mastery of high school algebra (1 year). Not open to students with credit for GEN 1135 or any MATH acronym course.

Attendance: Any student with more than 6 absences cannot receive a grade higher than D+.

Class Format: Lecture and group discussions

Laboratory/Field Experience: None

Readings: None

Paper/Projects: During the term, students will complete a total of three Task Sets

Evaluation: Homework, Quizzes, Tests, Task Set, and Final exam
Objectives: (A) To provide students with opportunities to experience the power of algebra first hand; (B) To allow students to develop proficiency with algebra in the context of real world situations, not in isolation; (C) To encourage students to become more active mathematical learners.

Course Content: Students will learn to reason algebraically by doing mathematics, not by studying how mathematics is done. They will study problem situations, develop and refine questions, generate and test hypotheses, select suitable mathematical models, and examine the ability of these models to accurately represent real-life situations.

Prerequisites: Open to all students who have fulfilled their BASK math requirements. Not open to students who are enrolled in or have completed GEN 1135 or any other MATH course.

Attendance: Attendance is critical to success in this course. Accordingly, absences are taken very seriously.

Class Format: Most classes will begin with a problem. Students will be asked to spend a few minutes considering the problem, usually in small groups. They will be required to keep a record of each investigation for reference. Solutions, alternate approaches and problem analysis will be discussed prior to the main topic(s) for the day. Students will be expected to participate in class by sharing ideas, asking questions, and working on problems. Although algebra skills and concepts will be presented and explained in class, most of the material will require work outside of class.

Supplies: Graphing calculators are required. (TI-83 or TI-83 Plus calculators may be rented from the Math Center for about $20)

Laboratory / Field Experience:

Readings: Material concerning the topics to be modeled will come from a variety of books and articles. Copies of relevant material will be provided during the term. The textbook covering algebraic concepts and procedures is Applying Algebraic Thinking To Data: Concepts and Processes for the Intermediate Algebra Student by DeMarois, McGowen, and Whitkanack, Addison Wesley 2001. Also suggested is Graphing Calculator Manual by DeMarois, McGowen, and Whitkanack. Addison Wesley 2001.

Papers/Projects: During the term there will be a total of four task sets. Each will contain several extended “real-life” applications requiring detailed analysis and written explanation. Consider these as mini-projects requiring the development and application of the mathematics appropriate for each situation.

Evaluation: Task Sets 25%, Mid Term Exam 20%, Class Participation 10%, Quizzes 25%, Final Exam 20%
Objectives: This Q1 course is intended for students who are interested in learning how to become better mathematical problem solvers.

Course Content: Throughout the term, we will examine a series of situations and systems, mostly from the sciences, which allow for the posing of questions. These questions may be vaguely defined at first. After refining the questions, we will generate and test hypotheses, selecting suitable mathematical models to represent these situations. The following list describes the general topics to be covered in this course: Mathematical Modeling; Simple Linear Models; Models with Multiple Constraints; Higher Order Models; Other Models. The mathematical content is generally at the level of Intermediate Algebra.

Prerequisites: Open to all students who have fulfilled their BASK math requirements. Not open to students who are enrolled in or have completed GEN 1135 or any other MATH course.

Attendance:

Class Format: Each unit will begin with the presentation of a provocative scenario. Students will be asked to consider this scenario, usually in small groups, working toward problem identification and solution. The use of graphing calculators is thoroughly integrated in the course. A small number of graphing calculators are available for rent to those students who do not already own a graphing calculator.

Supplies: Graphing calculators are required. (TI-83 or TI-83 Plus calculators may be rented from the Math Center for about $20.)

Laboratory/Field Experience:

Readings: Material concerning the topics to be modeled will come from several sources. The textbook for the course is Applying Algebraic Thinking to Data.

Paper/Projects: The course carries a W2 designation; students will write to communicate mathematical ideas. Students will complete a series of four task sets allowing them to be involved in extended writing projects.
Objectives: This course is intended for students who are interested in learning how to become better mathematical problem solvers.

Prerequisites: A grade of C or better in BASK 1203 or GNM 1124, or mastery of high school algebra (1 year). Not open to students with credit for GEN 1135 or any MATH-acronym course.

Attendance: Attendance will be taken.

Class Format: The use of class time will vary from day-to-day. Lecture, discussion, individual/group work are examples of such class use.

Readings: The course will be based on the material from the textbook *Applying Algebraic Thinking to Data*, by DeMarois, McGowen, and Whitanack and published in 2001 by the Addison Wesley. There may be occasional handouts.

Supplies: Either a TI-83- or TI-84-series graphing calculator is required. A limited number of such calculators are available for rent from the Math Skills Center (J-105).

Paper/Projects: An occasional take home group project will be given.

Evaluation: Final grades will be determined by using the higher point total of the following two sums:

a. all examination grades plus the comprehensive final examination grade or
b. all examination grades minus the lowest examination grade plus two times the comprehensive final examination grade.

Each examination grade (100 points) may be composed of a group project grade(s) and an in-class test grade. In addition, points will be given for attendance.
OBJECTIVE: To provide a general understanding of genes, heredity, and the science of genetics. Intended for non-science majors. Will include discussions of biotechnology, and how genetics affects medicine and society.

COURSE CONTENT: We will discuss patterns of inheritance in a family pedigree. How to determine if a trait is inherited or has a genetic component. We will learn about DNA, and how it provides the blueprint for life. Other topics will include biotechnology, gene therapy, genetics of cancer, the Human Genome Project, how genes affect behavior, sex determination, DNA fingerprinting, and eugenics.

PREREQUISITES: None. Intended for Majors other than biology of Biochemistry. Not open to those with credit for BIOL 2110 (Genetics).

ATTENDANCE: Recommended.

CLASS FORMAT: Lecture, Audio-visual, Class discussions.

LABORATORY/FIELD: None

READINGS: The Human Genome, a user’s guide (R. Scott Hawley and Catherine Mori).

PAPERS/PROJECTS: Family Pedigree project, Genetics Portfolio (a collection of readings and writings about genetics from the popular press).
GNM 2137-091
The World Ocean
Gordan Grguric
Writing Across the Curriculum Course(W2),
Distance Ed Course, Additional Fee May Apply
Spring 2006

OBJECTIVE: This is a telecourse based on the video series The Endless Voyage. The series focuses on the Marine Environment as a unique feature of Earth and includes 26 half-hour telecourse episodes. It is designed to offer the knowledge, theories and predictions of America's leading oceanographers. The objective of the course is to show students the many elements of the scientific method at work, while studying the ocean. These elements include observations of nature, data analysis, development of theories and models, and their subsequent verification or rejection.

COURSE CONTENT: Some of the topics covered include: ocean history, plate tectonics, islands, currents, waves, tides, marine organisms, light and sound in seawater, and ocean pollution.

PREREQUISITES: Access to email through home, work, or Stockton's computer labs.

ATTENDANCE: Mandatory for Orientation and Examinations.

CLASS FORMAT: Telecourse.

EVALUATION: Written quizzes and examinations, both short answer and essay-type.
OBJECTIVES: A survey of animal life with strong emphasis on both poisonous and venomous organisms.

COURSE CONTENT: The classification, ecology, and toxicology of marine fish and invertebrates, and snakes; symptoms and treatments. Mammals, insects, spider, and scorpions will be briefly discussed.

PREREQUISITES: High School biology; high school chemistry would be helpful but not essential.

ATTENDANCE: Required.

CLASS FORMAT: Lecture, Internet illustrations.

READINGS: Poisonous and Venomous Animals by M. Landau
Poisonous, Venomous, Electric Marine Organisms of the Atlantic Coast, Gulf of Mexico, and Caribbean by M. Landau.

EVALUATION: Four tests
OBJECTIVES: The overall purpose of the course is to help students understand, appreciate, and enjoy the natural regions and landform features of the United States. The course emphasizes the processes involved in forming the local surface as we see today. Because most of these forces are still operating today, the course informs the students about how nature and cultural activities interact.

COURSE CONTENT: The United States, far from being a homogeneous whole, possesses a rich variety of natural regions, each with its own unique landscape. The different landform regions (areas of roughly similar landscapes) provide the basis upon which the U.S. is subdivided into a geomorphic region. While landforms are the main course consideration, other features of the natural environment are also introduced. Some of these features, such as climate, have a direct influence upon landforms. Other, such as vegetation and soil, help provide a more complete landscape picture of a scenic region. Because of their important imprint upon the land, cultural activities also are studied.

PREREQUISITES: Not open to ENVL, GEOL or MARS majors.

CLASS FORMAT: A portion of the course deals with general concepts, processes, and terms. Emphasis will be placed upon recognition of landforms and understanding their evolution. General concepts and terms of other environmental features also will be studied. The main objective of this portion is to have the student gain an ability to "read" and understand the landscape.

A second portion of the course applies the concepts learned earlier to specific regions of the U.S. By understanding how the land evolved and the processes acting upon it today, the student should develop a greater understanding and appreciation of the land as he travels. Wherever possible, examples will be drawn from the National Park System. This is done because the parks usually are outstanding examples of the geomorphology of a region, because of the vast amount of information available, and because the parks are familiar to most people.

READINGS: Deblij and Muller, Physical Geography of the Global Environment, 3rd ed. 2004

PAPERS/PROJECTS: Short written assignments will be given during the semester.

EVALUATION: 3 Exams 80% and Assignments 20%
GNM 2164-001
Atmosphere and Global Change
Kristen A. Hallock-Waters
MWF 12:45PM-2:00PM
Spring 2006

COURSE CONTENT: The focus of this course will be on the atmospheric environment and how human activities have caused perturbations of the Earth’s natural atmosphere. Fossil fuel combustion, biomass burning, deforestation, industrial processes, and land use practices have all contributed to major changes in the composition of the Earth’s atmosphere and have led to various environmental problems including photochemical smog, the greenhouse effect, and stratospheric ozone depletion. Long-term climate change since the time of the Earth’s beginning as well recent changes resulting from man’s activities and predictions for the future will be discussed.

ATTENDANCE: Mandatory

CLASS FORMAT: Lecture. Student discussion of environmental issues in the news.

READINGS: Course Text and other summaries

PAPERS/PROJECTS: Quizzes, exam (3) plus cumulative final exam, problem assignments.
OBJECTIVES: Introduction to the fundamental chemistry involved in cosmetics through the study of some key chemical concepts applied to the preparation of cosmetic products.

COURSE CONTENT: Cosmetics: origin, types, chemical ingredients, preparation, chemical principles involved, calculations, quality controls, presentation marketing.

PREREQUISITES: High School chemistry and algebra highly desirable.

ATTENDANCE: Mandatory. There is substantial penalty for missing class.

CLASS FORMAT: lecture, problem sessions and laboratory work.

READINGS: Library search, and assigned readings from different sources. Term paper related to; experimental work and library search on a selected cosmetic product.

EVALUATION: Tests 65% Quizzes 15% Lab project 10% Problems and Homework 10%

Grading:
90-100%--A--Bonus Points: You can earn extra
79- 89%--B--points by correct answers to some
66-78%--C--class questions, exercise problems,
55-65%--D--surprise quizzes or special homework
less than 55%  --F--These opportunities can improve your grade but never lower it.

Note: I reserve the right to change these policies after proper announcement.
OBJECTIVES: This course aims to make recent exciting discoveries about the physical world tangible and meaningful to everyone. The discoveries of today could have a tremendous impact on tomorrow. After all, the concept of splitting the atom was a theoretical idea just sixty years ago. The transistor was only a figment of a scientist's imagination in 1946. Black holes are perhaps one of the most controversial topics in science today. Yesterday's Science Fiction has become today's reality.

COURSE CONTENT: This course aims to make recent exciting discoveries about the physical world tangible and meaningful to everyone. No background in science is required, but one year of high school algebra is expected. Non-science and science majors will be equally welcome. For non-science majors this course will not only meet the GNM requirement but will also be an introduction to the mind-expanding challenge of the frontiers of science today. Science majors will be able to update their view of science on the basis of the most recent developments. The world of the future will be as dramatic as Stanley Kubrick's Space Odyssey. Discoveries are unfolding in many fields of science in recent years and even months. These are exciting times for science. However, because many developments are so new, advances appear mysterious. Most people are baffled and misled by the media's inability to report science accurately and without sensationalism. The Atom, Man, Universe course is intended to be a forum where contemporary developments can be discussed at the elementary level. The scientific material will be handled in qualitative terms using analogies and theoretical models. We will explore some of the background and logical reasoning leading to the discoveries. The goal of the course is to provide a perspective on the universe, from sub-atomic particles to galaxies, as viewed by today's scientists. The course will also attempt to illustrate with concrete examples how scientists actually tackle problems, obtain information, construct models, and draw conclusions on the basis of limited data. The actual topics that the course will cover will depend to some extent on the interests of the class. A list of possible topics will be distributed early in the semester, and each student will be asked to convey his or her relative interest in each topic. This information will be one of the factors that will enter into the construction of the course syllabus.

Readings: The Text is From the Black Hole to the Infinite Universe. The book has a story line, where the adventures of the spaceship Top Dog are explored in physical terms, each chapter having first a fiction and then a non-fiction part. The reading of the text will be obligatory. There will also be some outside readings, based on handouts that will be distributed in class. Additional topics, which are not included in the text, will be discussed in lecture.

ATTENDANCE: Required.

PAPERS/PROJECTS: Weekly homework is required.

EVALUATION: Attendance 10%, Homework 20%, and Three tests each 23.3%
GNM 2209-001
Intelligent Machines/Human Beings
Jinchang Wang
MW 3:35-5:25
Spring 2006

Course Content: Machines are getting smarter and smarter with rapid development of computers. This course reviews the endeavors of human beings in developing smart machines, and the achievements in machine intelligence and their impacts on our life. This course introduces the areas of artificial intelligence and discusses how a machine thinks. This course looks at the future of intelligent machines and their influence on us. Examples of topics to be discussed are: How are our daily life and society influenced by the intelligent machines currently? How does a machine think? How smart can a machine be? What if machines are smarter than us? Is a spiritual machine possible?

Prerequisites: None

Attendance: Required

Class Format: Lectures, readings, videos, class discussions

Readings: Papers and articles provided by the instructor.

Evaluation: Quizzes/Test 35%
Assignments/Essays/Project 45%
Attendance/Participation 20%
OBJECTIVES: A scientific survey of our current knowledge about the universe for students with a knowledge of high school algebra and geometry. The emphasis is on what we know and how we study the solar system, stars and galaxies. Observation sessions will be held each clear night after class at the Stockton Observatory. Naked eye viewing will help student become familiar with the night sky. Viewing will also be done using the 16” telescope, both directly and using the CCD camera. Each student is expected to attend a minimum of 6 observing sessions. Computer activities will complement these sessions.

PREREQUISITES: High school algebra

ATTENDANCE: Required

CLASS FORMAT: Lecture

LABORATORY/OBSERVATIONS: Observing sessions at the Stockton College Observatory

TEXTBOOKS: Astronomy: Journey to the Cosmic Frontier, 4th Ed, by J. Fox.

PROJECTS/PAPERS: Computer based projects, Extra credit for research, and work at the Observatory.

EVALUATION: Midterm 30%, Final 30% and Observatory/ computer base projects 40%.
OBJECTIVE: The course will introduce students to achievements of American Black scientists and inventors and the role these achievements played in developing the technological base of America. It will also provide students with an insight as to how these tasks were accomplished in spite of an enormous array of social cultural problems.


CLASS FORMAT: Films, Lectures and Discussions


ATTENDANCE POLICY: Students must be present at each class meeting and on time.

EVALUATION: There will be four exams (25% each)
COURSE CONTENT: To gain an appreciation of the role of cryptography in the world and to learn the mathematics behind encoding and decoding messages, including modular arithmetic, linear, greatest common divisors, different number bases and more.

PREREQUISITES: MATH 1100, GEN 1135 or equivalent

CLASS FORMAT: Discussion, lectures, and hands-on-work.

TEXTBOOKS: *The Code Book* by Simon Singh and *A Short Course in Crytography* by Frank Beatrous (unpublished notes that will be provided either on the web or paper copy).

CALCULATORS: A scientific calculator will be useful.

EVALUATION: Class Participation, homework, and exams.
OBJECTIVES: introduce students to environmental issues that affect different parts of the world teach basic scientific concepts and how to apply them in analyzing environmental problems stimulate discussion on how environmental issues from other continents affect our lives in America and how our problems impact people on other continents.

The class will cover the most prevalent environmental issues in each of the seven continents, their causes, Impact on the global ecosystem, and possible solutions. For example, the impact of causes, impact on the global ecosystem, and possible solutions. For example, the impact of industrialization (Europe and N America), agriculture and deforestation (Africa, Asia, and S America), mining (most continents) and other activities (the depletion of the ozone layer over industrialization (Europe and N America), agriculture and deforestation (Africa, Asia, and S America), mining (most continents) and other activities (the depletion of the ozone layer over Antarctica) will be discussed. Case studies of countries from each continent will be presented. Emphasis will be placed on the global impact of the environmental problems and how world bodies try to solve them through international treaties and agreements.

PREREQUISITES: High school math, biology and chemistry. Some material will overlap topics covered in ENVL 1100 and ENVL 2300

ATTENDANCE: Class quizzes given regularly. There will be no make-up quizzes for unexcused Absences (examples of valid excuses include family emergencies and doctor’s appointments). 10% percent of your grade will be based on class participation. Online discussion on WebCT expected.

CLASS FORMAT: Lecture format, with considerable discussion. Class participation is expected.

LABORATORY/FIELD EXPERIENCE: We will visit a local contaminated area or an area of environmental interest during the semester. Some of the class assignments will deal with coverage of environmental issues in the media (radio, television, online and print media).

READINGS: Readings will be assigned in class. Readings will be taken from journals, newspapers, and book chapters.

PAPERS/PROJECTS: One term paper outlining issues (not limited to problems) on a problem of your choice.

EVALUATION: Grades will be based on class participation, assignments, quizzes, a term paper and project. Term paper: 10%, Final: 30%, Quizzes: 35%, Assignments: 15%, Participation: 10%, Total : 100%
COURSE CONTENT: To explore and understand the basic principles of chemistry; to become an informed citizen to make rational choices about complex technical issues which will have an increasing impact on our daily lives and standard of living.

DESCRIPTION: The course will examine how chemistry can be used to understand and explore everyday experiences and societal concerns. Chemical principles and the methods of science will be taught using examples from the text, newspapers, and journal articles. By applying the basic principles introduced, students will be able to relate them logically to their observations and their readings. This is a hybrid course with a telecourse component based on the World of Chemistry video series and an online component that makes use of WebCT. Assignments and tests will be posted and received on WebCT. The telecourse package includes a textbook and 26 half-hour programs. The course content is not limited to the topics covered in the videotapes. The textbook covers course content topics which are not dealt with in the video programs.


ATTENDANCE: This is a Distance Learning course and does not require weekly class meetings. However, a few class meetings have been scheduled. Some of these meetings will include periods for examinations. The class meetings will be used to discuss course content, problems and concerns.

EVALUATION: Quizess, 20% and four examinations, 80%
GNM 2804-001
Introduction to Geography
William Lubenow
TBA
Spring 2006

Course Content: An independent study of geography

Prerequisite(s): None

Attendance: To be arranged

Class Format: Individual conference

Readings: A standard text

Projects: A final paper

Evaluation: Based on quality of final paper
OBJECTIVES: This course is an inquiry into biology. Questions to be considered include: What constitutes a biological explanation? Is biology a historical science? What is meant by nature? Can biology explain the origin of life?

COURSE CONTENT: The course will center on the Charles Darwin and Gregor Mendel, along with the so-called “modern synthesis” of their work. We will study the simple mathematical models that express the modern synthesis.

PREREQUISITES: Not open to BIOL, ENVL, MARS Majors.

ATTENDANCE: Class participation will be a significant part of the course, attendance is required.

CLASS FORMAT: Lecture, Discussion, Demonstration.


EVALUATION: Based on class participation, and homework assignments, plus several short-essay exams