



MATH 1101: MATHEMATICAL MODELING Fall 2009

Instructor -- Bruce Thomas

CRN	Days	Time	Course Num/Sec	Location
85452	T R	12:30PM-1:45PM	MATH 1101/24	Nursing - 118

A Course in the General Education Program

Program Description: The General Education Program at KSU offers a common academic experience for all its students. In a series of interrelated courses in the liberal arts and sciences, it provides the opportunity for them to acquire the intellectual skills and knowledge characteristic of educated persons. Thus, it lays the foundation for success in their academic, professional, and personal lives. Whereas the major program contributes to a college education depth in a designated specialization, the General Education Program provides breadth by introducing and connecting a variety of disciplines.

Program Goals: The General Education Program at KSU has four goals. During the course of the program, students should demonstrate the following:

- knowledge and understanding in the General Education areas: Humanities, Fine Arts, Science, Mathematics, Technology, Social Science, and the Essential Skills (written and quantitative skills);
- proficiency in communication;
- skills in inquiry, critical thinking, and problem solving through scholarly and/or creative activity across the general education disciplines;
- an understanding of ethics, diversity, and a global perspective.

Course Description: Math 1101 is an applications-driven course that focuses on modeling real data concerning environmental issues. The course incorporates collaborative learning, oral and written reports, and technology in the form of graphing calculators. Topics include linear, quadratic, piecewise-defined, rational, polynomial, exponential and logarithmic functions.

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Attendance: Regular class attendance is essential and expected of every student enrolled in this class. In the event of any absence, students are responsible for all material, assignments, and announcements given in class. Homework will be assigned by the instructor.

Students are expected to spend 2.5 hours of quality study time between class sessions devoted to this course's material. This time should be divided among 4 activities:

1. studying the section(s) of the book that were discussed the previous classroom session;
2. working the assigned homework;
3. reading the section of the textbook scheduled to be lectured on during the next class session, and developing questions to ask in class;
4. preparing for tests.

The schedule of lectures and tests appears in this syllabus. There will be no make-up tests, quizzes, or exams (see grading policy below).

Classroom Expectations: Students are expected to observe courteous classroom etiquette. Please refrain from chatter during the lecture and discussion. Enter and exit the classroom quietly when class is in session. When entering after lecture has started, unpack books before coming into the room, and try not to cross in front of the speaker. Sit near the door, if you must leave early. Turn off cell phones and beepers before entering the classroom, and do not engage in online activities unrelated to the course when class is in session.

Grading Policies: There will be graded homework assignments, quizzes, three tests, a group project, attendance points, and a comprehensive final exam. They will count as follows:

Three tests counting 100 points each	300 points
Graded homework assignments (WebAssign)	100 points
Quizzes	50 points
Group project	50 points
Comprehensive final exam	<u>150 points</u>
Total	650 points

No make-up quizzes, tests, or exam will be given. If a student is absent on the day a test is given, a score of zero will be assigned. However, the final exam grade (scaled appropriately) will be substituted for the lowest of the student's test grades.

A one or two question unannounced quiz worth 10 points will be given occasionally in class. If a student is absence on the day a quiz is given, a score of zero will be assigned; **no** make-up quizzes will be given. Only the student's best 5 scores from all the quizzes will be counted.

At the end of the course, grades will be assigned as follows, based on the number of points accumulated by the student:

585 - 650 points	A
520 - 584 points	B
455 - 519 points	C
390 - 454 points	D
Below 390 points	F

Technology Statement: A TI-83, TI-84, or TI-83 Plus graphing calculator is required and will be used throughout the course to enhance mathematical thinking and problem solving and to judge the reasonableness of results. (An equivalent graphing calculator may be used, but the student will be responsible for learning to use any calculator other than the TI-83/84 models.)

Daily Homework (WebAssign): Daily homework assignments will be completed via WebAssign, an internet based learning platform that is a companion to the course textbook. The due date for assignments will typically be set at midnight the day before a test (homework for Chapter P and Chapter 1 will be due earlier; see WebAssign for the date). Late homework will not be accepted.

Homework points are accumulated automatically by WebAssign. Homework questions can be worked multiple times until a correct answer is recorded. Once the homework is “submitted,” the grade for that assignment is recorded in the WebAssign gradebook.

Getting set-up with WebAssign: The login webpage for accessing WebAssign is www.webassign.net/login.html. A tutorial for getting set-up in WebAssign is available (as demonstrated the first day of class) on your instructor’s website. The course key code is: **kennesaw 1121 1867**

New textbooks will have the cost of registering for WebAssign bundled into the price of the textbook; students buying used textbooks will have to pay for their registration on the website itself, using a credit card for the charge. WebAssign allows a 2-week grace period before you have to record your registration number or purchase the registration with a credit card, so that students can get set-up and begin using WebAssign immediately after the first day of class and settle-up later.

When completing registration in WebAssign, be sure to identify yourself with your KSU NetId, your full name, use the word “Kennesaw” for the institution, and key in a valid email address for yourself (so that your instructor can communicate with you during the semester).

Textbook: *Functions and Change*, Third Edition, by Crauder, Evans, and Noell

Important Dates:

Test 1 – Thursday, September 17

Last day to withdraw without academic penalty – Monday, October 12

Test 2 – Tuesday, October 13

Test 3 – Tuesday, November 3

Group project due – Tuesday, November 24

Thanksgiving Holiday, no class – Wednesday/Thursday, November 25-26

Last regular meeting day for this class – Thursday, December 3

Final Exam – Tuesday, December 8

Learning Outcomes:

1. Demonstrate knowledge and understanding of the Math 1101 topics.
 - a. Students will determine whether a relation given as a set of points, or as a graph, or as an equation represents a function.
 - b. Students will find the domain and range of a function.
 - c. Students will evaluate a function given by a graph or by an equation.
 - d. Students will combine functions arithmetically and relate combined functions to applications.
 - e. Students will form composite functions and specify their domains.
 - f. Students will compute the slope of a line and interpret the slope as rate of change.
 - g. Students will recognize characteristics of linear, quadratic, piece-wise, third and fourth degree polynomial, exponential, and logarithmic functions.
 - h. Students will locate relative and absolute maxima and minima, and x- and y-intercepts of functions.
 - i. Students will solve equations involving linear, quadratic, piece-wise, third and fourth degree polynomial, exponential, and logarithmic expressions using algebraic and/or graphical methods.
 - j. Students will model real data using linear, quadratic, piece-wise, third polynomial, exponential, and logarithmic functions.
 - k. Students will solve systems of linear equations using the methods of elimination, substitution, and matrix inverses.

2. Formulate and solve problems from both mathematical and everyday situations.
 - a. Students will use combined functions including composite functions to solve problems.
 - b. Students will solve applied problems involving the various classes of functions described in 1i above.
 - c. Students will justify the appropriateness of selecting a particular class of function for modeling a set of data.
 - d. Students will discuss the advantages and disadvantages of using a model for interpolation and extrapolation.
 - e. Students will interpret and use properties such as relative and absolute maxima and minima and x- and y-intercepts in solving problems.
 - f. Students will solve problems using systems of equations.

3. Communicate mathematical ideas using both everyday and mathematical language.
 - a. Students will use function notation correctly.
 - b. Students will describe what the answer to a problem means in practical terms.
 - c. Students will express English statements using mathematical notation, and interpret symbolic mathematical statements in English.

4. Use calculator to explore and solve problems.
 - a. Students will graph a function on an appropriate viewing window using the graphing calculator.
 - b. Students will create regression models using the graphing calculator.
 - c. Students will use the Trace/Calc feature of the graphing calculator to solve equations and to locate relative maxima and minima as well as zeros of polynomial functions.

5. Participate in collaborative groups and cooperative learning.
 - a. Students will work collaboratively in small groups to solve problems.

6. Connect mathematics to other disciplines and real-world situations.
 - a. Students will model real data using mathematical functions.
 - b. Students will solve applied problems from a variety of disciplines.

7. Experience the power and usefulness of mathematics in solving real problems.
 - a. Students will learn mathematics in the context of solving real world problems.
 - b. Students will make decisions about real world problems based on the mathematical models that they have created.

Math 1101, Section 24 Tentative Schedule

Meeting Number	Date	Classroom Topic
1	Tue, Aug 18	Prologue, 1.1
2	Thur, Aug 20	1.1, 1.2
3	Tue, Aug 25	1.3, 1.4
4	Thur, Aug 27	1.4
5	Tue, Sept 1	2.1, 2.2
6	Thur, Sept 3	2.2
7	Tue, Sept 8	2.3, 2.4
8	Thur, Sept 10	2.4, 2.5
9	Tue, Sept 15	Review
10	Thur, Sept 17	Test 1
11	Tue, Sept 22	3.1
12	Thur, Sept 24	3.2
13	Tue, Sept 29	3.3
14	Thur, Oct 1	3.4
15	Tue, Oct 6	3.5
16	Thur, Oct 8	Review
17	Tue, Oct 13	Test 2
18	Thur, Oct 15	4.1, 4.2
19	Tue, Oct 20	4.2
20	Thur, Oct 22	4.3
21	Tue, Oct 27	4.4
22	Thur, Oct 29	Review
23	Tue, Nov 3	Test 3
24	Thur, Nov 5	5.1
25	Tue, Nov 10	5.2, 5.3
26	Thur, Nov 12	5.3
27	Tue, Nov 17	5.4
28	Thur, Nov 19	5.5
29	Tue, Nov 24	Group Project due
30	Tue, Dec 1	Group Project presentations
31	Thur, Dec 3	Review
Finals	Tue, Dec 8	Final Exam

WITHDRAWAL FROM THE UNIVERSITY OR FROM INDIVIDUAL COURSES AND ACADEMIC INTEGRITY

Fall Term, 2009

Withdrawal

Students who find that they cannot continue in college for the entire semester after being enrolled, because of illness or any other reason, need to complete an online form. To completely or partially withdraw from classes at KSU, a student must withdraw online at www.kennesaw.edu, under Owl Express, Student Services.

The date the withdrawal is submitted online will be considered the official KSU withdrawal date which will be used in the calculation of any tuition refund or refund to Federal student aid and/or HOPE scholarship programs. It is advisable to print the final page of the withdrawal for your records. Withdrawals submitted online prior to midnight on the last day to withdraw without academic penalty will receive a "W" grade. Withdrawals after midnight will receive a "WF". Failure to complete the online withdrawal process will produce no withdrawal from classes. Call the Registrar's Office at 770-423-6200 during business hours if assistance is needed.

Students may, by means of the same online withdrawal and with the approval of the university Dean, withdraw from individual courses while retaining other courses on their schedules. This option may be exercised up until **October 12, 2009**.

This is the date to withdraw without academic penalty for Fall Term, 2007 classes. Failure to withdraw by the date above will mean that the student has elected to receive the final grade(s) earned in the course(s). The only exception to those withdrawal regulations will be for those instances that involve unusual and fully documented circumstances.

Academic Integrity

Every KSU student is responsible for upholding the provisions of the Student Code of Conduct, as published in the Undergraduate and Graduate Catalogs. Section II of the Student Code of Conduct addresses the University's policy on academic honesty, including provisions regarding plagiarism and cheating, unauthorized access to University materials, misrepresentation/falsification of University records or academic work, malicious removal, retention, or destruction of library materials, malicious/intentional misuse of computer facilities and/or services, and misuse of student identification cards. Incidents of alleged academic misconduct will be handled through the established procedures of the University Judiciary Program, which includes either an "informal" resolution by a faculty member, resulting in a grade adjustment, or a formal hearing procedure, which may subject a student to the Code of Conduct's minimal one semester suspension requirement.