

MAT 115 – Mathematical Models

Course Syllabus- Spring 2009

Instructor: Ron Koppenheffer
Office: Ferguson 110
Email: [rkoppenheffer @ abtech.edu](mailto:rkoppenheffer@abtech.edu)
(Please put MAT 115 in the subject line of any emails you send to me.)

Office Hours: Tu-Wed-Th 1:00-3:00 or by appointment

Credit Hours: 3.0 **Contact Hours:** 4.0

Class Location: ELM 338

Class Meeting Times: 9:00am – 9:50am MWF

Prerequisite(s): MAT 070 or placement

Required Text: Timmons, Johnson, McCook, *Fundamentals of Algebraic Modeling*, Fourth Edition

Calculator: A scientific calculator is **required** for this course. I suggest a TI-83 or equivalent.

Course Description: This course develops the ability to utilize mathematical skills and technology to solve problems at a level found in non-mathematics-intensive programs. Topics include applications to percent, ratio and proportion, formulas, statistics, functional notation, linear functions, probability, sampling techniques, scatter plots, and modeling.

Course Goal: Upon completion, students should be able to solve practical problems, reason and communicate with mathematics, and work confidently, collaboratively, and independently.

Course Specific Competencies: Upon successful completion of the course, you will be able to:

- Define and discuss a special kind of relationship between two quantities called a function.
- Define and discuss linear and non-linear functions
- Define and discuss mathematical models in geometry, business, personal finance and science and technology
- Define and discuss problems and models that involve the interaction of two or more variables
- Define and discuss the laws of probability and how they are used to assist in decision making
- Define and discuss statistics as the area of mathematics that is involved with collecting, classifying, summarizing and presenting data that has been collected
- Work collaboratively and communicate mathematics effectively.

Reinforcement Experiences for General Education Cross-Curriculum Competencies: This course encapsulates the following reinforcement experiences for the general education cross-curriculum competencies:

- Communicate effectively in speaking, writing, reading and listening
- Locate, evaluate and use information to analyze problems and make logical decisions
- Apply math skills and/or natural science knowledge appropriately to organize, analyze and make information useful
- Develop the ability to succeed as a self-directed learner.

Topic Outline

Chapter 1 A Review Of Algebra Fundamentals

- 1.1 Mathematical Models.
- 1.2 Real Numbers and Mathematical Equations.
- 1.3 Solving Linear Equations.
- 1.4 Formulas.
- 1.5 Ratio and Proportion.
- 1.5 Percents.
- 1.6 Word Problem Strategies.

Review

Test 1

Chapter 2 Graphing

- 2.1 Rectangular Coordinate System
- 2.2 Graphing Linear Equations
- 2.3 Slope
- 2.4 Writing Equations of Lines
- 2.5 Linear Inequalities

Review

Test 2

Chapter 3 Functions

- 3.1 Functions
- 3.2 Using Function Notation
- 3.3 Linear Functions
- 3.4 Direct and Inverse Variation
- 3.5 Nonlinear Functions

Review

Test 3

Chapter 4 Applications of Functions

- 4.1 Geometric Applications – Perimeter & Area
- 4.2 Geometric Applications – Right Triangles
- 4.3 Mathematical Models in Personal Finance
- 4.4 Mathematical Models in Banking & Finance
- 4.5 Mathematical Models in Consumer Credit
- 4.6 Mathematical Models in Business
- 4.7 Mathematical Models in Science and Technology

Review

Test 4

Chapter 5 Systems of Equations

Solving Systems by Graphing
Solving Systems Algebraically
Solving Systems with Cramer's Rule
Applications of Linear Systems
Systems of Nonlinear Functions
Review

Test 5**Chapter 6 Probability Models**

6.1 What is Probability?
6.2 Theoretical Probability
6.3 Odds 247 1-29
6.4 Counting Principle and Tree Diagrams
6.5 Or and And Problems
6.6 Permutations and Combinations
6.7 Applied Probability Problems
Review

Test 6**Chapter 7 Modeling with Statistics**

7.1 Introduction to Statistics
7.2 Descriptive Statistics
7.3 Organizing and Displaying Data
7.4 Variation
7.5 The Normal Curve
7.6 Scatter Diagrams and Linear Regression
Review

Test 7**Final Exam**

Grades: Your overall grade will be composed of tests (announced), quizzes (unannounced), homework, lab assignments and a comprehensive final exam. The percentage assigned each is as follows:

- Chapter Tests 60%
- Labs, Quizzes and HW assignments 15%
- Comprehensive final Exam 25%

Grades are assigned using the following scale:

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

Homework: Homework will be assigned regularly and graded. Your understanding of the material may also be assessed by unannounced homework quizzes.

You are expected to complete the assignments before the next class since part of class time will be used for discussion of homework and your homework quizzes will come from these problems.

Tests: There will be a test at the end of each chapter.

Make-up Work:

- **Labs:** Labs turned in late will drop 5% points for each day late. I will drop the lowest of your lab grades.
- **Quizzes:** There are **NO** make-ups for quizzes. However, I will drop the lowest of your quiz grades.
- **Tests:** If you have a prearranged activity that you cannot change, see me before the test date to arrange a time for make-up. If you don't contact me before the test and don't show up on test day, I will put your test, an altered version of that taken by the rest of the class, in the test center (Ferguson 114B) for you to complete. You have **one** week to makeup the test.

Attendance: Regular and punctual class attendance is **expected** of all students. If you don't attend, you can't learn. Missing class more than a few times is likely to make it difficult for you to keep up with course work and pass. An accurate record of class attendance will be kept. Entering class late and leaving class early also affect your ability to keep up; three such occurrences will be counted as an absence.

If you miss more than 20% or more of the classes, you will be given a grade of "U" and have to repeat the course, unless the student follows the official withdrawal procedure before the grade of "U" is recorded. If it appears that you will not be able to complete a course successfully, it is advisable to withdraw no later than the official withdrawal date at the 75% point of the class.

Please communicate with me when "stuff happens"! Cars break down, children get sick....don't give up on this class. I will work with you.

Email Policy: The ABTech student email is to be used for official school business. The format for student emails is: firstnamelastname@students.abtech.edu

Activity Schedule: This schedule will be used for most approved and announced student activities.

Normal Class Time	Activity Day Schedule
8:00 am	8:00 – 8:40 am
8:30 am	8:20 – 9:00 am
9:00 am	8:45 – 9:25 am
9:30 am	9:05 – 9:45 am
10:00 am	9:30 – 10:10 am
10:30 am	9:50 – 10:30 am
11:00 am	10:15 – 10:55 am
11:30 am	10:35 – 11:00 am (note 25 minutes)
11:00 am – 1:00 pm Scheduled Activities!!	
12:00 pm	1:00 – 1:40 pm
12:30 pm	1:20 - 2:00 pm
1:00 pm	1:45 – 2:25 pm
1:30 pm	2:05 – 2:45 pm
2:00 pm	2:30 – 3:10 pm
2:30 pm	2:50 – 3:30 pm
3:00 pm	3:15 – 3:55 pm
3:30 pm	3:35 – 4:15 pm
4:00 pm	4:00 pm

Inclement Weather Schedule: The college will close when weather conditions are such that driving is hazardous. The following procedure will be observed for inclement weather conditions:

1. Announcements concerning school operation will be made by 6:30 am on local radio and TV stations for the day classes. A voice message will be recorded on the switchboard. If it appears that the ice or snow may be cleared by midmorning, the schedule to follow will be used and all College personnel and students should report by 10 am.

2. Closing or delaying the day programs does not automatically close evening classes. Announcements will be made on radio stations and the College switchboard no later than 3 pm concerning the evening classes.
3. When weather conditions dictate early dismissal of the day or evening classes, the announcement will be made by telephone to each building on campus.
4. Adjustments in the College Calendar for the days missed because of inclement weather will be made at the end of the semester.
5. Important: If weather conditions become worst after the 6:30 am announcement, an additional announcement closing school for the day will be made no later than 8:30 am. Oak Student Center will open at 8 am for early arrivals.

Inclement Weather Schedule:

Normal Class Time	Delayed Opening
8:00 am	10:00 – 10:40 am
8:30 am	10:20 – 11:00 am
9:00 am	10:45 – 11:25 am
9:30 am	11:05 – 11:45 am
10:00 am	11:30 am – 12:10 pm
10:30 am	11:50 am – 12:30 am
11:00 am	12:15 – 12:55 pm
11:30 am	12:35 – 1:15 pm
12:00 pm	1:00 – 1:40 pm
12:30 pm	1:20 – 2:00 pm
1:00 pm	1:45 – 2:25 pm
1:30 pm	2:05 – 2:45 pm
2:00 pm	2:30 – 3:10 pm
2:30 pm	2:50 – 3:30 pm
3:00 pm	3:15 – 3:55 pm
3:30 pm	3:35 – 4:15 pm
4:00 pm	4:00 pm

Code of Class Room Conduct

Asheville-Buncombe Technical Community College is an institution for adult learning. It is a partnership between instructors with the desire to teach and students with the desire to learn. In order to create an appropriate environment for teaching and learning to flourish, there must be respect for the instructor and fellow students. Listed below are guidelines for classroom behavior which the College has established to ensure that the learning environment is not compromised.

1. Attendance: You are expected to be in class the entire class time. Do not enter late or leave early. Rare exceptions may be excused, particularly under emergency circumstances, but you should be prepared to explain your tardiness to the instructor after class. Likewise, the need to leave early should be explained to the instructor before class.
2. Absences: Inform the instructor in advance, if you know you are going to miss a class. Also, take responsibility for getting missed assignments from other students. Do not expect that you will be allowed to make up work, such as unannounced quizzes or tests, after an absence. Instructors are not responsible for re-teaching the material you missed because of absence.
3. Conversation: Do not carry on side conversations in class.
4. Other Activities: You may not work on other activities while in class. This includes homework for other courses or other personal activities.
5. Internet: In classes where Internet access is provided, you may use the Internet for valid, academic purposes only. You may not use it for open access to other non-academic sites which are unrelated to the course.

6. Sleep: Do not sleep in class.
7. Attitude: You are expected to maintain a civil attitude in class. You may not use inappropriate or offensive commentary or body language to show your attitude regarding the course, the instructor, assignments, or fellow students. Keep in mind that all electronic interactions (e-mail, chats, discussion forums, etc.) are extensions of the classroom and should be treated as such. Unacceptable language and behavior will be addressed as if you were sitting in the classroom.
8. Profanity and Offensive Language: You may not use profanity or offensive language in class.
9. Cell phones and beepers: You may not receive or send telephone calls or pages during class. You are responsible for turning off cell phones and beepers upon entering class.
10. Guests: You may not bring unregistered friends or children to class.
11. Food, Drink, Tobacco Products: You may not have food or drink in class. You may not use tobacco products in the buildings of A-B Tech.
12. Personal Business: You may need to transact personal business with the instructor, asking him or her to sign forms. Plan to do this before instruction begins or after class.

Typically, violations of the Code of Classroom Conduct will be dealt with as minor infractions. However, repetition of minor infractions or other more serious violations of the Code of Student Conduct may lead to removal from the classroom while the matter is resolved and referral to the Vice President for Student Services for disciplinary action.

Cheating: Cheating is a form of failure; it will therefore be assessed as such.

My Specific Class Rule: My only rule for this class is: Show respect for me and your classmates: turn off your cell phone, stop side conversations, allow others in the class to ask questions and not make judgments about those questions.

Cell Phones (again): It is disruptive when cell phones ring during class. Please be courteous to your classmates and me by having your phone turned off or on silent. In addition, you should not check for messages, play games or text during class. All cell phones should be placed in a handbag or backpack.

Please note that AB-Tech is now a tobacco free campus.

NETIQUETTE STATEMENT:

GENERAL:

1. Understand that typed messages lack cues normally associated with face-to-face conversation. Without these supporting cues for context, satire or sarcasm can come across in unintended ways.
2. Use parenthetical explanation to explain meanings that might be misunderstood.
3. Do not criticize spelling or grammar but do check your own spelling, punctuation, and grammar.
4. Don't use all capital letters. In the online world, this is the equivalent of shouting and it is difficult to read.
5. All lowercase letters indicate mumbling.
6. Be brief and to the point.

SUBJECT LINES:

1. Keep subject lines short.
2. Make subject lines informative by indicating the content of the message.
3. Make subject lines clear and unambiguous.

REPLYING:

1. If you excessively reply to ongoing discussions and include the original message, your messages will be very long and hard to follow.
2. For simple messages, quoting the original message when replying will clarify your response.
3. Using carets to indicate lines of text that are quoted.

EMAIL:

1. Unless you are explicitly given permission, don't publicly post email sent to you in private.
2. Recognize that instant delivery of email does not guarantee an instant response.
3. If you are sending information from another source, pay attention to whether the material is copyrighted and cite sources.
4. For important messages, compose a draft in a word processor so you can spell check it.
5. Be careful when addressing emails. One character out of place, or a ".com" suffix when the person's email really ends with ".edu", and your message won't be delivered.
6. If it is going to take considerable time to reply fully, try to acknowledge receipt of a message promptly and let the sender know that you will answer.

ATTACHMENTS:

1. Do not send huge attachments.
2. When you're replying to a message that has an attachment, do not include the attachment again.
3. Avoid sending attached files that lack filename extensions (that's because some computers won't be able to open them).

FLAMING:

1. Do not flame! Flaming refers to derogatory, abusive, threatening, sarcastic, rude, or otherwise mean-spirited messages directed at people.
2. If a message provokes a negative emotional response, put it away for a while, then reread it and see if you're misinterpreting it. If you don't understand a particular item, ask the sender for clarification before replying to an incorrect conclusion.
3. Messages are not secure. Remember, it's very easy for someone else to forward messages you thought were confidential.
4. Apologize. If there's been a misunderstanding or miscommunication, you can often nip a flame war in the bud by a brief apology.
5. Don't write anything that you won't want other people to be able to see for a long time (posts can be archived for years).

DISCUSSION:

1. Lurk before you leap. Lurking is visiting without participating. While it's rude to make a habit of lurking, a little lurking can acquaint you with rules and procedures, help you get the "lay of the land," and prevent embarrassment.
2. Avoid posting non-informative messages on bulletin boards. Chat is more like a telephone, so saying "Me, too!" or "I don't know" is accepted. But on bulletin boards, people don't like to read postings that aren't substantive.

CHAT:

1. Remember that chat rooms are "logged" (i.e., a record is kept of conversations).
2. Do not disrupt chat rooms by pasting large blocks of text into the input box (thus causing the screen to scroll faster than other users are able to type) or otherwise act in a manner that negatively affects other users' ability to engage in real time exchanges.
3. If you are having a conversation that is off the main topic, please move to another chat room.
4. If you are a fast typist, please pause occasionally to let slower typists contribute to the discussion.

*Please note this Netiquette statement was inserted as a requirement by the Math Department.
California State University at Fullerton Excerpted from Bramucci, Robert. Cal State Fullerton.

Students with Special Needs If you are a student with a disability and want to request academic accommodations (i.e., a notetaker, extended time on tests, or alternate testing), you must register with the Disability Services Office in the Azalea Building or by making an appointment by calling 254-1921 ext.141 or by email at Aclingenpeel@abtech.edu. This is the campus office responsible for reviewing documentation provided by students requesting academic accommodations, and for accommodations planning in cooperation with students and instructors, as needed and is consistent with course requirements.

Free Math Tutoring is available to students in Laurel 118!

Monday-Thursday 9:00 am to 6:00 pm

Friday 9:00 am to 1:00 pm

Important Dates: Spring Semester – 2009*

Classes begin:	January 6 th
Martin King Jr. Day	January 19 st
Last Day to Drop for Partial Refund	January 22 nd
Professional Development (no classes 12 pm-5 pm)	February 17 th
Last Day to Apply for Spring Graduation	February 27 th
Student Break	March 13 th *
Last Day to Withdraw from Class w/o Penalty	April 7 th
Spring Break	April 13 th -18 th
Activity Day – Earth Day	April 24 th
Last Day of Classes/Exams	May 12 th *
Spring Graduation	May 15 th

*Up to three days may be made up at the end of the semester for inclement weather. All dates are subject to change.

This syllabus has been prepared for the convenience of the students and instructor. Changes are sometimes necessary during the course of the class. Any changes will be given to students in class verbally and/or in writing.

Dear Student,

Welcome to the Mathematics Department!

We look forward to working with you and providing you with the very best education in mathematics.

We are a seven-member team that boasts a combined experience of over one-hundred-fifty years in professional education. We are extremely proud of our services and our accomplishments, and we always strive to maintain the best of quality instruction and as well as adherence to high academic standards and goals. Because of this dedication, we enjoy an excellent academic reputation with the surrounding upper-division colleges and universities in the region. It is a high priority to maintain this reputation, and consequently the value of your degree.

In order to be successful in your Math class and to ensure that other students have the learning environment they deserve, we require that you adhere to the Code of Student Conduct located in your Student Handbook, and on your syllabus. A positive learning environment makes it much easier for any student to achieve their goals.

If it is necessary for you to discuss any personal issue with your instructor, it is imperative that you do so during their office hours or during an out of class appointment. We are happy to meet with you to talk about any issue that is relevant to your participation in class, or your grade in the course. We have appropriate and time-proven suggestions that should help you.

As a student at AB-Tech, it is expected that you to keep up with the class, turn in assignments on time, and take responsibility for your education. The instructor will assist you in every way possible that does not compromise the integrity of the course itself. Our reputation depends on it.

Again, Welcome to AB-Tech and have a great semester!

R. Trent Codd, Jr.; Chairman; AA, BS, BSCS, MA, EASGC; 38 years of experience

Jerry L. Ashe; Instructor; AA, BS, MS; 22 years of experience

Jackie Caldwell; Instructor; BS, MA; 20 years of experience

Karma Crouch; Instructor; BS, MA Ed; 23 years of experience

Valerie Martin; Instructor; AA, BA, MS; 8 years of experience

Tammy Pagan; Instructor; AA, BS, MS; 20 years of experience

Robby Webb; Instructor; BA, MA; 23 years of experience

**Syllabus
MAT 115 D2
Mathematical Models
Spring 2009**

Acknowledgement

I have been provided access to the course syllabus for MAT 115 Mathematical Models and understand what is expected of me and agree with the provisions set forth in the syllabus.

Name Student

I.D. Number

Signature

Date