

Upper Iowa University

External Degree Program

MATH 105-06 College Algebra with Applications

COURSE DESCRIPTION:

This course is a survey of mathematical applications of functions. Topics that will be covered include: Fundamental concepts of algebra, algebraic equations and inequalities; functions and graphs, zeros of polynomial functions; exponential and logarithmic functions, systems of equations and inequalities. The mathematics of finance will also be covered. Three semester credits.

COURSE OBJECTIVES:

1. Demonstrate an understanding of mathematical concepts and terminology as evidenced by the ability to utilize this information to solve both computational and application problems. Expectations apply, but are not limited to, the major skills of this course as listed below:
 - Solve linear equations in one variable.
 - Add, subtract, multiply and divide polynomials and utilize this skill in solving equations.
 - Simplify expressions with rationale and negative exponents, as well as associated radicals.
 - Graph equations that are linear, quadratic and other various types.
 - Identify equations of linear functions by using the slope-intercept and points-slope formulas.
 - Solve systems of equations via graphing, substitution, and elimination methods. These skills will be used to find equilibrium in supply-demand problems and break even analysis.
 - Solve linear inequalities and related practical problems.
 - Demonstrate knowledge of domain, range and graphing functions.
 - Graph quadratic functions and find maximums and minimums.
 - Use logarithmic functions to solve practical problems.
2. Apply mathematical concepts and terminology to analyze numerical data, interpret results, compare options, propose solutions and make effective decisions in situations requiring quantitative thinking skills.
3. Utilize logic, reasoning, critical thinking skills and problems solving strategies in the fields of mathematics, sciences, social sciences and business.
4. Acquire fundamental knowledge and skills which are needed for success in related courses and careers that require quantitative analysis.

COURSE TOPICS:

Assignment 1 and Terms Tests 1: Review of algebra and computation skills necessary for the course

Chapter 0 - The following concepts and their applications will be covered: exponents, root, scientific notation, polynomial operations, factoring polynomials, rational expressions, solving linear equations, solving absolute value equations, graphing calculator basics.

Assignment 2 and Terms Test 2: Functions, how to plot them, and how to use them

Chapter 0 - The following concepts and their applications will be covered: graphing with your calculator, finding roots and graphing piecewise defined functions

Chapter 1 – The following concepts and their applications will be covered: relations and functions, maximums and minimums, combining functions, applications of functions

Assignment 3 and Terms Test 3: Polynomial functions of 1st, 2nd and higher degree.

Chapter 5 - The following concepts and their applications will be covered: linear models, systems of equations

Chapter 2 - The following concepts and their applications will be covered: complex numbers, solving quadratic equations, solving rational equations, solving inequalities.

Chapter 3 - The following concepts and their applications will be covered: polynomials and their characteristics

Assignment 4: Introduction to exponential and logarithmic functions

Chapter 1.6: The following concepts and their applications will be covered: Inverse functions

Chapter 4: The following concepts and their applications will be covered: exponential functions and their graphical characteristics, logarithmic functions and their properties and graphical characteristics, solving equations with exponentials and logarithms

Assignment 5: Applications of exponential and logarithmic functions, and data fitting

Chapter 4: The following concepts and their applications will be covered: compound and continuous interest, annuities and amortization, applications of growth and decay and logarithms.

Chapter 5: The following concepts and their applications will be covered: modeling with your graphing calculator using functions discussed in course.

Final Exam: All material covered, with emphasis on material since terms test 3.

REQUIRED COURSE MATERIALS:

1. Textbook:Essentials of College Algebra, First Edition, 2006, Authors: M. Holtfrerich and J. Haughn, Publishers: Thomson- Brooks/Cole, ISBN: 0-534-99801-1
2. Scientific Graphing Calculator, use one of the following two models ONLY – TI-83 or TI-84
3. Syllabus

OPTIONAL COURSE MATERIAL:

Student Solution Manual – while the manual is not required you may find it very useful for this course.

You may purchase your textbook through MBS Direct by calling their toll free number at: 800-325-3252 or through the UIU homepage: www.uiu.edu. Click on the option for current students, then the link on the left side titled - order textbooks. Follow the link and select External Degree for your location.

COURSE OVERVIEW:

The course will proceed as follows:

Unit One – Assignment 1:	Chapters 0.1-0.6
Exam One - Terms Test 1:	First proctored test over material from chapters 0.1-0.6
Unit Two – Assignment 2:	Chapters 0.7-0.8, Chapters 1.1-1.5
Exam Two – Terms Test 2:	Second proctored test over all material in previous assignments, with emphasis on material in assignment 2.
Unit Three – Assignment 3:	Chapters 5.1, 5.2, 2.1, 2.2, 2.4, 2.5, 3.1, 3.2
Exam Three - Terms Test 3:	Third proctored test over all material in previous assignments, with emphasis on material in assignment 3.
Unit Four – Assignment 4:	Chapters 1.6, 4.1-4.4
Unit Five – Assignment 5:	Chapters 4.5-4.8, 5.2-5.4
Final exam:	Final proctored exam over all material in course with emphasis on material in assignments 4 and 5.

Read each section and work the illustrated examples. Complete the assigned problems as stated for each section, following the directions provided by the text. In order to receive a grade, assignments must be submitted in Unit form with the appropriate cover sheet.

ASSIGNMENT INFORMATION

The assignment sheets list the category or type of problems within each section of a chapter, and the corresponding problem numbers of that category at the end of the section. It is advisable to do as many of the problems in each category you can until you have mastered those types of problems. The odd problems have answers in the back of the book for your guidance. Only a

selection of those problems will be graded, they are indicated in the right hand column. Most of the assigned problems are multiple choice with possible answers given in this workbook. To choose an answer circle the correct letter at the appropriate position on the answer sheet provided. In the last assignment there are some tables for you to fill out, please do so in the appropriate place on the answer sheet. Each assignment is worth 5% of your final grade. Because most of the questions are free response questions on the tests and exam, you should always calculate your answer first, and then see which option it corresponds to, rather than just seeing which of the options works.

TEST/EXAMINATION INFORMATION:

The homework units are excellent study guides for the proctored tests and exam. Therefore, consider allowing extra time for them to be graded and returned before taking the proctored tests and exam. Also use the practice tests provided in the manner described in the introductory letter.

The first assignment and test are designed to review and test your algebra skills that are necessary for you to be successful in this course. You should have previously had classes in the majority of this material. If you feel that you are really struggling with this material, I would advise you to consider taking either the “Math-090:Foundations of Math”, or “Math-095:Beginning Algebra” course to build your skills prior to embarking on the remainder of this course. Please discuss this with either myself or your advisor.

All the tests are comprehensive. Proctored terms test one will cover review material from Chapter 0.1-0.6 , proctored terms test two will cover material predominately from Chapters 0.7, 0.8, 1.1-1.5 but with some questions from Chapter 0.1-0.6, proctored terms test three will cover material predominantly from Chapter 5.1, 5.2, 2.1, 2.2, 2.4, 2.5, 3.1, 3.2 but with questions from Chapters 0 and 1. The final proctored exam will cover material from Chapters 0-5 covered in the assignments. On all proctored tests, the maximum time allowed to complete the test is two hours, and on the final exam the maximum time allowed to complete the exam is three hours. Graphing calculators should be used, however, no books or notes are allowed. A formula sheet will be given to you to use in the terms tests and exam. A copy of the formula sheet can be found on page 39.

Allowed calculators: TI-83, TI-84, **others by permission from instructor only.**

Not allowed calculators: TI-86, TI-89, any other without permission from instructor.

The practice tests provided in this booklet give you an idea of the format you can expect in the terms tests and final exam. To study for the test's you can use the practice tests as suggested in the introductory letter, as well as use the assignment problem categories, and their associated problems to make sure you are well prepared. The test questions fall into the categories in the assignments sheets. Even though some of the test questions are multiple choice you will need to work out the correct answer and then identify it. Some answers are designed to look right, but they are not. Don't just guess, they are NOT multiple guess questions. This advice also holds for the assignment multiple choice questions as well. The questions in the tests can cover *all* the material in the relevant chapters being tested.

COMPOSITION OF THE GRADE:

Grading for the course is determined as follows:

Homework assignments (5x 5%)	25%
Proctored Terms Test 1	15%
Proctored Terms Test 2	15%
Proctored Terms Test 3	15%
Proctored Final Exam	30%

Students must pass at least one of the three proctored tests (1 – 3) ***and*** the final exam to be able to pass this course. If a student achieves this, then the course grade is determined using the above weighting of test, exam and assignment grades.

Upper Iowa University Grading Criteria:

A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	59% or less

Upper Iowa University uses a standard grading system:

A = All work is excellent, shows exceptional understanding of materials; logical, clear, and insightful written and oral work, incorporates knowledge from other sources and moves easily to the next level of understanding, works well beyond minimum requirements.

B = Understanding material is good to very good, demonstrates good grasp of material, good oral and written skills, produces more than the minimum requirements, quality of all work is high.

C = Satisfactory understanding of the material, submits only the minimum requirements, communicates adequately in oral and written formats, displays an adequate understanding of all basic concepts.

D = Quality and quantity written and oral work is below average and barely acceptable.

F = Quality and quantity written and oral work is unacceptable.

CHEATING, ACADEMIC DISHONESTY AND PLAGIARISM:

Because cheating, academic dishonesty and plagiarism are affronts to the University community as a whole and a denial of the offender's own integrity, they will not be tolerated. Cheating includes but is not limited to:

- the use of unauthorized books, notes or other sources in the giving or securing of help in an examination or other course assignments,
- the copying of other students' work or allowing others to copy your work,
- the submission of work that is not your own or allowing others to submit your work as theirs,
- the submission of the same work for two or more classes without the approval of any

instructors involved.

Academic dishonesty includes, but is not limited to:

- sharing academic materials knowing they will be used inappropriately,
- having access to another person's work without permission,
- providing false or incomplete information on an academic document,
- changing student records without approval.
- obtaining and using texts intended for instructor use only.

Plagiarism includes, but is not limited to:

- the presentation of another's published or unpublished work as one's own,
- taking words or ideas of another and either copying them or paraphrasing them without proper citation of the source,
- using charts, graphs, statistics or tables without proper citation.

Detected cheating, academic dishonesty, or plagiarism will result in consequences that may, at the instructor's discretion, include course failure. In addition, an offender may be reported to the Senior Vice President for the Extended University, the Dean of the Extended University, or designee for possible disciplinary action, which may include suspension or dismissal from the University. Upper Iowa University may make use of various plagiarism detection services. Individuals, by enrolling in courses offered by the University, consent to submission by the University of course-related assignments to such services and the retention of a copy of such assignments by the service.

Cheating, academic dishonesty and plagiarism infractions are tracked by the Dean of the Extended University, and cumulative evidence collected from multiple incidents will be considered when making suspension or dismissal decisions.

Extended University Catalog 2006/07 page 94.

http://www.uiu.edu/catalogs/eu/html/univ_policies.html#cheating

ATTENDANCE:

Even though a student does not attend a regular classroom in the traditional sense and keep up with a set schedule of assignments, it should be pointed out how important it is to keep yourself on a regular timely schedule if possible to complete and send in units. It is too easy to set work aside and decide to do it later. Suddenly, the need to complete assignments and get them in by deadlines can become stressful and, at times, impossible. The key would be to set time aside on a regular basis and submit work in a timely manner.

LIBRARY RESOURCES:

As a student of Upper Iowa University, you have access to the resources of the Henderson-Wilder Library on the Fayette campus. If travel to the campus is not feasible, you can access the library through the University's website. Go to: www.uiu.edu and click on the Library option located on the left side of the home page. To use the InfoTrac, type in the user name of uiu, and the password is peacocks. Be sure to use all lower case as the both items are case sensitive.

WITHDRAWAL:

If you wish to withdraw prior to the last day of the enrollment period you must contact the External Degree office by phone or in writing. After your original six month enrollment period you no longer have the option to withdraw from the course. You must finish the course or have a final grade assigned based on the coursework submitted.

SPECIAL NEEDS:

If you require accommodation for special needs, please provide documentation to: Director of External Degree.

This syllabus is tentative and subject to change.