

University of Delaware
Department of Mathematical Sciences

MATH 114 – College Mathematics and Statistics
Syllabus – Fall 2009

Textbooks: *Understanding Basic Statistics*, Brase and Brase, 5th edition, Houghton Mifflin
College Algebra: Concepts and Models, Larson, Hostetler, and Hodgkins, 5th edition, Houghton Mifflin

Calculator: A TI-84, TI-83+, TI-83 or TI-82 graphing calculator is required and will be used extensively throughout this course. The homework assignments and exams contain problems that require the use of one of these calculators. It is the student's responsibility to have access to a working calculator for all classes and during all exams.

The Department of Mathematical Sciences has a limited number of graphing calculators to lend to students. You should contact Mrs. Betty Walls, room 501 Ewing Hall, to borrow a calculator.

Welcome to MATH 114! For most students, this will be their first experience in a university mathematics course. High school and university education are very different, especially mathematics. Some of the differences particular to MATH 114 are

1. The pace of the course is considerably faster than most high school courses.
2. Classes meet a total of just two and a half hours per week.
3. Exams are departmental (i.e., they are not made up by the individual instructor).
4. The grading scale is fixed – **there is no “curving”**.
5. The course schedule is fixed (e.g., Exam I will cover certain sections, etc.).

It is assumed that MATH 114 students have a basic knowledge of arithmetic and elementary algebra. This includes basic factoring and operations with signed numbers, fractions, and polynomials. Students who lack this background should consider changing their enrollment to MATH 010 – Intermediate Algebra.

Students whose goals involve sciences and engineering, or who are inclined toward these areas, should consider whether MATH 114 is the correct course for them. Some students may benefit by enrolling in MATH 115 (Precalculus) or MATH 117 (Precalculus for Engineers).

I. Course Content

Mathematics and statistics are important! There are many fields in which mathematics and statistics are used today which were thought of as largely or entirely non-mathematical not long ago. Fields such as literature, linguistics, art, political science, criminology, psychology and

anthropology are just a few examples. Students should be aware that even though they may currently be studying subjects that are not primarily mathematical or statistical, research shows that career shifts are common.

MATH114, which fulfills the university mathematics requirement, is designed for liberal arts majors who currently do not intend to take additional courses in mathematics. For approximately the first five weeks, the course will focus on statistics. Descriptive statistics and the normal distribution will be studied. The purpose of this unit is to provide the student with an understanding of some of the tools that are used to analyze data and make informed decisions in the workplace, in research and in everyday situations.

The emphasis in the second part of the course is on algebra, mathematical modeling, and applications. One aspect of this is the relationship between statistics and algebra. Students will use various functions to model and analyze data. The connections between algebraic and graphical representations of functions will be stressed throughout the course. Linear programming, a powerful method of finding solutions to problems ranging from formulating diets for animals to saving lives of people trapped by war and disaster, will also be studied.

II. Course Organization

MATH 114 meets two and one half hours per week in a class of approximately 50 students. Lists of the lecture topics and the assigned homework problems are included in this syllabus. Students are expected to complete assignments following the lecture concerning that section and prior to the next class meeting. Additional problems may be assigned at the instructor's discretion.

III. Assessment

Assessment of your progress in this course will be based on hour exams, instructor-designated points, and a final exam.

Exams will be administered promptly at 5:15 p.m. on Thursday evenings. You should be in your exam room by 5:00 p.m. with sharpened #2 pencils, your calculator, a ruler, and your student ID. The exams are scheduled as follows.

Exam I	September 24	Statistics: Chapters 1, 2, and 3
Exam II	October 22	Statistics: Chapter 7 Algebra: Chapter R2
Exam III	November 19	Algebra: Chapter 1, Sections 2.1, 3.1, 3.2, and 3.3
Final Exam	Finals Week	Cumulative Exam

PLEASE NOTE: Changes to exam content may be made at the instructors' discretion. Exams will consist of multiple-choice, free-response, and short answer questions. The cumulative final exam will assume the same format as the exams and will be administered during the designated "finals week", December 11 - 18. Do not plan to leave campus before 9:00 p.m. December 18, 2009.

PLEASE NOTE: It is your responsibility to ensure that you have no scheduling conflicts. There are no provisions for taking exams at other times.

Exam scheduling conflicts are not recognized as a legitimate excuse for missing an exam. As stated by the Faculty Senate, the policy of the University of Delaware is as follows.

"The Registrar's Office will insure that there are no conflicts among the common examinations scheduled and will announce the dates and times of the common examinations in the Registration Booklet."

"In the few instances where it may be necessary for a student to schedule a course in conflict with a common examination, the instructor of the single-section course will treat the student's absence from class on that day as excused."

There are no make-up exams. *Students who have a verified approved university excuse for missing a regularly scheduled course hour exam will have that score replaced by the average of the percentage scores of all other hour exams and the final exam.*

PLEASE NOTE: It is the policy of Math 114 to replace the lowest exam score with the final exam percentage score when the final exam percentage score is higher. This will also be applied in the case of an excused absence.

Course grades depend solely on the number of points earned during the semester. Points are earned through 3 hour exams, instructor-designated activities, and the final exam.

3 hour exams @ 100 points	300 points
Instructor-designated points	100 points
Final exam	<u>150 points</u>
Total	550 points

PLEASE NOTE: **There is no "extra credit" or "curving of grades" in this course. There are no special grading arrangements. No exceptions will be made to this grading scheme.**

Final grades will be assigned according to the following scale.

Grade Distribution

Grades	Total Points	Percentage
A	495 – 550 points	90 – 100
A-	479 – 494 points	87 – 89
B+	462 – 478 points	84 – 86
B	440 – 461 points	80 – 83
B-	424 – 439 points	77 – 79
C+	407 – 423 points	74 – 76
C	385 – 406 points	70 – 73
C-	369 – 384 points	67 – 69
D+	352 – 368 points	64 – 66
D	330 – 351 points	60 – 63
D-	314 – 329 points	57 – 59
F	less than 314 points	less than 57

PLEASE NOTE: The last day to drop this class without academic penalty is October 27, 2009.

IV. Additional Resources

Please make use of the resources available to you to ensure your success in this course.

1. Instructor office hours
2. The Department of Mathematical Sciences Tutorial Site (106 Ewing Hall)
 - a. Limited, but free, tutorial assistance from faculty and undergraduate and graduate tutors is available on a drop-in basis. No appointment is necessary.
 - b. Manuals containing solutions to even-numbered problems and other study guides are available.
 - c. Booklets containing course examinations given in previous semesters, along with exam solutions, are available for photocopying.
3. Textbook
4. Online materials available from the publisher, Houghton Mifflin
5. The Academic Enrichment Center (148 – 150 S. College Avenue) keeps lists of private tutors available for hire. These tutors are not employed by the University. Fees must be negotiated between the student and the tutor.

V. Academic Dishonesty

The University Policy on Academic Dishonesty found in the *Student Guide to University Policies* applies to this course. The guide is on the World Wide Web at the following address: <http://www.udel.edu/stuguide>.

PLEASE NOTE: No pagers, cell phones, beepers or any other electronic devices may be used during any exam.

VI. Homework Assignments

Below is a list of lecture topics and accompanying homework problems. Please read a section or two before coming to lecture and then complete the homework assignment immediately thereafter. You are encouraged to attempt some of the problems before the lecture in order to use the lecture more effectively. You should bear in mind that this list of assignments has been carefully pruned. Some students will have to attempt more than the suggested assigned problems in order to fully understand the material. It is imperative that you do, indeed, complete all assigned problems. This cannot be overemphasized.

The following exercises are from *Understanding Basic Statistics*, 5th edition, Brase and Brase.

Section	Topic	Page	Assignment
1.1	What is Statistics?	10	1 – 12
1.2	Random Samples	17	1 – 6, 11, 13 - 16
2.1	Frequency Distributions, Histograms	44	1 – 7, 11 – 13
2.2	Bar Graphs, Circle Graphs	54	1 – 9 odd, 10
2.3	Stem-and Leaf Displays	60	1 – 3, 5, 7, 10
3.1	Measures of Central Tendency	81	1 – 8, 9abc, 10
3.2	Measures of Variation	93	1 – 9, 11 – 17
3.3	Percentiles, Box-and-Whisker Plots	105	1 – 10

The material for Exam I ends here.

The following statistics exercises are from *Understanding Basic Statistics*, 5th edition, Brase and Brase.

The following algebra exercises are from *College Algebra*, 5th edition, Larson, Hostetler, and Hodgkins.

Section	Topic	Page	Assignment
7.1	Graphs of Normal Probability Distributions	248	1 – 11
7.2	Standard Normal Distribution	259	1 – 7, 9 – 11, 15, 19, 23, 27, 29, 33, 37, 41, 45
7.3	Standard Normal Distribution	270	1 – 5, 7 – 35 odd
R2.1	Linear Equations	R76	1 – 6, 17 – 41 odd, 49 – 53, 59 – 64, 71 – 77 odd
R2.2	Mathematical Modeling	R87	1 – 19 odd, 29 – 41 odd, 42, 51, 52, 55, 57, 59, 67 – 79 odd
R2.3	Quadratic Equations	R100	1, 5, 9, 13, 17, 21, 25, 29, 33, 37, 41, 45, 49, 53, 57, 61 – 73 odd, 77, 79, 81
R2.4	The Quadratic Formula	R110	1, 5, 9, 13, 17, 21, 25, 29, 33, 37, 41, 45, 47 – 51, 53, 57 – 67 odd, 71
R2.6	Linear Inequalities	R134	1 – 10, 21 – 41 odd, 69 – 81 odd

The material for Exam II ends here.

The following exercises are from *College Algebra*, 5th edition, Larson, Hostetler, and Hodgkins.

Section	Topic	Page	Assignment
1.2	Lines in the Plane	24	1 – 7 odd, 8, 11, 15 – 21 odd, 27 – 33 odd, 37 – 43 odd, 49, 57 – 67 odd, 68, 69, 71, 75 – 81 odd
1.3	Linear Modeling	35	1 – 4, 5 – 15 odd, 19 – 23 odd, 25 – 28, 31, 33 – 37, 39 – 45, 47, 51
1.4	Functions	48	1 – 4, 5, 9, 13, 17, 21, 23, 27 – 37 odd, 41 – 46, 51, 53, 55, 59 – 65 odd, 70, 71 – 77 odd
1.5	Graphs of Functions	61	1 – 19 odd
1.8	Inverse Functions	91	1 – 25 odd, 45 – 48
2.1	Quadratic Functions and Models	112	1 – 8, 9 – 15 odd, 19, 23, 27, 31 – 41 odd, 47 – 55 odd
3.1	Exponential Functions	198	1 – 9 odd, 11 – 20, 29 – 43 odd, 47 – 61 odd
3.2	Logarithmic Functions	209	1 – 37 odd, 41, 45, 47, 53 – 58, 59 – 71 odd, 72, 73
3.3	Properties of Logarithms	217	1, 5, 9, 13, 17, 21, 25, 29, 33, 37, 41, 45, 47, 55, 57, 63 – 69 odd, 73, 77, 79, 85 – 105 odd

The material for Exam III ends here.

The following exercises are from *College Algebra*, 5th edition, Larson, Hostetler, and Hodgkins.

Section	Topic	Page	Assignment
3.4	Solving Exponential and Logarithmic Equations	228	1 – 47 odd, 57 – 69 odd, 73 – 85 odd, 93 – 99
3.5	Exponential and Logarithmic Models	239	1 – 19 odd, 25, 27, 33, 35, 41 – 47 odd, 48 – 54
4.1	Solving Systems Using Substitution	261	1 – 7 odd, 11 – 31 odd, 45 – 55 odd
4.2	Solving Systems Using Elimination	272	1 – 4, 7 – 15 odd, 21 – 29 odd, 47 – 52
4.4	Systems of Inequalities	297	1 – 4, 7 – 15 odd, 21 – 29 odd, 47 – 52
4.5	Linear Programming	306	1 – 9 odd, 13, 17, 21 – 27 odd, 33 – 45 odd
			Regression Analysis Handout

Reminder: The final exam for this course is cumulative.