

UNIVERSITY OF DELAWARE
DEPARTMENT of MATHEMATICAL SCIENCES

Syllabus – Mathematics 114
College Mathematics and Statistics

Fall Semester - General

TEXTBOOKS (2): **Understanding Basic Statistics. Brase and Brase, Houghton Mifflin, Fourth Edition.**
College Algebra: Concepts and Models. Larson, Hostetler, Hodgkins, Houghton Mifflin, Fifth Edition.

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

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1. The pace of the course is considerably faster than most high school courses.
2. Classes meet a total of only 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 important that students in Math 114 realize that it is their responsibility to keep up with the material. To help them with this task, the following resources are available:

1. Instructor’s office hours
2. The Department of Mathematical Sciences Tutorial Site (106 Ewing)
3. Textbook
4. Online materials
5. The Academic Enrichment Center (148 – 150 S. College Ave.)

However, in order to benefit from these resources, students must seek them out!

It is assumed that Math 114 students have a basic knowledge of arithmetic and elementary algebra. This includes operations with signed numbers, operations with fractions, basic factoring, and operations with polynomials. Students who lack this background should consider changing their enrollment to Mathematics 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 other mathematics course.

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.

Mathematics 114, which fulfills the university mathematics requirement, is designed for liberal arts majors who currently do not intend to take additional courses in mathematics. Descriptive statistics, the normal distribution, and confidence intervals 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

Mathematics 114 meets two and one half hours per week (either three 50 minute meetings, or two 75 minute meetings), in a class of approximately 50 students. A list of the lecture topics as well as the assigned homework problems are included in this syllabus. Students are expected to complete these problems following the lecture concerning the section and prior to the next class meeting. Additional problems may be assigned at the instructor's discretion.

III. CALCULATORS

A TI-83⁺, TI-83, TI-84 or TI-82 graphing calculator is required for 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 calculator at all times*** during the semester for all classes and during all examinations. It is also the student's responsibility and to ensure that the calculator is in working order.

Many students who do not own one of these calculators borrow one from a friend. Students who plan to take other courses in mathematics, statistics, or science may wish to purchase a graphing calculator. The Department also has a limited number of calculators available for loan. Please see the instructor concerning this option.

IV. TESTING AND GRADING

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

3 hourly exams @ 100 points	= 300 points
Instructor-designated activities	= 100 points
1 Final Exam @ 150 points	= 150 points

Total	= 550 points

Final grades will be assigned according to the following scale. Note that this is an absolute scale. **There is no “curving” of grades in this course. NO exceptions will be made to this grading system.**

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

IMPORTANT! Make-ups are not given for hourly examinations in this course. **The following statement defines the policy concerning missed examinations.**

Please note that students who have a verified university excuse to miss a regularly scheduled course examination will have that score replaced by the average of the percentage scores of all other hourly exams and the final exam.

It is also the policy of Mathematics 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.

EXAMINATION SCHEDULE

Three “**hourly**” exams, 1 hour and 15 minutes each (5:30 pm - 6:45 p.m.) will be administered promptly at 5:30 P.M. on **three specific Thursdays**. Students are advised to be in the assigned room at 5:15 p.m.

FINAL To Be Announced **Cumulative** (Final exams week December 8-15)

Do not make plans to leave campus until the Final Examination schedule has been announced.

Bring student I.D., sharpened #2 pencils, an eraser and a functioning TI-83⁺, TI-83, TI-84, TI-82 calculator to all exams. **Calculators will not be provided at exams**

ROOM ASSIGNMENTS for hourly exam will be announced by your instructor well in advance of the first exam

EXAM SCHEDULING “CONFLICTS” ARE NOT RECOGNIZED AS LEGITIMATE IN THIS COURSE BECAUSE:

As established by the Faculty Senate, **the policy of the University of Delaware** is:

“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.**”

It is the student’s responsibility to make sure that there are **no scheduling conflicts** with the exams. As stated above there are **no provisions** for taking examinations at other times.

^V. ADDITIONAL RESOURCES

The Department of Mathematical Sciences Tutorial Site, Room 106, Ewing Hall is a tutoring and resource room for Mathematics 114 as well as several other mathematics courses. The following resources are available there:

- 1) limited, but free, tutorial assistance from faculty and undergraduate and graduate tutors. Tutoring sessions are done on a walk – in basis, there are no appointments.
- 2) manuals containing solutions to even-numbered problems and other study guides

- 3) booklets containing course examinations, with solutions, given in previous semesters, which are available for photocopying.

The hours of operation will be posted on the site door early in the semester. Keep in mind that it can become quite crowded just before an exam.

A list of **private tutors available for hire** can be obtained from the Academic Services Center, (near the Main St. end of the Trabant Student Center). These tutors are not employed by the University. Fees must be negotiated between the student and the tutor.

VI. ACADEMIC DISHONESTY

The University policy on Academic Dishonesty, found in the *Official Student Handbook* (www.udel.edu/stuhb), applies to Mathematics 114, as it does to all courses at the University.

HOMEWORK ASSIGNMENT

The following exercises are from **Understanding Basic Statistics**, Third Edition by Brase and Brase, unless otherwise indicated.

<u>Section</u>	<u>Topic</u>	<u>Assignment</u>
1.1	Populations, Samples & Data	1, 2, 3, 6 – 9
1.2	Random Samples	1, 2,3,8,9,10,11
2.1	Histograms & Frequency Distributions	1,2,3,6,7, 8and 9
2.2	Graphs	1,5,6,7 and 8
2.3	Stem and Leaf Displays	1,2,5 and 6
---	Chapter Review	3, 4, 8.
3.1	Measures of Central Tendency Mode, Median, Mean	1-5 and 7.
3.2	Measures of Variation	1,2,3,9,10 and 11
3.3	Box-and-Whisker Plots	5 – 10
---	Chapter Review	1 – 8.
7.1	Graphs of Normal Probability Distributions	1 – 11.
7.2	The Standard Normal Probability Distribution	1 – 47 (odd).
7.3	Areas Under Any Normal Curve	1 – 29(odd).
---	Chapter Review	1 – 10

The material for EXAM I ends here

7.4	Sampling Distributions	1 – 9.
7.5	The Central Limit Theorem	1 – 9.
---	Chapter Review	1-11
8.1	Estimating μ when δ is known Samples	1-7.
---	Chapter Review	2, 3, 5, 6.

All exercises beyond this point are from **College Algebra: Concepts and Models**, 4th Edition by Larson, Hostetler, and Hodgkins, unless otherwise indicated.

R2.1	Linear Equations	1-6, 31-35, 71-75.
R2.2	Mathematical Modeling	1-19, 30-40, 67-80.
R2.6	Linear Inequalities	1 – 6, 21 – 41 (odd), 69-76.
----	Chapter Review	5,6,7,11-17 (odd),27-39 (odd), 43-49 (odd).
1.2	Lines in the Plane	31-34, 37-49 (odd), 63-68, 76-80.
1.3	Linear Modeling	2 – 4, 19 – 31 (odd), 45, 48, 50. Regression Handout
1.4	Functions	1-11 odd, 31-34, 41-45, 51-58, 69-73.
1.5	Graphs of Functions	1 – 11.
----	Chapter Review	7 – 10, 21-29, 44-46, 51,52, 61 and 62.
R2.3	Quadratic Equations	11-21 odd, 23-55 odd, 61-66, 71-73.
R2.4	Quadratic Formula	1 – 69 (odd).
2.1	Quadratic Functions & Quadratic Modeling (Handout)	1 – 14, 15 – 31(odd), 33 - 42, 47 – 56.

The material for EXAM II ends here

3.1	Exponential Functions	11 – 38, 39 – 53 (odd).
3.2	Logarithmic Functions	1 – 51 (odd).
3.3	Properties of Logarithms	1 – 73 (odd).
3.4	Solving Exponential & Logarithmic Equations	1 – 45 (odd), 61 – 85 (odd), 93-99 (odd).
3.5	Exponential & Logarithmic Models	1 – 15 (odd), 25 – 53 (odd). & Modeling Handout
----	Chapter Review	17-22, 65-89 (odd).
4.1	Systems of Equations	1, 2, 5, 6, 15-25, 45-55 odd.
4.2	Linear Systems	1 – 10, 11 – 29 (odd), 37, 38.
4.4	Systems of Linear Inequalities	7, 8 11-16, 21-28, 7-52.

The material for EXAM III ends here

4.5	Linear Programming	1 – 19, 21 – 29 (odd). 30, 31, 33, 34, 35, 37 – 42.
----	Chapter Review	1 – 6, 9, 24, 49-52, 69-75. 53, 56 – 71.

Reminder: The final exam for this course is cumulative
