THE UNIVERSITY OF WINNIPEG

Department of Mathematics and Statistics

STAT-1501(3)-004

Elementary Biological Statistics I (Fall 2015)

This is an elementary course providing students in biological and health sciences with an introduction to data analysis and statistical inference. Topics can include: data presentation; descriptive statistics; basic concepts of probability; probability distributions; sampling distribution of the mean; one-sample inference and hypothesis testing about the mean

Instructor: Dr. Melody Ghahramani
Office: 6L25
Office Hours: Tues/Thurs: 1:15-2:00p.m., W: 12:30p.m.-1:20p.m., or by appointment.
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Lecture: Tues/Thurs: 11:30a.m.– 12:45 p.m.
Classroom: 1L11

Text:
Title: Biostatistics: For the Biological and Health Sciences
Author: Marc M. Triola and Mario F. Triola
Publisher: Pearson Addison Wesley, 2006.

Grading scheme:
Assignments (4 or 5): 10%
Term Test 1: 20% (October 15, 2015; in class)
Term Test 2: 20% (November 5, 2015; in class)
Final Exam: 50% (December 14, 2015, check current postings to confirm)
http://www.uwinnipeg.ca/index/current-exam-schedule

Assignments: Assignments are to be written on 8.5" x 11" paper, stapled on the upper left-hand corner; do not use paper clips or fold the corner. There is no need to typeset the assignment solution. Write your name and student number on each page of the assignment. Answer the questions in the order in which they appear in the assignment. Show ALL work done to arrive at the solution. Write clearly and legibly. Messy assignments will not be marked and will receive a zero grade. You may discuss the assignment with your classmates, however, the written solution must be your own work. Assignments are due at the end of class.

It is important that you do lots of practice problems on a regular basis. The solutions to the odd numbered problems in your textbook appear at the end of the book.

Identification: Student identification cards are required during tests/exams. Students who are not able to provide identification during the test will have one day to produce it. Tests will not be graded until assurance of identity is made.

Missed exams: Note that there will be no make-up tests. If you miss a test for a valid reason you must provide written documentation (e.g. Medical Doctor's note) in order to avoid receiving a mark of 0. *If* acceptable written documentation is provided the weight of the test will be added to that of the final exam.

A student may ask the instructor for a deferred final exam on documented medical or compassionate grounds. It is department policy that the instructor not grant any such request based on the student's vacation plans. Notwithstanding this departmental policy, the student has the right to formally petition the Senate Student Appeals Committee for a deferred exam. The student must consult an Academic Advisor before filing a formal appeal.

Calculators & electronic devices: Simple hand-held calculators are permitted for both tests and the final examination. By "simple", I mean basic scientific calculators that are not capable of graphing functions and storing text (e.g. formulas, definitions). No other electronic devices are permitted during the tests and the final examination including electronic translators. You may use paper copies of dictionaries for the purpose of translation, provided that you show me the dictionary immediately prior to the exam.

In-Class policy: All cell phones or other electronic devices should be turned off before the student enters the classroom. In order to create an environment conducive to learning, students are invited to respectfully give their opinions and contributions to class discussions, bearing in mind the usual courtesies.

Voluntary withdrawal: You must formally withdraw from a course. If you simply stop going to classes, you may receive an "F" on your transcript and loss of tuition credit. Please note that the deadline for *voluntary withdrawal from this course is October 29, 2015*. Students are encouraged to speak to me prior to withdrawing. By this date you should have received results from some evaluative feedback.

Students are reminded to refer to Section VII of the University Course Calendar for policies on grading, appeals and academic misconduct.
http://www.uwinnipeg.ca/index/calendar-calendar

Students facing a charge of academic or non-academic misconduct may choose to contact the University of Winnipeg Students' Association (UWSA) where a student advocate will be available to answer any questions about the process, help with building a case, and ensuring students have access to support. For more information or to schedule an appointment, visit our website at www.theuwsa.ca/academic-advocacy or call 204-786-9780.

Services for Students with Disabilities: Students with documented disabilities, temporary or chronic medical conditions, requiring academic accommodations for tests/exams (e.g., private space) or during lectures/laboratories (e.g., note-takers) are

encouraged to contact Accessibility Services (AS) at 786-9771 or accessibilityservices@uwinnipeg.ca to discuss appropriate options. All information about a student's disability or medical condition remains confidential. http://www.uwinnipeg.ca/accessibility.

Final grades shall be approved by the Department Review Committee and may be subject to change. The grade distribution used is **(APPROXIMATELY!)** as follows:

A+	93 – 100	A	85 – 92	A-	80 - 84		
B+	75 – 79	B	69 – 74	C+	63 – 68	C	56 - 62
D	50 – 55	F	0 – 49				

Miscellaneous:

Content, emphasis, etc. of the course is defined by means of the lectures, ***not only the text***. It is important to attend all lectures, as there is normally no simple way to make up for the missed lectures. Classroom attendance is also a very important part of the learning process.

Students who plan to conduct research interviews, focus groups, surveys, or any other method of collecting data from any person, even a family member, must obtain the approval of the UHREB before commencing data collection. Exceptions are research activities in class as a learning exercise. See http://www.uwinnipeg.ca/index/research-human-ethics for submission requirements and deadlines.

We ask that you please be respectful of the needs of classmates and instructors/professors by avoiding the use of unnecessary scented products while attending lectures. Exposure to scented products can trigger serious health reactions in persons with asthma, allergies, migraines or chemical sensitivities. Please consider using unscented necessary products and avoiding unnecessary products that are scented (e.g. perfume).

All students, faculty and staff have the right to participate, learn and work in an environment that is free of harassment and discrimination. The UW Respectful Working and Learning Environment Policy may be found online at www.uwinnipeg.ca/respect.

Course Outline: *Time permitting*, topics will include the following:

Chapter 1: Introduction to Biostatistics

- Some terminology; basic concepts
- Measurement scales; types of data

Chapter 2: Describing, Exploring and Comparing Data

- Frequency distributions
- Graphical representations (Bar charts, Histograms, Stem-and-leaf displays, Frequency polygons, Boxplots)
- Measures of location / centre (Mean, Median, Mode)
- Measures of variation / dispersion (Range, Interquartile range, Variance, Standard deviation, etc.)

- Measures of relative standing (Percentiles, Quartiles)

Chapter 3: Probability
- Elementary properties
- Probability rules
- Bayes' Theorem, Screening tests, Sensitivity, Specificity, etc.

Chapter 4: Discrete Probability Distributions
- Random variables
- Binomial and Poisson probability distributions with applications

Chapter 5: Normal Probability Distributions
- The Standard Normal distribution with applications
- Sampling distributions
- Distribution of the sample mean
- The Central Limit Theorem
- Distribution of the sample proportion

Chapter 6: Estimates and Sample Sizes with One Sample
- Estimating an unknown population proportion via a confidence interval
- Estimating an unknown population mean via a confidence interval
- The *t* distribution
- Sample size determination for estimation of means and proportions

Chapter 7: Hypothesis Testing with One Sample
- Testing the proportion of a single population
- Testing the mean of a single population
- Power of a test; Type II Error; Sample size determination to control Type II error