BIOSTATISTICS
BIO 4835 – Section 01
FALL 2014

Classes: Monday: 8:00 AM – 10:45 AM Room J336

Instructor: Prof. Dr. Frank Osborne
Office Location: Hutchinson Hall J334A
Office Hours: Monday: 11:00 AM - 2:00 PM
              Tuesday: 11:00 AM - 2:00 PM
              Wednesday: 11:00 AM - 12:00 PM
              Thursday: 11:00 AM - 12:00 PM
Telephone: 1-908-737-4002
E-mail: fosborne@kean.edu
Website: www.kean.edu/~fosborne
Classwork: osbornefrank99@gmail.com

Course Catalog Description: BIO 4835 Biostatistics (3)

Basic statistical techniques useful in biological research including frequency
distributions, statistical inference, and application of chi square, analysis of variance and
regression. Prerequisites: 16 credits in Biology including BIO2200 and BIO 2400, and
MATH 1054, or permission of instructor.

Course Student Learning Objectives (SLOs):
(SLO 1) Perform biostatistical analyses including data analysis techniques, measures of
central tendency, measures of variation, analysis of variance and sampling distributions.
(SLO 2) Apply methods of biostatistics to analysis of biological data and understand the
effects of sample size on results.
(SLO 3) Understand and apply the normal distribution and chi square distribution to
biological data.
(SLO 4) Use methods of inferential biostatistics including hypothesis testing, confidence
interval evaluation and analysis of variance.
(SLO 5) Identify the type of data presented by a biological dataset, and use this information
to select an appropriate statistical test.
(SLO 6) Utilize both computer software based and calculator based methods of biostatistical
analysis.

Instructional Methods:

This course is taught using a variety of instructional methods including classroom
lectures and instruction, classroom individual/group activities, examinations, and
electronic communication/discussion.

Important Date: Last day to withdraw with WD grade is October 29, 2014
Textbook and Materials:


Supplies: Each student must provide their own TI-83 or TI-83Plus (or equivalent) calculator.

Topics and Assignments:

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<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>M</td>
<td>9/8/14</td>
<td>Introduction/Descriptive Biostatistics</td>
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<td>Descriptive Biostatistics/Normal Distribution</td>
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<td>M</td>
<td>9/15/14</td>
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<td>Sampling Distributions</td>
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<td>Confidence Intervals, <strong>Project 1 (due 11/3/14)</strong></td>
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<tr>
<td>M</td>
<td>9/29/14</td>
<td><strong>Activity 1</strong>, Recitation and Problems</td>
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<td>Confidence Intervals</td>
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<td>10/6/14</td>
<td><strong>Activity 2</strong>, Recitation and Problems</td>
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<td>Confidence Intervals--Chi-Square--Variance Ratio--F Distribution</td>
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<td>10/13/14</td>
<td>Columbus Day Holiday--No school</td>
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<td>10/20/14</td>
<td><strong>Exam 1</strong>: Introduction through Sampling Distributions</td>
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<td>Testing Hypotheses</td>
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<td><strong>Activity 3</strong>, Recitation and Problems, Testing Hypotheses,</td>
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<td><strong>Project 2 (due 11/17/14)</strong></td>
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<td>11/17/14</td>
<td>Testing Hypotheses, <strong>Project 3 (due 12/15/14)</strong></td>
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<td>ANOVA, Regression and Correlation</td>
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<td>12/22/14</td>
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Assessment:

The four tests will count 12.5% each for a total of 50% of the final grade. The remainder of the grade is for activities, recitation and problems, 20% of the final grade; project 1, 5% of the final grade; project 2, 10% of the final grade; and, project 3, 15% of the final grade.

Homework. Biostatistics is used to solve problems. In order to learn a subject such as biostatistics, you have to do problems. Problems are supplied for most sections of the textbook. Some of these problems will be assigned to be done. It is strongly recommended that you do as many of the problems as possible, including unassigned problems. The review questions and exercises at the end of each chapter are excellent for the purpose of practicing biostatistics and preparing for exams.

GRADE CALCULATION

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Grading Scale

3.71+ A
3.51 - 3.70 A-
3.16 - 3.50 B+
2.71 - 3.15 B
2.51 - 2.70 B-
2.16 - 2.50 C+
1.71 - 2.15 C
0.70 - 1.70 D
<0.71 F

Tests. Each student must take all four of the scheduled tests on the days indicated. If, due to an emergency, it is not possible to take the test as scheduled, you must send a message by e-mail to fosborne@kean.edu stating that you will not take the test on that day and a reason why not. Only a note from a physician constitutes acceptable grounds for your absence. There will be only one (1) make-up test on 12/8/14. The grade on this test will be substituted for the grade on the test you missed. Any student missing more than one test will accept a grade of zero (0) on the second test missed. The telephone calls must be received by NOON on the day of the scheduled test. The content of the make-up test may be the same material as the test you missed or it may
contain different material from the test you missed. **Students will not be given unlimited time to take tests. One full 75-minute class period is allotted for the test. Students who do not finish the test will not be given additional time later and will have points taken away for refusal to turn the test in on time.**

**Activities, Recitation and Problems.** These sessions are scheduled on a frequent, regular basis for the purpose of learning biostatistics first hand. This will be the place to go into details with hands-on activities and demonstrations. Intricate procedures on the TI-83 calculator and Microsoft Excel can be studied first hand. As this requires active participation, attendance is mandatory on these days.

**Projects.** There will be three projects in this course. They are listed below with the percentages of how they will be counted in the final grade.
- Project 1. An individual project with the objective of obtaining data from published academic scientific journals. [5%]
- Project 2. An individual project using random numbers to develop a sampling plan for water in an estuary. [10%]
- Project 3. A group/individual project for obtaining and analyzing bivariate data that are related. [15%]

Projects are submitted electronically by email to osbornefrank99@gmail.com. Each project will be individually introduced during the course at the appropriate time.

**Reports.** Reports are required for the projects and may be also required for other activities in this course. With the availability of high-quality computer software packages, there is no valid reason for work to be submitted in any form other than correct, error-free, typewritten form, either by typewriter or word processor, at the time it receives its final grade. In addition, Microsoft Excel can be used to do biostatistical work and prepare graphs and charts. Handwritten work is therefore discouraged. In order to obtain maximum credit, reports must be factually correct, correctly written and typed. Submit reports electronically by email to osbornefrank99@gmail.com. There is no provision made for the policy of extra credit for extra work.

**PENALTIES FOR LATE WORK**

Students are expected to complete work assigned on or before the due date given in class. To avoid penalties, you must either attend class and submit the work on the day it is due, or email it to me by **Thursday** of the week in which it was due. Late work will be subject to deductions of credit as follows:
- 20% off maximum value if up to 1 week late
- 50% off maximum value if up to 2 weeks late
- No credit if more than 2 weeks late

In addition, if you are absent, it is your responsibility to make arrangements to have materials picked up by another student or email me requesting any handouts to be sent to you. Most of the handouts are on my website at [www.kean.edu/~fosborne](http://www.kean.edu/~fosborne), so there should be no reason not to have them.
ATTENDANCE POLICY

Attendance is expected in all courses. Attendance will be a component of the grade of any course if so stated in the syllabus. Students are responsible for informing the instructor in advance or in a timely manner of the reasons for their absence. Instructors in consultation with their department chairs are expected to respect university practices and policies regarding what counts as an excused absence. Typically excused absences include illness, bereavement or religious observances. Serious tardiness may be dealt with at the discretion of the instructor.

Observance of a religious holiday is to be considered an excused absence from class for any student. If a student misses a scheduled examination or other announced assignment because of observance of a religious holiday, the student and instructor shall agree upon a mutually convenient time as an alternate date for completion of the assignment.

*Absence for any reason does not mean that your work will be given full credit if it is submitted late. To assure compliance with deadlines, penalties will be assessed for late assignments. One week late 20% reduction in grade. Two weeks late, 50% reduction in grade. Over two weeks late, the assignment is listed as final with a grade of 0 (zero).*

IMPORTANT UNIVERSITY POLICIES:

- Academic Integrity

Kean University is committed to nurturing the growth of intellectual reasoning, academic and professional values, individual ethics and social responsibility in its students. It also provides academically rigorous undergraduate programs which adhere to the twin principles of honesty and academic integrity. These principles are essential to the fiber that ensures and maintains excellence in the quality of Kean’s academic instructional programs and facilitates the intellectual development of Kean students.

Academic dishonesty in any form, written or non-written, media or technology, seriously compromises the mission of Kean University to provide quality programs and opportunities for the optimum development of all students.
Academic integrity is the obligation of all Kean students. It ensures the application of the highest academic standards and principles of conduct, honesty and truth. An individual’s work must reflect that person’s own efforts and achievements. Any collaboration of effort by an individual or groups of individuals must be acknowledged. Failure to acknowledge such contributions constitutes an act of dishonesty and a misrepresentation of the individual’s work.

The University maintains that all students are expected to employ the highest standards of academic integrity in their coursework. Any violation of such may be subject to a penalty based on the infraction which may include a reprimand, reduction in grade, failing grade, or suspension or dismissal from the University.

Anyone needing more information should consult the Kean University Academic Integrity Policy.

Students are responsible to review and understand the University Academic Integrity Policy (available at the Center for Academic Success or at http://www.kean.edu/admin/uploads/pdf/AcademicIntegrityPolicy.pdf)

- Code of Conduct

Students should review the Student Code of Conduct, as it discusses expectations of appropriate conduct in the classroom: http://www.kean.edu/KU/Code-of-Conduct.

- Students Rights and Responsibilities

The Students Rights and Responsibilities handbook is available at: http://www.kean.edu/KU/Forms-Policies-and-Publications

- Emergency Notification System

Students are strongly encouraged to register for the University's emergency notification system (www.mir3.com/kean) in order to be informed of campus emergencies, weather notices, and other announcements.
Email Accounts

All students must have a valid Kean email account. For those who do not already have one, forms are available on-line at http://www.kean.edu/KU/Forms-OCIS; click on E-mail Account Request Form. 

Note that any communication with the class will be done using your Kean email account. If you prefer to use a different account, you can change the settings on your Kean email account so that it will automatically send all mail to the other account that you regularly use.

Americans with Disabilities Statement & Non-Discrimination Statement:

Kean University is an affirmative action, equal opportunity institution. Students with documented disabilities who may need special instructional accommodations or who may need special arrangements in the event of an evacuation should notify the instructor as soon as possible, no later than the second week of the term. Students may contact Kean Disability Office in Downs Hall Rm 127 to discuss special needs, 737-4910.

KU Non-Discrimination Policy:

Kean University is an affirmative action, equal opportunity institution.

UNIVERSITY H1N1 POLICY

Kean University personnel have been working over the summer to prepare the institution for response to an outbreak of the H1N1 flu virus during the upcoming academic year. Predictions regarding the scope of a possible outbreak vary widely, but the concern is very real. The U.S. Air Force Academy recently quarantined roughly 10% of their cadets who had contracted the virus during summer training. 245 of the 1400 cadets were isolated at one time or another during the response. As you are aware, Kean University has a mix of commuter and resident students which requires us to plan and react in a different manner.

We realize that many individual faculty and several departments have very strict attendance policies. However, given the nature of this virus, we strongly encourage faculty to follow Center for Disease Control (CDC) guidelines which recommend that individuals who experience flu-like symptoms should stay home from class. Below is a draft of language to either include in your syllabi or distribute as an addendum. Should you have any questions, please feel free to contact the Office of Academic Affairs. Thank you.
Personal Health & Safety

The CDC has reported it expects an increase in cases of H1N1 (flu) for this coming fall. While this may or may not happen, to be prepared and have minimal impact on your classroom studies, we are asking that if you have a fever over 100', a sore throat and cough at any time during the semester - PLEASE STAY HOME from class.

In order to avoid an academic penalty, you must alert this professor immediately before class of your absence and request any missed class materials and assignments. All assignments will only be obtained upon email request.

If you require medical attention see your primary care provider and/or Kean University Health Services located in Downs Hall.

Proactive things you can do to prevent you, your dorm-mates and/or your family from getting ill....

- Vaccination is the single best way to prevent flu
  + Get Vaccinated for Seasonal Flu
  + Get Vaccinated for H1N1 (series of two shots given within 3 weeks)
- Stay home when you are sick
- Wash your hands often with plain soap and water.
- When hand washing is not possible, use of a hand sanitizer gel with 60% alcohol is recommended
- If you have to use an alcohol sanitizing gel, wash your hands with soap and water as soon as practicable after using the hand sanitizer.
- Social distancing (where possible) of 6 feet or more
- DO NOT USE YOUR HANDS when sneezing or coughing. Cover the almost invisible droplets by coughing or sneezing into your elbow or arm
- Avoid touching your eyes, nose or mouth

- Limit use of over the counter disinfectants when cleaning...Use steam sanitizing where possible

* Because hand sanitizers are alcohol based, excessive use can dry out the skin and possibly contribute to dermatitis especially in the cold, dry months of the year.

* Some hand sanitizers may contain pesticides. Read labels carefully.
Kean University
-- SYLLABUS NOTICE FOR LABORATORY COURSES --

REPRODUCTIVE HAZARDS
Reproductive hazards are substances or agents that may affect the reproductive health of women or men or the ability of couples to have healthy children. Efforts have been made to eliminate the use of known reproductive hazards in our labs. However, the vast majority of laboratory chemicals have never been tested by the manufacturer or by any governmental agency. As a result, their effect on a developing fetus is unknown; female students must assume that each chemical used in this lab presents a hazard to an unborn child. If you are pregnant, become pregnant or are planning to become pregnant during the semester, you are strongly encouraged to speak privately with your instructor who will be able to provide written health and safety information about each chemical that will be used in the class. You are asked to review and discuss this information with your healthcare provider. After you have reviewed the information, you can choose to:
1. Continue your enrollment in the lab - You will be asked to sign a waiver and will be expected to follow a strict set of health and safety procedures while in the lab.
2. Withdraw from the lab - Your instructor will assist you in creating a plan to complete the course at a later date.

-- ADMINISTRATIVE PROCEDURES FOR FACULTY AND STAFF --

If a student voluntarily discloses to you that she is pregnant or is planning to become pregnant while enrolled in a laboratory class, please treat the information as confidential protected health information. The instructor should contact the Office of Environmental Health and Safety (EHS) (908-737-5109, skupiec@kean.edu) for assistance, and should be prepared to provide a list of all chemical substances that will be used in the class. EHS will gather safety data sheets for the substances, conduct a risk assessment, and prepare a set of health and safety instructions for the student. EHS will also notify Kean’s University Council of the need to prepare a waiver. EHS will provide the safety data sheets, the health and safety instructions, and the waiver to the instructor. The instructor will send the information to the student via email, and allow her time to review the material and to choose whether to stay in the lab or not. If she chooses to withdraw, the instructor should contact the Dean’s office for assistance. If she chooses to remain enrolled in the course, ensure that she signs the waiver, and follows the health and safety instructions provided.

June 2014