School of Public Health-Bloomington
Indiana University

T591
Introduction to Statistics in Public Health

CLASS MEETING INFORMATION

Day/Times:                               Location:
Tuesday:  12:45Pm-2:00PM               HP 017
Thursday: 12:45Pm-2:00PM                Wells Library 503 Lab

CONTACT INFORMATION

Instructor: Ahmed YoussefAgha, Ph.D.
Office: HPER C108
Phone: (812) 856-6782
Office Hours: Tuesday and Thursday 11:00 AM-12:15 PM

Meeting by appointment, please be sure to put T591 in the subject line;
Please use my email; and ensure delivery in a timely manner

Email: ahmyouss@indiana.edu

COURSE MATERIALS

Required
Lisa M. Sullivan. Essentials Of Biostatistics In Public Health, by; Jones &
Bartlett Publishers; (2008); ISBN-10: 0763737372
Note: I have 3 books at the HPER Library for the class students.

Recommended Complementary Readings (optional):
   Jones and Bartlett Publishers.
4. Aron, A.; Aron, E.N.; Coups, E.J. (2008); Statistics for the Behavioral and Social
   Sciences, Pearson-Prentice Hall.

COURSE DISCRIPTION:
An applied approach to the collection, organization, analyses and interpretation of data
pertinent to public health and vital statistics is outlined. The application of statistical and
biostatistical methods to public health is explained.

COURSE COMPETENCIES
This course will help students attain three of the competencies in the MPH program.
After this course students will be able to:
1. Describe the roles biostatistics serves in the discipline of public health.
2. Apply descriptive and inferential methodologies according to the type of study data and/or study design (in public health) for answering a particular research question.

3. Interpret results of statistical analyses for/in public health studies.

**COURSE CONTENT**
This course will cover the following topics:
- The Roles Biostatistics Serves in the Discipline of Public Health
- Basic Study Design
- Summarizing Data Collection in the Sample
- The Role of Probability
- Quantifying the Extent of Disease
- Hypothesis Testing Procedures
- Power and Sample Size Determination
- Basic Multivariable Methods

**TEACHING AND LEARNING METHODS**
Teaching methods will include PowerPoint presentations for overall conceptual understanding; demonstrating step-by-step data analyses using Excel or/and SAS; handouts for illustration of data analytic procures; take-home assignments; use of transparencies for graphical presentation of data; and discussion on the various issues in data collections.

Before each class, PowerPoint slides will be uploaded, in its entirety to Oncourse, by about 12 hrs; this time-limit is to give the students enough hours for warm-up reading (i.e. to read in the text book); this decision is related to IU Teaching & Learning Center recommendation. You are 99.99% expected to read the assigned chapter before coming to each class. Thus, you may want to download the slides, print them, and bring them with you to class so you can add notes to the appropriate places.

**MAJOR COURSE OBJECTIVES**
This course is designed to acquaint students to general statistical and biostatistical methods pertinent to public health and health sciences. Specifically, special attention is given to:
- Describe the roles biostatistics serves in the discipline of public health.
- Explain basic concepts of probability, random variation and commonly used statistical probability distributions.
- Distinguish among the different measurement scales and select statistical methods to be used based on these distinctions.
- Apply descriptive techniques commonly used to summarize public health data.
- Apply common statistical methods for inference.
- Apply basic informatics techniques with vital statistics and public health records and in public health research and evaluation.
- Interpret results of statistical analyses found in public health studies.
# COURSE REQUIREMENTS

1. **Attendance at and active participation in all classes.**
   a. Attendance is very important; maximum allowable absence during the semester is “1” time. So, each time a student be absent more than “1” class, he/she will get Neg.10 (-10) of the total attendance score (100).
   b. Coming late to the class, by 10 minutes, will be equal to (1/2) absence.
   c. Leaving the class before early will be equal to (1/2) absence class.
   d. Class Participation/Performance (e.g. solving in class exercises; and warm-up reading) equal to (100) score.

2. **Complete two examinations:** These will be not open-book, not open handouts, non-cumulative exams. Each of the exams is composed of both multiple choice and computational problem solving questions. The final exam may include EXCEL or SAS interpretation questions in addition to the multiple choice and computational questions (in class exam).

3. **Complete homework assignments:** There will be “6” assignments throughout the semester. All assignments must be turned in all at the beginning of the class on the due date. Late submission will NOT be accepted.

## CLASS ROOM CONTACT:

Students are asked not to create a distraction from the learning of other students. You may want to have your cell phone silent during class time. **DO NOT use computers during class room time, on Tuesdays.** Also, please do not attempt to discuss individual grades or assignment scores during class time. I will be happy to discuss your class performance or any other individual concerns during office hours or by individual appointment.

## IMPORTANT NOTES:

There will be NO MAKEUP EXAMS. However, if an emergency does occur (i.e. illness or death in the family), you must call me before the exam begins and then you must present valid written documentation in order to make up the exam (i.e. note from your doctor on official letterhead, death certificate of deceased). The exam must be made up within one week of the exam date. If you cannot call me in advance because of this emergency, then valid written documentation must be produced before you can make up the exam (i.e. note from your doctor on official hospital letterhead). If this procedure is not followed, then you will receive a zero for the exam. Any make-up exams may be given in the form of an essay or oral exam.

After reviewing the results of your tests, the test booklets will be kept for two weeks and then destroyed. So, if you have any question regarding your examinations, you should see the instructor within two weeks.

*Academic dishonesty* of any kind with respect to examinations, course assignments, alteration of records, or illegal possession of examination shall be considered cheating. It is the responsibility of students not only to abstain from cheating but, in addition, to avoid the appearance of cheating and to guard against making it possible for others to
cheat. Any student who helps another student to cheat is as guilty of cheating as the student he/she assists. The student shall also do anything possible to induce respect for the examining process and honesty in the performance of assigned tasks in or out of class. For further information, please refer to the Indiana University Code of Student Rights, Responsibilities, and Conduct. If you need help or assistance, simply ask the instructor. In the long run, honesty always pays off.

It is the policy of this school to request that students evaluate all courses taught through the school. Final course evaluations in this class will be conducted in a manner that maintains the integrity of the process that guarantees the anonymity of your responses. In order to facilitate this, the School of HPER has instituted a procedure that removes the instructor from handling completed forms, and provides me with computer printout and a typed version or your comments only after semester grades have been issued.

This introductory graduate public health biostatistics course is designed for graduate students with no or little biostatistical background. If you have a background in public health biostatistics, you have the following options:
a. Drop the course and take an advanced biostatistics course;
b. Substitute the course with another graduate course with approval of your primary academic advisor;
c. Speak to the professor about an alternative advanced independent research project;
d. Other options recommended by your primary academic advisor.

**TENTITIVE GRADING SCALE**

Scoring Scale:
1. Examination I (Competency 1&2)                        100 maximum points
2. Attendance                                            100 maximum points
3. Examination II (Competencies 2 & 3)                  100 maximum points
4. Class Participation/Performance                      100 maximum points
5. Homework                                              100 maximum points

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Total: 500 points

<table>
<thead>
<tr>
<th>Points Earned</th>
<th>Final Grade</th>
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<tbody>
<tr>
<td>99-100%</td>
<td>A+</td>
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<td>92-98%</td>
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<td>B+</td>
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<td>82-87%</td>
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<tr>
<td>60-69%</td>
<td>D</td>
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<tr>
<td>Below 60%</td>
<td>F</td>
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REMEMBER: The above grading scale is a basic scale developed to provide you with some general information concerning your performance. The instructor reserves the right to modify the above scale based on the students’ performances.

COURSE PREREQUISITE: Graduate Students Only

ASSIGNMENTS AND DUE DATES
Each Student should do warm-up reading before come to class (warm-up reading belongs to in class participation/performance).

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<thead>
<tr>
<th>Week Number</th>
<th>Chapter Covered</th>
<th>Textbook Due</th>
<th>OnCourse Lab-work Due</th>
<th>Lab Work</th>
<th>Competencies</th>
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<tbody>
<tr>
<td>Week 1 Aug 21, Tue.2012</td>
<td>Chapter 1 Introduction</td>
<td>Chapter 1</td>
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<td></td>
<td>Chapter 2 Study Design</td>
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<td>Week 2</td>
<td>Chapter 1</td>
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<td>Week 3</td>
<td>Chapter 2</td>
<td>HW1 = Quiz</td>
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<td>Week 4</td>
<td>Chapter 3</td>
<td>HW2: Problem Solving of Ch4</td>
<td>Excel Ch. 4</td>
<td>Yes</td>
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<td>Week 5</td>
<td>Chapter 4</td>
<td>HW3: Problem Solving of Ch3</td>
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<td>Week 6</td>
<td>Chapter 5</td>
<td>HW4: Problem Solving of Ch5</td>
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<td>Week 7</td>
<td>Chapter 6 Hypothesis Testing</td>
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<td>2 and 3</td>
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<td>Week 8</td>
<td>Chapter 7</td>
<td>HW5: Problem Solving of Ch7</td>
<td>2 and 3</td>
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<td>Week 9 Oct 15th</td>
<td>Review</td>
<td>Review for Midterm</td>
<td>2 and 3</td>
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<td>Week 10</td>
<td>Intro. of Chapter 8 Readings in Ch6</td>
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<td>2 and 3</td>
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<td>Week 11 Oct 30</td>
<td>Chapter 8</td>
<td>HW7: solving problems of Ch8</td>
<td>2 and 3</td>
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<td>Week 12 Nov 6</td>
<td>Chapter 9</td>
<td>Quiz</td>
<td>Excel Ch. 8</td>
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<td>Week 13 No 13</td>
<td>Basic SAS or SPSS</td>
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<td>2 and 3</td>
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<td>Week 14</td>
<td>Thanks Giving</td>
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<td>2 and 3</td>
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<td>Week 15</td>
<td>Chapter 11 Life Table</td>
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<td>2 and 3</td>
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<td>Week 16</td>
<td>Review</td>
<td>Review for Final Exam; Dec. 4th is the last class</td>
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<td>2 and 3</td>
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<td>Week 17</td>
<td>Exam II (Final Exam)</td>
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<td>2 and 3</td>
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