University of Florida College of Public Health and Health Professions  
PHC 6050: Statistical Methods for Health Sciences I  
Fall 2009

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Office hours:  T 10:30-11:30am; R 11:30am-12:30pm; or by appointment

Teaching Assistant:  Zhuangyu Cai, e-mail: zycai@ufl.edu  
Office hour: M 4:00-5:00pm, W 11:00am-12:00pm in HPNP 3105

Note: I will be out of town from Sep. 30 – Oct. 4 for a COG meeting. So the class on Thursday, Oct. 1 will be cancelled.

Course Webpage:  http://www.phhp.ufl.edu/~xlu2/Fall09phc6050.htm

Course Description and Goals  
Statistical methods for description and analysis provide investigators with useful tools for making sense out of data. The pervasiveness of statistics in public health as well as other fields has led to increased recognition that statistical literacy – a familiarity with the goals and methods of statistics – should be a basic component of a well-rounded educational program. In this course, students will develop a statistical vocabulary, learn methods for descriptive data analysis, study the fundamentals of probability and sampling distributions, learn methods for statistical inference and hypothesis tests based on one or two samples, and become familiar with categorical data analysis and linear regression. Data analysis will be conducted using statistical software such as SPSS/SAS/Minitab.

Course Objectives:  Upon completion of the course, students will be able to 
1. Describe the roles biostatistics serves in the discipline of public health  
2. Describe basic concepts of probability, random variation and commonly used statistical probability distributions.  
3. Describe preferred methodological alternatives to commonly used statistical methods when assumptions are not met.  
4. Distinguish among the different measurement scales and the implications for selection of statistical methods to be used based on these distinctions  
5. Apply descriptive techniques commonly used to summarize public health data
6. Apply common statistical methods for inference
7. Apply descriptive and inferential methodologies according to the type of study design for answering a particular research question.
8. Apply basic informatics techniques with vital statistics and public health records in the description of public health characteristics and in public health research and evaluation.
9. Interpret results of statistical analyses found in public health studies.
10. Develop written presentations based on statistical analyses for both public health professionals and educated lay audiences.

**COURSE MATERIALS**


**Webpage for Textbook:** http://www.thomsonedu.com/ (enter ISBN number and click on the textbook link and then on the Companion Website link)

**Software:** SPSS is one of the best software programs for us to impart a statistical computing competency that will transfer to real world settings. We will demonstrate statistical examples using SPSS in the class. However, the data analysis of homework assignments can be conducted using other statistical software, such as SAS or Minitab, by your convenience.

A student version 17 of SPSS is available for $100 at the University of Florida Bookstore online: www.journeyed.com. Those wishing to use SPSS in subsequent work or courses should strongly consider purchasing the Graduate Pack for $200 at the same website.

SPSS can also be leased directly from e-Academy http://www.e-academy.com/ with much cheaper prices (click on “e-Store”, then “SPSS 17 for Students”, then select the software you choose to lease). Other statistical software, such as SAS and Minitab, are also available at the University Bookstore and the e-Academy website.

For those who do not want to spend money on SPSS or other statistical software, you may use the CIRCA labs on campus (http://labs.at.ufl.edu/) for data analysis assignments requiring SPSS.
COURSE REQUIREMENTS

Quizzes: You are required to take a quiz of the materials provided with each module for review and preparation for the midterm and final exams. Quizzes may be taken at any time (of course before the end of the last class) via E-Learning (https://lss.at.ufl.edu/), as often as you would like, and as long as you would like. E-Learning will assign a grade to your quiz based on your best attempt. These grades are for you to assess how well you know the material. Quiz grades will be counted as 5% toward the final course grade. A PDF version of each quiz (with answer) will also be posted on the course website.

Homework: Homework will be assigned approximately once every one-two weeks. As the focus of the class is on the practical application of statistical methods, many of the problems will involve using statistical software to carry out analyses on real data sets. To implement the analyses, we will use SPSS (but other software as SAS/Minitab is acceptable); examples of the use of SPSS are included in the lecture notes and will be discussed in class.

Homework will be collected at the beginning of class on the date it is due. It should be neat, all work should be shown, and no late homework accepted unless prearranged with the instructor. There will be no exceptions to this policy.

For problems involving SPSS or some other statistical software, please do not simply copy and paste the outputs without any further explanation. Students are encouraged to consult one another on homework problems, but everyone should turn in their own homework, and no “blind copying” permitted.

Midterm and Final Exams: We will have one midterm exam and one final exam during this semester. These will be in-class. The two exams are tentatively scheduled on Thursday, October 22 9:35-11:35am and Monday, December 14, 2009 8:30-10:30am. The final exam will be comprehensive, but the majority part of it will involve material covered since midterm.

GRADING

All homework and exams will be graded on a scale of 0-100. A numerical final score on this scale will be determined according to the following breakdown:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Quiz</td>
<td>5%</td>
</tr>
<tr>
<td>Homework</td>
<td>25%</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>30%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>40%</td>
</tr>
</tbody>
</table>

The numerical final score will be converted to the letter grades according to the following scale:

<table>
<thead>
<tr>
<th>Numerical Score</th>
<th>Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>93-100</td>
<td>A</td>
</tr>
<tr>
<td>83-86.9</td>
<td>B</td>
</tr>
<tr>
<td>73-76.9</td>
<td>C</td>
</tr>
<tr>
<td>63-66.9</td>
<td>D</td>
</tr>
<tr>
<td>50-52.9</td>
<td>F</td>
</tr>
</tbody>
</table>

<60 = E
Depending on overall class performance, these ranges may be adjusted (but only downward – criteria will only become easier, not harder).

**ATTENDANCE POLICY**

Students are strongly recommended to attend the classes. It is understandable if you would like to skip one or two classes to attend the conferences or meetings of your interest. But be sure to let me know in advance. If you have difficulty in catching up with the missed materials, feel free to contact me and we can make appointments to discuss them.

**MAKE-UP POLICY**

Make-up Policy: No late assignments or tests will be allowed, except for urgent need.

**STUDENTS WITH DISABILITIES**

Students requesting a disability accommodation must first register with the Dean of Students Office, which will provide documentation to the student. The student should then provide this documentation to the instructor.

**ACADEMIC INTEGRITY**

Students are expected to act in accordance with the University of Florida policy on academic integrity (see Graduate Student Handbook for details). Cheating or plagiarism in any form is unacceptable and inexcusable behavior.

*We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.*

**OUTLINES OF CLASS TOPICS**

1. The Role of statistics
2. Data analysis process and collecting data sensibly
3. Graphical methods for describing data
4. Numerical methods for describing data
5. Summarizing bivariate data
6. Probability
7. Population distribution
8. Sampling variability and sampling distributions
9. Estimation using a single sample
10. Hypothesis testing using a single sample
11. Comparing two populations or treatments
12. The analysis of categorical data and goodness-of-fit tests
13. Simple linear regression and correlation

Additional topics on the multiple regression analysis and analysis of variance will be discussed if time permitted.