Introduction to Biostatistics  
(BE7022 and PH7010)  
Summer 2016  
Department of Environmental Health  
University of Cincinnati

Message to Students:  
This course is listed as Introduction to Biostatistics. There is no prerequisite of statistical backgrounds to the class. The objectives of this course are summarized in the following: (1) to introduce some common but basic statistical tools such as t-test, z-test, two sample t-test, paired t-test, ANOVA model, regression model and other non-parametric tests; (2) to connect the dots between different statistics tests, parametric vs. non-parametric tests, hypothesis testing vs. confidence interval and show how different statistical concepts and methods are connected; (3) to focus on application while at the same time providing basic statistical reasoning behind the application; and (4) to teach how to use SAS Enterprise in computation. In addition, I will also teach how to use Excel to handle some statistical problems. Remember, learning statistics can be fun, especially when you start to know what to do and how to use the right tools to solve real problems. This class is an online class. Students are provided online modules and notes in each week to learn concepts. SAS modules will also be provided in accordance with lecture modules and notes.

Instructor:  
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Online Coordinator:  
Ms. Lisa Groh  
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Contacts:  
1. For questions related to learning modules (including SAS/EXCEL modules and in-class exercise modules), please contact Lisa by email.  
2. For questions related to class notes, homework assignments, please contact Chi by email or set up a face to face meeting with her.  
3. For questions backboard, virtual lab (using SAS) or other tech related issues, please contact UCIT for help.  
4. Other requests and questions can be raised to Dr Ying directly by email. Please make sure to put “16US Introduction to Biostatistics” in the title.
Course website: Course materials will be available in the Blackboard (meta_yingj_1573: (Meta 16US) INTRO BIOSTATISTICS (001))

Course Description:
This course will provide an introduction of basic concepts of statistics, methods of statistical analysis, and tools of statistical computation. The goal is to help students understand the language of statistics and the art of statistical investigation; perform basic statistical analysis of their own research; and read and evaluate analytical results in health and research articles.

Course Objectives:
By the completion of this course, students will
1. Use descriptive statistics and graphical methods to describe sample data.
2. Understand the reasoning by which findings from sample data can be extended to larger, more general populations.
3. Estimate population parameters using point and interval estimation.
4. Perform hypothesis tests about one, two, or more than two population means or proportions.
5. Use regression and correlation techniques to examine linear relationships in data.
6. Perform statistical computations and read statistical summaries using software packages SAS Enterprise and Excel.
7. Critically evaluate the results of scientific studies.

Textbook and Readings:
There is NO required test book for this class.
Any book entitled “Introduction to Biostatistics” or “Introduction to Statistics” or “Basic Biostatistics” or “Basic Statistics” can be used as your own reference.

Statistical Software:
There is NO required software to purchase for this class.
However, students are suggested to install VMWare in order to use UC Virtual Lab at home and anywhere off campus. The Virtual Lab provides SAS Enterprise for free.

Prerequisite:
There is NO prerequisite for this class.
It is expected students know basic calculus and have some basic knowledge of using EXCEL.

Course Format:
Online Learning Modules w. Onsite and WebEX Discussion Session

Learning Modules:
Learning Modules are posted on each Friday morning, starting on 6/3/2016, and required to complete reading before Thursday mid night of the next week. Evidence of completing modules on time will be counted as a portion of the course grade.

**WebEX Sessions:**
There will be 3 WebEX meetings in the term. Please see Table2 for details of schedules. A WebEX link will be sent out to you by email before the session. Attendance will be required and counted into the course grade.

**Assignments and Final Project:**
There will be 4 homework assignments and one final project for the class. Schedules of posting dates and due dates are available in Tables3. All homework assignments and the final project will be submitted to the Blackboard only. Email submission will NOT be accepted unless pre-approved by the instructor.

**Criteria Included for Evaluation and Determination of Grade:**
1. Learning modules each week 32%
2. Attending WebEX sessions (Fridays) 15%
3. Homework and In class exercise 40%
4. Take Home Project 13%

**Content of Course and Schedule (see Tables 1-3 below):**

<table>
<thead>
<tr>
<th>Table1 Contents of course</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Contents</th>
<th>Module</th>
<th>SAS Module</th>
<th>In Class Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6/3-6/9</td>
<td>Introduction; Measures; Graphic</td>
<td>1.1, 1.2, 2.1, 2.2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>6/10-6/16</td>
<td>Summary Statistics; Probability and Distributions</td>
<td>3.1, 3.2, 4.1, 4.2</td>
<td>2, 3, 4, 5</td>
<td>Module4 In Class 2A, 2B</td>
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<tr>
<td>3</td>
<td>6/17-6/23</td>
<td>Probability and Distributions; Inference, CI and HT</td>
<td>4.2, 5.1, 5.2</td>
<td>5, 6, 7</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>6/24-6/30</td>
<td>Inference, CI and HT</td>
<td>5.1, 5.2, 5.3</td>
<td>6, 7</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>7/1-7/7</td>
<td>Comparing Means</td>
<td>6.1, 6.2</td>
<td>9,10,11</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>7/8-7/14</td>
<td>Comparing Means</td>
<td>6.1, 6.2</td>
<td>9,10,11</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>7/15-7/21</td>
<td>ANOVA</td>
<td></td>
<td>7</td>
<td>12</td>
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<tr>
<td>8</td>
<td>7/22-7/28</td>
<td>Comparing Proportions; Regression</td>
<td>8.1, 8.2, 9.1, 9.2</td>
<td>13, 14</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>29-Jul</td>
<td>Summary; Special Topics</td>
<td></td>
<td>WebEX</td>
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</tr>
</tbody>
</table>

**Final Project Due on 8/1/2016**
Table 2: Schedule of 3 WebEX sessions

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Time</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6/3/2016</td>
<td>12:45-2</td>
<td>WebEX Session1</td>
</tr>
<tr>
<td>5</td>
<td>7/1/2016</td>
<td>12:45-2</td>
<td>WebEX Session2</td>
</tr>
<tr>
<td>8</td>
<td>7/29/2016</td>
<td>12:45-2</td>
<td>WebEX Session3</td>
</tr>
</tbody>
</table>

Table 3: Schedule for homework (HWK), in-class exercise and final project

<table>
<thead>
<tr>
<th>HWK/In Class Exercise/Final Project</th>
<th>Posted Date</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>HWK3</td>
<td>7/1/2016</td>
<td>7/14/2016</td>
</tr>
<tr>
<td>HWK4</td>
<td>7/15/2016</td>
<td>7/28/2016</td>
</tr>
<tr>
<td>Final Project</td>
<td>7/15/2016</td>
<td>8/1/2016</td>
</tr>
</tbody>
</table>

**Attendance and Participation Policy:**

1. Modules will be completed on time in each week specified in Table 1. The attendance will be checked based upon the log information of each module. Missing one module on time will cause a deduction of 4 points from the final score.

2. **WebEX sessions are encouraged to attend. They may be recorded afterwards and make available on the BB for students to watch. It is students’ responsibility to attend or watch the WebEX session on time in order to catch information relevant to the classes.** Failing to do so may cause difficulties to understand contents related to modules, notes and homework assignments and students will have to bear the cost themselves as the consequence.

3. Late submission of an assignment will receive 0 point unless it is pre-approved by the instructor.

4. **Missing 3 module deadlines or missing 3 assignments will automatically receive an “I” (incomplete) from the course.**

**Academic Integrity:** All students shall comply with the Code of Student Conduct of the University of Cincinnati (UC) [http://www.uc.edu/conduct/Academic_Integrity.html](http://www.uc.edu/conduct/Academic_Integrity.html). Academic misconduct will be zero tolerated in this course. Regardless of the type of assignment, students found responsible for violating the UC Academic Integrity Policy will receive an "F" for the course. All violations will be forwarded to the Office of University Judicial Affairs, Department of Student Life where a university disciplinary file will be created.