HLTH 653 Quantitative Research Methods II in Public Health

Semester: Spring 2013
Classroom and Time: SPH 0301, W 7:00pm- 9:45pm
Instructor: Dr. Raul Cruz-Cano
Office Hours: M 5:00 pm – 7:00 pm
W 11:30am – 1:30pm
Office: SPH Bldg. 2234DD
Phone: 301-405-0560
Email: raulcruz@umd.edu

Course Pre- and Co-requisites: Instructor Approval.

Recommended Book:

Other Readings:
1. Fundamentals of Biostatistics, 2000 5th edition; Rosner, B. Duxbury
2. Discovering Statistics using SPSS for Windows by Field, A. Sage Pub, 2000;
3. SAS v9.1.2 and manuals

Course Description: The course covers advanced statistics and procedures in health-related research for doctoral students with the focus on applications of these statistical methodological methods to public health research.

Course Learning Objectives:
At the conclusion of this course, the student will be able to understand and apply advanced statistical model including:

1. Statistical models to clustered data
2. Statistical models to longitudinal data
3. Statistical models to multistage data
4. Growth curve models

In addition, the statistical assumptions associated with these models will be examined; and the data management skills and programming syntax will be applied.

Program Competencies Addressed in this Course:
The following competencies are addressed in this course:

• Conduct statistical analysis of longitudinal data and assess change over times

Course Requirements: The instructor will present concepts related to Quantitative Research Methods and then provide practical examples of how to use such concepts. Paying attention to this material is not enough to learn the class material, the student is expected to practice on her/his own after class.
Course Policies:

Email – The Official University Correspondence:
Verify your email address by going to www.my.umd.edu.

All enrolled students are provided access to the University’s email system and an email account. All official University email communication will be sent to this email address (or an alternate address if provided by the student). Email has been adopted as the primary means for sending official communications to students, so email must be checked on a regular basis. Academic advisors, faculty, and campus administrative offices use email to communicate important and time-sensitive notices.

Students are responsible for keeping their email address up to date or for redirecting or forwarding email to another address. Failure to check email, errors in forwarding email, and returned email (from “full mailbox” or “unknown user” errors for example), will not excuse a student from missing University announcement, messages, deadlines, etc. Email addresses can be quickly and easily updated at www.my.umd.edu or in-person at the Student Service Counter on the first floor of the Mitchell Building.

For technical support for University email: www.helpdesk.umd.edu or call 301-405-1400.

Attendance:
Regular attendance and participation in this class is the best way to grasp the concepts and principles being discussed. However, in the event that a class must be missed due to an illness, the policy in this class is as follows:
1. For every medically necessary absence from class (lecture, recitation, or lab), a reasonable effort should be made to notify the instructor in advance of the class. When returning to class, students must bring a note identifying the date of and reason for the absence, and acknowledging that the information in the note is accurate.
2. If a student is absent more than 2 time(s), the instructor may require documentation signed by a health care professional.
3. If a student is absent on days when tests are scheduled or homework are due he or she is required to notify the instructor in advance, and upon returning to class, bring documentation of the illness, signed by a health care professional.

Absence Policy:
In accordance with University policy if you are absent for a single (1) lecture due to illness or some form of personal or family emergency, this absence will be considered “excused” and the instructor will accept a note from you attesting to the date of the illness/incident, along with an acknowledgement that the information is true. Whenever feasible, you should try to contact the instructor in advance.

Multiple or prolonged absences, and absences that prevent attendance at a major scheduled grading event (like an exam or test) will require written documentation from an appropriate health care provider/organization.
A link to pull information on the new policy covering absences from class can be found at http://www.president.umd.edu/policies/v100g.html

Late work and Missed Exams / Assignments:
Both are inadmissible unless there are extraordinary circumstances. Must be discussed with the instructor.

Religious Observances:
The University System of Maryland policy provides that students should not be penalized because of observances of their religious beliefs; students shall be given an opportunity, whenever feasible, to make up within a reasonable time any academic assignment that is missed due to individual participation in religious observances. It is the student's responsibility to inform the instructor in advance of any intended absences for religious observance.

Special Accommodations / Disability Support Services:
If you have a documented disability and wish to discuss academic accommodations for test taking or other needs, you will need documentation from Disability Support Service (301-314-7682). If you are ill or encountering personal difficulties, please let the instructor know as soon as possible. You can also contact Learning Assistance Services (301-314-7693) and/or the Counseling Center (301-314-7651) for assistance.

Academic Integrity:
The University's code of academic integrity is designed to ensure that the principle of academic honesty is upheld. Any of the following acts, when committed by a student, constitutes academic dishonesty:

- **CHEATING**: intentionally using or attempting to use unauthorized materials, information, or study aids in an academic exercise.
- **FABRICATION**: intentional and unauthorized falsification or invention of any information or citation in an academic exercise.
- **FACILITATING ACADEMIC DISHONESTY**: intentionally or knowingly helping or attempting to help another to violate any provision of this code.
- **PLAGIARISM**: intentionally or knowingly representing the words or ideas of another as one's own in any academic exercise.

For more information see: http://www.shc.umd.edu/code.html.

The Honor Pledge is a statement undergraduate and graduate students should be asked to write by hand and sign on examinations, papers, or other academic assignments. The Pledge reads:

I pledge on my honor that I have not given or received any unauthorized assistance on this assignment/examination.

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the
Code of Academic Integrity or the Student Honor Council, please visit http://www.shc.umd.edu.

Inclement Weather / University Closings:
In the event that the University is closed for an emergency or extended period of time, the instructor will communicate to students regarding schedule adjustments, including rescheduling of examinations and assignments due to inclement weather and campus emergencies. Official closures and delays are announced on the campus website (http://www.umd.edu) and snow phone line (301-405-SNOW), as well as local radio and TV stations.

Course Evaluations
The University, the School of Public Health, and the Department of XXX are committed to the use of student course evaluations for improving the student experience, course and curriculum delivery, and faculty instruction. Your evaluations help instructors improve their courses; help deans and department chairs decide on merit pay for faculty, renewal of contracts, and support tenure and promotion decisions; and help current and future students decide on classes. The system (www.CourseEvalUM.umd.edu) will open Tuesday, April 24th and close on Friday, May 11th for Spring 2012 courses.

Commercial Use of Course Materials:
In accordance with the University of Maryland Policy on Intellectual Property (http://www.president.umd.edu/policies/iv320a.html), course instructors own the copyright in all course materials they create, including written lectures, power point presentations, study materials, and tests (Course Materials) and in the selection of readings and assignments for their courses. Course Materials are protected by copyright because they exist in a tangible medium; e.g., written, electronic, audio-visual, and are the original works of the faculty.

Available Support Services: There are many resources available to learn about the quantitative research techniques discussed in this class. UMD’s Engineering and Physical Sciences Library has many books devoted to this subject and there are several free websites available online.

Grading Procedures:
1. Attendance: Students will be responsible for any announcements and material covered in class, whether or not they are present.
2. Homework: You can work on homework with other students in the class. However simply copying another student’s answers to homework problems is strongly discouraged (negative consequences of this academic strategy are usually experienced during examinations). No late homework will be accepted.
3. Tests: All tests might be closed book and closed-note. Formula sheets will be allowed, if necessary. Tests will be given during class and will be loosely based on the assigned homework and the lectures. A total of two tests will be given during the semester. If due to an emergency, you cannot take the test, please notify me (if possible) prior to the exam.
4. Quizzes: Short quizzes might be given at the start of the class. Each quiz will be counted as a homework assignment. Same rules as the tests.
Grading Method

1. Homework and Quizzes: 50%
2. Midterm Exam: 25%
3. Final Exam: 25%

Grading Scale:

90% - 93% → A,
80% - 83% → B,
70% - 73% → C,
60% - 63% → D,
less than 60% → F

84% - 93% → A,
74% - 77% → C,
64% - 67% → D,
98%+ → A+
88% - 89% → B+
78% - 79% → C+
68% - 69% → D+

Course Outline / Course Calendar:

<table>
<thead>
<tr>
<th>Session</th>
<th>Date</th>
<th>Topic</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>1/28/2013</td>
<td>Introduction of the topics and overview of the advanced</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>statistical models and applications I</td>
<td></td>
</tr>
<tr>
<td>#2</td>
<td>2/4/2013</td>
<td>Introduction of the topics and overview of the advanced</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>statistical models and applications II</td>
<td></td>
</tr>
<tr>
<td>#3</td>
<td>2/11/2013</td>
<td>Moderator variable analysis</td>
<td>#2</td>
</tr>
<tr>
<td>#4</td>
<td>2/18/2013</td>
<td>Mediator variable analysis</td>
<td>#3</td>
</tr>
<tr>
<td>#5</td>
<td>2/25/2013</td>
<td>Multistage national data analysis I</td>
<td>#4</td>
</tr>
<tr>
<td>#6</td>
<td>3/4/2013</td>
<td>Multistage national data analysis II</td>
<td>#5</td>
</tr>
<tr>
<td>#7</td>
<td>3/11/2013</td>
<td>Midterm Exam</td>
<td></td>
</tr>
<tr>
<td>#8</td>
<td>3/18/2013</td>
<td>Spring Break</td>
<td></td>
</tr>
<tr>
<td>#9</td>
<td>3/25/2013</td>
<td>Longitudinal data analysis I</td>
<td>#6</td>
</tr>
<tr>
<td>#10</td>
<td>4/1/2013</td>
<td>Longitudinal data analysis II</td>
<td></td>
</tr>
<tr>
<td>#11</td>
<td>4/8/2012</td>
<td>Topic – Mixed model I</td>
<td>#7</td>
</tr>
<tr>
<td>#12</td>
<td>4/15/2013</td>
<td>Topic - Mixed model II</td>
<td>#8</td>
</tr>
<tr>
<td>#13</td>
<td>4/22/2013</td>
<td>Topic - Mixed model III</td>
<td>#9</td>
</tr>
<tr>
<td>#14</td>
<td>4/29/2013</td>
<td>Growth curve model</td>
<td>#10</td>
</tr>
<tr>
<td>#15</td>
<td>5/6/2013</td>
<td>Wrap-up – summary and questions/answers</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
- The homework will be sent electronically.
- It is recommended to bring a USB memory stick to each of the sessions.

Session Outline

**Session 1**

1/28/2013
Introduction of the topics and overview of the advanced statistical models and applications I
- Statistical Programming: Environment, Read Data, Print Results, Variables and Functions

**Session 2**

2/4/2013
Introduction of the topics and overview of the advanced statistical models and applications II
- Descriptive Univariate Statistics, Frequency Tables and Correlation
- T-tests and ANOVA
<table>
<thead>
<tr>
<th>Session</th>
<th>Date</th>
<th>Topic</th>
<th>Theory</th>
<th>Practical Examples</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2/11/2013</td>
<td>Regression</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assignment #1 – Due date: 2/11/2013</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2/18/2013</td>
<td>Moderator variable analysis</td>
<td>Theory</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assignment #2 – Due date: 2/18/2013</td>
<td>Practical Examples</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>2/25/2013</td>
<td>Mediator variable analysis</td>
<td>Theory</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assignment #3 – Due date: 2/25/2013</td>
<td>Practical Examples</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>3/4/2013</td>
<td>Multistage national data analysis I</td>
<td>Clustered Data Theory</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Multilevel Linear Models</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assignment #4 – Due date: 3/4/2013</td>
<td>Practical Examples</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>3/11/2013</td>
<td>Midterm Exam</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>3/25/2013</td>
<td>Longitudinal data analysis I</td>
<td>Theory</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>4/1/2013</td>
<td>Longitudinal data analysis I</td>
<td>Practical Examples</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assignment #6 – Due date: 4/8/2013</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>4/8/2012</td>
<td>Mixed model I</td>
<td>Unconditional Means Model Theory</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unconditional Means Model Practical Examples</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assignment #7 – Due date: 4/15/2013</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>4/15/2013</td>
<td>Mixed model II</td>
<td>Conditional Model with Level I Predictors Theory</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conditional Model with Level I Predictors Practice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assignment #8 – Due date: 4/22/2013</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>4/22/2013</td>
<td>Mixed model II</td>
<td>Conditional Model with Level II Predictors Theory</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conditional Model with Level II Predictors Practice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assignment #9 – Due date: 4/29/2013</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Session 13 4/29/2013

Topic: Growth Curve Model
- Theory
- Practice
Assignment #10– Due date: 5/6/2013

Additional Literature, Websites and Other Resources:
1. Instructor’s Personal Webpage: http://brac.umd.edu/~raulcruz/
2. 24/7 Laboratory: The lab is open 24 hours, 7 days per week, you should be able to access SAS on the computers in there without any problem: http://www.oit.umd.edu/as/cl/
   Other Labs: http://www.it.umd.edu/as/cl/

Note: The contents of this syllabus might be changed if deem necessary by the instructor.