HLTH 652 - Quantitative Research Methods I in Public Health

Semester: Fall 2016
Classroom and Time: SPH 0301 Tue 4-6:45PM
Instructor: Professor Min Qi Wang
Office: SPH 2373
Phone: 301-405-6652
Email: mqw@umd.edu

Office Hours: Tu-Th 2-4pm
Or by appointment

Required Texts and Other Readings: [Includes titles, authors, dates of publication, and ISBN if available]

Required: Any textbook for 650/651 or equivalent

Recommended:
3. http://informationr.net/rm/

Additional Materials Required:
None

Course Description:
The course covers intermediate statistics and procedures in health-related research for doctoral students. The course focuses on the applied level of statistics rather than theoretical with the emphasis on 1) how to apply statistical models, 2) how to perform the analysis with available software, and 3) how to interpret findings.

Course Learning Objectives:
Upon completing this course, the student will be able to understand and apply:
1) linear regressions
2) logistic regressions
3) one-way analysis of variance
4) factorial -way analysis of variance
5) repeated analysis of variance
6) analysis of covariance
7) factor analysis
8) reliability analysis

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 for the [program title] are addressed in this course:

1. Conduct univariate and multivariate statistical tests, and be able to interpret results.

**Course Requirements:** [This should include a general description of the course content, information about instructional methods, course objectives/goals not listed above, expectations of students, rationale for course structure and a description of various assignments.]

**Notes:**
Be sure that course requirements (papers, exams, etc.) “match” your course objectives and mastery of identified program competencies above.

If attendance is required, be sure to state as much. Specify the nature of in-class participation expected and the effects of absences on the student’s grade.]

**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.
Late work and Missed Exams / Assignments: No points earned or reduced points if no justifiable reasons can be provided (medical emergency for example).

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](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](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.

Available Support Services: [Information regarding any additional support services available to students that may be useful during the course. Examples include Learning Assistance Service programs and short courses, the Writing Center, library facilities/tools, computer facilities and helpdesk at OIT, etc. Some faculty have included a bibliography of sorts, including major peer-reviewed journals in the field that students may wish to reference, key websites with which students should be familiar, and notable books, articles or other cornerstone publications with historical significance and/or which contributed to a revolutionary or profound change in the thinking or practice of a particular field.]

Grading Procedures: [This should include a complete listing of all graded assignments, the point/percentage value of each in the overall grade calculation, and the grading scale/rubric for the course (e.g. the point range associated with each letter grade).]

Exam I: 50%

Exam II: 50%

96-100 points    A+
91-95 points      A
86-90 points      A-
81-85 points      B+
76-80 points      B
71-75 points      B-
66-70 points      C+
61-65 points      C
56-60 points      C-
51-55 points      D+
46-50 points      D
41-45 points      D-
40 & below        F
**Course Outline / Course Calendar:** [Schedule of topics to be covered by week or class meeting if possible, dates for exams, quizzes and any other means of assessment listed above, due dates for assignments and readings, any required special events.]

<table>
<thead>
<tr>
<th>Session</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction of the topics and overview of the statistical models and applications.</td>
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<tr>
<td>2</td>
<td>One-way analysis of variance and post hoc tests</td>
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<td>3</td>
<td>Factorial analysis of variance</td>
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<td>4</td>
<td>Repeated analysis of variance</td>
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<td>5</td>
<td>Analysis of covariance and regression analysis</td>
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<td>6</td>
<td>Regression model building, entry method - stepwise, forward, and backward independent</td>
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<tr>
<td>7</td>
<td>Partial correlations, interactions, and model fit test</td>
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| 8       | MID-TERM EXAMINATION  
Place: SPH 0301  
Time: 4pm |
| 9       | Topic – Factor analysis |
| 10      | Topic - Reliability test |
| 11      | Topic – Multivariate logistic models I |
| 12      | Topic - Multivariate logistic models II |
| 13      | Topic – Logistic model fit testing and assessment |
| 14      | Topic – Wrap-up – summary, questions/answers |
| 15      | FINAL EXAMINATION  
Place: SPH 0301  
Time: 4pm |

**Additional Literature, Websites and Other Resources:** [Some faculty have included a bibliography of sorts, including major peer-reviewed journals in the field that students may wish to reference, key websites with which students should be familiar, and notable books, articles or other cornerstone publications with historical significance and/or which contributed to a revolutionary or profound change in the thinking or practice of a particular field.]
<table>
<thead>
<tr>
<th>Describe the role biostatistics serves in the discipline of public health.</th>
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<tr>
<td>Describe basic concepts of probability, random variables, and commonly used statistical probability distributions</td>
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<td>Distinguish among the different measurement scales or types of variables and select appropriate descriptive statistical methods for summarizing public health data.</td>
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<td>Select appropriate inferential statistical methods to answer research questions relevant to public health research.</td>
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<td>Conduct descriptive and inferential statistical analyses that are appropriate to different basic study designs used in public health research.</td>
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<td>Interpret results of statistical analyses found in public health studies.</td>
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<td>Critically review and summarize statistical analyses presented in public health literature.</td>
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<td>Perform appropriate sample size and power calculations to ensure that the study is sufficiently powered to achieve the scientific aims.</td>
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<tr>
<td>Use a basic software package to describe, explore, and summarize data as well as perform the basic conventional statistical procedures.</td>
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