University of Maryland College Park
School of Public Health

HLTH 652 - Quantitative Research Methods I in Public Health

Course (Section):	HLTH652 (0101)		
Semester:	Fall 2019		
Classroom and Time:	SPH 0301 every Tuesday from 4:00-6:45pm		
Instructor:	Tim Tilert	Office Hours:	
Office:	Any mutually agreed upon location	By appointment	
Phone:	301-633-7661		
Email:	ttilert@umd.edu		
ELMS Site:	https://www.elms.umd.edu		

Prerequisites: EPIB 650 *Biostatistics I* and EPIB 651 *Biostatistics II* or permission of instructor.

Required Texts and Other Readings:

Required: Any textbook for 650/651 or equivalent

Recommended:

1. Discovering Statistics using SPSS for Windows by Field, A. Sage Pub, 2000 or newer editions

2. https://stats.idre.ucla.edu/other/annotatedoutput/

3. https://libguides.library.kent.edu/SPSS/OneWayANOVA

4. https://www.radford.edu/~jaspelme/202/SPSS%20guiide%20to%20Factorial%20ANOVA.pdf

5. https://stats.idre.ucla.edu/spss/seminars/repeated-measures/

6. The Reviewer's Guide to Quantitative Methods in the Social Sciences, edited by Hancock & Mueller, 2010 or newer editions

Additional Materials Required:

Students are expected to have access to a computer for hands-on analysis tasks and assignments. A laptop that could be brought to each class would be preferred/ideal. Additionally, as the bulk of the analyses will be conducted in SPSS and a discounted annual license for SPSS, Version 25 is available to students through the UMD Terpware website (https://terpware.umd.edu) for $60, it is expected that students will have downloaded and installed SPSS, Version 25 on their computers prior to the first class.

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 regression
    2) Logistic regression
    3) One-way analysis of variance
    4) Factorial n-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 Behavioral and Community Health program are addressed in this course:

- Describe the role biostatistics serves in the discipline of public health.
- Describe basic concepts of probability, random variables, and commonly used statistical probability distributions
- Distinguish among the different measurement scales or types of variables and select appropriate descriptive statistical methods for summarizing public health data.
- Discuss the appropriateness of a variety of statistical techniques to analyze quantitative data
- Select appropriate inferential statistical methods to answer research questions relevant to public health research.
- Conduct descriptive and inferential statistical analyses that are appropriate to different basic study designs used in public health research.
- Interpret results of statistical analyses found in public health studies.
- Critically review and summarize statistical analyses presented in public health literature.
- Perform appropriate sample size and power calculations to ensure that the study is sufficiently powered to achieve the scientific aims.
- Use a basic software package to describe, explore, and summarize data as well as perform the basic conventional statistical procedures.

Course Requirements:

Lectures:
Lectures may consist of a combination of video displays, powerpoint sides, verbal lectures, blackboard presentations and/or hands-on software presentations and assignments. Given the diversity of presentation tools utilized, concise lecture notes will not be distributed so students should be prepared to take notes in class, as needed.

Homework:
Homework will be assigned periodically at the discretion of the instructor. Homework assignments and due dates will be given in class. **Late homework will NOT be accepted without a reasonable and advance notice.** You may discuss the homework problems with other students. **However, the final work you turn in must be your own.**

Exams:
Exam I and Exam II will be in class, closed book and closed note exams. The final exam will be comprehensive and *may* be a take-home exam at the discretion of the instructor.

As a general rule, make-up exams and advance exams will NOT be given. Exceptions to this rule are evaluated on a case-by-case basis and students must submit the request *before* the exam takes place with valid supporting documentation. No post-exam request will be considered except in cases of documented medical emergencies during the exam period.

Course Website:
Course announcements, data sets, and homework assignments will be distributed on the ELMS (Enterprise Learning Management System). Please check it on a regular basis. Again, lecture notes will not be distributed so students should be prepared to take notes in class, as needed. The ELMS website can be accessed here: https://www.elms.umd.edu.

Grading Procedures:

Graded assignments and percent contribution of each to overall grade:
- In-class assignments and homework: 20%
- Exam I: 20%
- Exam II: 20%
- Final Exam: 40%

Grading scale/rubric:
- 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 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.

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 information on the new policy covering absences from class can be found at http://www.president.umd.edu/policies/v100g.html.

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 that students will 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 Epidemiology and Statistics 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. Your participation in the evaluation of courses through CourseEvalUM is a responsibility you hold as a student member of our academic community. Your feedback is confidential and important to the improvement of teaching and learning at the University as well as to the tenure and promotion process. CourseEvalUM will be open for you to complete your evaluations starting about two weeks prior to the last day of the term before exams begin. Please go directly to the website

(http://www.CourseEvalUM.umd.edu) to complete your evaluations. By completing all of your evaluations each semester, you will have the privilege of accessing online evaluation reports for the thousands of courses for which 70% or more students submitted their evaluations. You can access results at http://www.CourseEvalUM.umd.edu, the same link you use to submit your evaluations. Click View Past Results instead.

Proposed Course Outline / Course Calendar: *Note that this is a tentative schedule and subject to change based on time requirements, school closings, etc.*

Session 1	Class introduction, review of statistical concepts and introduction to SPSS
Session 2	One-way analysis of variance and post hoc tests
Session 3	Factorial analysis of variance
Session 4	Repeated analysis of variance
Session 5	Analysis of covariance
Session 6	EXAM 1
Session 7	Correlation, simple linear regression
Session 8	Multivariable linear regression
Session 9	Regression interactions and variable selection techniques
Session 10	Chi-square and logistic regression
Session 11	Factor Analysis
Session 12	EXAM 2
Session 13	Reliability
Session 14	Introduction to SAS, Stata and R or lesson catch-up, as needed
Session 15	FINAL EXAM / ASSIGNMENT