HK510: Introduction to Quantitative Methods of Public Health
Fall 2018
Lecture: LAMB 104 Tuesday, 5:00 PM – 6:30 PM
Lab: PHYS 022 Tuesday, 6:45 PM – 7:45 PM (in general)

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Course Website:
Blackboard will be utilized for all of the course information. https://mycourses.purdue.edu

Course Description:
The main goals of the course are to acquaint students with the basic concepts and methods of statistics, their applications, and their interpretation as used in public health. Students will learn basic terminology and its meaning, how to calculate various statistical measures and indices, how to quantify health relationships and how to compute and interpret inferential statistical techniques. Students will also acquire the ability to utilize the statistical software packages of Excel and SPSS as tools to facilitate the processing, editing, storing, displaying, analysis, and interpretation of health research-related data.

Course Objectives:
At the completion of the course, you will be able to:
- Describe the roles biostatistics serves in the discipline of public health
- Understand standard statistical terminology and symbols
- Describe basic concepts of probability, random variation and commonly used statistical probability distributions
- Select appropriate statistical techniques to investigate public health problems
- Apply descriptive techniques commonly used to summarize public health data
- Describe preferred methodological alternatives to commonly used statistical methods when assumptions are not met
- Conduct analyses with statistical software
- Apply common statistical methods for inference
- Distinguish among the different measurement scales and the implications for selection of statistical methods to be used based on these distinctions
- Interpret results of statistical analyses found in public health studies
- Develop written and oral presentations based on statistical analyses
- Understand how to develop research questions that can be answered with quantitative data

Course Competencies:
The Association of Schools and Programs of Public Health requires that programs and schools of public health identify and support a set of core competencies for the training of their students. Consequently, the Purdue Public Health Graduate Program (www.purdue.edu/hhs/mph) has identified competencies for its Core Course offerings and its Concentrations. In the case of Introduction to Quantitative Methods of Public Health (HK510) the competencies addressed include the following:

3a. Explain the role of quantitative methods and sciences in describing and assessing a population's health

6. Explain the critical importance of evidence in advancing public health knowledge
8a. Explain biological factors that affect a population's health
9a. Explain behavioral factors that affect a population's health

Additional Competencies:
1. Apply epidemiological methods to the breadth of settings and situations in public health practice
2. Select quantitative and qualitative data collection methods appropriate for a given public health context
3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate
4. Interpret results of data analysis for public health research, policy or practice
11. Select methods to evaluate public health programs
18. Select communication strategies for different audiences and sectors
19. Communicate audience-appropriate public health content, both in writing and through oral presentation

Required Course Materials:
Heather M. Bush. (2012). Biostatistics: An Applied Introduction for the Public Health Practitioner (1st Edition).
ISBN-13: 978-1111035143   ISBN-10: 1111035148

Other Useful Resources:
- Field, A. (2013). Discovering statistics using IBM SPSS Statistics (4th Edition). Los Angeles, CA: Sage.
- https://stats.idre.ucla.edu/spss/seminars/introduction-to-regression-with-spss/
- https://stats.idre.ucla.edu/spss/
- https://www.youtube.com/results?search_query=spss

Statistical Software:
We will use Excel and SPSS as the statistical software packages in this course. The university makes these programs available on lab computers and to students to download to their personal computers.

Class Format/Structure:
I will put great effort into assisting you in developing a solid understanding of applied biostatistics and SPSS. This course focuses on developing the skills needed to complete a data analysis project at a basic level. Overall, your goal is to empirically answer research questions and correctly interpret results. The major challenge is not mathematics, but focusing your time on course material and thinking critically to understand statistical concepts. In addition, data analysis using any other statistical software requires TIME AND CONTINUOUS EFFORT to become proficient.

Lecture is a time that I will introduce and cover course topics. Students are encouraged to participate in classroom discussion and ask questions before, during or after class.

Lab is dedicated to applying topics covered in lecture and course materials. Students will have the opportunity to acquire skills in data management, analysis, and interpretation.

Requisite Technical Skills:
It is an expectation that you have proficiency in completing computer-related tasks such as browsing the internet, creating Microsoft Powerpoint (electronic) presentations, creating, and editing existing Microsoft

Word documents, uploading and downloading documents to the course website and saving electronic files to the appropriate directory. These skills are prerequisites for this course.

Student's Responsibilities:
Be present, keep up to date with the course, and have assignments completed.
Read all assigned materials BEFORE class and be prepared to discuss in class.
Everyone brings unique experiences to the classroom. Please be respectful about the opinions and questions of others.
Be an active learner! Ask questions! This is the best way for you and others in the class to learn. If you have a question about a particular statistical concept, it is likely that someone else has the same question.
Routinely devote approximately 4–6 hours to course materials and assignments outside of the classroom.
Please communicate with me in person about any concerns you may be having about the class. I cannot assist you in achieving a positive learning experience if I do not know you are struggling with the class or its contents and/or assignments. I sincerely want you to succeed!

Course Philosophy and Participation:
Graduate education is largely a self-directed approach to learning. Your success depends upon your commitment to understanding statistical concepts and using Excel/SPSS. You should understand the importance of quantitative methods in answering research questions. This course affords the opportunity for you to gain skills that will greatly increase your success in future research projects and public health related jobs. Please be willing to listen, share insights, ask questions, and participate in class discussion and activities. In addition, I encourage you to work in groups to discuss issues and think critically about issues and assignments. Much can be learned through brainstorming and thoughtful interaction.

Attendance:
Students are expected to attend all class meetings and are responsible for all of the material covered. It is to your advantage to attend every class. Make-ups will NOT be given unless an emergency situation has occurred and is documented. Please do NOT attend class when ill, but notify the instructor prior to your absence (preferably via email). Additional course information and any changes to this syllabus will be announced during class meetings.

Late Policy:
All assignments must be completed by the due date and time. Late assignments will NOT be accepted, unless students contact the instructor and receive approval prior to the due date.

Cell Phones/Texting/Email/Etc.:
Please be considerate of others by turning off cell phones prior to class. If you have a special need that makes it necessary to leave your phone on, please see the instructor before class. During class please refrain from communication outside of the classroom through the use of text messages, email, social media, etc. Please also refrain from multitasking, such as browsing the web, during class/lab.

Academic Integrity:
Academic integrity is an important part of university life, and will be taken very seriously in this course. Academic dishonesty that includes, but is not limited to, behaviors consistent with cheating, falsification, and plagiarism for any assignment/exam will be referred to the student's graduate advisor, Department Head, and/or the Dean of Students and handled according to Purdue University guidelines. Leaving an in-class exam with test materials is also a form of academic dishonesty for this course.
Link to Information Regarding Academic Integrity:
http://www.purdue.edu/odos/osrr/academic-integrity/index.html

Link to Information Regarding Student Conduct:
http://www.purdue.edu/studentregulations/student_conduct/index.html

Special Accommodations:
Students seeking special accommodation(s) in this course are expected to inform the instructor of their individual situations at the start of the semester. Depending on the circumstances, written documentation may be necessary in order to provide the student with additional means. Special accommodations include, but are not limited to, academic support, medical needs, athletic contests, etc.

Americans with Disabilities Act (ADA):
It is the policy of Purdue University to accommodate and welcome students with disabilities. In compliance with the American with Disabilities Act (ADA) all qualified students enrolled in the course are entitled to "reasonable accommodations". It is the student's responsibility to inform the instructor of any special needs.

Adverse weather/emergency cancellation:
To receive the latest information about any weather and other emergencies please check Purdue University's main website: www.purdue.edu. In the event of a major campus emergency (i.e. Novel H1N1 influenza outbreak) this syllabus is subject to changes due to a revised semester calendar or other circumstances beyond the instructor's control. Email will be used to notify students about any class cancellation. You are expected to read your @purdue.edu email on a frequent basis.

One Week Resolution Policy:
Any assignments that need to be made up and any discrepancies with grades all need to be brought to the attention of the instructor within one week of the missed assignment or the posting of the disputed grade. After one week passes, the instructor will no longer entertain requests for makeup assignments or grade adjustments. Furthermore, students with questions about their grades must see the instructor before the final exam.

Course Evaluation:

Requirements (see descriptions below):	Points:	Percentage:
Attendance (7 points each)	100	25
Assignments (25 points each)	100	25
Quizzes (25 points each)	100	25
Final Exam (50 points)	50	12.5
Final Project/Presentation (50 points)	50	12.5
Total Points:	400	100

Attendance (15 @ 7pts each):
Attending the course lectures and labs is an important part of learning the material. Each attended day is worth 7 points, so with 15 weeks you have the potential of earning 105 total points (essentially 5 bonus points).

Assignments (4 @ 25pts each):
The assignments are an important part of learning the applied material of this course. See course schedule for due dates. These need to be written in a professional style. This will require you to do a revision of the assignment before it is due. You have to do your own work; however, you are encouraged to solicit peer review of your first draft before you revise it and you are encouraged to help each other. Interpretations of statistical and substantive significance will be expected. Assignments are due at the beginning of class. Assignments must be clearly written (so the instructor does not need to search for answers) to receive full credit.

Quizzes (4 Quizzes @ 25pts each):
There will be four quizzes to assess understanding of the conceptual material for this course. See course schedule for dates. Each quiz will be on a different chapter of the book, so it is important that you read and ask questions about the chapter in order to prepare. Quizzes will be in class and take approximately an hour to complete. Quizzes will be free response, so a superficial understanding of the material will not be good enough to receive full credit in most instances.

Final Exam (50pts):
There will be a final exam in this course during finals week. The final exam will be a combination of "quiz 5" and a cumulative assessment of your knowledge.

Final project/oral presentation (50 pts):
The course will lead to the completion of a final project that will be presented during the final week of class as a research presentation. The final project will build of prior assignments. More details about the final project will be given at a later date.

Course Grading System:

A	94-100%	B-	80-83%	D+	67-69%
A-	90-93%	C+	77-79%	D	64-66%
B+	87-89%	C	74-76%	D-	60-63%
B	84-86%	C-	70-73%	F	<60%

**So there will be no misunderstandings: I will NOT give additional points towards your final grade. In other words, an 89.5% or an 89.999% is a B+, etc.

This is a tentative course schedule for HK 510, and therefore, all topics, readings, and assignments are subject to change. It is your responsibility to attend to any announcements made in class or through e-mail regarding schedule changes.

Week	Date	Topic	Readings	Assignments/ Quizzes
Week 1	8/21	Course introduction and orientation Qualtrics Survey Activity		
Week 2	8/28	Samples, study designs, and variable types Qualtrics Survey Results	Bush: 1-20	
Week 3	9/4	Central limit theorem, concepts for statistical inference, power Review for Quiz 1	Bush: 20-31	Assignment 1 due
Week 4	9/11	Variability, Introduction to t-tests, t distributions Quiz 1	Bush: 33-56	Quiz 1 Chapter 1
Week 5	9/18	T-tests continued, conducting t-tests	Bush: 57-73	
Week 6	9/25	Introduction to ANOVAs, conducting ANOVAs Review for Quiz 2	Bush: 73-87	Assignment 2 due
Week 7	10/2	Correlation and introduction to Simple Linear Regression Quiz 2	Bush: 89-107	Quiz 2 Chapter 2
Week 8	10/9	FALL BREAK		
Week 9	10/16	Simple Linear Regression continued, conducting regressions	Bush: 107-118	
Week 10	10/23	Multiple Linear Regression, conducting regressions	Bush: 118-138	
Week 11	10/30	Assumptions of regression Review for Quiz 3	Bush: 138-152	Assignment 3 due
Week 12	11/6	Proportions, contingency tables, chi-squared test Quiz 3	Bush: 153-176	Quiz 3 Chapter 3

Week	Date	Topic	Readings	Assignments/Quizzes
Week 13	11/13	Chi-squared test continued, odds, proportion ratios Conducting and interpreting chi-squared tests and odds ratios Review for Quiz 4	Bush: 176-193	
Week 14	11/20	Introduction to logistic regression Quiz 4	Bush: 197-208	Quiz 4 Chapter 4
Week 15	11/27	Logistic regression continued Prepare for final presentations	Bush: 208-228	Assignment 4 due
Week 16	12/4	Final Project Presentations		
Week 17	12/10-12/14	Finals Week		Final Exam