UNIVERSITY OF KENTUCKY
COLLEGE OF PUBLIC HEALTH

Course Syllabus

CPH 682-001: Quantitative Methods for Healthcare Management
Fall 2017

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Course Meetings: This three-credit-hour course meets on Thursdays from 2 to 4:30 p.m., beginning 24 August 2017 and ending 07 December 2017, in NURS 214. There is no class on 23 November 2017 (Thanksgiving). Final examination is on Thursday 14 December 2017 from 10:30 a.m. to 12:30 p.m. in a location TBD.

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Contact information

Instructor: Dr. Richard Charnigo, Professor of Statistics and Biostatistics
Office: MDS 203
Telephone: 859.218.2072
E-mail: RJCharn2 at aol.com
richard.charnigo at uky.edu
      1. I check both e-mail addresses, but I may see e-mail at AOL sooner than at UKY. However, if there is sensitive content you prefer not to go through AOL, send it to UKY.
      2. Please include "CPH 682" as the first two words in the subject line of any e-mail to me regarding this course.
      3. If you are attaching a file to an e-mail, please do not use TNEF encoding.
      4. On weekdays I will usually reply to e-mail (for which it is clear from the context that a reply is needed) within 24 hours.
Office Hours: Wednesdays from 10 a.m. to 12 Noon in MDS 203
      No prior appointment is required.
      Beginning 06 September 2017 and ending 13 December 2017.
      None on 22 November 2017 (day before Thanksgiving).
Internet: www.richardcharnigo.net

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Course description
This course is a survey of quantitative methods for healthcare managers. Specific content areas include problem selection, data collection, measurement, analytic techniques, and research design.

Course rationale
This course is intended to provide conceptual and computational skills for the kinds of data management and analysis for which a healthcare administrator may be responsible or have oversight. Particular areas to be featured are analysis of injury and disease incidence and prevalence, assessment of population health needs, and assessment of organizational issues and services.

Course prerequisites
Enrollment in a College of Public Health degree program or permission of instructor.

Course Objectives, Student Learning Outcomes and Related Competencies

Program Related Outcomes	
• *MHA SLO Domain (B): Critical Thinking, Analysis, and Problem Solving* • *MHA SLO Domain (E): Individual and Population Health*	
Competencies/Student Learning Outcomes	**Course Objectives**
• Apply appropriate quantitative methods in assessing organizational issues and services and interpreting the results. [3 (P)] • Analyze the incidence and prevalence of injury and disease using epidemiological and statistical methods. [25 (S)] • Assess and prioritize population health needs. [26 (S)]	• Learn how to use Excel for data analysis and display. (Chapters 1, 2 and most of the below chapters to some degree) • Learn about probability and sampling. (Chapters 3, 5) • Be able to numerically and graphically summarize data. (Chapters 4, 6; competency 3) • Understand fundamental concepts of statistical inference. (Chapter 7; competencies 3 and 26) • Employ appropriate techniques to relate two variables when both are categorical. (Chapter 8; competencies 3 and 25) • Employ appropriate techniques to relate two variables when one is categorical and one is continuous. (Chapters 9, 10; competency 3) • Employ appropriate techniques to relate two continuous variables. (Chapter 11; competency 3) • Complete team projects to develop skills for the kinds of data management and analysis for which a healthcare administrator may be responsible or have oversight. (Most of the above chapters; competencies 3, 25, 26) • Complete individual examinations to illustrate skills for the kinds of data management and analysis for which a healthcare administrator may be responsible or have oversight. (Most of the above chapters; competencies 3, 25, 26)

Competencies/Student Learning Outcomes for Quantitative Methods for Healthcare Management (CPH 682)		
Competency/Student Learning Outcome	**Minimum expected level of competence**	**Method of assessment**
#3 [P] Apply appropriate quantitative methods in assessing organizational issues and services and interpreting the results.	2: Selects appropriate quantitative methods for specific issues and provides general interpretation	Team projects 2, 4, 5, 6; midterm exam; final exam
#25 [S] Analyze the incidence and prevalence of injury and disease using epidemiological and statistical methods.	2: Applies core epidemiological and statistical methods to generate descriptive statistics	Team project 5; final exam
#26 [S] Assess and prioritize population health needs.	1: Able to utilize basic concepts to quantify the health needs of a population.	Team project 4; final exam

Textbooks and Other Materials

1. Veney, Kros, and Rosenthal (2009). *Statistics for Health Care Professionals: Working with Excel, 2nd Edition*. Jossey-Bass. ISBN: 978-0-470-39331-4.

A 3rd Edition was published in January 2016. You are welcome to use that Edition, if you wish, but I may refer to page numbers as they are in the 2nd Edition. I have been asked whether a student should order a hard copy version or an electronic version. That is your choice. A hard copy version may be advantageous since my examinations will be "open notes" for any hard copy materials you care to bring with you but will not be "open computer". That said, my examinations will never require you to refer to specific pages of the textbook.

2. Microsoft Excel 2013 {https://www.uky.edu/ukat/labs/virtual-den-software}

Access to this software is required. The 2007 and 2010 versions are also acceptable.

3. Course website {http://www.richardcharnigo.net/CPH682F17}

The course website will be activated by the first day of class and will remain accessible for a number of months after the course concludes. Please visit the website at least once a week this semester, to take note of any updates; doing so on Tuesday or Wednesday is probably "optimal", in that materials for a Thursday class may not always be posted more than 48 hours in advance. If you wish to have hard copies of any documents posted on the course website, please print them for yourself.

4. You'll need a hand-held calculator with exponential and logarithmic functions for the examinations. (Calculator apps on cell phones are not permissible for examinations, because cell phones cannot be used during examinations.) You are responsible for knowing how to operate your calculator and for ensuring the adequacy of its batteries.

5. Albright, Winston, and Zappe (2011). *Data Analysis and Decision Making, 4th Edition*. South-Western Cengage Learning. ISBN: 978-0-538-47612-6.

This book will not be used in the course but may be a good supplementary reference to add to your library, either now or at some future date. (Also, a more recent edition has been published.)

Course requirements and learner evaluation

Team Projects: There will be six team projects for you to complete outside of class. Tentatively, they will be due at the end of class on the Thursdays of 14 September, 28 September, 12 October, 02 November, 16 November, and 07 December – essentially every other week, with consideration for the midterm examination (see below) and the Thanksgiving holiday. Note, however, that you can (and probably should) do some work outside of class every week. If you like, think of having a weekly task but being permitted to bundle a pair of weekly tasks into a single project for flexibility and convenience.

   Team projects are to be completed in self-selected teams of three or four students. You may stay with the same team all semester, or you may work in different teams for different projects. You may discuss the projects with anyone you wish, including other teams, but each team must prepare and is responsible for its own submitted work. Moreover, each team member is expected to understand all of the work which has been submitted for grading.

   Team projects are to be submitted electronically using the Canvas system, unless I indicate otherwise. Please retain your own copy of each team project that is submitted for grading.

Midterm Examination: There will be a two-hour midterm examination from 2:30 to 4:30 p.m. on Thursday 19 October. You may simply arrive at 2:30 p.m. that day, or you may arrive earlier and ask me questions during the 30 minutes preceding the examination.

The midterm examination is a strictly individual activity; you are not permitted to discuss the examination with anyone until after 4:30 p.m. on Thursday 19 October, except to ask me to clarify some point if needed. You will need a hand-held calculator for the examination. (A cell phone app is not acceptable, because a cell phone cannot be used during the examination.)

You may consult any materials that you bring with you in hard copy, including but not limited to the textbook, course notes, and team project solutions. However, such materials may not be shared with other examinees. Moreover, computers may not be used during the examination. Tentatively, the scope of the midterm examination will be chapters 1 through 6 of the textbook.

Final Examination: There will be a two-hour final examination from 10:30 a.m. to 12:30 p.m. on Thursday 14 December. Please make your holiday travel plans, if any, accordingly; I am not obligated to offer the final examination early only to avoid a conflict with holiday travel plans. The location, if different from the ordinary classroom, will be announced later.

The final examination is a strictly individual activity; you are not permitted to discuss the examination with anyone until after 12:30 p.m. on Thursday 14 December, except to ask me to clarify some point if needed. You will need a hand-held calculator for the examination. (A cell phone app is not acceptable, because a cell phone cannot be used during the examination.)

You may consult any materials that you bring with you in hard copy, including but not limited to the textbook, course notes, and team project solutions. However, such materials may not be shared with other examinees. Moreover, computers may not be used during the examination. Tentatively, the scope of the final examination will be chapters 7 through 11 of the textbook, but competence with material from chapters 1 through 6 will still be required because the later material builds on the earlier content.

Grading Components: Each of the six team projects will count for 100 points, and each of the two examinations will count for 200 points. Ten (10) points on each examination will be allocated to a short self-assessment, about which you will be briefed in advance so that it will not consume too much time during the examination. Full credit will be awarded for honest completion of the self-assessment, whether or not the assessment itself is positive.

Outstanding participation, such as (correctly) answering one of my questions in class or correcting me in a (substantial) mistake, will be acknowledged with a post-it note. Place your name and the calendar date on the post-it note, and submit it at the end of class for extra credit: 1 bonus point in each instance. (If you accrue multiple bonus points in a given class session, then please also write the number of bonus points accrued on your post-it note.)

Students accumulating at least 600 points in total and 220 between the two examinations will receive at least an official letter grade of "C", at least 750 points in total and 240 between the two examinations will receive at least an official letter grade of "B", and at least 900 points in total and 300 between the two examinations will receive an official letter grade of "A". An official letter grade of "D" will not be offered. I am not making a promise, but based on past experience the typical student will earn an "A" or a "B".

Instructor expectations

1. I expect you to attend essentially all classes. Missing one or two class sessions for a legitimate reason is not a problem. However, missing several class sessions undermines your efforts to fulfill the course objectives. Please note that, whether present or absent, you are responsible for all material and announcements conveyed in a class session.

2. I expect not just your attendance but also your active involvement. You are always welcome to ask me questions during class. I will often pose questions myself, which you will be invited to answer. You may also come to office hours and send me e-mail if you have questions.

3. I expect you to keep a positive attitude throughout the semester. This is the third consecutive year in which I have taught CPH 682; as such, I hope that the course will proceed smoothly, but your timely feedback about what does or does not work well will still be welcomed.

4. You are permitted to make audio recordings of class sessions to aid your study and/or that of your classmates, provided that: (a) this is done discreetly; (b) this is not used as substitute for attending class, except when missing a class is otherwise necessary for a legitimate reason; and, (c) recordings are not publicized (including on social media), not used for financial or commercial gain, and not shared with persons not enrolled in this class. Video recordings are not permitted unless required as a University-prescribed academic accommodation, in which case the above conditions apply as well as a restriction on the scope of the video, to include only that part of the room from which the instructor speaks.

5. Please do not engage in extended text messaging or in any phone conversations during class. Except during examinations, up to one minute of texting for a sufficiently important and urgent reason is not a problem for me, provided it's done inconspicuously; if you need more than that, you are free to quietly step outside the classroom to handle your business.

6. You are expected to check the course webpage at least once a week (preferably Tuesday or Wednesday) and to check the e-mail address under which you registered for the course at least once per 48 hours on weekdays. As a courtesy, I will add alternate e-mail addresses to my mailing list upon request. However, you are responsible for all material and announcements conveyed by e-mail and, indeed, for ensuring that you can receive messages from me (i.e., your mailbox is not full, or your mail system does not bounce my messages for some other reason).

7. Grading will be based primarily on appropriateness of concept or methodology, technical or numerical accuracy of results presented, and soundness of conclusions (approximately 80%). However, I will also consider clarity, succinctness, and adherence to appropriate conventions of written English (approximately 20%). I will be appropriately more lenient on the latter aspect for the examinations since you will have only two hours.

8. Graded team projects will ordinarily be returned to you electronically within one week of their submission. Graded midterm exams will be made available for viewing during the following class session, but I will hold on to the graded midterm exams because this is a self-study year for accreditation of the MHA program. Graded final exams will be made available for viewing during my office hours in Spring 2018, but again I will hold on to the graded final exams. If you wish to appeal my grading, you may present your appeal to me in person or submit it to me in writing, but this must be done within one week of the time that the graded material is initially made available for viewing.

9. You are encouraged to skim the appropriate textbook chapter before we cover it in class and then study some portions of it more closely (as needed) afterward; do not expect a two-and-a-half hour class session by itself to provide you with all of the knowledge you will need.

Academic Policies

It is the student's responsibility to be informed concerning all regulations and procedures required by the program of study, College or the University. Students should become familiar with the Undergraduate Bulletin or the Graduate School Bulletin as appropriate. Academic disputes will be evaluated against these policies. This serves as formal notification of academic policies.

Students and faculty can locate the College of Public Health and University policies at: http://www.uky.edu/publichealth/student-resources/academic-policies

Policies that are available include:
- Academic Integrity
- Accommodations Due to Disability
- Religious Observances
- Inclement Weather
- Excused Absences Policy
- Verification of Absences
- Student Resources

A hard copy of the policies will be provided by the Office of Academic Affairs upon request by the student.

Late work policy

Cases involving any of the following will be handled individually: excused absences, University-prescribed academic accommodations, recommendations for special consideration from the office of an appropriate Dean or the Ombud. Otherwise: Late submission of a team project will be accepted at 25% penalty within 24 hours of the deadline. (If a project is partially finished at the deadline, you may submit the completed portion at that time without penalty and receive the penalty only on the portion submitted late.) A late (portion of a) team project should also be submitted electronically using the Canvas system, unless I indicate otherwise. An examination missed due to an unexcused absence may be made up at 25% penalty within one week at a mutually acceptable time; the make-up version of an examination may differ from the version that was offered at the appointed time. The student is responsible for initiating the conversation to make up the missed examination. Failing to attempt either the midterm or the final examination will result in failure of the course.

Course schedule and topics

This schedule is tentative and approximate. I will try to get us through (parts of) the first 11 chapters, but the timing may not be exactly as indicated here. For example, we may cover parts of two chapters on one day.

Date [Thursdays 2 to 4:30 p.m. except where indicated otherwise in next column]	Agenda
24 August	Chapter 1: Statistics and Excel
31 August	Chapter 2: Excel as a Statistical Tool
07 September	Chapter 3: Data Acquisition: Sampling and Data Preparation
14 September	Chapter 4: Data Display: Descriptive Presentation, Excel Graphing Capability; Team project #1 due (10%)
21 September	Chapter 5: Basic Concepts of Probability
28 September	Chapter 5: Basic Concepts of Probability; Team project #2 due (10%)
05 October	Chapter 6: Measures of Central Tendency and Dispersion: Data Distributions
12 October	Chapter 6: Measures of Central Tendency and Dispersion: Data Distributions; Team project #3 due (10%)
19 October	2:30 to 4:30 p.m. Thursday afternoon: Midterm Examination (20%)
26 October	Chapter 7: Confidence Limits and Hypothesis Testing
02 November	Chapter 7: Confidence Limits and Hypothesis Testing; Team project #4 due (10%)
09 November	Chapter 8: Statistical Tests for Categorical Data
16 November	Chapter 9: t Tests for Related and Unrelated Data; Team project #5 due (10%)
23 November	None – Thanksgiving holiday
30 November	Chapter 11: Simple Linear Regression
07 December	Chapter 10: Analysis of Variance; Team project #6 due (10%)
14 December	10:30 a.m. to 12:30 p.m. Thursday: Final Examination (20%)

Other Course Related Information:

While I try to be thorough in preparing documents such as this, occasionally unforeseen contingencies arise. For example, what penalty should be imposed if a team project is completed by five persons instead of the maximum of four persons? My answer is that I would discount the score by 20%. However, other similar questions can be proposed. I cannot anticipate all of them in advance, and after a certain point the effort becomes counterproductive. So, instead of trying to provide a document that is absolutely loophole-free, I will simply augment what is already written with the following: If an unforeseen contingency arises that requires a new policy, or if some clarification is warranted, then I will make an appropriate announcement in class or by e-mail, either to the class generally or to the affected parties specifically.