Course Change Request

Date Submitted: 11/09/17 5:11 pm

Viewing: PHEB 609: Categorical Data Analysis

Last edit: 12/14/17 12:27 pm
Changes proposed by: jen.horney

Catalog Pages referencing this course: Department of Epidemiology and Biostatistics
PHEB - Public Hlth Epide Biost

Other Courses referencing this course: As A Banner Prerequisite:
PHEB 614: Analysis of Longitudinal and Multilevel Data

Contact(s)

<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jennifer Horney</td>
<td><a href="mailto:horney@sph.tamhsc.edu">horney@sph.tamhsc.edu</a></td>
<td>979-436-9391</td>
</tr>
</tbody>
</table>

Rationale for Course

Edit

Other

Explain other rationale
non-traditional; distance education

Course prefix: PHEB
Course number: 609

Department: Epidemiology & Biostatistics
College/School: Public Health
Academic Level: Graduate
Effective term: 2018-2019

Complete Course Title
Categorical Data Analysis

Abbreviated Course Title
CATEGORICAL DATA ANALYSIS

Catalog course description
This course will introduce the basic theory and applications of methods used to analyze categorical data. The theory will be covered but the emphasis will be on selecting appropriate analysis strategies, analyzing data and interpreting results of those analyses. No background in calculus or matrix algebra is required.

Prerequisites and Restrictions
PHEB 602 and PHEB 603 (or STAT 651 and STAT 652).

Concurrent Enrollment: No
Should catalog prerequisites / concurrent enrollment be enforced?
Yes

In Workflow
1. PHEB Reviewer
2. PHEB Department Head
3. Curricular Services Review
4. PH Committee Preparer
5. PH Committee Chair
6. PH College Dean
7. GC Preparer
8. GC Chair
9. Faculty Senate Preparer
10. Provost II
11. President
12. Curricular Services
13. Banner

Approval Path
1. 11/10/17 8:30 am
   Samantha Payton (samantha-payton): Approved for PHEB Reviewer
2. 11/10/17 8:41 am
   Jennifer Horney (jen.horney): Approved for PHEB Department Head
3. 11/15/17 8:13 pm
   Sandra Williams (sandra-williams): Approved for Curricular Services Review
4. 12/05/17 4:20 pm
   Rick Danko (danko): Approved for PH Committee Preparer
5. 12/14/17 12:28 pm
   Szu-Isuan Lin (micheyszu): Approved for PH Committee Chair
6. 12/14/17 1:06 pm
   Jay Maddock (maddock): Approved for PH College Dean
7. 01/02/18 4:39 pm
   LaRhesa Johnson (lrjohnson): Approved for GC Preparer
8. 01/20/18 9:39 pm
   LaRhesa Johnson (lrjohnson): Approved for GC Chair

https://nextcatalog.tamu.edu/courseleaf/approve/
Enforced Prerequisites / Concurrent Enrollment

<table>
<thead>
<tr>
<th>And/Or</th>
<th>Course Prefix/Number</th>
<th>Min Grade/Score</th>
<th>Academic Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>And</td>
<td>PHEB 602</td>
<td>C</td>
<td>GR</td>
</tr>
<tr>
<td>Or</td>
<td>PHEB 603</td>
<td>C</td>
<td>GR</td>
</tr>
<tr>
<td>Or</td>
<td>STAT 651</td>
<td>C</td>
<td>GR</td>
</tr>
<tr>
<td>Or</td>
<td>STAT 652</td>
<td>C</td>
<td>GR</td>
</tr>
</tbody>
</table>

Crosslistings: No
Crosslisted With: No
Stacked: No
Stacked with: No

Semester: 3
Credit Hour(s): 3
Contact Hour(s) (per week): 3
Lecture: 3
Lab: 0
Other: 0
Total: 3
Repeatable for credit: No
CIP/Fund Code: 2611020002
Default Grade Mode: Letter Grade(G)
Method of instruction: Distance Education
Lecture
Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education): Yes

Learning Outcomes

Meets traditional face-to-face learning outcomes.

Describe how learning outcomes are met or provide justification why they are not met.

Syllabi of the non-traditional and traditionally delivered versions of the course have identical SLOs

Hours

Meets traditional face-to-face hours.

Describe how hours are met or provide justification why they are not met.

Documentation describes >45 hours of formalized instruction and >90 hours of homework.

Will this course be taught as a distance education course? Yes

I verify that I have reviewed the FAQ for Export Control Basics for Distance Education.

Yes

Is 100% of this course going to be taught in Texas? Yes

Will classroom space be needed for this course? No

This will be a required course or an elective course for the following programs:

Required (select program)

<table>
<thead>
<tr>
<th>Program(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(MPH-PHEB) Master of Public Health in Biostatistics</td>
</tr>
<tr>
<td>(MPH-PHEP) Master of Public Health in Epidemiology</td>
</tr>
</tbody>
</table>
# Course Syllabus

<table>
<thead>
<tr>
<th>Syllabus:</th>
<th>Upload syllabus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upload syllabus</td>
<td><a href="#">PHEB609_2018.pdf</a></td>
</tr>
</tbody>
</table>

| Letters of support or other documentation | No |

| Additional information | 12/14/17: syllabus updated |

| Reviewer Comments | Szu-hsuan Lin (micheysz) (12/14/17 12:28 pm): SPH CC approved for nontraditional delivery, per University Rule 11.03.99.M1. |

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[Key: 12855](#)
Instructor Information

Course title and number: Categorical Data Analysis: PHEB 609
Term: Fall 2018
Meeting times and location: Online

Instructor Name(s): Qi Zheng
Teaching Assistant(s): Not applicable
Telephone number: 979-436-9398
Email address: qzheng@sph.tamhsc.edu
Office hours: By appointment
Office location: Room 227, SPH Administration Building

Course Description

PHEB 609 is an introduction to categorical data analysis that is tailored to the needs of students majoring in public health sciences. The choice of topics and illustrative examples reflects common features in current public health research. A student taking this course is expected to possess basic high school mathematics knowledge, such as the exponential and logarithmic functions. The student is also assumed to have rudimentary computer skills, such as transferring and editing text files. The course is concept-driven and hands-on, and the motto is “comprehension before computation.”

Prerequisites

PHEB 602 & PHEB 603, or equivalent

Course Competencies and Objectives

<table>
<thead>
<tr>
<th>Competencies</th>
<th>Course Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply inferential methodologies according to the type of study design for answering a particular research question.</td>
<td>1. Understand the concept of likelihood function, maximum likelihood estimation, confidence interval in the context of categorical data analysis</td>
</tr>
<tr>
<td></td>
<td>2. Understand the basic logistic regression model and several important variants thereof.</td>
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<tr>
<td></td>
<td>3. Acquire computing skills to analyze data using the above-mentioned models.</td>
</tr>
<tr>
<td></td>
<td>4. Gain ability to interpret accurately computer output when the above analyses are performed.</td>
</tr>
</tbody>
</table>

Textbook and/or Resource Material


Course Topics, Calendar of Activities, Major Assignment Dates
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Required Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The binomial distribution; odds; odds ratio; logit</td>
<td>Lecture 1 Notes</td>
</tr>
<tr>
<td>2</td>
<td>Anatomy of a SAS program; proc PCMP; SAS loop; the log function; the binomial coefficient</td>
<td>Lecture 2 Notes</td>
</tr>
<tr>
<td>3</td>
<td>The binomial distribution; the log-likelihood function; SAS data input</td>
<td>Lecture 3 Notes</td>
</tr>
<tr>
<td>4</td>
<td>The logit model; how to code a log-likelihood function for a simple logit model; basic SAS graphics</td>
<td>Lecture 3 Notes</td>
</tr>
<tr>
<td>5</td>
<td>Computing the log-likelihood function; the chi-square distribution; SAS proc LOGISTIC</td>
<td>Lecture 4 Notes</td>
</tr>
<tr>
<td>6</td>
<td>Writing a log-likelihood function in SAS; SAS proc GENMOD</td>
<td>Lecture 4 Notes</td>
</tr>
<tr>
<td>7</td>
<td>Verifying a likelihood-ratio confidence interval; calculating odds, odds ratios and probabilities from a fitted logit model; the saturated model and the Deviance</td>
<td>Lecture 5 Notes</td>
</tr>
<tr>
<td>8</td>
<td>Interaction in a logit model; likelihood ratio test for interaction</td>
<td>Lecture 5 Notes</td>
</tr>
<tr>
<td>9</td>
<td>Goodness-of-fit and the deviance; model selection and the AIC</td>
<td>Lecture 6 Notes</td>
</tr>
<tr>
<td>10</td>
<td>The Poisson distribution and the Poisson regression model; offset; the log-likelihood function for a Poisson model</td>
<td>Lecture 6 Notes</td>
</tr>
<tr>
<td>11</td>
<td>Write the log-likelihood function for a Poisson model; SAS proc GENMOD for the Poisson model; the rate ratio</td>
<td>Lecture 7 Notes</td>
</tr>
<tr>
<td>12</td>
<td>Wald-type CI and likelihood-ratio CI; verifying the boundaries of a likelihood-ratio CI</td>
<td>Lecture 7 Notes</td>
</tr>
<tr>
<td>13</td>
<td>Over-dispersion and its remedies; Poisson regression with interaction</td>
<td>Lecture 8 Notes</td>
</tr>
<tr>
<td>14</td>
<td>The negative binomial distribution; the negative binomial regression model</td>
<td>Lecture 8 Notes</td>
</tr>
<tr>
<td>15</td>
<td>Finals week: consultation on term project available</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>October 28, 2018</td>
<td>Mid-term exam 1:00-5:00pm</td>
</tr>
<tr>
<td></td>
<td>December 11, 2018</td>
<td>Term project due 11:59pm</td>
</tr>
</tbody>
</table>
Grading Policies

Homework assignments ----- 50%
Mid-term test ----- 30%
Term project ----- 20%

Grading Scale
- 90 and above      A
- Between 80 and 90  B
- Between 70 and 80  C
- Between 60 and 70  D
- Below 60          F

Attendance and Make-up Policies

The University views class attendance as the responsibility of an individual student. Attendance is essential to complete the course successfully. University rules related to excused and unexcused absences are located on-line at http://student-rules.tamu.edu/rule07.

Enter additional information here. Must include attendance and make-up policy, especially if attendance/class participation will count as a grade. Policies should detail excused absences, unexcused absences, and make-up policies. Attendance and make-up policies cannot contradict TAMU student rules.

Other Pertinent Course Information

Your work may be chosen to be critiqued in class, or posted on the course website to serve as key to homework/exam problems. If you do not want your work to be chosen, notify the instructor during the first week of class.

As a registered student, you are entitled to have SAS installed on your own computer. Resist the temptation to access SAS remotely. Let the software physically reside on your computer’s hard disk. This will save you considerable amount of time throughout the semester, as the Internet is not as reliable as you might imagine.

Each time when you submit work, make sure the final product is a single PDF file. Do not submit multiple files for a single assignment, and do not submit Word files (they can be saved as PDF files). Scanning your hand-written work is the preferred method to submit your work, typesetting is time-consuming and error-prone.

Every effort will be made to ensure that power point lecture files, notes, articles and assignments are available online in a timely manner. Written assignments will be delivered thru the Blackboard course website. Handouts, changes in assignments or the schedule of class modules will be announced on the Bb course webpage. E-mail contact will be initiated with all students the first week of class. If you do not have access to your assigned TAMHSC e-mail account, it is your responsibility to make the instructor aware of that fact so that other arrangements may be made. You are expected to use Blackboard e-mail address for all official correspondence.

eCampus (Blackboard)

If this course uses eCampus: Within the course’s eCampus site you will access the learning materials, tutorials, and syllabus; discuss issues; submit assignments; take quizzes; email other students and the instructor; participate in online activities; and display your projects.

In order to access the course material you will need to go to login into Howdy and then click the eCampus
button on the top right or look for Quick Links on the bottom of the School's homepage or go to http://ecampus.tamu.edu Please do not contact your instructor with technical problems. If you are having a technical problem with the course, review the Blackboard Learn Tutorials (at the top-right of School's Office of Academic Assessment and Instructional Technology website). For login issues (password not working), please contact TAMU Help Desk at helpdesk@tamu.edu via E-mail, or phone to (979) 845-8300. Your eCampus login is the same as your Howdy login (NetID).

Computer Requirements for Online Courses
For this and all online courses we recommend the minimum technical requirements outlined on our "SPH Computer Requirements for Online Courses" web page, located at http://www.sph.tamhsc.edu/assessment-instructional/com-requirement.html

All computing problems or other technical issues not related to eCampus, please contact:
- TAMHSC related account: helpdesk@tamhsc.edu via E-mail, or phone to (979) 862-8029
- TAMU related account: helpdesk@tamu.edu via E-mail, or phone to (979) 845-8300

Important!!! Save your work as you go along. Nothing is more discouraging than to lose an assignment due to a computer hang ups! You may want to also make hard copies of your work to have "proof" and save yourself time and trouble!

Plagiarism Virtual Course
Plagiarism is the leading form of academic dishonesty that the School of Public Health has to address. As a SPH student, you are responsible for knowing what plagiarism is and how to avoid it. All SPH students are automatically enrolled in Plagiarism Virtual Course on eCampus. This virtual course provides you with information and examples related to plagiarism in an effort to reduce the number of reported incidents. Please find a tutorial and resources under "Content." In addition, please find Turnitin, a software package that allows you to check whether you may have plagiarized your document. Please see Phuong Huynh: phuong@sph.tamhsc.edu for additional information.

Course Evaluation
Constructive feedback from students on course evaluations is taken very seriously at the School of Public Health. I am asking for your assistance in helping the School in its assessment of courses and faculty through your participation in the evaluation of your courses. As public health professionals you will one day have the responsibility to evaluate colleagues and health initiatives. The School views providing feedback on the School's courses as part of your professional responsibility.

SPH Mission
The Texas A&M School of Public Health is committed to transforming health through interdisciplinary inquiry, innovative solutions, and development of leaders through the Aggie tradition of service to engage diverse communities worldwide.

Americans with Disabilities Act (ADA)
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional
information, visit http://disability.tamu.edu.

**Academic Integrity**

Academic integrity is the pursuit of scholarly activity free from fraud and deception and is an educational objective of this institution. Students are expected to adhere to all TAMUS, TAMU, HSC, and School policies regarding academic integrity and classroom conduct. Academic dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used, or tampering with the academic work of another student. Individuals found guilty of academic dishonesty may be dismissed from the degree program, and at a minimum will receive an F for the course. It is the student’s responsibility to have a clear understanding of how to reference other individuals’ work, as well as having a clear understanding in general as to the various aspects of academic dishonesty. A tutorial on this issue is available at: http://SPH.tamhsc.edu/academic-affairs/academic-integrity.html. A plagiarism tutorial can be found in Blackboard. Information on the Aggie Honor Code can be found at http://aggiehonor.tamu.edu.

Remember: “An Aggie does not lie, cheat, or steal, or tolerate those who do.”

**Copyright Statement**

The materials used in this course are copyrighted. These materials include but are not limited to syllabi, quizzes, exams, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless permission is expressly granted by the instructor.

**FERPA**

The Federal Education Rights & Privacy Act requires that we advise students that by registering for this course, their HSC assigned e-mail address will be revealed to classmates and the instructor. By continuing your enrollment in the course you acknowledge your understanding of this policy. By enrolling in this course you agree to the following statement: “I understand that as a result of registering for this course, my HSC/Blackboard assigned e-mail address will be revealed to classmates and the instructor.”

**Equal Opportunity Statement**

The Texas A&M Health Science Center is an Equal Opportunity/ Affirmative Action employer. Inquiries regarding nondiscrimination policies may be directed to the Human Resources Officer by phone at (979) 436-9208, email hr@tamhsc.edu, or by mail at 200 Technology Way, College Station, TX 77845.

**DISCLAIMER**

This syllabus is representative of materials that will be covered in this class; the schedule and topics list are subject to change. These changes will be discussed in class and subsequently communicated via email or posted as announcements. If you have any problems related to this course, please feel free to discuss them with the instructor.

**Title IX**

Title IX of the Education Amendments of 1972 protects people from sex discrimination in educational programs and activities at institutions that receive federal financial assistance. Texas A&M University and the Texas A&M Health Science Center are committed to maintaining a learning environment that is free from discriminatory conduct based on gender. As required by Title IX, the University does not discriminate on the basis of sex in its education programs and activities, and it encourages any student or non-student
who thinks that he or she has been subjected to sex discrimination, sexual harassment (including sexual violence) or sexual misconduct by another student, member of the faculty or staff, or campus visitor or contractor, to immediately report the incident to any of the individuals persons or offices listed below.

WHERE TO REPORT:
James Nachlinger,
Executive Director, Payroll and HR Services
Title IX Coordinator
979-436-9207
nachlinger@tamhsc.edu

The University encourages students to immediately consult with or report incidents of sex discrimination, sexual harassment (including sexual violence) or sexual misconduct to the TAMHSC Title IX Coordinator. Students may also report incidents of sex discrimination, sexual harassment (including sexual violence) or sexual misconduct to any School of Public Health administrator, university administrator, official or unit supervisor, who is then responsible for promptly notifying any of the above Title IX coordinators of the reported incident.
APPENDIX A: CEPH COMPETENCIES

D1. MPH & DrPH Foundational Public Health Knowledge

Profession & Science of Public Health
D1.1. Explain public health history, philosophy and values
D1.2. Identify the core functions of public health and the 10 Essential Services
D1.3. Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population’s health
D1.4. List major causes and trends of morbidity and mortality in the US or other community relevant to the school or program
D1.5. Discuss the science of primary, secondary and tertiary prevention in population health, including health promotion, screening, etc.
D1.6. Explain the critical importance of evidence in advancing public health knowledge

Factors Related to Human Health
D1.7. Explain effects of environmental factors on a population’s health
D1.8. Explain biological and genetic factors that affect a population’s health
D1.9. Explain behavioral and psychological factors that affect a population’s health
D1.10. Explain the social, political and economic determinants of health and how they contribute to population health and health inequities
D1.11. Explain how globalization affects global burdens of disease
D1.12. Explain an ecological perspective on the connections among human health, animal health and ecosystem health (e.g., One Health)

D2. MPH Foundational Competencies

Evidence-based Approaches to Public Health
D2.1. Apply epidemiological methods to the breadth of settings and situations in public health practice
D2.2. Select quantitative and qualitative data collection methods appropriate for a given public health context
D2.3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate
D2.4. Interpret results of data analysis for public health research, policy or practice

Public Health & Health Care Systems
D2.5. Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings
D2.6. Discuss the means by which structural bias, social inequities and racism undermine health and create challenges to achieving health equity at organizational, community and societal levels

Planning & Management to Promote Health
D2.7. Assess population needs, assets and capacities that affect communities’ health
D2.8. Apply awareness of cultural values and practices to the design or implementation of public health policies or programs
D2.9. Design a population-based policy, program, project or intervention
D2.10. Explain basic principles and tools of budget and resource management
D2.11. Select methods to evaluate public health programs

Policy in Public Health
D2.12. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence
D2.13. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes
D2.14. Advocate for political, social or economic policies and programs that will improve health in diverse populations
D2.15. Evaluate policies for their impact on public health and health equity

Updated 10/12/2017
Leadership
D2.16. Apply principles of leadership, governance and management, which include creating a vision, empowering others, fostering collaboration and guiding decision making
D2.17. Apply negotiation and mediation skills to address organizational or community challenges

Communication
D2.18. Select communication strategies for different audiences and sectors
D2.19. Communicate audience-appropriate public health content, both in writing and through oral presentation
D2.20. Describe the importance of cultural competence in communicating public health content

Interprofessional Practice
D2.21. Perform effectively on interprofessional teams

Systems Thinking
D2.22. Apply systems thinking tools to a public health issue

EHC. MPH in Epidemiology Concentration Competencies
EPI.C.1. Select epidemiologic methods that are appropriate to address epidemiologic content areas.
EPI.C.2. Analyze strengths and limitations of study designs for providing evidence for causal associations.
EPI.C.3. Apply appropriate advanced data analysis methods and data management techniques to epidemiologic data.
EPI.C.4. Assess and compare different reporting formats to communicate epidemiologic data to a variety of audiences.
EPI.C.5. Demonstrate the role of epidemiology in developing, implementing, and evaluating health policy.

BIO.C. MPH in Biostatistics Concentration Competencies
BIO.C.1. Translate research questions or aims into testable hypotheses and propose appropriate statistical methods to test those hypotheses.
BIO.C.2. Apply statistical methods that assure a study is adequately powered for achieving scientific aims or testing a specific research hypothesis.
BIO.C.3. Evaluate and recommend study designs based on identified strengths and weaknesses and desired study goals.
BIO.C.4. Analyze and interpret data using a variety of advanced analytical tools.
BIO.C.5. Communicate commonly used statistical ideas and methods to collaborators in non-technical terms.

Dr.PH in Epidemiology and Environmental Health Competencies
DRHC.1. Evaluate epidemiologic and environmental health evidence pertaining to the scope and magnitude of environmental threats to public health.
DRHC.2. Plan, implement, and evaluate interventions designed to respond to environmental hazards that threaten individual, community and population health.
DRHC.3. Explain the theoretical foundations and change strategies for addressing critical public health issues.
DRHC.4. Translate epidemiology and environmental health issues to interdisciplinary research.
DRHC.5. Influence relevant state-of-the-art practice and prepare reports and scholarly presentations and participate in conference presentations.