UNIVERSITY OF KENTUCKY

New Course Report

8/14/2013 9:25:22 AM

1. General Information

1a. Submitted by the College of: PUBLIC HEALTH

Date Submitted: 7/31/2013

1b. Department/Division: Dept Of Biostatistics

1c. Contact Person

Name: Johanna Wray

Email: jst227@uky.edu

Phone: 859-218-2097

Responsible Faculty ID (if different from Contact)

Name: Richard Kryscio

Email: kryscio@email.uky.edu

Phone: 859-257-4064

1d. Requested Effective Date: Semester following approval

1e. Should this course be a UK Core Course? No

2. Designation and Description of Proposed Course

2a. Will this course also be offered through Distance Learning?: No

2b. Prefix and Number: CPH 580

2c. Full Title: Biostatistics I

2d. Transcript Title:

2e. Cross-listing: STA 580

2f. Meeting Patterns

LECTURE: 2

LABORATORY: 2

2g. Grading System: Letter (A, B, C, etc.)

2h. Number of credit hours: 3

2i. Is this course repeatable for additional credit? No

If Yes: Maximum number of credit hours:

If Yes: Will this course allow multiple registrations during the same semester?

2j. Course Description for Bulletin: CPH 580 covers univariate statistical methods commonly encountered in public health studies. This includes descriptive statistics, hypothesis testing, paired and unpaired t tests, ANOVA, contingency tables, log rank test, regression and correlation.

2k. Prerequisites, if any: MA 109 or higher

2l. Supplementary Teaching Component:

3. Will this course taught off campus? No

If YES, enter the off campus address:

4. Frequency of Course Offering: Spring,

Will the course be offered every year?: Yes

If No, explain:

5. Are facilities and personnel necessary for the proposed new course available?: Yes

If No, explain:

6. What enrollment (per section per semester) may reasonably be expected?: 30

7. Anticipated Student Demand

Will this course serve students primarily within the degree program?: Yes

Will it be of interest to a significant number of students outside the degree pgm?: Yes

If Yes, explain: [var7InterestExplain]

8. Check the category most applicable to this course: Traditional – Offered in Corresponding Departments at Universities Elsewhere,

If No, explain:

9. Course Relationship to Program(s).

a. Is this course part of a proposed new program?: No

If YES, name the proposed new program:

b. Will this course be a new requirement for ANY program?: No

If YES, list affected programs:

10. Information to be Placed on Syllabus.

a. Is the course 400G or 500?: Yes

b. The syllabus, including course description, student learning outcomes, and grading policies (and 400G-/500-level grading differentiation if applicable, from **10.a** above) are attached: Yes

Distance Learning Form

Instructor Name:

Instructor Email:

Internet/Web-based: No

Interactive Video: No

Hybrid: No

1.How does this course provide for timely and appropriate interaction between students and faculty and among students? Does the course syllabus conform to University Senate Syllabus Guidelines, specifically the Distance Learning Considerations?

2.How do you ensure that the experience for a DL student is comparable to that of a classroom-based student's experience? Aspects to explore: textbooks, course goals, assessment of student learning outcomes, etc.

3.How is the integrity of student work ensured? Please speak to aspects such as password-protected course portals, proctors for exams at interactive video sites; academic offense policy; etc.

4.Will offering this course via DL result in at least 25% or at least 50% (based on total credit hours required for completion) of a degree program being offered via any form of DL, as defined above?

If yes, which percentage, and which program(s)?

5.How are students taking the course via DL assured of equivalent access to student services, similar to that of a student taking the class in a traditional classroom setting?

6.How do course requirements ensure that students make appropriate use of learning resources?

7.Please explain specifically how access is provided to laboratories, facilities, and equipment appropriate to the course or program.

8.How are students informed of procedures for resolving technical complaints? Does the syllabus list the entities available to offer technical help with the delivery and/or receipt of the course, such as the Information Technology Customer Service Center (http://www.uky.edu/UKIT/)?

9.Will the course be delivered via services available through the Distance Learning Program (DLP) and the Academic Technology Group (ATL)? NO

If no, explain how student enrolled in DL courses are able to use the technology employed, as well as how students will be provided with assistance in using said technology.

10.Does the syllabus contain all the required components? NO

11.I, the instructor of record, have read and understood all of the university-level statements regarding DL.

Instructor Name:

SIGNATURE|BECKI|Rebecca L Flanagan|College approval for ZCOURSE_NEW CPH 580|20120921

SIGNATURE|JDLIND2|Jim D Lindsay|HCCC approval for ZCOURSE_NEW CPH 580|20121126

SIGNATURE|BECKI|Rebecca L Flanagan|Approval resent to college for ZCOURSE_NEW CPH 580|20121219

SIGNATURE|JDLIND2|Jim D Lindsay|HCCC approval for ZCOURSE_NEW CPH 580|20130104

SIGNATURE|JMETT2|Joanie Ett-Mims|Undergrad Council approval for ZCOURSE_NEW CPH 580|20130104

SIGNATURE|ZNNIKO0|Roshan N Nikou|Graduate Council approval for ZCOURSE_NEW CPH 580|20130501

SIGNATURE|JEL224|Janie S Ellis|Senate Council approval for ZCOURSE_NEW CPH 580|20130502

SIGNATURE|WF-BATCH|Batch User|Reminder for minor course work item|20130516

SIGNATURE|WF-BATCH|Batch User|Subworkflow for college notifications|20130618

SIGNATURE|BECKI|Rebecca L Flanagan|Approval resent to approvers for ZCOURSE_NEW CPH 580|20130618

SIGNATURE|WF-BATCH|Batch User|Subworkflow for college notifications|20130625

SIGNATURE|WF-BATCH|Batch User|Get the department head person|20130731

SIGNATURE|ASTRO11|Arnold J Stromberg|CPH 580 NEW Cross-List Chair Review|20130731

SIGNATURE|BECKI|Rebecca L Flanagan|CPH 580 NEW College Review|20130731

Course Information and Syllabus Document
CPH 580: Biostatistics I
Sections 001 and 002

Instructor: Dr. Richard Kryscio
Office: 230 Center on Aging
Phone: 859-257-4064
E-Mail: kryscio@email.uky.edu (preferred method of contact) (office hours by apt.)

TA: Feng Zhou
Phone: 859-230-4257 E-Mail: Feng.Zhou@uky.edu
Office: MDS 338 with office hours: MW 11:00 a.m.– 12:00 p.m.

Class Meetings: Lectures in MDS 223: Thursdays 3:30 - 5:30
Labs in NURS 625: Thursdays 6:00–7:50 (Section 001)
Mondays 3:30-5:20 p.m. (Section 002).

Course Description: CPH 580 covers univariate statistical methods commonly encountered in public health studies. This includes descriptive statistics, hypothesis testing, paired and unpaired t tests, ANOVA, contingency tables, log rank test, regression and correlation.

Course Rationale: This is a first course in biostatistics at the graduate level. It is also a core requirement in the M.P.H. program.

Textbook: Rosner, Bernard (2006). *Fundamentals of Biostatistics*, seventh edition. Brook/Cole, Cengage Learning, Boston, MA. Note: the textbook is used as a reading source for the course as well as a source for practice problems and in some weeks for lab exercises. Another useful resource for extra material is the Kahn Academy on the web.

Prerequisite: MA 109 (or higher).

Course Objectives (College of Public Health students: please read additional material on the last page of this document):
1. Apply basic principles of Biostatistics used in the univariate analysis of data.
2. Use elements of hypothesis testing including power, sample size, and tests of significance.
3. Apply methods for analyzing data from designed experiments arising from one-way layouts and two-way layouts including multiple comparisons and contrasts
4. Apply methods for the analysis of contingency tables including related concepts of relative risk and odds ratios
5. Apply methods for the analysis of time dependent data subject to right censoring
6. Apply methods for regression modeling and correlation

Learning Outcomes

1. Distinguish among different measurement scales and recognize appropriate statistical procedures for summarizing and analyzing for each scale
2. Apply common statistical procedures including t-tests, ANOVA, regression, correlation, odds ratios, log rank tests
3. Apply alternatives methods when the usual assumptions for the above methods are not met
4. Be able to read and interpret computer output form a standard statistical package (course preference is SAS but other packages such as SPSS are acceptable)

Instructional Strategies: Learning will take place in three different settings: in lecture, in laboratory, and at home. Lectures will motivate and describe biostatistical methods, emphasizing concepts and interpretations; you are encouraged to ask questions during the lectures. Laboratory sessions will provide opportunities to develop the basic computing skills needed to carry out the methods discussed in lectures as well as reinforce your understanding of concepts. Home study, including the completion of substantive written assignments, will help you continue to strengthen your command of concepts as you gain valuable experience in analyzing data; you will get practice in clearly articulating biostatistical findings, rendering contextually appropriate interpretations, and assessing the strengths and weaknesses of your analyses.

Blackboard: All course materials will be posted on the University of Kentucky Blackboard Course Management System server, at https://elearning.uky.edu/ . To log in to Blackboard 6, you must use your active directory account.

Written Assignments: There will be weekly lab assignments to prepare outside of class. Assignments on this weeks lecture are due in lab next week. You may work individually or in self-selected groups but in either case you are responsible for your own work. Please note that many items on the written assignments will require the use of statistical software. You will become familiar with SAS Analyst in the lab sessions, but you may use any software that can perform the required computations. Written assignments are to be submitted in hard copy, unless you have obtained my permission to use an alternative mechanism for submission.

Examinations: There will be written exams on the following dates: September 20, October 25, and December 13 (final non cumulative exam). All exams including the final are held in the same room and at the same time as the lectures. Exams may contain a portion which requires you to demonstrate that you can use the statistical software (SAS Analyst) in the lab. There will be no lectures on exam dates. You need to bring a calculator, your text (use Tables only), and one sheet of paper upon which you can write anything that you desire to prepare for the exam.

Grading: Lab assignments are weighted at 34%, and the three exams are weighted at 22% each. Letter grades are assigned using the table below. Also, undergraduates will receive a mid-term grade based on their performance in the lab and the first exam (equally weighted) using the letter grade guidelines for the final grade.

Final Letter Grade	Graduate Student Range	Undergraduate Student Range
A	91-100 %	89-100%
B	76-90%	70-88%
C	60-75%	60-69%
D	-	50-59%
E	0-59%	0-49%

Attendance Policy: None but it is your best interest to attend lecture and laboratory every week

Classroom Etiquette: Please turnoff or place in silent mode all cell phones, beepers, pagers, and other portable electronic devices during class lecture. Please do not text during class since this distracts your fellow students.

Late Policy: Cases involving University-excused absences, University-prescribed academic accommodations, or explicit requests from your Assistant or Associate Dean will be handled individually. Otherwise, assignments and examinations may be submitted one day late (before 3:00 p.m.) at a 25% loss of credit; assignments and examinations will not be accepted two or more days late. Extra exception: you are out of town attending a scientific meeting.

Accommodations: If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center
http://www.uky.edu/StudentAffairs/DisabilityResourceCenter/

Academic Honesty: The Department of Biostatistics, the College of Public Health, and the University of Kentucky place a premium on academic honesty. Please refer to the University of Kentucky Student Rights and Responsibilities document (www.uky.edu/StudentAffairs/Code/part1.html).

Per university policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the university may be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained

in the Code of Student Rights and Responsibilities. Complete information can be found at the following website: http://www.uky.edu/Ombud. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

Provisionality: the instructor can change the course calendar, course schedule, etc.

Inclement weather: The University of Kentucky has a detailed policy for decisions to close in inclement weather. The snow policy is described in detail at http://www.uky.edu/PR/News/severe_weather.htm or you can call (859) 257-1754.

Religious Observances: Students will be given the opportunity to make up work (typically, exams or assignments) when students notify their instructor that religious observances prevent the student from completing assignments according to deadlines stated in this syllabus. Students must notify the course instructor **at least two weeks prior to such an absence** and propose how to make up the missed academic work.

Instructor expectations

1. I expect you to attend every class session. The components are highly interrelated; missing a class will detract from the learning potential of subsequent sessions.
2. I expect you to submit lab assignments using proper English grammar, syntax, and spelling. You are encouraged to use spell check and grammar check prior to submitting your written work.
3. I expect (and encourage) you to provide honest and timely feedback regarding the content and process of this course throughout the semester.
4. I expect you to share in the responsibility for making this course an enjoyable and beneficial learning experience.

Course Syllabus:
Month & Day / Lecture # & Session / Topics (in parens : corresponding text sections)

8/23 1a measurement scales, summary tables, stem & leaf plots, histograms, empirical cumulative distribution functions, and Kaplan-Meier plots (2.8, 2.9, 14.9)
1b measures of location: mean, median, and the percentiles, measures of dispersion: interquartile range, and standard deviation. Chebyshev's and empirical rule, Z scores, coefficient of variability (2.2 – 2.7)

8/30 2a between and within subject variability, reliability of measurements. Pearson's linear correlation coefficient and the intra-class correlation coefficient (11.7, 12.9)
2b normal probability curve, sampling distribution of the sample mean for random samples, standard error of the mean, Central Limit Theorem (5.1-5.5, 6.1-6.5)

9/6 3a hypothesis testing: simple null hypothesis versus simple alternative hypothesis for an unknown mean, Type I/II errors, and the probability of such errors (7.1-7.2)
3b testing a simple null hypothesis versus a composite alternative hypothesis for the mean: one and two tailed tests. Critical value method and P values (7.3-7.4)

9/13 4a power and sample size requirements for tests concerning the mean (7.5-7.6)
4b confidence interval for the mean, sample size requirements. (6.5, 6.6, 6.10, 7.7)

9/20 Exam 1

9/27 5a paired t-test, sample size requirements, and confidence intervals (8.1-8.3)
5b comparison of two means: pooling sample variances, testing equality of variances, two sample t-test based on pooled variances,. (8.4-8.8)

10/4 6a sample size requirements to detect a difference in means. (8.10)
6b nonparametric comparison of two independent samples: Wilcoxon rank sum statistic (Mann-Whitney test). Paired samples signed rank test (9.3-9.4)

10/11 7a one-way analysis of variance for comparing k > 2 means. (12.1-12.3)
7b multiple comparison procedures: Fisher's LSD, Student-Newman-Keuls, Tukey, Scheffe. (12.4)

10/18 8a testing linear contrasts among the means . (12.5)
8b nonparametric comparison of k independent samples. (12.7)

10/25 Exam 2

11/1 9a two-way analysis of variance: balanced designs. (12.6)
9b comparing two proportions (independent samples) (10.2)

11/8 10a comparing 2 proportions: rare events / small samples sizes. Fisher's exact test
10b comparing two proportions: paired data (10.3, 10.4)

11/15 11a contingency tables (10.6)
11b Kaplan-Meier plot (review) and the log rank test (14.10)

11/29 12a simple linear regression; best fitting line through a scattergram using least Squares (11.3)
12b analysis of variance table, test for significance of slope, Pearson's linear correlation and percent variance explained. (11.4)

12/6 13a predictions based on fitted regression: confidence intervals, prediction intervals, inverse regression, dose response, test for linearity (11.5)
13b comparison of two regression lines.

12/13 **Exam 3 (Final Exam)**

ASPH competency attainment for CPH 580 – Biostatistics I

Key:

Competency level	Number	Description
Unaware	0	No information or skill in this area
Aware	1	Able to identify the concept or skill but with limited ability to perform or apply it independently
Knowledgeable	2	Able to apply and describe the concept or skill
Proficient	3	Able to synthesize, critique, or teach the concept or skill

Biostatistics competencies attained:

Competency	Level attained
Describe the roles biostatistics serves in the discipline of public health	2
Distinguish among the different measurement scales and the implications for selection of statistical methods to be used based on these distinctions	2
Apply descriptive techniques commonly used to summarize public health data	2
Describe basic concepts of probability, random variation, and commonly used statistical probability distributions	2
Apply common statistical methods for inference	2
Describe preferred methodological alternatives to commonly used statistical methods when assumptions are not met	2
Apply descriptive and inferential methodologies according to the type of study design for answering a particular question	2
Interpret results of statistical analyses found in public health studies	2
Develop written and oral presentations based on statistical analyses for both public health professionals and educated lay audiences	1
Apply basic informatics techniques with vital statistics and public health records in the description of public health characteristics and in public health research and evaluation	1