UNIVERSITY OF KENTUCKY
APPLICATION FOR NEW COURSE

1. Submitted by College of Medicine

Department/Division offering course School of Public Health

Date February 26, 2002

2. Proposed designation and Bulletin description of this course

a. Prefix and Number SPH 630

b. Title* Biostatistics II

*NOTE: If the title is longer than 24 characters (including spaces), write
A sensible title (not exceeding 24 characters) for use on transcripts Mixed Models

c. Lecture/Discussion hours per week 2

d. Laboratory hours per week 2

e. Studio hours per week 0

f. Credits 3

g. Course description
Students will learn statistical methods used in public health studies. This includes receiver operator curves, multiple
regression logistic regression, confounding and stratification, the Mantel-Haenzel procedure, and the Cox proportional
hazardous model.

h. Prerequisites (if any)
STA 580 or equivalent

i. May be repeated to a maximum of N/A (if applicable)

4. To be cross-listed as

STA 681

Prefix and Number

Signature, Chairman, cross-listing department

5. Effective Date Fall 2003 (semester and year)

6. Course to be offered ☒ Fall ☐ Spring ☐ Summer

7. Will the course be offered each year? ☒ Yes ☐ No

(Explain if not annually)

8. Why is this course needed?

This course will be required for the Biostatistics track and the Epidemiology track in the MPH program. Students in these
tracks need to learn multivariable methods for analyzing data routinely encountering in public health studies.

9. a. By whom will the course be taught? Richard Kryscio, Ziyad Mahfoud

b. Are facilities for teaching the course now available? ☒ Yes ☐ No

If not, what plans have been made for providing them?

APPLICATION FOR NEW COURSE

10. What enrollment may be reasonably anticipated? estimated 15 students per year
11. Will this course serve students in the Department primarily? ☑ Yes ☐ No
   Will it be of service to a significant number of students outside the Department? ☐ Yes ☑ No
   If so, explain.

   Although primarily for SPH students, some graduate students in the Biomedical Sciences may find this course useful. This includes students in Nursing, Pharmacy, Dentistry, and Gerontology.

12. Check the category most applicable to this course
   ☑ traditional; offered in corresponding departments elsewhere;
   ☐ relatively new, now being widely established
   ☐ not yet to be found in many (or any) other universities

13. Is this course part of a proposed new program?
   If yes, which? ☐ Yes ☑ No

14. Will adding this course change the degree requirements in one or more programs?*
    If yes, explain the change(s) below ☑ Yes ☐ No

15. Attach a list of the major teaching objectives of the proposed course and outline and/or reference list to be used.

16. If the course is a 100-200 level course, please submit evidence (e.g., correspondence) that the Community College System has been consulted.

17. Within the Department, who should be contacted for further information about the proposed course?
   Name  Richard J. Kryscio  Phone Extension  7-4064

*NOTE: Approval of this course will constitute approval of the program change unless other program modifications are proposed.
UNIVERSITY OF KENTUCKY
APPLICATION FOR NEW COURSE

Signatures of Approval:

____________________________________________________________________
Department Chair ____________________________________ Date

____________________________________________________________________
Dean of the College _____________________________________ Date

____________________________________________________________________
Date of Notice to the Faculty ____________________________

____________________________________________________________________
*Undergraduate Council ________________________________ Date

____________________________________________________________________
*University Studies ____________________________________ Date

____________________________________________________________________
*Graduate Council ________________________________ Date

____________________________________________________________________
*Academic Council for the Medical Center Date

____________________________________________________________________
*Senate Council (Chair) _______________________________ Date of Notice to University Senate

*If applicable, as provided by the Rules of the University Senate

____________________________________________________________________
ACTION OTHER THAN APPROVAL

Rev 11/98
Proposed Course: SPH 630 Biostatistics Methods II

Prerequisite: STA580 or equivalent

Course Description:
Students will learn statistical methods used in public health studies. This includes receiver operator curves, multiple regression, logistic regression, confounding and stratification, the Mantel-Haenzel procedure, and the Cox proportional hazards model.

Major Teaching Objectives:

1. Students will learn basic principles of probability and inference used for discrete distributions: binomial and Poisson.

2. Students will learn to use multivariate models including multiple regression, logistic regression, Poisson regression, and the Cox hazards model.

3. Students will learn basic principles for designing and analyzing epidemiologic studies including confounding, standardization, and stratification.

4. Students will become familiar with the design and analysis of studies routinely used in medicine: crossover studies, equivalence studies, meta analysis studies, and studies with clustered responses.

Course Topics:

1. Applications of Probability in Biostatistics and Epidemiology
   - Binomial Probability model
   - Poisson Probability model
   - Poisson approximation to Binomial
   - Normal approximation to Binomial and Poisson
   - Sensitivity, specificity, positive predictive values
   - Receiver Operator Curves
   - Statistical inference based on Poisson models: hypothesis tests and confidence intervals

2. Regression and Correlation
   - Simple regression and correlation
   - Two regression lines
   - Multiple regression
   - Partial and multiple correlation
   - Collinearity
   - Rank correlation
   - Logistic regression
   - Multiple logistic regression
   - Poisson regression

3. Design and Analysis for Epidemiologic Studies
   - Measures of effect for categorical data
   - Confounding and standardization
   - Mantel Haenzel statistics
   - Power and sample size for stratified categorical data
   - Equivalence studies
   - Cross-over designs
   - Clustered binomial data
   - Meta analysis

4. Analysis of Person Time Data
   - Inference for incidence rate data: one-sample and two-sample cases
   - Power and sample size for person time data
   - Testing for trend in incidence rates
Kaplan-Meier estimates
Log rank test
Cox proportional hazards model
Power and sample size

Course Text:

Course Grading Criteria:
Grades will be based on two exams (midterm and final) and a lab grade, all equally weighted. The lab grade is a composite grade for weekly lab assignments; these assignments emphasize computation and illustrate the methods discussed in class. The midterm covers the course topics listed under 1 and 2 above, while the final exam covers the course topics listed under 3 and 4 above. Both exams emphasize concepts and interpretations.

Course Instructors:
Richard Kryscio, Ziyad Mahfoud