

APPLICATION FOR NEW COURSE

1. Submitted by the College of Public Health Date: 16 January 2008

Department/Division proposing course: Biostatistics

2. Proposed designation and Bulletin description of this course:

a. Prefix and Number BST 764

b. Title* Applied Statistical Modeling for Medicine and Public Health

*If title is longer than 24 characters, write a sensible title (24 characters or less) for use on transcripts:

Statistical Modeling

c. Courses must be described by at least one of the categories below. Include the number of actual contact hours per week for each category, as applicable.

() CLINICAL () COLLOQUIUM () DISCUSSION () LABORATORY (3) LECTURE
() INDEPEND. STUDY () PRACTICUM () RECITATION () RESEARCH () RESIDENCY
() SEMINAR () STUDIO () OTHER – Please explain: _____

d. Please choose a grading system: Letter (A, B, C, etc.) Pass/Fail

e. Number of credit hours: 3

f. Is this course repeatable? ES NO If ES, maximum number of credit hours: _____

g. Course description:

This course introduces some useful statistical models not typically encountered in the core courses of a master's or doctoral biostatistics curriculum. These include finite mixture models, nonparametric regression models, covariance-based models, and stochastic models.

h. Prerequisite(s), if any:

BST 675 (Biometrics II) and BST 760 (Advanced Regression)

i. Will this course be offered through Distance Learning? ES NO

If ES, please circle one of the methods below that reflects how the majority of the course content will be delivered:

Internet/Web-based Interactive video Extended campus Kentucky Educational Television (KET/teleweb) Other

Please describe "Other": _____

3. Teaching method: N/A or Community-Based Experience Service Learning Component Both

4. To be cross-listed as: _____
Prefix and Number Signature of chair of cross-listing department

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5. Requested effective date (term/year): Fall / 2010
6. Course to be offered (please check all that apply): Fall Spring Summer
7. Will the course be offered every year? YES NO
If NO, please explain: This course will be an elective in the proposed Ph.D. Epidemiology/Biostatistics program. We anticipate offering it perhaps every third semester (i.e., twice every three years).
8. Why is this course needed?
This course will be an elective in the proposed Ph.D. Epidemiology/Biostatistics program. This course will also be available as a selective for M.P.H. and Dr.P.H. students concentrating in Biostatistics who have the prerequisite noted above.
9. a. By whom will the course be taught? Richard Charnigo or Richard Kryscio
- b. Are facilities for teaching the course now available? ES NO
If NO, what plans have been made for providing them?

10. What yearly enrollment may be reasonably anticipated?
5-10 students per offering
11. a. Will this course serve students primarily within the department? ES No
- b. Will it be of interest to a significant number of students outside the department? ES NO
If ES, please explain.
The course will be an elective for the proposed Ph.D. in Epidemiology/Biostatistics. Some of the students in that program may consider Epidemiology their home department.
12. Will the course serve as a University Studies Program course[†]? ES NO
If ES, under what Area? _____
[†]AS OF SPRING 2007, THERE IS A MORATORIUM ON APPROVAL OF NEW COURSES FOR USP.
13. Check the category most applicable to this course:
- traditional – offered in corresponding departments at universities elsewhere
 - relatively new – now being widely established
 - not yet to be found in many (or any) other universities
14. Is this course applicable to the requirements for at least one degree or certificate at UK? ES No
15. Is this course part of a proposed new program? ES NO
If ES, please name: Ph.D. Epidemiology/Biostatistics
16. Will adding this course change the degree requirements for ANY program on campus ? ES NO
If ES [†], list below the programs that will require this course:

APPLICATION FOR NEW COURSE

In order to change the program(s), a program change form(s) must also be submitted.

- 17. [X] The major teaching objectives of the proposed course, syllabus and/or reference list to be used are attached.
18. [] Check box if course is 400G or 500. If the course is 400G- or 500-level, you must include a syllabus showing differentiation for undergraduate and graduate students by (i) requiring additional assignments by the graduate students; and/or (ii) the establishment of different grading criteria in the course for graduate students. (See SR 3.1.4)

19. Within the department, who should be contacted for further information about the proposed new course?

Name: Richard Kryscio Phone: 257-4064 Email: kryscio@email.uky.edu

20. Signatures to report approvals:

4-1-08
DATE of Approval by Department Faculty

Richard Kryscio / Richard Kryscio
printed name Reported by Department Chair signature

6-26-08
DATE of Approval by College Faculty

Linda Alexander / Linda Alexander
printed name Reported by College Dean signature

* DATE of Approval by Undergraduate Council

printed name Reported by Undergraduate Council Chair signature

* DATE of Approval by Graduate Council

Richard A Jackson / Richard A Jackson
printed name Reported by Graduate Council Chair signature

8/19/08
* DATE of Approval by Health Care Colleges Council (HCCC)

Hedi Anderson / Hedi Anderson
printed name Reported by Health Care Colleges Council Chair signature

* DATE of Approval by Senate Council

Reported by Office of the Senate Council

* DATE of Approval by University Senate

Reported by Office of the Senate Council

*If applicable, as provided by the University Senate Rules. (http://www.uky.edu/USC/New/RulesandRegulationsMain.htm)

BST 764: Applied Statistical Modeling for Medicine and Public Health

Course Description: This course introduces some useful statistical models not typically encountered in the core courses of a master's or doctoral biostatistics curriculum. These include finite mixture models, nonparametric regression models, covariance-based models, and stochastic models.

Course Structure: 3 credit hours (3 hours of lecture, 0 hours of laboratory)

Prerequisites: BST 675 (Biometrics II) and BST 760 (Advanced Regression)

Initial Offering: Fall 2010

Instructors: Any faculty member in the Department of Biostatistics

Philosophical Statement: While linear models, generalized linear models, and mixed models are the "bread and butter" statistical methods, many problems in medicine and public health can be better addressed through more specialized methods not typically encountered in the core courses of a master's or doctoral biostatistics curriculum. These methods include finite mixture models, nonparametric regression models, covariance-based models, and stochastic models. A special feature of this course will be the motivating "case studies" that will be incorporated into the various units. Each case study will illustrate how a problem in medicine or public health can be addressed through one of the specialized methods introduced in the course. Doctoral students may also find that the course provides ideas for dissertation topics.

Objectives: Students completing BST 764 will be able to:

1. Apply finite mixture models to problems in medicine and public health.
2. Apply nonparametric regression models to problems in medicine and public health.
3. Apply covariance-based models to problems in medicine and public health.
4. Apply stochastic models to problems in medicine and public health.

References:

1. McLachlan and Peel (2000). *Finite Mixture Models*. New York: Wiley.
2. Loader (1999). *Local Regression and Likelihood*. New York: Springer.
3. Hastie, Tibshirani, and Friedman (2001). *The Elements of Statistical Learning*. New York: Springer-Verlag.
4. Mueller (1996). *Basic Principles of Structural Equation Modeling*. New York: Springer-Verlag.
5. Taylor and Karlin (1998). *An Introduction to Stochastic Modeling*. San Diego: Academic Press.

Detailed Outline:

I. Finite Mixture Models

- a. Case study #: Describing birthweight distribution and fetal -infant mortality
- b. Case study #: Comparing microarray data for adenoma patients vs. healthy controls
- c. Hierarchical structure and identifiability
- d. Expectation-maximization algorithm
- e. Selecting the number of components
- f. Estimating within-component risk
- g. Resolution of motivating case studies

II. Nonparametric Regression Models

- a. Case study: Describing trends in SARS incidence
- b. Kernel smoothing
- c. Local regression
- d. Spline smoothing
- e. Resolution of motivating case study

III. Covariance-Based Models

- a. Case study: Relating economic status and depression in rural women
- b. Path analysis
- c. Exploratory and confirmatory factor analysis
- d. Structural equation models
- e. Resolution of motivating case study

IV. Stochastic Models

- a. Case study: Describing the cognitive function of Alzheimer's patients
- b. Discrete time Markov Chains
- c. Continuous time Markov Chains
- d. Brownian Motion
- e. Resolution of motivating case study

Note: Motivating case studies may vary from year to year.

Assessment: There will be regular homework assignments (60%) and a final project (40%).

Grading Scale:

Grade	%
A	90-100
B	80-89
C	70-79
E	60-69

LaRoche, Adrea S.

From: Brothers, Sheila C
Sent: Monday, September 22, 2008 8:42 AM
To: LaRoche, Adrea S.
Subject: FW: HCCC Transmittal - Program Change: MS in Athletic Training
Attachments: PhD Epi Bio Final Signatures.pdf; FW: important-EPI 714; FW: regarding the New Program Proposal for the PhD in Epidemiology and Biostatistics

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Curricular Items

Don't let the subject line fool you – this is for a PhD in Epidemiology. ☺
Sheila

*Office of the Senate Council
Phone: (859) 257-5872*

From: Lindsay, Jim D.
Sent: Friday, September 19, 2008 2:20 PM
To: Nikou, Roshan; Jackson, Brian A
Cc: Brothers, Sheila C; Anderson, Heidi Milia; Flanagan, Rebecca; Alexander, Linda A; Kryscio, Richard
Subject: RE: HCCC Transmittal - Program Change: MS in Athletic Training

September 19th, 2008

T R A N S M I T T A L

TO: Brian Jackson, Roshan Nikou
Graduate Council
FROM: Jim Lindsay
Health Care Colleges Council

At its August 19th 2008 meeting, the Health Care Colleges Council approved the following proposal and is now forwarding it to the Graduate Council to approve:

College of Public Health
New Program: Ph.D. in Epidemiology

Attached are the materials to implement the requested action.

cc: Linda Alexander
Becki Flanagan
Richard Kryscio
Shelia Brothers
Heidi Anderson

Jim Lindsay
Health Care Colleges Council Coordinator
Associate Provost for Faculty Affairs Office
University of Kentucky, 205 Frazee Hall
Lexington, KY 40506-0031 Ph. (859) 323.6638
www.uky.edu/Provost/AcademicCouncil/council.php

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Heldi Anderson / Heldi Anderson
printed name Reported by Health Care Colleges Council Chair signature

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