APPLICATION FOR NEW COURSE

1. Submitted by the College of Arts and Sciences
Department/Division offering course: Statistics
Date: 10/04/01

2. Proposed designation and Bulletin description of this course:
   (a) Prefix and Number: STA 709
   (b) Title*Advanced Survival Analysis* (subt. req.)
   *NOTE: If the title is longer than 24 characters (including spaces), write a sensible title (not exceeding 24 characters) for use in transcripts: Adv. Survival Analysis
   (c) Lecture/Discussion hours per week: 3
   (d) Laboratory hours per week: ____________
   (e) Studio hours per week: ____________
   (f) Credits: 3
   (g) Course description: Lindberg CLT, Kaplan-Meier and related estimators, Cox proportional hazards and related models, approximations of type I and II error.
   (h) Prerequisites (if any): STA 635
      STA 701
   (i) May be repeated to a maximum of: ____________ (if applicable)

4. To be cross-listed as:
   Prefix & No. ____________ Signature, Chairman, cross-listing department

5. Effective Date: Spring, 2003 (semester and year)

6. Course to be offered: (a) Fall ☐ (b) Spring ☑ (c) Summer ☐

7. Will the course be offered each year? (a) Yes ☑ (b) No ☐
   (Explain if not annually): ____________

8. Why is this course needed: It is an important research area in biostatistics. Potential employers, both academic and industrial, will expect graduates of our new tract in Biostatistics to have had a course in survival analysis.

9. (a) By whom will the course be taught? Mai Zhou
   (b) Are facilities for teaching the course now available? (a) Yes ☑ (b) No ☐
   If not, what plans have been made for providing them?
10. What enrollment may be reasonably anticipated? **5-10**

11. Will this course serve students in the Department primarily?  
   (a) Yes ☒  (b) No ☐

   Will it be of service to a significant number of students outside the Department?  
   (a) Yes ☐  (b) No ☒

   If so, explain: ____________________________________________________________

12. Will the course serve as a University Studies Program course?  
   (a) Yes ☐  (b) No ☒

   If yes, under what Area?

13. 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

14. Is this course part of a proposed new program?  
   (a) Yes ☒  (b) No ☐

   If yes, which? **Biostatistics tracts within the Statistics Ph. D.**

15. Will adding this course change the degree requirements in one or more programs?*  
   (a) Yes ☒  (b) No ☐

   If yes, explain the change(s) below: **This course will be part of the core curriculum for the Ph. D. in Statistics**

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

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

18. Within the Department, who should be contacted for further information about the proposed course?  
   Name/e-mail: **Arnold J. Stromberg, DGS**  Phone Extension: **7-6903**

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

Signatures of Approval:
Constance H. Wood
Department Chair

Philip
Dean of the College

ACTION OTHER THAN APPROVAL:

03/22/02

APR 09 2002

MAR 28 2002

Rev 11/98
Course Description for STA709

Advanced Computational Inference


Teaching Objectives:

1. Students should be familiar with the Lindberg central limit theorem for sums of independent counting processes, including those with stochastic intensity as martingales.
2. Students should understand the properties of the Kaplan-Meier, Nelson-Aalen, and related estimators, e.g. NPMLE, self-consistency, confidence intervals, and martingale representations of these estimators.
3. Students should understand rank tests as the weighted difference of two Nelson-Aalen estimators and be familiar with optimal censored rank tests and the logrank test with proportional hazards alternative.
4. Students should be familiar with the Cox proportional hazards model, the Cox partial likelihood estimator, the Breslow baseline estimator, and their relationship to weighted counting processes/martingales.
5. Students should understand the theory and use of frailty models and models for multiple events per subject.
6. Students should understand of approximate calculations of type I and II errors, and methods for possible improvement of these approximations.

Outline:

1. The Lindberg central limit theorem and variations.
3. Censored and uncensored rank tests.
4. The Cox proportional hazards and related models.
5. Frailty models.
6. Approximate calculations for type I and type II errors.

Nature of Assignments and Grading Criteria:

Weekly Homework – 25%
2 Midterms – 25% each
Final – 25%

Grading Scale:
90-100 – A
80-90 – B
70-80 – C
Below 70 – E
At his or her discretion, the instructor may use a curve.
ARTS AND SCIENCES COLLEGE COUNCIL/CURRICULUM COMMITTEE

INVESTIGATOR REPORT

INVESTIGATING BODY  Area A,  Shelley Steiner  
(Area, Area Chair)  COURSE MAJOR or DEGREE  STA 709  
(department or college)

DATE FOR COUNCIL REVIEW  4/9/02  CATEGORY: NEW CHANGE DROP

INSTRUCTIONS: This completed form will accompany the course application to the Graduate/Undergraduate Council(s) in order to avoid needless repetition of investigation. The following questions are included as an outline only. Be as specific and as brief as possible. If the investigation was routine, please indicate this. The term "course" is used to indicate one course, a series of courses or a program, whichever is in order. Return the form to Phil Harling, Associate Dean, 231 Patterson Office Tower for forwarding to the Council(s). ATTACH SUPPLEMENT IF NEEDED.

1. List any modifications made in the course proposal as submitted originally and why.

    None

2. If no modifications were made, review considerations that arose during the investigation and the resolutions.

3. List contacts with program units on the proposal and the considerations discussed therein.

    Dr. Cann Wood

4. Additional information as needed.

    None

5. A&S Area A, Natural & Mathematical Sciences Curriculum Committee Recommendation:

    APPROVE, APPROVE WITH RESERVATION, OR DISAPPROVE

6. A&S Council Recommendation:

    APPROVE, APPROVE WITH RESERVATION, OR DISAPPROVE

7. A&S Council Investigator, Dr. Shelley Steiner  
Date: 4-9-02

File: InvestigatorRpt