APPLICATION FOR NEW COURSE

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

2. Proposed designation and Bulletin description of this course:
   
   (a) Prefix and Number: **STA 707**  
   (b) Title* **Advanced Data 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. Data Analysis**

   (c) Lecture/Discussion hours per week **3**  
   (d) Laboratory hours per week
   (e) Studio hours per week
   (f) Credits: **3**

   (g) Course description: **Theory and data analysis involving likelihood functions, mixed models, missing responses**

   (h) Prerequisites (if any): **STA 643**

   (i) May be repeated to a maximum of

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

5. Effective Date: **Fall, 2002**

6. Course to be offered:  
   (a) Fall **X**  
   (b) Spring **O**  
   (c) Summer **O**

7. Will the course be offered each year?  
   (a) Yes **X**  
   (b) No **O**

   (Explain if not annually):

8. Why is this course needed: **Potential employers, both academic and industrial, will expect graduates of our department to be experts in modern data analysis.**

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

   (b) Are facilities for teaching the course now available?  
   (a) Yes **X**  
   (b) No **O**

   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?  
   Will it be of service to a significant number of students outside the Department?  
   If so, explain:  

   Will the course serve as a University Studies Program course?  
   If yes, under what Area?  

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?  **Statistics/Probability and Biostatistics tracts within the Statistics Ph. D.**  

14. Will adding this course change the degree requirements in one or more programs?  
   If yes, explain the change(s) below:  **This course will be part of the core curriculum for the Ph. D. in Statistics**  

15. Attach a list of the major teaching objectives of the proposed course, 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/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 L. Wood
Department Chair

Philip Fleming
Dean of the College

*Undergraduate Council

*University Studies

*Graduate Council

*Academic Council for the Medical Center

*Senate Council

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

03/22/02

APR 09 2002

MAR 28 2002

Date of Notice to the Faculty

Date of Notice to Univ. Senate

ACTION OTHER THAN APPROVAL:
Course Description for STA707

Advanced Data Analysis


Teaching Objectives:

1. Students should show an understanding of the theoretical foundations for advanced data analytic models including restricted likelihood functions, partial likelihood functions, conditional likelihood functions, marginal likelihood functions, and alternative frameworks based on semi-parametric models.

2. Students should be able to construct general classes of mixed models for binary responses, unordered categorical responses, responses with normal distributions, and responses with distributions based on the general exponential family of random variables. Moreover, students should be able to construct and use these models for longitudinal and/or multilevel data.

3. Students should demonstrate knowledge of the current theory for analyzing sets of longitudinal measurements having informative missing responses including pattern mixture models, multiple imputation, and dropout models.

Outline:

1. Theoretical foundations for data analysis.
2. General classes of mixed models
3. Applications of mixed models for longitudinal and/or multilevel data.
4. Theory and applications for informative missing responses.

Nature of Assignments and Grading Criteria:

Periodic (at least 8) homework assignments will be given to students and then combined into one grade on a 100 point scale. Also, a midterm and final exam will be given each producing one grade on a 100 point scale. The final grade will be determined from the sum of these three scores.

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.
INVESTIGATOR REPORT

INVESTIGATING BODY  Area A, Shelley Steiner
(Course, Major or Degree  STA 907
(Area, Area Chair) (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. Connie Wood and Area A Committee

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: 4-5-02

File: \InvestigatorRpt