APPLICATION FOR NEW COURSE

1. Submitted by the College of Arts and Sciences  Date: 02/10/02
Department/Division offering course: Statistics

2. Proposed designation and Bulletin description of this course:
   (a) Prefix and Number: STA 580  (b) Title: Biostatistics I (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:

   (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: Descriptive statistics, hypothesis testing, paired and unpaired tests, ANOVA, contingency tables, log rank test, and regression with biostatistics applications

   (h) Prerequisites (if any): MA 109 or equivalent

   (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: Fall, 2002  (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: An introductory biostatistics has been requested by numerous departments across campus and will be required for all MPH students.

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

   (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? 25
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:  This course will be required core course for all MPH students in the School of Public Health
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?
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 required for students in the School of Public Health.
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 L. Wood
Department Chair

Dean of the College

03/22/02
Date

04/09/02
Date

MAR 2 8 2002
Date of Notice to the Faculty

*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

ACTION OTHER THAN APPROVAL:

Rev 11/98
Course Description for STA580

Biostatistics I


Teaching Objectives:

1. Students will learn the basic principles of Biostatistics used in the univariate analysis of data commonly encountered in biomedical studies
2. Students will learn the elements of hypothesis testing including power, sample size, and tests of significance
3. Students will learn methods for analyzing data from designed experiments arising from one-way layouts and two-way layouts including multiple comparisons and contrasts
4. Students will learn the analysis of contingency tables including related concepts of relative risk and odds ratios
5. Students will be introduced to the analysis of time dependent data subject to right censoring
6. Students will be introduced to the concepts of regression modeling and correlation

Outline:

1a measurement scales, summary tables, stem and leaf plots, histograms, empirical cumulative distribution functions, and Kaplan-Meier plots
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
2a between and within subject variability, reliability of measurements. Pearson’s linear correlation coefficient and the intra-class correlation coefficient
2b normal probability curve, sampling distribution of the sample mean for random samples, standard error of the mean, Central Limit Theorem
3a hypothesis testing: simple null hypothesis versus simple alternative hypothesis for an unknown mean, Type I/II errors, and the probability of such errors
3b testing a simple null hypothesis versus a composite alternative hypothesis for the mean: one and two tailed test. Critical value method and P values
4a power and sample size requirements for tests concerning the mean
4b confidence interval for the mean, sample size requirements.
5a paired t-test, sample size requirements, and confidence intervals
5b comparison of two means: pooling sample variances, testing equality of variances, tow sample t-test based on pooled variances.
6a sample size requirements to detect a difference in means.
6b nonparametric comparison of tow independent samples: Wilcoxon rank sum statistic (Mann-Whitney test). Paired samples signed rank test
7a/7b Midterm
8a one-way analysis of variance F statistic for comparing k>2 means.
8b multiple comparison procedures: Fisher’s LSD, Student-Newman-Keuls, Tukey, Scheffe.
9a testing linear contrasts among the means.
9b nonparametric comparison of k independent samples.
10a two-way analysis of variance: balanced designs.
10b comparing two proportions (independent samples)
11a comparing two proportions: rare events or small samples sizes. Fisher’s exact test
11b comparing two proportions: paired data
12a  contingency tables
12b  Kaplan-Meier plot (review) and the log rank test
13a/b  simple linear regression; best fitting line through a scattergram using least squares, properties of fitted regression: analysis of variance table, test for significance of slope, Pearson’s linear correlation and percent variance explained.
14a  predictions based on fitted regression: confidence intervals, prediction intervals, inverse regression, dose response, test for linearity
14b  comparison of two regression lines.
15a/b  Review session for final
       Final Exam

Nature of Assignments and Grading Criteria:

Weekly lab assignments will be graded and 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 grades.

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 (Area, Area Chair)  
COURSE MAJOR or DEGREE: STA 580 (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. Cameron Wood, all members of 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

7. A&S Council Investigator, Dr. Shelley Steiner  
Date: 4-5-02

File: \InvestigatorRpt