George Mason University
Graduate Course Approval/Inventory Form

Please complete this form and attach a copy of the syllabus for new courses. Forward it as an email attachment to the Secretary of the Graduate Council. A printed copy of the form with signatures should be brought to the Graduate Council Meeting. Complete the Coordinator Form on page 2, if changes in this course will affect other units.

Please indicate:  ___X___ NEW  ___ MODIFY  ___ DELETE

Local Unit:  APPLIED AND ENGINEERING STATISTICS  Graduate Council Approval Date:

Course Abbreviation:  STAT  Course Number:  660

Full Course Title:  BIOSTATISTICAL METHODS

Abbreviated Course Title (24 characters max.):  BIOSTATISTICAL METHODS

Credit hours:  3  Program of Record:  MS in Statistical Science

Repeateable for Credit?  ___ D=Yes, not within same term Up to hours
                     ___ T=Yes, within the same term Up to hours
                     ___ N=Cannot be repeated for credit

Activity Code (please indicate):  ___ Lecture (LEC)  ___ Lab (LAB)  ___ Recitation (RCT)
                                 ___ Studio (STU)  ___ Internship (INT)  ___ Independent Study (IND)
                                 ___ Seminar (SEM)

Catalog Credit Format  3:3:0  Course Level:  GF(500-600)  ___X___ GA(700+)

Maximum Enrollment:  35  For NEW courses, first term to be offered:  SPRING 06

Prerequisites or corequisites:

STAT 554 or STAT 535 and a working knowledge of a statistical software package such as SAS or SPSS.

Catalog Description (35 words or less):  Please use catalog format and attach a copy of the syllabus for new courses.:  STAT 660 Biostatistical Methods (3:3:0). Statistical methods essential to the analysis of rates and proportions from data associated with clinical trials, case-control, prospective and cross-sectional studies in the health care sector. Risk assessment as measured by relative risks and odds ratios are central concepts. Construction and interpretation of logistic regression models for binary and polytomous responses. Poisson regression models for the analysis of rates. Concepts are applied to the analysis of real data from major medical studies using statistical software packages such as SAS, SPSS, and StatExact.

For MODIFIED or DELETED courses as appropriate:
Last term offered:  Previous Course Abbreviation:  Previous number:

Description of modification:

APPROVAL SIGNATURES:
Submitted by:  __________________________________ email:  _______________________

Department/Program:  __________________________________ Date:  4/20/04

College Committee:  __________________________________ Date:  5/24/04

Graduate Council Representative:  __________________________ Date:  ___________________
**Approval from other units:**

Please list those units outside of your own who may be affected by this new, modified, or deleted course. Each of these units must approve this change prior to its being submitted to the Graduate Council for approval.

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Graduate Council approval: _______________________________ Date: _________

Graduate Council representative: __________________________ Date: _________

Provost Office representative: _____________________________ Date: _________
NEW COURSE PROPOSAL TO THE GRADUATE COUNCIL

SCHOOL OF INFORMATION TECHNOLOGY AND ENGINEERING

1. CATALOG DESCRIPTION
   (a) STAT 660 Biostatistical Methods (3:3:0)
   (b) Prerequisites: STAT 554 or STAT 535 and a working knowledge of a statistical software package such as SAS or SPSS.
   (c) Catalog Description:
   Statistical methods essential to the analysis of rates and proportions from data associated with clinical trials, case-control, prospective and cross-sectional studies in the health care sector. Risk assessment as measured by relative risks and odds ratios are central concepts. Construction and interpretation of logistic regression models for binary and polytomous responses. Poisson regression models for the analysis of rates. Concepts are applied to the analysis of real data from major medical studies using statistical software packages such as SAS, SPSS, and StatExact.

2. JUSTIFICATION
   (a) Course Objectives
   This course will provide a thorough examination of advanced statistical methods needed for the analysis of data from clinical trials and other areas of medical research and health care studies. Students will learn how to properly model and interpret binary and count data from these studies and to assess risk. They will gain experience by working with data from case studies. Students will utilize statistical software packages to aid in the analysis of such data.
   (b) Course Necessity
   This is a fundamental course for the Graduate Certificate in Biostatistics program and will be required for the proposed M.S. in Biostatistics program. The proximity to GMU of the National Institute of Health and numerous private biotech and pharmaceutical research firms suggest that this course will significantly aid students in their preparation and attractiveness for employment as statisticians in the health care field. In addition to serving as a desirable elective for the M.S. in Statistical Science program, this course should be attractive to quantitatively oriented graduate students in the M.S. in Health Science and the Ph.D. in Nursing degree programs offered by the College of Nursing and Health Science.
   (c) Relationship to Existing Courses
   STAT 554: ‘Applied Statistics’ or STAT 535: ‘Analysis of Experimental Data’ is prerequisite for STAT 660. (Students in the M.S. in Statistical Science program must take STAT 554.) A working knowledge of SAS (equivalent to STAT 501) or SPSS software is also required. The proposed course is a natural companion to STAT 668: ‘Survival Analysis’, another core course in the Biostatistics Certificate and (proposed) M.S. programs. It is more advanced than HSCI 701: ‘An Introduction to Biostatistics’ which provides an introduction to some biostatistical techniques at a level suitable for graduate students in the Nursing and Health Science programs, but cannot be taken for credit towards the Certificate or (proposed) M.S. in Biostatistics. The content of the proposed course overlaps by about 50% with the current version of STAT 665: ‘Categorical Data Analysis’. However, the latter will be revised to eliminate most of the duplication and include more advanced material upon approval of the proposed course.

3. APPROVAL HISTORY
4. SCHEDULING

Spring semester of odd-numbered years, commencing in the Spring of 2005.

Proposed Instructors: Bolstein, Carr, Miller

5. COURSE OUTLINE

(a) Sample Syllabus

1. Types of biomedical studies, sampling models, relative risk and odds ratio.
2. Large sample tests and exact inference for two independent groups.
3. Cross-sectional sampling designs.
4. Prospective and retrospective sampling designs. Clinical trials.
5. Comparison of proportions from several independent samples.
7. Logit models for binary responses and categorical predictors.
9. Logistic regression models for binary responses, both categorical and numerical predictors.
11. Multiple logistic regression.
12. Analysis of data from matched samples.
13. Conditional logistic regression models for matched samples.

(b) Suggested Texts


(c) Other References


(c) Student Evaluation Criteria

Homework  60%
Final Exam 40%