

Approval Form

Proposal Title: Statistical Design of Experiments II 1702-372

Sponsor(s) 2 Oberlin Dept.: Mathematics Ext. 6514
F. Marini

Check one: Course Specialization Concentration Minor Achievement Certificate
 Certification Program Major Program Minor Change (Please name, deletion or credit/title/catalog change)

Undergraduate Graduate 3 Credit Hours

<p>Step 1 (Department)</p> <p><input checked="" type="checkbox"/> Approved <u>2/5/91</u> Date</p> <p><input type="checkbox"/> Not Approved</p> <p><u>Gary Strowitz</u> Dept. CC Chairperson</p> <p><input type="checkbox"/> Reviewed _____ Date</p> <p><u>Gary Strowitz</u> Dept. Chairperson</p>	<p>Step 2 (Receipt)</p> <p><input checked="" type="checkbox"/> SCC# <u>90-91-43</u></p> <p>Proposal Received <u>2-8-91</u> Date</p> <p><u>Donna Hathaway</u> SCC Chairperson</p>	<p>Step 3 (School CC)</p> <p>Reviewed <u>3/4/91</u> <u>10/4/91</u> Date</p> <p><input checked="" type="checkbox"/> Approved <u>update</u></p> <p><input type="checkbox"/> Not Approved</p> <p>Comments: Suggestions made in March were incorporated.</p> <p><u>Ronald J. Ecker</u> School Curr. Comm. Chairperson</p>
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Step 4 (Academic Dean) **Comments:**

Recommend
 Not Recommend
 Conditionally Recommend (see comments)

Reviewed _____ Date

Signature, Dean of School

Step 5 (SCC)

Open Hearing 10/23/91 Approved by Senate Curriculum Committee 10/23/91
Date Date

Returned to sponsor(s) for the following reasons: later sent to chair to take a
trial to change implementation date

Step 6 (Senate)

Presented to Senate 11/1/91 Approved Not Approved
Date

Notification to Executive Vice-President/Provost _____
Date

Signature, SCC Chairperson

Step 7 (Executive V.P./Provost)

Received _____

If no, reasons ^{Date} are as follows:

Approved Yes No



Student credit hours _____

Faculty load hours _____

Equalized credit hours _____

Official copy and approval sheet filed _____
Date

Signature, Executive Vice-President/Provost

Registrar

Approved course description received 23 Feb 93
Date

Hegis Taxonomy and Course Number assigned 1702.372

B. F. Kelsey
Signature, Registrar

23 Feb 93
Date

Notification forwarded:

- Senate Curriculum Committee Chairperson
- Department Chairperson(s)
- Academic Dean(s)
- Registrar
- Sponsor(s)

Glassboro State College

Department of Mathematics

Course Proposal

Statistical Design of Experiments II

I. Details

- a) Course Title: Statistical Design of Experiments II
- b) Sponsors: Dr. Zenaida Otero Keil and the Department of Mathematics
- c) Credit hours: 3 s.h.
- d) Course Level: Junior, Senior
- e) Curricular effect: elective for the Statistics Concentration proposed
- f) Prerequisites: Statistics I and II or Statistical and Research Methods in Psychology I and II, and Statistical Design of Experiments I
- g) Suggested Time, Fall 1993
Implementation:
- h) Resources: Faculty are available to teach the course, available equipment is satisfactory and library resources are adequate

II. Rationale:

Statistical design of experiments has gained significant recognition in the last decade. As experimentation and data collection have become more costly and regulated, the statistical design of experiments has offered a means to get the maximum information for the minimum number of experimental trials.

Statistical design of experiments will be the major avenue for the design of experimental programs in the future. Corporations

II. Rationale (Con't)

are hiring new employees to develop internal expertise in the area of statistical experiment design along with their statistics groups. The proposed course will allow Glassboro to offer education in state of the art analysis theories and techniques.

The proposed course would be an elective course for the Statistics Concentration in the Department of Mathematics and is the second semester of a two semester sequence. This course would make use of the material covered in the Statistical Design of Experiments I course to explore more complex experimental design techniques and optimality criteria. This course will give Glassboro students interested in statistical design additional techniques, applications and theoretical background. An understanding of the more complex techniques in statistical design can give students a solid advantage in the market place.

Students from many other departments including those with an interest in actuary science may use the course to supplement their education. Even without completion of the requirements for the Statistics Concentration, students in Psychology, Sociology, the Physical and Biological Sciences, and Business can benefit from the course. The techniques and theory presented in the proposed course are relevant to a wide range of subject areas and are now frequently used to develop and analyze experiments in all of the disciplines mentioned above.

3. Essence of the Course

a) Objectives in relation to student outcome

Students will

- o use the material presented in Statistical Design of Experiments I to explore theoretical and practical aspects of statistical design in more detail
- o learn complex statistical design techniques not covered in Statistical Design of Experiments I. These techniques are useful for complex or constrained experimental systems.
- o make liberal use of computers
- o be exposed to a wide range of complex applications in areas including engineering, business and the physical and social sciences

a. Objectives in relation to student Outcome (con't)

o be required to write a paper on an application or theoretical aspect of their choice

b) Topical outline

I. Statistical Design of Experiments II

Statistical techniques will be reviewed and introduced using the basics covered in Statistical Design of Experiments II. Design techniques for complex and constrained systems will be presented along with criteria for development of optimal techniques.

- a) advanced model building
- b) regression techniques
- c) analysis of variance in complex systems
- d) constrained systems
- e) complex response surfaces
- f) Development of optimality criteria
- g) D optimal designs

II. Applications

Rigorous and detailed applications will be covered. Students will develop design techniques for specific commercial applications as mini-projects for the course.

- a) detailed analysis of two or three practical applications
- b) mini-projects that apply complex statistical techniques to commercial problems
- c) Evaluation and grading procedure of students: The major basis for grading would be projects and a paper. Exams and homework would also be used.
- d) Course evaluation: Student evaluations and review by the Department of Mathematics Curriculum Committee

4. Consultants:

Karen Rappaport, Supervisor
Statistics Group, Hoechst Celanese

Kim Kearns Hockman, Statistician,
E.I. duPont de Nemours and Company

4. Consultants (con't):

Charles Schultz, Chairperson
Physical Sciences

Harold W. Lucius, Dean
School of Business

Eleanor Gaer, Chairperson
Psychology Department

John Myers, Chairperson
Sociology Department

Ben Hitchner, Chairperson
Economics Department

Catalog Description

Statistical Design of Experiments II

(Prerequisites: Statistics I and II or Statistical and Research Methods in Psychology I and II, and Statistical Design of Experiments I)

Students will be exposed to advanced techniques and theories in statistical design of experiments. Applications from a wide variety of disciplines will be considered in detail. Students will learn the theoretical aspects of statistical design as well as the application of complex techniques to realistic situations. Optimization of experimental design techniques will also be covered.



November 14, 1990

To: Dr. Keil
From: Dr. Peter Kressler *Peter Kressler*
Re: Statistics Concentration
Statistical Design of Experiments
Advanced Statistical Design of Experiments

We received the proposals for a Statistics Concentration and the two new mathematics course proposals.


We support fully these proposals. Indeed, we anticipate that some of our majors will take advantage of this course of study.

We request, however, that Elementary Statistics and Economic Statistics be included as an option in the requirements for the concentration as well as in the prerequisites for the two proposed new mathematics courses. This will enable our majors to participate in this worth while concentration.



November 26, 1990

To: Dr. Zenaida Otero Keil
Associate Professor
Dept. of Mathematics

From: John P. Myers 
Sociology

Re: Proposal for Statistics Concentration

Thank you for sharing the proposal for the Statistics Concentration. Dr. Pearl Bartelt, Dr. Ted Tannenbaum and I discussed your proposal. We believe that such a concentration as you propose would be of benefit to Glassboro students. However, we believe that the Sociological Methods and Statistics course should be included as an elective. As far as we know, this is the only course which combines various research designs with quantitative methods. The result of this is that students become aware of the relationship between abstract ideas and concrete applications. Students learn how to raise research questions, develop ways to measure appropriate variables, construct data collection techniques, and gain skills in preparing, organizing, and analyzing empirical data.

I hope that our comments have been helpful. Please let me know if we can provide further input.

JPM/m
cc: P. Bartelt
T. Tannenbaum