

MEMORANDUM

To Senate

From Senate Committee on Undergraduate
Studies

Subject Changes - Mathematics

Date November 21, 1977

Action taken by the Senate Committee on Undergraduate Studies at its meeting of November 8, 1977 gives rise to the following motions:

MOTION 1

"That the proposed changes in description, prerequisite, title and syllabi, as set forth in S.77-155, be approved and recommended to the Board for approval. These changes are specifically as follows:

- i) Changes in Description
 - MATH 154-3
 - MATH 155-3
- ii) Prerequisite Changes
 - MATH 161-3
 - MATH 343-3
 - MATH 443-4
- iii) Title Change - MATH 371-3
- iv) Change in Description, Title, Syllabus - MATH 489-4
- v) Change in Title, Description, Prerequisites and Syllabus - MATH 490-4

MOTION 2

"That the proposed new courses, MATH 404-3 (Statistical Design and Analysis of Experiments) and MATH 480-3 (Non Parametric Statistics), as set forth in S.77-155, be approved and recommended to the Board for approval.

Note - The first of these courses, MATH 404, is intended as a "service course" for students requiring statistical tools for use in research. The second, MATH 480, is designed for the student specializing in statistics as a field of mathematics. The non-specialist will be admitted provided he/she has an adequate mathematical background.

D. R. Birch
D. R. Birch

SIMON FRASER UNIVERSITY

SCUS 77-45

MEMORANDUM

To H.M. Evans
Secretary, SCUS
MATH 154-3 and MATH 155-3
Subject Changes in Calendar Description

From N. Heath
Assistant to the Dean of Science
Date October 31, 1977

At its meeting of October 28, 1977, the Faculty of Science unanimously approved changes to the Mathematics entry in the Undergraduate Calendar. These changes are outlined in the attached memorandum dated October 20, 1977 and are herewith submitted to the Senate Committee on Undergraduate Studies for further consideration.



N. Heath

/ad
Attachment

SIMON FRASER UNIVERSITY

MEMORANDUM

To Members of the Faculty of Science

From Ann Dawe

Secretary to the Dean

Subject MATH 154-3 and Math 155-3
CALENDAR CHANGES

Date October 20, 1977

At its meeting of October 18, 1977, the Faculty of Science Undergraduate Curriculum Committee approved the following changes to the Mathematics entry in the Undergraduate Calendar:

MATH 154-3: reads at present 'The logarithmic, trigonometric, and exponential function. Limits and continuity. The derivative and techniques of differentiation. Maxima, minima, the mean value theorem. Applications for the Biological Sciences'.

Change approved by the Faculty of Science Undergraduate Curriculum Committee: 'This course is designed for students specializing in the biological and medical sciences. Topics include: limits; growth rate and the derivative; logarithmic, exponential and trigonometric functions and their applications in population study; optimization and approximation methods'.

MATH 155-3: reads at present 'The integral. Techniques of integration. Differential equations. Partial differentiation. Applications to the Biological Sciences'.

Change approved by the Faculty of Science Undergraduate Curriculum Committee: 'The integral and its applications; partial derivatives; differential equations and their applications in ecology; mathematical models of biological processes'.

The Committee noted that there was no change in the syllabus of either MATH 154-3 or MATH 155-3. The purpose of the change in the calendar descriptions is to improve the current calendar descriptions so that they provide a better indication as to the emphasis and nature of the two courses.

The changes in the calendar descriptions of MATH 154-3 and MATH 155-3 are herewith forwarded to the Faculty of Science for further consideration.

/ad

SIMON FRASER UNIVERSITY

MEMORANDUM

To..... H.M. Evans

Secretary, SCUS

Subject..... MATH 161-3: Prerequisite Change

From..... N. Heath

Assistant to the Dean of Science

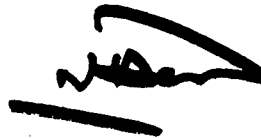
Date..... October 31, 1977

At its meeting of October 28, 1977, the Faculty of Science unanimously passed the following motion:

"That the prerequisite for MATH 161-3 be changed from 'Math 151-3 or 154-3 must precede or be taken concurrently' to 'Math 152-3 or Math 155-3 or Math 158-3 must precede or be taken concurrently'."

The rationale for the proposed change is contained in the attached memorandum dated October 4, 1977.

This motion is herewith submitted to the Senate Committee on Undergraduate Studies for further consideration.



N. Heath

/ad
Attachments

SIMON FRASER UNIVERSITY

MEMORANDUM

Dr. D. Ryeburn

Chairman

Faculty of Science U.G.C.C.

From Dr. N.R. Reilly

Chairman

Mathematics Department

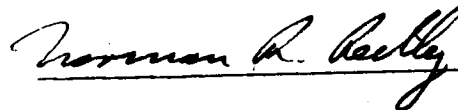
Subject Math 161-3 Prerequisite changes

Date October 4, 1977

The Department of Mathematics wishes to change the prerequisite for Math 161-3, Statics. The current prerequisite for the course reads as follows: "Math 151-3 or 154-3 must precede or be taken concurrently". It is proposed that this prerequisite be changed to:

"Math 152-3 or Math 155-3 or Math 158-3 must precede or be taken concurrently".

It has been the experience of the instructors in this course that those students who are only taking their first calculus course concurrently with this course are inadequately prepared in the very early stages where it is essential to have some familiarity with differentiation. In addition, later parts of the course require a knowledge of definite and indefinite integration and consequently it is essential that students at least take their second calculus course concurrently with Math 161.



N.R. Reilly

NRR/lh

SIMON FRASER UNIVERSITY

MEMORANDUM

To H.M. Evans

Secretary, SCUS

MATH 343-3 and MATH 443-4:

Subject Prerequisite Changes

From N. Heath

Assistant to the Dean of Science

Date October 31, 1977

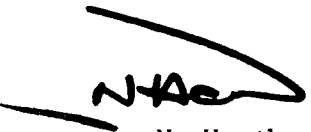
At its meeting of October 28, 1977, the Faculty of Science unanimously passed the following motions:

"That the prerequisite for Math 343-3 be changed from 'Math 232-3 and either knowledge of a programming language or CMPT 103-3 (or 102-2)' to 'Knowledge of PL/1 or Fortran or (with permission of the instructor) Algol or APL, and either MATH 243-3 or CMPT 205-3'."

"That the prerequisite for Math 443-4 be changed from '15 semester hours of mathematics recommended' to 'Math 243-3'."

The rationale for the proposed changes is contained in the attached memorandum dated October 4, 1977.

These motions are herewith submitted to the Senate Committee on Undergraduate Studies for further consideration.



N. Heath

/ad
Attachments

SIMON FRASER UNIVERSITY

MEMORANDUM

Dr. D. Ryeburn
Chairman
Faculty of Science U.G.C.C.
Subject Math 343-3 and 443-4: Prerequisite
Change

From Dr. N.R. Reilly
Chairman
Mathematics Department

Date October 4, 1977

The Department of Mathematics wishes to change the prerequisites for Math 343-3 Combinatorial Aspects of Computing, and Math 443-4 Combinatorial Theory.

The present calendar entry for the prerequisites for Math 343-3 is: "Math 232-3 and either knowledge of a programming language or CMPT 103-3 (or 102-2)".

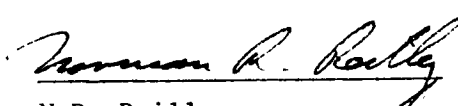
At the Senate meeting on July 4, 1977, along with changes to several courses involving programming language prerequisites, this was changed to: "Math 232-3 and knowledge of PL/1 or FORTRAN, or (with permission of the instructor) ALGOL or APL". However, Math 232-3 was required as a prerequisite in order to ensure that students had sufficient maturity in algebra and not due to any specific need of a knowledge of linear algebra. However, Math 243-3, Discrete Mathematics or Cmpt 205-3, Introduction to Formal Topics in Computing Science, now make excellent prerequisites (Cmpt 205-3 is not presently listed in the calendar but was approved by Senate on Monday, October 3, 1977.)

It is therefore proposed that the prerequisite for Math 343-3 be changed to:

"Knowledge of PL/1 or Fortran or (with permission of the instructor) Algol or APL, and either MATH 243-3 or CMPT 205-3."

The current prerequisite for Math 443-4, Combinatorial Theory reads: 15 semester hours of mathematics recommended. It is proposed that the new prerequisite be Math 243-3.

Once again, when Math 443-4 was introduced there were no appropriate lower level courses that could serve as prerequisites. With the introduction of Math 243-3 this situation has changed and it is now appropriate to introduce Math 243-3 as a prerequisite course.


N.R. Reilly

SIMON FRASER UNIVERSITY

MEMORANDUM

To H.M. Evans

Secretary, SCUS

Subject MATH 371-3: Change in Title

From N. Heath

Assistant to the Dean of Science

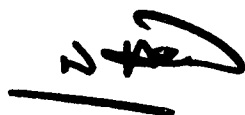
Date October 31, 1977

At its meeting of October 28, 1977, the Faculty of Science unanimously passed the following motion:

"That the title of MATH 371-3 be changed from
'Introduction to Probability' to 'Introduction to
Probability and Statistics'."

The rationale for the proposed change is contained in the attached memorandum dated October 4, 1977.

This motion is herewith submitted to the Senate Committee on Undergraduate Studies for further consideration.



N. Heath

/amd
Attachments

SIMON FRASER UNIVERSITY

MEMORANDUM

Dr. D. Ryeburn
Chairman
Faculty of Science U.G.C.C.

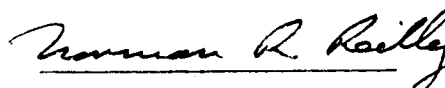
Subject Math 371-3 Change of Title

From Dr. N.R. Reilly
Chairman
Mathematics Department

Date October 4, 1977

The Department of Mathematics wishes to change the title of Math 371-3. It is proposed that the title of this course be changed from "Introduction to Probability" to "Introduction to Probability and Statistics".

The main reasons for this proposal are twofold. On the one hand it is believed that this title is a more accurate reflection of the syllabus for this course. (Note, for instance, that the recommended texts for the course are: Mathematical Statistics by Freund, Introduction to the Theory of Statistics by Mood and Graybill and Probability and Statistics by M. DeGroot). The second reason is that this is the main entry point for students wishing to pursue a course of studies in mathematical statistics and it should therefore have an appropriate label.


N.R. Reilly

NRR/1h

SIMON FRASER UNIVERSITY

MEMORANDUM

To H.M. Evans

Secretary, SCUS

Subject MATH 489-4: Change in calendar
description, title and syllabus

From N. Heath

Assistant to the Dean of Science

Date October 31, 1977

At its meeting of October 28, 1977, the Faculty of Science unanimously approved the following changes with regard to MATH 489-4:

(i) Change in Calendar Description

from: 'Estimation and tests of hypotheses. Correlation, regression, non-parametric tests. Introduction to analysis of variance'

to: 'Estimation and tests of hypotheses. Correlation, regression. Bayesian and sampling theory approaches to inference'.

(ii) Change in title

from: *Mathematical Statistics I*

to: *Mathematical Statistics*

(iii) Change in Syllabus

The proposed new syllabus is attached hereto.

The rationale for these changes is contained in the attached memoranda dated October 3, 1977, September 30, 1977 and October 19, 1977.

These changes are herewith submitted to the Senate Committee on Undergraduate Studies for further consideration.


N. Heath

/ad
Attachments

SIMON FRASER UNIVERSITY

MEMORANDUM

To Dr. D. Ryeburn
Chairman
Faculty of Science U.G.C.C.

From Dr. N.R. Reilly
Chairman
Mathematics Department

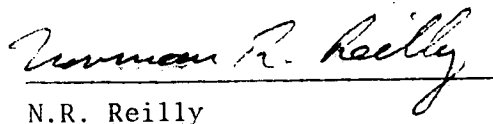
Subject Math 489

Date October 3, 1977

The Department of Mathematics wishes to change the current calendar description and to make some minor changes in the syllabus of Math 489. The present calendar description reads as: "Estimation and tests of hypotheses. Correlation, regression, non-parametric tests. Introduction to analysis of variance.". The proposed new calendar entry would read as follows: "Estimation and tests of hypotheses. Correlation, regression. Bayesian and sampling theory approaches to inference.".

It is felt that this description is a more accurate reflection of the course as it is currently offered. The main item being removed from the syllabus and calendar description is that of non-parametric tests. The previous syllabus was simply overambitious in this respect and in reality very little was done on this topic. In addition, with the introduction of a new course devoted to non-parametric tests there is no longer any need to attempt to touch upon this topic in Math 489.

Due to the accompanying proposed changes in the prerequisites for Math 490, it is felt that this is an appropriate time to change the title of both courses which are presently labelled Mathematics Statistics I and Mathematics Statistics II. It is proposed that the title of Math 490 be changed to Linear Models in Mathematical Statistics and therefore it seems appropriate to change the title of Math 489 from Mathematical Statistics I to Mathematical Statistics.


N.R. Reilly

NRR/1h

SIMON FRASER UNIVERSITY

MEMORANDUM

o Dr. Ryeburn, Chairman
Faculty of Science Undergraduate
Studies Committee

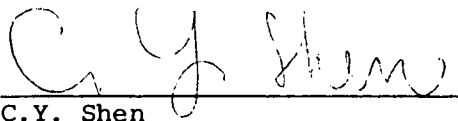
From C.Y. Shen, Chairman
Undergraduate Studies Committee
Mathematics Department

Subject MATH 489-4 and MATH 490-4

Date September 30, 1977

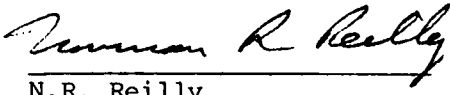
The Mathematics Department wishes to change the prerequisite of Math 490 (Mathematical Statistics II) from "Math 232-3 and Math 489-4 (Mathematical Statistics I)" to "Math 232-3 and Math 371-3". In view of the material covered in Math 489 and 490 they are more like two parallel courses rather than sequential as their names suggest. Originally the requirement of Math 489 was designed to enhance the maturity and sophistication of students entering Math 490 and only to a minor extent for reasons of material covered. Our experience, during recent years, has been that the quality of students entering these courses has improved substantially so that maturity is no longer a problem. The new prerequisite of Math 490 (Math 371 in place of Math 489) is comparable to that of Math 489.

Also, we wish to give new titles and calendar descriptions to these two courses (see accompanying papers). They are designed to provide a better description of the nature of these two courses rather than a change in content.


C.Y. Shen

CYS/dr

These proposals were approved at the meeting of the Department of Mathematics held on Monday, October 3, 1977.


N.R. Reilly

MATHEMATICS 489-4

MATHEMATICAL STATISTICS

1. Joint, marginal and conditional distributions. Transformations of joint distributions.
2. Prior and posterior distributions. Utility and loss functions. Bayesian decision theory.
3. Confidence and likelihood intervals. Bayesian and sampling theory methods for testing hypotheses.
4. Applications of the above methods to comparing means and variances of two normal populations.
5. The method of least squares. Bayesian and sampling theory approaches to regression and correlation.

PREREQUISITE: MATH 253-4 and 371-3

TEXT: Probability and Statistics by M. DeGroot, Addison-Wesley

OR

As noted in textbook list, Mathematics Department

19/10/77

SIMON FRASER UNIVERSITY

MEMORANDUM

To H.M. Evans
Secretary, SCUS
Subject MATH 490-4: Change in Title, Calendar
Description, Prerequisites and
Syllabus

From N. Heath
Assistant to the Dean of Science
Date October 31, 1977

At its meeting of October 28, 1977, the Faculty of Science unanimously approved the following changes with regard to MATH 490-4:

(i) Change in Calendar Description:

from: *'Linear models, analysis of variance and an introduction to the design of experiments'*

to: *'Linear models, analysis of variance and covariance, multiple regression, introduction to the design of experiments'*

(ii) Change in Title

from: *Mathematical Statistics II*

to: *Linear Models in Mathematical Statistics*

(iii) Change in Prerequisites

from: *'Math 232-3 and 489-4'*

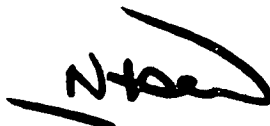
to: *'Math 232-3 and 371-3'.*

(iv) Change in Syllabus

Changes in the syllabus were made at the request of the Faculty of Science Undergraduate Curriculum Committee. The Committee felt that the changes to the syllabus were necessary in order that the syllabus would more accurately reflect the new calendar description. The Faculty of Science agreed to the changes in the syllabus.

The rationale for the changes in calendar description, title, and prerequisites are contained in the attached memoranda dated October 6, 1977 and September 26, 1977.

These changes, as outlined above, are herewith submitted to the Senate Committee on Undergraduate Studies for further consideration.



N. Heath

SIMON FRASER UNIVERSITY

MEMORANDUM

To: Dr. D. Ryeburn Chairman Faculty of Science U.G.C.C.	From: Dr. N.R. Reilly Chairman Mathematics Department
Subject: Math 490 - Change in Title, Calendar Description & Prerequisites	
Date: October 6, 1977	

The Department of Mathematics wishes to change the title of Math 490 from Mathematical Statistics II to

Linear Models in Mathematical Statistics

and to change the calendar description from "linear models, analysis of variance and an introduction to the design of experiments" to

"Linear models, analysis of variance and covariance, multiple regression, introduction to the design of experiments."

This does not involve any change in the syllabus for the course but it is felt that the proposed new title and calendar description are more descriptive of the actual contents on the course.

It is also proposed to change the prerequisite for Math 490 from "Math 232-3 and 489-4" to:

Math 232-3 and 371-3.

The reason for requiring Math 489 as a prerequisite for Math 490 in the past was not based on the need for students in Math 490 to have been exposed to the specific content of Math 489 but rather to ensure that the students had attained a sufficient maturity in mathematics and statistics. From time to time the requirement has been waived and students have been admitted directly from Math 371 without experiencing any obvious disadvantage. As a consequence, it is felt that it is now appropriate to make a change in the prerequisite.

Since Math 253 was a prerequisite for Math 489 it was also therefore a prerequisite for Math 490. However, although it should continue to be a prerequisite for Math 489, it is not considered to be a necessary prerequisite for Math 490. With Math 371 as a prerequisite for Math 490 there is an implied prerequisite of two calculus courses and this is considered to be sufficient preparation for Math 490.

In addition, these changes will allow for greater flexibility in the scheduling of this course and in the planning of students' programmes.


N.R. Reilly

SIMON FRASER UNIVERSITY

MEMORANDUM

To..... Members of the Undergraduate Studies
Committee
..... Mathematics Department

From..... D. Eaves

..... Mathematics Department

Subject..... Math 490-4 Change

Date

26 Sept '77

This change constitutes a removal of 489-4 as a prerequisite of 490-4. 371-3 is already a prerequisite of 489-4. 489-4 has heretofore been a prerequisite of 490-4 largely to enhance the maturity and sophistication of students entering 490-4, and only to a minor extent for reasons of material covered. The quality of students entering these courses has improved substantially, so that maturity is no longer a serious problem.

D M Eaves

D. Eaves

/lh

MATHEMATICS 490-4

Linear Models in Mathematical Statistics

1. The multivariate normal distribution.
2. Distribution theory of quadratic forms in normal variables.
3. The general linear model: matrix formulation.
4. Application of the linear model to analysis of variance: one-way, and two-way crossed and nested models, with distribution theory of the ANOVA table. Tests of appropriate hypotheses. Effects of failure in model assumptions.
5. Applications of the linear model to (a) multiple regression
(b) curvilinear models
including use of orthogonal polynomials
(c) analysis of covariance.
6. Introduction to design of experiments.

PREREQUISITES: MATH 232-3 and 371-3

TEXT: An Introduction to Linear Statistical Models, Vol. I

by Graybill

OR

As noted in the Textbook List, Mathematics Department

Oct. 1977

SIMON FRASER UNIVERSITY

MEMORANDUM

To H.M. Evans

Secretary, SCUS

Subject New Course Proposal: MATH 404-3

From N. Heath

Assistant to the Dean of Science

Date October 31, 1977

At its meeting of October 28, 1977 the Faculty of Science unanimously approved a new course proposal, MATH 404-3 "Statistical Design and Analysis of Experiments".

The budgetary implications of this course are set out in the attached memorandum from Dr. N.R. Reilly dated October 31, 1977.

The proposed course has been circulated for course overlap; to date no replies have been received indicating any overlap.

The proposed course is also being reviewed by Mr. L. Thomas, who has been requested to confirm the statements on the New Course Proposal Form concerning the library collection.

The course proposal is herewith submitted to the Senate Committee on Undergraduate Studies for further consideration.



N. Heath

/ad
Attachments

SIMON FRASER UNIVERSITY

MEMORANDUM

To Dr. D. Ryeburn
Chairman, Faculty of Science
Undergraduate Curriculum Cttee.

Subject Budgetary Implications of MATH 336-0,
337-0, 436-0, 437-0, 404-3 & 480-3.

From Dr. N.R. Reilly
Chairman
Mathematics Department

Date October 31, 1977

The SCUS forms list these courses as having no faculty budgetary implications. MATH 336-0, 337-0, 436-0 and 437-0 replace MATH 450-8. The faculty members now supervising MATH 450-8 will supervise these four Job Practicum courses. No increase in teaching credit is envisaged.

MATH 404-3 (Statistical Design and Analysis of Experiments) and MATH 480-3 (Non-Parametric Statistics) will be taught by present members of the Department specializing in statistics. An additional faculty position in statistics was authorized and filled last year. That appointment provided the necessary manpower to mount these courses and was authorized, in part, with this specific objective in mind.

N.R. Reilly
N.R. Reilly

NRR/1h

OCT 31 1977

SENATE COMMITTEE ON UNDERGRADUATE STUDIESCOURSE PROPOSAL FORMCalendar InformationDepartment: MathematicsAbbreviation Code: MATH Course Number: 404 Credit Hours: 3 Vector: 3-1-0Title of Course: Statistical Design and Analysis of Experiments

Calendar Description of Course: Design of experiments, factorial experiments, block designs and confounding; analysis of variance; analysis of covariance; regression and multiple regression.

Nature of Course Lecture/Tutorial

Prerequisites (or special instructions): Math 302 or Math 371. Permission will be given to students from other departments with suitable backgrounds.

What course (courses), if any, is being dropped from the calendar if this course is approved: None

2. Scheduling

How frequently will the course be offered? Once per year.

Semester in which the course will first be offered? 79-1

Which of your present faculty would be available to make the proposed offering possible: Dr. Stephens, DeJong

Objectives of the Course This course is intended to provide a natural sequel to Mathematics 302-3. It will cover some of the major advanced techniques of applied statistics (most univariate) especially those used in industrial and economic applications.4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas:

Faculty

Staff

Library

Audio Visual

Space

Equipment

None.

5. ApprovalDate: 20th Oct 1977Norman R. Rully
Department Chairman12/11/77
DeanNov. 1/77
DeBrich
Chairman, SCUS

SCUS 73-34b:- (When completing this form, for instructions see Memorandum SCUS 73-34a. Attach course outline).

Statistical Design and Analysis of Experiments

MATH 404-3

1. Brief review of:

- (a) Distribution of random variables, expected values
- (b) Sampling from $N(\mu, \sigma^2)$ with the generation of chi-squared, F and t distribution.
- (c) Two parameter tests with explanation of $H_0 : \mu_1 = \mu_2$ test by t or F, and generalization to one-way ANOVA
- (d) Review of Power and required sample size.

2. Analysis of variance

- (a) One-way analysis (one factor)
- (b) Two or more factors
- (c) Fixed, random and nested models
- (d) Tukey's and Scheffé's tests

3. Analysis of covariance

4. Multiple regression

5. Factorial Experiments

- (a) 2^n models
- (b) Latin squares and Greco-Latin squares
- (c) Conformity
- (d) Fractional designs
- (e) Incomplete block designs
- (f) Response surfaces

PREREQUISITES: Math 302 or Math 371. Permission will be given to students from other departments with suitable backgrounds.

RECOMMENDED TEXT: Dixon & Massey - Introduction to Statistical Analysis
McGraw-Hill

John - Statistical Design & Analysis of Experiments.

OR

As noted in the Mathematics Department's textbook list.

20/10/77

SIMON FRASER UNIVERSITY

MEMORANDUM

To.....	H.M. Evans	From.....	N. Heath
Secretary, SCUS		Assistant to the Dean of Science	
Subject.....	New Course Proposal: MATH 480-3	Date.....	October 31, 1977

At its meeting of October 28, 1977, the Faculty of Science unanimously approved a new course proposal, MATH 480-3 "Non-Parametric Statistics".

The budgetary implications of this course are set out in the attached memorandum from Dr. N.R. Reilly dated October 31, 1977.

The proposed course has been circulated for course overlap; to date no replies have been received indicating any overlap.

The proposed is also being reviewed by Mr. L. Thomas, who has been requested to confirm the statements on the New Course Proposal Form concerning the library collection.

The course proposal is herewith submitted to the Senate Committee on Undergraduate Studies for further consideration.

N. Heath

/ad
Attachments

SIMON FRASER UNIVERSITY

MEMORANDUM

To Dr. D. Ryeburn
Chairman, Faculty of Science
Undergraduate Curriculum Cttee.

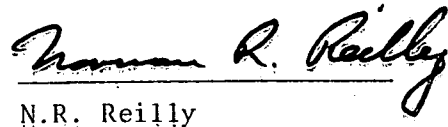
Subject Budgetary Implications of MATH 336-0,
337-0, 436-0, 437-0, 404-3 & 480-3.

From Dr. N.R. Reilly
Chairman
Mathematics Department

Date October 31, 1977

The SCUS forms list these courses as having no faculty budgetary implications. MATH 336-0, 337-0, 436-0 and 437-0 replace MATH 450-8. The faculty members now supervising MATH 450-8 will supervise these four Job Practicum courses. No increase in teaching credit is envisaged.

MATH 404-3 (Statistical Design and Analysis of Experiments) and MATH 480-3 (Non-Parametric Statistics) will be taught by present members of the Department specializing in statistics. An additional faculty position in statistics was authorized and filled last year. That appointment provided the necessary manpower to mount these courses and was authorized, in part, with this specific objective in mind.


N.R. Reilly

NR/1h

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SIMON FRASER UNIVERSITY

MEMORANDUM

Dr. D. Ryeburn
Chairman
Faculty of Science U.G.C.C.

Subject New Course Proposal
Math 480-3

From Dr. N.R. Reilly
Chairman
Mathematics Department

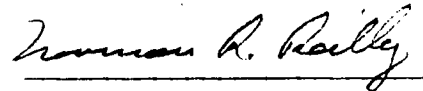
Date October 3, 1977

The Department of Mathematics wishes to introduce a new course as follows:

Math 480-3, Non-Parametric Statistics.

Non-Parametric Statistics is a topic which is a standard part of almost all statistics curricula. Due to inadequate staffing levels in the area of statistics, it has not been possible to offer such a course in the past but we now have sufficient personnel to do so and we would like to include it as part of our regular offerings.

The main objective of the course is to introduce students to statistical tests in situations where no special assumptions are made regarding parent distributions.



N.R. Reilly

NRR/lh

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: MATHEMATICS

Abbreviation Code: MATH Course Number: 480 Credit Hours: 3 Vector: 3-1-0

Title of Course: NON PARAMETRIC STATISTICS

Calendar Description of Course: Non-parametric statistics concerns methods which do not involve special assumptions of parent distributions; tests based on the binomial distribution, contingency tables and chi-squared test; tests for two or more samples based on ranks and rank correlation statistics.

Nature of Course Lecture/Tutorial

Prerequisites (or special instructions): Math 302-3 (with a grade of A or B) or Math 371-3. Permission will be given to students from other departments with suitable backgrounds.

What course (courses), if any, is being dropped from the calendar if this course is approved: None.

2. Scheduling

How frequently will the course be offered? Once per year

Semester in which the course will first be offered? 79-1

Which of your present faculty would be available to make the proposed offering possible? Drs. Stephens, DeJong.

3. Objectives of the Course This is a natural extension of the topics introduced in Math 371-3. Non-parametric statistics offers methods of analysis without using normal theory or theory for any particular distribution. It is a very important area of statistics and essential to a good set of statistics undergraduate courses.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas:

Faculty

Staff

Library

Audio Visual

Space

Equipment

} None

5. Approval

Date: 5th Oct 1977

Norman R. Reilly
Department Chairman

7/15/11/77
Al D. Webster
Dean

15/11/77
DR Birch
Chairman, SCUS

NON-PARAMETRIC STATISTICS

1. PROBABILITY THEORY

- 1.1 Preliminary Remarks
- 1.2 Counting
- 1.3 Probability
- 1.4 Random Variables
- 1.5 Some Properties of Random Variables
- 1.6 Continuous Random Variables

2. STATISTICAL INFERENCE

- 2.1 Populations, Samples and Statistics
- 2.2 Estimation
- 2.3 Hypothesis Testing
- 2.4 Some Properties of Hypothesis Tests
- 2.5 Nonparametric Statistics

3. SOME TESTS BASED ON THE BINOMIAL DISTRIBUTION

- 3.1 The Binomial Test
- 3.2 The Quantile Test
- 3.3 Tolerance Limits
- 3.4 The Sign Test and Some Variations

4. CONTINGENCY TABLES

- 4.1 The 2 x 2 Contingency Table
- 4.2 The r x c Contingency Table
- 4.3 The Median Test
- 4.4 Measures of Dependence
- 4.5 A Goodness of Fit Test
- 4.6 Cochran's Test for Related Observations

5. THE USE OF RANKS

- 5.1 The One-Sample or Match Pairs Case
- 5.2 A Confidence Interval for the Median
- 5.3 Two Independent Samples
- 5.4 A Confidence Interval for the Difference Between Two Means
- 5.5 Measures of Rank Correlation
- 5.6 Several Independent Samples
- 5.7 Several Related Samples
- 5.8 The Balanced Incomplete Block Design
- 5.9 Tests with Efficiency of One or More

6. STATISTICS OF THE KOLMOGOROV-SMIRNOV TYPE

- 6.1 Tests of Goodness of Fit
- 6.2 Tests for Two Independent Samples
- 6.3 Tests for Several Independent Samples

7. SOME MISCELLANEOUS TESTS

- 7.1 Some Quick Tests
- 7.2 A Slippage Test for Several Independent Samples
- 7.3 Tests Based on Runs
- 7.4 Fisher's Method of Randomization

Recommended Text:

Practical Nonparametric Statistics by W.J. Conover,
John Wiley & Sons Inc., New York, London, Sydney,
Toronto

OR:

As noted in the Mathematics Department's textbook list.

Prerequisites: Math 302-3 (with a grade of A or B) or Math 371-3.
Permission will be given to students from other
departments with suitable backgrounds.

29/9/77