

SIMON FRASER UNIVERSITY

S. 82-129

MEMORANDUM

SENATE

From SENATE COMMITTEE ON UNDERGRADUATE STUDIES

Subject MATHEMATICS CHANGES

Date NOVEMBER 17, 1982

Action undertaken by the Senate Committee on Undergraduate Studies at its meeting of November 2, 1982 gives rise to the following motions:-

MOTION 1:

"That Senate approve and recommend approval to the Board of Governors, as set forth in S.82-129, the proposed:

New course - MATH 102-3 - Introduction to Statistics (Algebra 12 required) and changes of course description, prerequisites, and objectives of the course MATH 101-3 - Introduction to Statistics (Algebra 11 required) - with adjustment of various prerequisite statements."

MOTION 2:

"That Senate approve and recommend approval to the Board of Governors, as set forth in S.82-129, the proposed

Joint Honours Program in Mathematics and Computing Science, including

1. Lower Division Requirements
2. Upper Division Requirements
3. Entry and Continuation Requirements"

MOTION 3:

"That Senate approve and recommend approval to the Board of Governors, as set forth in S.82-129, the following changes

- i) Change in Mathematics Major requirements
- ii) Change in course-list requirements to satisfy lower division requirements for Mathematics Major or Honors.
- iii) Change in course-list requirements for optional program - (page 106)"

MOTION 4:

"That Senate approve and recommend approval to the Board of Governors, as set forth in S.82-129, the substantive change of prerequisites for -

- 1) MATH 151-3 - Calculus I
- 2) MATH 154-3 - Calculus for the Biological Sciences
- 3) MATH 157-4 - Calculus for Social Science
- 4) MATH 100-3 - Survey of College Mathematics"

Discussion on this topic was commenced at SCUS and the topic was then deferred pending provision of additional information which was distributed to SCUS and consolidated under "SCUS 82-41, F-82-15 with updates to Nov. 8, 1982" (copies included herewith). Further data was provided under "Appendix I, 8 November 1982" (copy provided). These documents provide data on the present very unsatisfactory situation with clear need for improvement, and also give some indication of the problems which may still arise even with change. They also included the question of "regulatory" provisions versus "strongly advising" procedures. The Committee has adopted the regulatory process.

SIMON FRASER UNIVERSITY

MEMORANDUM

SCUS 82-41
(PART I)

To: H. Evans
Secretary to SENATE
Subject: FACULTY OF SCIENCE
RECOMMENDATIONS TO SCUS

From: P. Dobud
Administrative Assistant
to the Dean of Science

Date: October 20, 1982

I would appreciate it very much if you would place on the Agenda of the next SCUS meeting, for consideration and approval, the following items approved by this Faculty.

- 1. (a) New Course Proposal F-82-10

MATH 102-3, Introduction to Statistics
and

- (b) Changes of Course Description, Prerequisites and Objectives of the Course

MATH 101-3, Introduction to Statistics

NOTE: The approval of the above recommendation implies that in all Mathematics Department calendar entries where MATH 101-3 is now mentioned, it should be replaced by MATH 101-3 or MATH 102-3. This includes prerequisites for MATH 302-3 and 304-3.

- 2. Change of Prerequisites F-82-11

MATH 272-3, Introduction to Probability and Statistics

From: MATH 152-3 or 155-3 or 158-3

To: MATH 152-3, 155-3 or 158-3 must precede or be taken concurrently.

3. Approval of a New _____
F-82-12

4. Change in Mathematics Major Requirements F-82-13

From: Mathematics majors will be required to take at least three 400 division courses, none of which may be Directed Studies or Honors Essay courses.

To: Mathematics majors will be required to take at least three 400 division Mathematics courses, none of which may be Directed Studies or Honors Essay courses.

5. Change in the list of courses which may be used to satisfy the lower division course requirements for Mathematics Major and Honors students

F-82-14(a)

To add: CMPT 101-4, Introduction to Programming Language for Computing Majors/Minors/Honors

To delete: CMPT 105-3, Fundamental Concepts of Computing

6. Change in the listing of required courses in the optional program described in Page 106 of the 1982-83 SFU Calendar

F-82-14(b)

To replace: CMPT 103-4, Introduction to a Programming Language I for Non-Computing Science Majors/Minors/Honors

With: CMPT 101-4, Introduction to a Programming Language for Computing Majors/Minors/Honors

...3/

7. Change of Prerequisites for the following courses F-82-16

(a) MATH 151-3, Calculus I

From: **Prerequisite:** B.C. High School Algebra 12 (or equivalent) or MATH 100-3. Students with other qualifications must consult an advisor in the Department of Mathematics before they may be admitted to the course. Such students may be required to study additional work prior to or concurrent with MATH 151-3.

Students with credit for either MATH 154-3 or 157-3 (or 150-3) may not receive credit for MATH 151-3.

To: **Prerequisite:** B.C. High School Algebra 12 (or equivalent) with a grade of B or higher, or MATH 100-3. Students with a grade of C or C+ in Algebra 12 may not take this course unless they also enroll in MATH 100-3 concurrently, or (preferably) complete MATH 100-3 first. Students with a grade of D or P in Algebra 12 will not be allowed to take this course until MATH 100-3 is successfully completed. Students with credit for either MATH 154-3 or 157-3 (or 150-3) may not receive additional credit for MATH 151-3.

(b) MATH 154-3, Calculus I for the Biological Sciences

From: **Prerequisite:** B.C. High School Algebra 12 (or equivalent) or MATH 100-3. Students with other qualifications must consult an advisor in the Mathematics Department before they may be admitted to the course. Students with credit for either MATH 151-3 or 157-3 (or 150-3) may not receive credit for MATH 154-3.

To: **Prerequisite:** B.C. High School Algebra 12 (or equivalent) with a grade of B or higher, or MATH 100-3. Students with a grade of C or C+ in Algebra 12 may not take this course unless they also enroll in MATH 100-3 concurrently, or (preferably) complete MATH 100-3 first. Students with a grade of D or P in Algebra 12 will not be allowed to take this course until MATH 100-3 is successfully completed. Students with credit for either MATH 151-3 or 157-3 (or 150-3) may not receive additional credit for MATH 154-3.

(c) MATH 157-4, Calculus for Social Sciences I

From: **Prerequisite:** B.C. High School Algebra 12 or MATH 100-3. Students with credit for MATH 150-3 or 151-3 or 154-3 may not receive credit for MATH 157-3.

To: **Prerequisites:** B.C. High School Algebra 12 (or equivalent) with a grade of B or higher, or MATH 100-3. Students with a grade of C or C+ in Algebra 12 may not take this course unless they also enroll in MATH 100-3 concurrently, or (preferably) complete MATH 100-3 first. Students with a grade of D or P in Algebra 12 will not be allowed to take this course until MATH 100-3 is successfully completed. Students with credit for either MATH 151-3 or 154-3 (or 150-3) may not receive additional credit for MATH 157-3.

(d) MATH 100-3, Survey of College Mathematics

From: **Prerequisites:** B.C. High School Algebra 11 or permission of the department. Students with B.C. High School Algebra 12, its equivalent, or any further university level Mathematics courses (with the exception of MATH 190-3 or 191-3), may not normally take this course for credit.

NOTE: Students will not be permitted to register concurrently for MATH 100 and any of MATH 144, 151, 154, 157.

To: **Prerequisites:** B.C. High School Algebra 11 or permission of the Department. This course may not be taken for credit by students who already have credit for any course for which this course (or B.C. High School Algebra 12) is a prerequisite.

NOTE: Students will not be permitted to register concurrently for MATH 100-3 and MATH 144-3. Students with grades of C or C+ in B.C. High School Algebra 12 (or equivalent) intending to take MATH 151-3, 154-3, or 157-3 must take MATH 100-3 concurrently or (preferably) before attempting the Calculus courses. Students with grades of D or P in B.C. High School Algebra 12 (or equivalent) intending to take MATH 151-3, 154-3 or 157-3 must take MATH 100-3 before attempting the Calculus courses.

SIMON FRASER UNIVERSITY

MEMORANDUM

F-82-10

Dr. A.G. Sherwood, Chairman
Undergraduate Curriculum Committee
Faculty of Science
Subject: MATH 101 AND 102

From: Dr. D. Ryeburn, Chairman
Undergraduate Studies Committee
Department of Mathematics
Date: April 29, 1982

The Mathematics Department wishes to propose a new introductory statistics course, MATH 102-3. This course will be very much like the existing MATH 101-3, but will require Algebra 12 (or MATH 100) as a prerequisite rather than Algebra 11, and will have greater emphasis on mathematical notation and on standard statistical formulas than MATH 101-3 has. It must be emphasized that MATH 102-3 is a user's course, not a Mathematical Statistics course, just as MATH 101-3 is. This course has been developed to meet the needs of other departments (particularly Criminology) who have pointed out that, unlike MATH 101-3, PSYC 210-3 has an Algebra 12 (or MATH 100) prerequisite.

In all Mathematics Department calendar entries where MATH 101-3 is now mentioned, it should be replaced by MATH 101-3 or MATH 102-3. This includes prerequisites for MATH 302-3 and MATH 304-3.

We suggest that the Biological Sciences Department consider whether it wishes to replace the MATH 101-3 requirement for its majors and honors students by a MATH 101-3 or MATH 102-3 requirement, or possibly by a MATH 102-3 requirement alone. Likewise the Geography Department should address the same question for the students in its B.Sc. program.

David Ryeburn

DR:nj

Enclosures

c.c. Dr. N.M.G. Bhakthan, Chairman, Undergraduate Curriculum Committee,
Faculty of Interdisciplinary Studies

Dr. M.K. Egan, Chairman, Undergraduate Curriculum Committee,
Faculty of Education

Dr. C.L. Hamilton, Chairman, Undergraduate Curriculum Committee,
Faculty of Arts

Dr. S.H. Verdun-Jones, Chairman, Criminology Department

Dr. H.L. Alexander, Chairman, Undergraduate Curriculum Committee,
Archaeology Department

Dr. R. Harrop, Chairman, Undergraduate Curriculum Committee,
Computing Science Department

Dr. C.L. Kemp, Chairman, Undergraduate Curriculum Committee,
Biological Sciences Department

c.c. Dr. G.A. Rheumer, Chairman, Undergraduate Curriculum Committee,
Geography Department

Dr. V.F. Sacco, Chairman, Undergraduate Curriculum Committee,
Criminology Department

Dr. W. Turnbull, Chairman, Undergraduate Curriculum Committee,
Psychology Department

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

COURSE PROPOSAL FORM

Calendar Information

Department: Mathematics

Abbreviation Code: *MATH Course Number: 101-3 Credit Hours: 3 Vector: 3-0-1

Title of Course: Introduction to Statistics (Algebra 11 required)

Calendar Description of Course: Problems connected with observational studies and design of experiments, descriptive statistics, correlation and regression, sampling, confidence intervals, tests of significance. Emphasis is on understanding statistical concepts.

Nature of Course Lecture/Open Laboratory

Prerequisites (or special instructions): B.C. Algebra 11. Students with B.C. Algebra 12 (or MATH 100) may prefer to take MATH 102-3 instead. Students with credit for ARC. 376-5, ECON 332-3, or MATH 272-3 (formerly MATH 371-3) may not subsequently receive credit for MATH 101-3. ~~Students may not receive credit for both MATH 101-3 and MATH 102-3.~~ What course (courses), if any, is being dropped from the calendar if this course is approved: This course will take the place of MATH 101-3(S), the Social Sciences section of MATH 101-3.

2. Scheduling

How frequently will the course be offered? MATH 101-3 and 102-3 together will be offered as frequently as MATH 101-3 is now offered. The balance between the two courses will be adjusted Semester in which the course will first be offered? Fall 1983 /to match the demand that

Which of your present faculty would be available to make the proposed offering /develops possible: Eaves, Lockhart, Routledge, Stephens, Villegas, Weldon

Objectives of the Course

To allow students with minimal algebraic skills to become familiar with statistical phenomena and to understand the need for the common strategies of properly executed statistical studies.

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. This course replaces certain offerings of the present version of MATH 101-3.

5. Approval

Date: April 26, 1982

Department Chairman

Dean

Chairman, SCUS

INTRODUCTION TO STATISTICS

Aimed at a non-mathematical audience, this course discussed procedures that are most commonly used in the summary of statistical surveys and in the interpretation of experimental data. The rationale of these procedures is explained in detail, but the use of mathematical formulas is kept to a minimum. Students with B.C. Algebra 12 (or MATH 100) may wish to take MATH 102-3 instead.

1. THE DESIGN OF A STATISTICAL STUDY

The two major design types, controlled experiments and observational studies, are discussed, with special emphasis on the limitations of each.

2. DESCRIPTIVE STATISTICS

The following methods of summarizing the information in large data sets are introduced: histograms and other graphs, averages, standard deviations, and the normal approximation.

3. CORRELATION AND REGRESSION

The correlation coefficient is introduced as a measure of the strength of association between two quantities; the regression line, as a graph of averages. Deviations from this line are discussed.

4. PROBABILITY

Methods are presented for computing the probabilities of chance occurrences. The binomial formula is stressed.

5. CHANCE VARIABILITY

Fallacious interpretations of "The Law of Averages" are brought to light, and the predictable patterns that do indeed emerge in repetitions of chance experiments are discussed.

6. SAMPLING

The concept of a sample survey is studied from the design stage through the conduction of the survey to the analysis of the results. Special attention is given to the role of chance errors on the accuracy of the results.

7. CHANCE MODELS AND TESTS OF SIGNIFICANCE

Elementary methods of analyzing the results of controlled experiments and observational studies are presented. Standard t -tests and χ^2 -tests and related confidence intervals are introduced with emphasis on the role of the chance model, and the interpretation of the results.

TEXTBOOK: STATISTICS by David Freedman, Robert Pisani, and Roger Purves, published by W.W. Norton and Company

SENATE COMMITTEE ON UNDERGRADUATE STUDIESCOURSE PROPOSAL FORMCalendar InformationDepartment: MathematicsAbbreviation Code: *MATH Course Number: 102-3 Credit Hours: 3 Vector: 3-0-1Title of Course: Introduction to Statistics (Algebra 12 required)Calendar Description of Course: A course similar to MATH 101-3 but with more emphasis on **statistical** formulas.

Nature of Course Lecture/Open Laboratory

Prerequisites (or special instructions): B.C. Algebra 12 (or MATH 100-3). Students with credit for ARC. 376-5, ECON 332-3, or MATH 272-3 (formerly MATH 371-3) may not subsequently receive credit for MATH 102-3. Students may not receive credit for both MATH 101-3 and MATH 102-3.

What course (courses), if any, is being dropped from the calendar if this course is approved: This course replaces certain sections of MATH 101-3.

2. SchedulingHow frequently will the course be offered? MATH 101-3 and 102-3 together will be offered as frequently as MATH 101-3 is now offered. The balance between the two courses will be adjusted Semester in which the course will first be offered? Fall 1983 /to match the demand that

Which of your present faculty would be available to make the proposed offering. /develops possible: Eaves, Lockhart, Routledge, Stephens, Villegas, Weldon

Objectives of the Course

To gain familiarity with statistical phenomena, to understand the need for the common strategies of properly executed statistical studies, and to learn the mathematical notation for elementary statistical methods.

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. This course replaces certain offerings of the present version of MATH 101-3.

5. ApprovalDate: April 26, 1982_____
Department Chairman_____
Dean_____
Chairman, SCUS

INTRODUCTION TO STATISTICS

Aimed at a non-mathematical audience, this course discussed procedures that are most commonly used in the summary of statistical surveys and in the interpretation of experimental data. The rationale of these procedures is explained in detail. Mathematical theory is not emphasized, but the standard formulas commonly used in applied statistics are introduced.

1. THE DESIGN OF A STATISTICAL STUDY

The two major design types, controlled experiments and observational studies, are discussed, with special emphasis on the limitations of each.

2. DESCRIPTIVE STATISTICS

The following methods of summarizing the information in large data sets are introduced: histograms and other graphs, averages, standard deviations, and the normal approximation.

3. CORRELATION AND REGRESSION

The correlation coefficient is introduced as a measure of the strength of association between two quantities; the regression line, as a graph of averages. Deviations from this line are discussed.

4. PROBABILITY

Methods are presented for computing the probabilities of chance occurrences. The binomial formula is stressed.

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Fallacious interpretations of "The Law of Averages" are brought to light, and the predictable patterns that do indeed emerge in repetitions of chance experiments are discussed.

6. SAMPLING

The concept of a sample survey is studied from the design stage through the conduction of the survey to the analysis of the results. Special attention is given to the role of chance errors on the accuracy of the results.

7. CHANCE MODELS AND TESTS OF SIGNIFICANCE

Elementary methods of analyzing the results of controlled experiments and observational studies are presented. Standard t -tests and χ^2 -tests and related confidence intervals are introduced with emphasis on the role of the chance model, and the interpretation of the results.

8. NOTATION

Symbolic notation for the above procedures.

TEXTBOOK: STATISTICS by David Freedman, Robert Pisani, and Roger Purves, published by W.W. Norton and Company, and Mathematical Methods in Statistics by David Freedman and David Lane published by W.W. Norton and Company.

SIMON FRASER UNIVERSITY

6-82-11

MEMORANDUM

Mr. A.G. Sherwood, Chairman
Undergraduate Curriculum Committee
Faculty of Science

From..... Dr. D. Rychburn, Chairman
Undergraduate Studies Committee
Department of Mathematics

Subject: MATH 272 PREREQUISITE CHANGE

Date..... April 29, 1982

The enclosed Course Proposal Form is self-explanatory. The Calculus II course is adequate as a **corequisite** rather than as a prerequisite, and making it so will allow interested students (particularly Co-op students) to take the MATH 272 course in the second semester of studies.

David Rychburn

DR:nj

Encl. (MATH 272-3 Course Proposal Form)

SIMON FRASER UNIVERSITY

MEMORANDUM

To..... Dr. A.G. Sherwood,
Chemistry Department,
Chairman Faculty of Science.....
Undergraduate Curriculum Committee

From..... Janet Blanchet, Secretary.....
FIDS Undergraduate Curriculum
Committee

Subject...JOINT HONORS... PROGRAM IN
MATHEMATICS & COMPUTING SCIENCE.

Date..... August 6th, 1982

ISC 82-19

The Faculty of Interdisciplinary Studies Undergraduate Curriculum Committee reviewed the above proposal at a meeting held on Tuesday, August 3, 1982. This memorandum is to inform you that members of the Committee gave approval in principle to the proposal, with the understanding that it will be forwarded to your Committee for consideration in the near future.

J. N. Blanchet

Janet Blanchet

cc: Chairman, Mathematics Department
Chairman, Computing Science Department

RECEIVED

AUG 10 1982

REGISTRAR'S OFFICE
MAIL DESK

SIMON FRASER UNIVERSITY

MEMORANDUM

F-82-12

To..... Dr. A.G. Sherwood, Chairman.....
Faculty of Science
..... Undergraduate Curriculum Committee..

From..... Dr. D. Ryeburn, Chairman.....
Undergraduate Studies Committee
..... Mathematics Department.....

Subject..... JOINT HONORS PROGRAM IN MATHEMATICS
AND COMPUTING SCIENCE

Date..... August 2, 1982.....

Enclosed are papers supporting a proposal for a Joint Honors program in Mathematics and Computing Science. The July 28, 1982 memorandum from Dr. R. Harrop needs little to be added by me, except to state that the Mathematics Department has approved the program and supports it very strongly. Dr. Harrop informs me that the program has now been approved in principle by the Faculty of Interdisciplinary Studies. I trust that our committee, and the Faculty of Science, will approve the program soon.



Dr. D. Ryeburn

DR/c11

SIMON FRASER UNIVERSITY

MEMORANDUM

F-82-12

To..... Ms. Janet Blanchet, FIDS

From..... Ronald Harrop

..... Computing Science

Subject..... MATH/COMPUTING SCIENCE HONORS PROGRAM

Date..... August 2, 1982 (M.F.H.)

I attach a copy of proposals for a Joint Honors program in Mathematics and Computing Science which has been approved by the Joint Committee set up for that purpose, by the Undergraduate Committees of Mathematics and Computing Science, and by general meetings of the Departments concerned. The proposed Honors program, which will not be accompanied by a corresponding major program, combines most of the lower division requirements of the Mathematics and Computing Science programs and follows, at upper division, with a structured selection of courses taken from the offerings of the two participating Departments. The resulting degree gives flexibility in some details of satisfaction of requirements while ensuring that recipients, as well as having attained a grade point average appropriate for an Honors degree have also satisfied requirements of breadth and depth in their studies in each of the two disciplines. The content of the level of attainment in each discipline is slightly short of a major (25 upper division hours in each rather than 30) but is such as should enable a student with at most minimal make-up work, to proceed to graduate work in either Department. The combination of the Mathematics and Computing Science courses represents an overall unified content of academic work rather than the juxtaposition of work in two vaguely related separate areas of study.

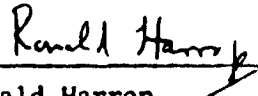
Should a student, by choice or through CGPA dropping somewhat below Honors level, not wish to continue in the program, then transfer to a program involving major/minor in each or both of Mathematics/ Computing Science (or to separate Honors program if the CGPA is satisfactory) would be a reasonable possibility attainable with little or no inconvenience or delay arising from the transfer of program. It should be noted in this regard that not only is no joint major program intended but that none is proposed. If there were one it would amount to a structured double minor and neither Department wishes to support such a joint degree at this time.

It is proposed that the degree, which is to be in the Faculty of Science, shall be administered jointly by the Departments using a Committee with membership from the Departments to act in an advisory capacity. All courses involved in the program are existing ones (MATH, MACM, CMPT). Any changes to the courses in the future are anticipated to be ones which will still use courses (possibly new ones) within those occurring in the program of the participating Departments.

The current membership of the Committee is

Dr. B. Alspach,	Professor of Mathematics
Dr. R. Harrop,	Professor of Mathematics, Professor of Computing Science
Dr. P. Hell,	Associate Professor of Mathematics, Associate Professor of Computing Science
Dr. T. Kameda,	Professor of Computing Science
Dr. R. Lardner,	Professor of Mathematics
Dr. A. Liestman,	Assistant Professor of Computing Science
Dr. R. Russell,	Adjunct Member of Computing Science, Professor of Mathematics
Dr. K. Weldon,	Associate Professor of Mathematics

It is expected that Dr. Harrop will be the initial Faculty Advisor for the program with administration advice being given by Kathy Hammes and Elma Krbavac, the Departmental Assistants of Mathematics and Computing Science respectively.



Ronald Harrop

RH/c11

SIMON FRASER UNIVERSITY

MEMORANDUM

To..... Dr. J. Zaslove, Chairman.....

..... English Department.....

Subject..... Proposed Mathematics/Computing
Science Honours Program.....

From..... Dr. R. Harrop, Chairman.....

..... Undergraduate Curriculum Committee.....

Date..... August 3, 1982 (retyped).....

I wish to confirm a conversation I have had with you over the phone regarding a proposed Mathematics/Computing Science Honours program which contains a "100 division" English course requirement. Students in the program will probably be few in number and I do not expect any who would not otherwise be enrolled in a program involving at least a minor in Computing Science. Hence I cannot see any increase in English enrollment arising because of the existence of the program if approved. You stated to me that you could see no problems arising from your Department due to the proposal.

Ronald Harrop

R. Harrop

RH/dp

cc: Dr. C. Hamilton, Faculty of Arts UCC
History Department

Shiela Roberts, Faculty of Arts UCC
Dean of Arts

A Joint Honors Program in Mathematics and Computing Science is offered by the Departments of Mathematics and Computing Science. Entry into this program requires the permission of both Departments. It is possible for graduates from this program to proceed to graduate work in either Mathematics or Computing Science, though depending upon the particular area of interest of the student, a small amount of additional undergraduate work in either Mathematics or Computing Science may be required. Students interested in this program are strongly recommended to contact Ms. K. Hammes as soon as possible regarding the scheduling of this program.

RH
/ 11882

MATHEMATICS/COMPUTING SCIENCE HONORS PROGRAMLower Division Requirements

- Math 151-3 Calculus I
 152-3 Calculus II
 232-3 Elementary Linear Algebra
 242-3 Introduction to Analysis
 243-3 Discrete Mathematics
 251-3 Calculus III
 272-3 Introduction to Probability and Statistics
- CMPT 101-4 Introduction to a High Level Programming Language
 (for Majors, Minors and Honors)
 105-3 Fundamental Concepts of Computing
 118-3 Computing Projects in the Arts and Sciences
 201-4 Data and Program Organization
 205-3 Introduction to Formal Topics in Computing Science
 260-3 Social Implications of a Computerized Society
 290-3 Introduction to Digital Systems
 or 291-4 Introduction to Digital Circuit Design

A 100-division English course
 or Phil 001-3 In Pursuit of Truth

Note: A student who, in satisfaction of upper division requirements (see below), wishes to use group (d) as one of the two upper division required groups taken from the list (a), (b), (c), (d), must also obtain credit for the Lower Division course Math 252-3 Vector Calculus I.

Upper Division Requirements

- (i) The following courses:
 MACM 316-3 Numerical Analysis I
 CMPT 400-3 Hardware Architecture
 CMPT 405-3 Design and Analysis of Computing Algorithms
- (ii) The required courses in each of two of the groups (a), (b), (c), (d) below and in at least three of the groups (e), (f), (g), (h), (i) below.
- (iii) At least one course taken from one of lists (f), (g), (h), (i) below additional to ones used in the satisfaction of conditions (i), (ii) above and further additional courses as required taken from the lists (a), (b), (c), (d), (e), (f), (g), (h), (i) below to bring the total number of credits in Upper Division MATH courses to at least 25 and the total number of credits in Upper Division CMPT courses to at least 25 where for this purpose credit obtained in MACM courses is divided evenly between MATH and CMPT.
- (iv) Additional courses as required to bring the total number of Upper Division credits to at least 60 and the total number of credits to at least 132.

(a) Statistics

Required

Math 372-3 Mathematical Statistics I
Math 387-3 Introduction to Stochastic Processes
Math 472-3 Linear Models in Statistics

Other Courses

Math 473-3 Non-Parametric Statistics
MACM 360-3 Computation for Statistical Data Processing

(b) Discrete Mathematics

Required

Math 308-3 Linear Programming
and two of the following four courses:

Math 343-3 Combinatorial Aspects of Computing
Math 408-3 Discrete Optimization
Math 443-3 Combinatorial Theory
Math 445-3 Introduction to Graph Theory

(c) Numerical Analysis

Required

Math 310-3 Introduction to Ordinary Differential Equations
Math 416-3 Numerical Analysis II

(d) Applied Mathematics

Required

Math 310-3 Introduction to Ordinary Differential Equations
and two of the following five courses:

Math 314-3 Boundary Value Problems
Math 362-3 Fluid Mechanics I
Math 415-3 Ordinary Differential Equations
Math 418-3 Partial Differential Equations
Math 470-4 Variational Calculus

(e) Theoretical Computing Science

Required

MACM 306-3 Introduction to Automata Theory

Other Courses

MACM 401-3 Switching Theory and Logical Design
MACM 402-3 Automata and Formal Languages

(f) Computer Design and Organization

Required - one of the following six courses

CMPT 390-3 Digital Circuits and Systems
CMPT 391-3 Microcomputer Hardware Workshop
CMPT 392-3 Introduction to Digital Signal Processing
CMPT 491-4 Analogue and Digital Circuits
CMPT 492-3 Microprogramming and Emulation
CMPT 495-3 Digital Systems Design and Specification Lab I
CMPT 496-3 Digital Systems Implementation Laboratory

(g) Software Systems
Required

CMPT 401-3 Software Architecture

Other Courses

CMPT 301-3 System Development Methodology
CMPT 305-3 Computer Simulation and Modeling
CMPT 383-3 Comparative Programming Languages
CMPT 393-4 Systems Software for Minicomputers and Microcompute
CMPT 404-3 Computer System Measurement and Evaluation
CMPT 483-4 Compiler Construction

(h) Information Systems
Required

CMPT 354-3 File and Database Structures

Other Courses

CMPT 302-3 System Development Projects
CMPT 350-3 Information and Public Policy
CMPT 370-3 Information System Design
CMPT 371-3 Data Communications and Networking

(i) Intensive Application

Required-one of the following two courses

CMPT 351-3 Introduction to Computer Graphics
CMPT 410-4 Artificial Intelligence

Other Courses

CMPT 340-3 Computers in Biomedicine
CMPT 380-3 Computational Linguistics
CMPT 451-3 Interactive Graphics and Animation Systems

General Requirements

The program is subject to the general requirements of the Faculty of Science and of the University. Admission to courses and requirements relating to satisfaction of prerequisites are subject to the requirements of the Departments offering the courses. Admission to and continuation in the program is subject to the obtaining of and maintenance of an overall GPA of at least 3.0.

MEMORANDUM

To: Dr. A.G. Sherwood, Chrmn. From: David Ryeburn, Chairman
 UGCC, Faculty of Science UGSC, Mathematics

Re: Majors & Honors Date: September 20, 1982
 Requirements

Recently a very good student applied for graduation with only two 400 division Mathematics courses but with a third 400 division course in another department. He pointed out to us that the calendar requirement for the B.Sc. with a major in Mathematics reads (in part):

Mathematics Majors will be required to take at least three 400 division courses, none of which may be a Directed Studies or Honors Essay course.

In contrast, the requirement for the B.Sc. with honors in Mathematics reads (in part);

Mathematics Honors students will be required to take at least five 400 division Mathematics courses, none of which may be a Directed Studies or Honors Essay course.

When these requirements were added (1977), the intent was for the three (or five) courses to be in Mathematics. Interestingly enough, the B.A. requirements for both majors and honors students specify that the courses must be Mathematics courses.

The Mathematics Department would like to see this error rectified in the 1983-84 calendar, by inserting the word Mathematics between the words division and courses, in the B.Sc. major requirements. A careful reading of pages 178 and 487 of the 1981-1982 calendar (before the existence of MACM courses) and of pages 51 and 106 of the 1982-1983 calendar discloses that the 30 (or 50) hours must be MATH (1981-82), and MATH or MACM (1982-1983) while the three (or five) 400 division courses, when required to be anything, are required to be MATH (either calendar). It can be argued that this editorial change in the Registrar's office, occurring upon the introduction of MACM courses, was incomplete, and that the three (or five) 400 division courses should be MATH or MACM. (MATH 401 and 402 did not suddenly become unacceptable upon being labelled MACM.) If the Registrar's office agrees (and there is reason to believe that it will) then this further change (which would require a matching change in the B.A. requirements, for which there is not enough time) will not be needed.

David Ryeburn

SIMON FRASER UNIVERSITY

F-82-14

MEMORANDUM

To..... Dr. A.G. Sherwood, Chairman
..... Undergraduate Curriculum Committee
..... Faculty of Science

From..... Dr. D. Ryeburn, Chairman
..... Undergraduate Studies Committee
..... Department of Mathematics

Subject..... CMPT COURSES AS LOWER DIVISION
..... MATHEMATICS COURSES

Date..... 21 September 1982

On pages 50 and 106 of the 1982-1983 calendar, CMPT 103 and 105 appear among the courses which may be used to satisfy lower division course requirements for Mathematics majors and honors students. The course CMPT 101 did not exist when this regulation was written. The Mathematics Department wishes to add CMPT 101 to the lists, to retain CMPT 103 on the lists, and to delete CMPT 105 from the lists.

The reason for adding 101 is obvious. The reason for removing 105 is that only three hours additional credit are needed once MATH 151, 152, 232, 242, 251, and 252 are taken, and CMPT 105 cannot be taken until after CMPT 101 or 103 is completed. (Some years ago, CMPT 105 could be taken without taking a programming course first.)

Also the Department recommends that the requirement of CMPT 103 be replaced by the requirement of either CMPT 101 or CMPT 103, in the optional program described in the second column of page 106 of the 1982-1983 calendar.

David Ryeburn

D. Ryeburn

DR/cll

cc: P. Dobud, Administrative Assistant
to Dean of Science

SIMON FRASER UNIVERSITY

MEMORANDUM

APPENDIX I

8 NOVEMBER, 1982

H.M. Evans

Registrar

Subject..... MATH 151, 154, and 157

PREREQUISITES

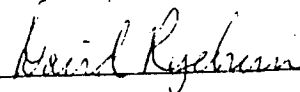
From..... D. Ryeburn, Chairman
Undergraduate Studies Committee
Mathematics Department

Date..... 3 November 1982

Here is our suggested rewording for the prerequisites for these courses.

Prerequisite: MATH 100-3. Students with grades of C or C+ in B.C. Algebra 12 or its equivalent may take the MATH 100-3 course concurrently. Students with grades of B or A in B.C. Algebra 12 or its equivalent are excused from the MATH 100-3 requirement.

as adopted
by SCUS
Nov 9/82.


D. Ryeburn

DR/cll

Registrar's Note: In the discussion held to the end of the November 2 meeting attention was given to the "regulatory" provisions in the papers submitted through Mathematics, and to the possibilities of using a "strongly advising or strongly recommending" approach.

The statement above continues on the "regulatory" approach with some improvement in wording. Mathematics, with support from the Faculty of Science, does not believe that the "strongly advising" approach can be successful or is sufficient.

In the event a "strongly advising" approach were to be utilised a possible wording follows:-

"Prerequisite: B.C. High School Algebra 12 (or equivalent) or MATH 100-3. Students with grades of C or C+ in B.C. Algebra 12 or its equivalent are strongly advised and expected to take the MATH 100-3 course concurrently, as the failure rates of those with lower gradings in Algebra 12 are significantly high. Students with grades of B or A in B.C. Algebra 12 or its equivalent are excused from MATH 100-3."

Attention is drawn to the data which has been made available. Apparently some 25% of the students who obtain grades of C or C+ in Algebra 12 are successful in the calculus course; some 75% are not successful. The submission of June 11 from Analytical Studies indicates "It is clear from the data that successful completion of MATH 100 is not a good basis for assuming successful completion of calculus." The submission from Mathematics dated July 21, 1982 indicates "While a C in MATH 100 is no guarantee of success in calculus, students with C grades from MATH 100 who complete a Calculus I course are about twice as likely to complete it successfully as are students with C grades in Algebra 12."

SIMON FRASER UNIVERSITY

MEMORANDUM

SCUS 82-41
F.82-15
with updates to
Nov. 8, 1982

To..... SENATE COMMITTEE ON UNDERGRADUATE STUDIES

From..... H. M. EVANS, SECRETARY

..... SENATE COMMITTEE OF UNDERGRADUATE STUDIES

..... MEETING - TUESDAY, NOVEMBER 9, 1982

Subject..... AGENDA ITEM 3 a) - FACULTY OF SCIENCE
..... MATHEMATICS CHANGES - SCUS 82-41 (F.82-15)

Date..... Nov 8, 1982

Discussion on the above-mentioned item commenced at the SCUS meeting of November 2, 1982. It was agreed that the item was to be carried forward for this next meeting. Additional data was to be provided.

For convenience a consolidated package is now distributed to you. It consists of the following items:-

1. F.82-15 which contains a memorandum dated July 21, 1982 Ryeburn/Sherwood. It also contains data on MATH 151-3, 154-3, 157-3, 100-3. As part of that data it contains the suggested change in prerequisite wording, as originally submitted by the Mathematics Department.
2. For information - a copy of the extract from the 1982-83 Calendar covering MATH 100-3, 151-3, 154-3, 157-3.
3. A memorandum dated 3 November, 1982 Ryeburn/Evans. This contains a suggested rewording for the prerequisites, significantly different from the 1981-82 Calendar and paralleling the recent recommendations.
4. A memorandum dated November 8, 1982 Chase/Evans providing information on "mean grades" and "drop rates" in selecting first year undergraduate courses.
5. Information provided earlier by Analytical Studies to Mathematics relative to high school grades in mathematics/SFU grades in mathematics, and SFU MATH 100 grades/calculus grades.

At the last meeting D. Ryeburn indicated that on Friday, November 6 he would be attending a meeting of the Mathematics Articulation groups involving a number of other institutions and representatives. He has informed me that at that meeting there was indication of a number of colleges showing concern about these types of problems and that a number would attempt to improve the situation through the "strongly recommending" procedures. Apparently neither UBC nor U.Vic were sufficiently concerned to be initiating any particular actions on a broad basis. There apparently was some interest in the approach being contemplated by Simon Fraser but I understand that there was not indication that other institutions were preparing to follow suit.

I expect that Dr. Ryeburn will be able to speak to this in somewhat greater detail.

SIMON FRASER UNIVERSITY

SC 45 82-41

MEMORANDUM

F-82-15
with updates to

Dr. A.G. Sherwood, Chairman
Undergraduate Curriculum Committee
Faculty of Science
PREREQUISITE CHANGES FOR MATH 151,
154, and 157, AND RESULTING
CHANGES FOR MATH 100

From: Dr. D. Ryeburn, Chairman
Undergraduate Studies Committee
Department of Mathematics

Date: July 21, 1982

Nov 8, 1982

The Mathematics Department has been very concerned about the high drop rates in our three Calculus I courses (MATH 151, 154 and 157), and the low grades received by many students remaining in the courses. The drop rates have increased, and the grades received have become lower, in the last few years. Discussions with our colleagues at other British Columbia universities and colleges have made it clear that exactly the same thing is happening there too, and most of us have come to the conclusion that the weakening of the high school mathematics curriculum several years ago is responsible for much of this.

Since it had been observed elsewhere that few students with C or C+ grades in Algebra 12 were succeeding in Calculus courses, we asked Analytical Studies to investigate whether such students were having trouble with Calculus courses here. The statistics produced by Analytical Studies show that while there are some variations among the three courses MATH 151, 154, and 157, and while there are some variations from year to year over the last few years, two general conclusions may be drawn: (i) A high percentage of students with C or C+ grades in B.C. Algebra 12 who complete MATH 151, 154, or 157 receive grades of D or F in their Calculus courses, and (ii) the percentage has tended to increase as the years have gone by and has become very large by the time we look at students who took Algebra 12 in 1981.

We also asked Analytical Studies to look at Calculus grades versus MATH 100 grades. While a C in MATH 100 is no guarantee of success in Calculus, students with C grades from MATH 100 who complete a Calculus I course are about twice as likely to complete it successfully as are students with C grades in Algebra 12.

All these observations support our desire to change the prerequisites for the Calculus I courses. Instead of allowing students with C or C+ grades in Algebra 12 to take Calculus I with clear entry, as has been the case, we now wish to recommend that such students complete MATH 100 successfully first. However if such a student insists on taking a Calculus I course immediately, we wish to allow that, provided that the student also takes MATH 100 concurrently. (The logic of this is that if the student finds that the Calculus course is too difficult and drops it, at least the MATH 100 course may be continued, and the student is ultimately only one semester behind, not two.) Students with grades of D or P in Algebra 12 would be required to take MATH 100 before Calculus I, not at the same time. (This is no change from the present regulation, but we'd certainly like to see it enforced more carefully. Almost all the students who manage to take a Calculus I course despite a D or P in Algebra 12 do as badly as one would expect.)

A slight change in the MATH 100 calendar entry is needed if the Calculus prerequisites are changed. The prohibition on concurrent registration in MATH 100 and a Calculus I course, in the present calendar, should be removed, as such concurrent registration is to be demanded of those students with C or C+ grades in Algebra 12 who are too much in a hurry to take the MATH 100 course before the Calculus I course. Also the wording of the relationship with Algebra 12 needs to be changed.

David Ryeburn

Dr. D. Ryeburn, Chairman
Undergraduate Studies Committee
Mathematics Department

DR/cll

JUL 23 1987

MATH 151-3

Prerequisite: MATH 100-3. Students with grades of C or C+ in B.C. Algebra 12 or its equivalent may take the MATH 100-3 course concurrently. Students with grades of B or A in B.C. Algebra 12 or its equivalent are excused from the MATH 100-3 requirement. Students with credit for either MATH 154-3 or 157-3 (or 150-3) may not receive additional credit for MATH 151-3.

MATH 154-3

Prerequisite: MATH 100-3. Students with grades of C or C+ in B.C. Algebra 12 or its equivalent may take the MATH 100-3 course concurrently. Students with grades of B or A in B.C. Algebra 12 or its equivalent are excused from the MATH 100-3 requirement. Students with credit for either MATH 151-3 or 157-3 (or 150-3) may not receive additional credit for MATH 154-3.

MATH 157-3

Prerequisite: MATH 100-3. Students with grades of C or C+ in B.C. Algebra 12 or its equivalent may take the MATH 100-3 course concurrently. Students with grades of B or A in B.C. Algebra 12 or its equivalent are excused from the MATH 100-3 requirement. Students with credit for either MATH 151-3 or 154-3 (or 150-3) may not receive additional credit for MATH 157-3.

MATH 100-3

Prerequisites: B.C. High School Algebra 11 or permission of the Department. This course may not be taken for credit by students who already have credit for any course for which this course (or B.C. High School Algebra 12) is a prerequisite.

NOTE:

Students will not be permitted to register concurrently for MATH 100-3 and MATH 144-3. Students with grades of C or C+ in B.C. High School Algebra 12 (or equivalent) intending to take MATH 151-3, 154-3, or 157-3 must take MATH 100-3 concurrently or (preferably) before attempting the Calculus courses. Students with grades of D or P in B.C. High School Algebra 12 (or equivalent) intending to take MATH 151-3, 154-3 or 157-3 must take MATH 100-3 before attempting the Calculus courses.

For Information

See also courses listed under Mathematics/Computing Science (MACM).
Mathematics programs are listed on page 180.

MINIMUM GRADE REQUIREMENT

Students wishing to register for Mathematics courses must have obtained grades of C- or better in prerequisite courses. Students will not normally be permitted to enrol in any MATH course for which a D grade or lower was obtained in any prerequisite.

Courses marked with an asterisk (*) are intended to be particularly accessible to students who are not specializing in Mathematics.

Extract from
1982-83
Calendar

***MATH 100-3 Survey of College Mathematics**

This course is designed for students with relatively weak mathematical backgrounds. It will introduce them to applications of college mathematics and prepare them for MATH 151-3, 154-3 or 157-3. (3-0-1)

Prerequisites: B.C. High School Algebra 11 or permission of the Department. Students with B.C. High School Algebra 12, its equivalent, or any further university level Mathematics courses (with the exception of MATH 190-3 or 191-3), may not normally take this course for credit.

Note: Students will not be permitted to register concurrently for MATH 100 and any of MATH 144, 151, 154, 157.

***MATH 101-3 Introduction to Statistics**

An introductory course in random variables and their distributions, estimating and hypothesis testing. (3-0-1)

Students should have a reasonable degree of facility with the algebraic techniques covered up to and including B.C. High School Grade 11.

Students with credit for ARC 376-5, BUEC 332-3 or MATH 272-3 (formerly MATH 371-3) may not subsequently receive credit for MATH 101-3.

MATH 144-3 Introduction to Pure Mathematics

The fundamental notions of modern Pure Mathematics (logic, sets, functions, relations, etc.) are presented, and are applied in an investigation of the "counting numbers" 1, 2, 3, ... as an abstract axiomatic system. Other applications as time permits. (3-1-0)

Prerequisites: B.C. High School Algebra 12; or MATH 100-3, or permission of the Department.

Students with credit for MATH 141-2 may not receive credit for MATH 144-3.

MATH 151-3 Calculus I

Real number, functions and graphs, conic sections, limits and continuity, derivatives, techniques and applications of differentiation, trigonometric functions, logarithms and exponentials, extrema, the mean value theorem. (3-1-0)

Prerequisite: B.C. High School Algebra 12 (or equivalent) or MATH 100-3.

Students with other qualifications must consult an adviser in the Department of Mathematics before they may be admitted to the course. Such students may be required to study additional work prior to or concurrent with MATH 151-3.

Students with credit for either MATH 154-3 or 157-3 (or 150-3) may not receive credit for MATH 151-3.

MATH 152-3 Calculus II

Integrals, techniques and applications of integration, approximations, sequences and series. (3-1-0)

Prerequisite: MATH 151-3 or 154-3; or MATH 157-3 (or 150-3) with a grade of A or B.

Students with credit for MATH 155-3 or 158-3 may not receive credit for 152-3

***MATH 154-3 Calculus I for the Biological Sciences**

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. (3-1-0)

Prerequisite: B.C. High School Algebra 12 (or equivalent) or MATH 100-3. Students with other qualifications must consult an adviser in the Mathematics Department before they may be admitted to the course.

Students with credit for either MATH 151-3 or 157-3 (or 150-3) may not receive credit for MATH 154-3.

***MATH 155-3 Calculus II for the Biological Sciences**

The integral and its applications; partial derivatives; differential equations and their applications in ecology; mathematical models of biological processes. (3-1-0)

Prerequisite: MATH 151-3 or 154-3; or MATH 157-3 (or 150-3) with a grade of A or B.

Students with credit for MATH 152-3 or 158-3 may not receive credit for MATH 155-3.

***MATH 157-3 Calculus for Social Sciences I**

Introduction to those concepts of differential calculus that are of value in the social sciences. (3-0-1)

Prerequisite: B.C. High School Algebra 12 (or equivalent) or MATH 100-3. Student with credit for MATH 150-3 or 151-3 or 154-3 may not receive credit for MATH 157-3.

SIMON FRASER UNIVERSITY

MEMORANDUM

To..... Mr. H. Evans, Secretary SCUS

From..... Dr. John S. Chase, Director

..... Office of Analytical Studies

Subject..... Average grades and drop rates for
select first year courses

Date..... November 8, 1982

At the request of Professor David Ryeburn and yourself, an analysis has been undertaken of mean grades and drop rates in select first year undergraduate courses.

The courses selected reflect those which satisfy one or more of the following criteria:

- a. frequently taken by students in first semester of study, (i.e., no pre-requisites, introduction to .., etc.)
- b. the course is a pre-requisite for further course work in the same discipline.
- c. the course enrolment is sufficiently large to warrant the calculation of mean grades for interdepartmental comparisons.

The mean grade is the average of the grades assigned to students taking that course. The drop rate reflects the attrition in the course from end of third week to end of semester.

1981 Fall semester courses served as the basis for the analysis.

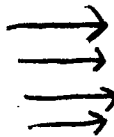
For the information of members of SCUS, the mean grade for all university lower division undergraduate courses in the Fall semester 1981 was 2.64; the corresponding mean grade for upper division courses was 2.81; the attrition rate for all undergraduate courses, lower and upper division, was 13%.

JSC/gma

John Chase

AVERAGE GRADES AND DROP RATES FOR SELECTED FIRST YEAR COURSES; FALL, 1981.

COURSE	MEAN GRADE	DROP RATE
ECON 101	2.06	12%
ENGL 101	2.66	11
ENGL 102	2.72	12
ENGL 103	2.73	11
ENGL 104	2.52	6
GEOG 111	2.15	19
HIST 101	2.42	10
FREN 151	2.71	16
PHIL 110	2.27	11
PSYC 101	2.78	14
S.A. 100	2.91	11
CRIM 101	2.49	19
CMPT 103	2.14	30
CMPT 105	2.55	11
KIN. 100	2.25	15
W.S. 100	2.95	10
BISC 101	2.34	12
BISC 102	2.40	21
CHEM 104	2.17	15
MATH 151	1.73	19
MATH 154	1.85	19
MATH 157	1.76	21
PHYS 101	1.86	21
PHYS 120	2.35	24



SIMON FRASER UNIVERSITY

MEMORANDUM

To D. Rycburn, J. Cochran, J. Munro

From Walter Sudmant

Analytical Studies

Subject Relationship between Math grades
and high school prerequisites.

Date May 17, 1982

The attached tables are an analysis of the relationship between grades in first semester calculus courses at SFU and high school Algebra 12 grades (the prerequisite for calculus courses), controlling for the year of high school graduation.

The data consist of course grades for all students completing one of: MATH 151, MATH 154, MATH 157 along with the grades obtained in Algebra 12 and the year of high school graduation for the years 1978-1981.

Each table shows the distribution of course grades for a given high school grade for a particular course and year. For example, referring to the first table:

- 1) The top of the page shows that this table is for Math 151; year of graduation = 1978.
- 2) The rows of the table correspond to the Algebra 12 grade (1 = 0, 2 = D, 2.5 = C+, 3.0 = B, 4.0 = A). The columns correspond to the grade received in MATH 151.
- 3) The 4 numbers in each cell are: the number in that cell; the row percent, column percent and overall percent occurring in the cell.

eg. The row labelled "3.0" shows that of all students receiving a 3 ("B") grade in Algebra 12, 8.6% received an A in Math 151, 20.4% received a B, etc. (+ and - grades have been collapsed to simplify the table.)

Following the tables for the 4 different graduation years is a table for all years. It should be noted that the data contained in a table for a particular year is not data for any specific class or classes offered in that year, but a collection of all grades achieved by students from a particular graduation year (albeit weighted most heavily by the classes offered immediately after the graduation year), so that year to year changes in the data track changes in high school achievement assuming difficulty and grading in SFU math courses remains constant.

Following are some general observations arising from the tables:

- 1) Students achieve grades in SFU math courses which are substantially lower than their Algebra 12 grades. In most cases the "best guess" (i.e. most probable grade) of SFU math grade is one letter grade below the Algebra 12 grade.
- 2) Students with low Algebra 12 grades have an especially high probability of receiving a D or F in SFU Math. e.g. Of the students with a "C" in Algebra 12 in 1981, 70% received a D or F in Math 154.
- 3) Although no clear trends over the four years are apparent in the data there is some evidence that high school grades are increasing while achievement at SFU declines:

MEAN GRADES BY YEAR OR HIGH SCHOOL GRADUATION

YEAR	1978	1979	1980	1981
<u>Course</u>				
MATH 12	2.8	2.7	2.9	3.0
MATH 151	1.9	2.1	2.0	1.9
MATH 154	2.2	1.8	2.3	1.7
MATH 157	2.3	2.1	2.2	2.0

- 4) The correlation co-efficient (Pearson Corr. Coeff.) between high school grade and university grade ranges from .29 to .68. Predictor equations based on these are available but the probabilities in the attached tables might provide more meaningful information.

(Note: similar analyses of high school prerequisite relationships to Chemistry, Physics and Math 101 will follow.)

Will. L. ...