SIMON FRASER UNIVERSITY

MEMORANDUM

To: Senate

From: Senate Committee on Undergraduate Studies

Subject: Department of Mathematics and Statistics - New Course

Date: November 12, 1986

Action undertaken by the Senate Committee on Undergraduate Studies at its meeting of October 21, 1986 gives rise to the following motion:

MOTION:

That Senate approve and recommend approval to the Board of Governors as set forth in S.86- 79, the proposal to combine the following two courses:

MATH 190-3   Principles of Mathematics for Teachers I; and
MATH 191-3   Principles of Mathematics for Teachers II

into one new course

MATH 190-4   Principles of Mathematics for Teachers."

SIMON FRASER UNIVERSITY

MEMORANDUM

..........Dr. R. SAUNDERS, Chairman...........　　From...GLEN H. GEEN, Dean....................

..........to SCUS....................................　　....FACULTY OF SCIENCE.....................

Subject.....MATH 190-4.............................　　Date....21 October 1986...................

The Department of Mathematics and Statistics is proposing the creation of MATH 190-4 (4-1-0). The course is designed for teachers. The proposal was tabled at the last Faculty of Science meeting. The Mathematics and Statistics Department has now changed the vector to 4-1-0 which Dr. Freedman, Dr. Frindt and I have agreed would now likely be an acceptable format and would likely be approved by the faculty as a whole. Hence I send it forward for SCUS consideration at this time.
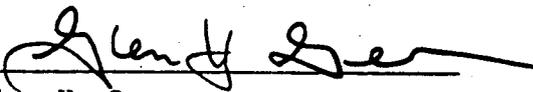
Glen H. Geen

/wy
Encls.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

COURSE PROPOSAL FORM

Calendar Information

Department: MATHEMATICS & STATISTICS

Abbreviation Code: MATH **Course Number:** 190 **Credit Hours:** 4 **Vector:** 4-1-0

Title of Course: Principles of Mathematics for Teachers

Calendar Description of Course:

Mathematical ideas involved in number systems and geometry in the elementary school curriculum. Whole number, fractional number, and rational number systems. Plane geometry, solid geometry, metric geometry, and motion goemetry.

Nature of Course

Prerequisites (or special instructions):

Unchanged

What course (courses), if any, is being dropped from the calendar if this course is approved:

Math 191-3 (3-1-0)

2. Scheduling

How frequently will the course be offered?

Semester in which the course will first be offered?

Which of your present faculty would be available to make the proposed offering possible:

Objectives of the Course

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: 21 October 1986   21 Oct '96

_____   _____   _____
Department Chairman   Dean   Chairman, SCUS

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

Math 190 (4-1-0) Principles of Mathematics for Teachers.
The calendar entry replacing the entries for Math 190, 191 would
be as follows:

"Math 190-4 Principles of Mathematics for Teachers
Mathematical ideas involved in number systems and geometry in
the elementary school curriculum. Whole number, fractional
number, and rational number systems. Plane geometry, solid
geometry, metric geometry, and motion geometry.
                                                    (4-1-0)

Prerequisite: See Entry Level Requirements. Those students who
are currently taking or have received credit for MATH 151 or 154
or 157 (or 150) may not take this course for further credit.
This course may not be counted toward Mathematics Minor, Major
or Honors degree requirements.
Candidates for degrees in the Faculty of Science may not use
this course along with any of MATH 151, 154, 157 for the
satisfaction of degree requirements."

Rationale: Math 190 is mostly taken by students from the
Faculty of Education. Revisions to the B.C. mathematics
curriculum thus necessitate revisions of Math 190 such as
inclusion of geometry from Math 191. The prerequisite for Math
190 stays exactly as is (essentially Algebra 11); to keep the
course number the same is appropriate (compare old course
outlines with new course outline) and convenient (making
redundant statements about duplication of courses).

1.2	1	Sets whole numbers and counting numbers
2.1	1	Addition of whole numbers
2.2	1	Multiplication of whole numbers
2.3	1	Hand calculators and flow charts
3.1	1	Subtraction of whole numbers
3.2	1	Division of whole numbers
4.1	1	Exponents
4.2	2.0	Factorization and primes
5.1	1	Fractional numbers
5.2	1	Equivalence of fractions
5.3	1.5	Simplest form and greatest common factors
5.4	1	Addition and subtraction of fractional numbers
5.5	1	Least common denominators & least common multiples
5.6	0.5	Multiplication and division of fractional numbers
6.1	1	Decimal fractions – addition & subtraction
6.2	1	Multiplication and division of decimals
6.3	1	Repeating decimals
6.4	2.0	Percent
6.5	2.0	Applications of percents
7.1	1	Addition of integers and rationals
7.2	1	Subtraction of integers and rationals
7.3	1	Multiplication and division of integers & rationals
7.4	1	Negative exponents and scientific notation
9.1	2.0	Points, lines and planes
9.2	1	Length and the metric system
9.3	1	Separation
9.4	1	Angles and angle measurement
9.5	1	Simple closed curves and polygons
10.1	1.5	Areas
10.2	1	Polyhedrons and surface areas
10.3	1	Volume
10.4	0.5	Circles, cylinders, cones and spheres
11.1	1	Flips
11.2	1	Slides
11.3	1	Turns
11.4	1	More on angles
12.1	2.0	Congruence of triangles
13.1	1	Functions
13.2	1	Graphs
14.1	1	Probability
14.2	1	Statistics

Prerequisite: B.C. High School Algebra 11 (or equivalent). Students lacking this background may take the non-credit Basic Math Course offered through Continuing Studies, AQ6050. Students with a grade of P in B.C. High School Algebra 11 should take the Math Assessment Test. Those students who are currently taking or have received credit for MATH 151-3 or MATH 154-3 or MATH 157-3 (MATH 150-3) may not take this course for further credit. This course may not be counted towards Mathematics Minor, Major or Honors degree requirements. Candidates for degrees in the Faculty of Science may not use this course for the satisfaction of degree requirements.

Textbook: MATHEMATICS FOR ELEMENTARY SCHOOL TEACHERS, by H. Gerber, published by C.B.S. College Publishers

SIMON FRASER UNIVERSITY

MEMORANDUM

To .... Harvey Gerber ....

Dept of Mathematics & Statistics

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From .... Tom O'Shea ....

....

Subject .... Revised Math 190/191 ....

Date .... 86-01-27 ....

We have examined your proposed revisions to the mathematics
courses that are intended to prepare elementary teachers to teach
mathematics.   The changes are entirely in line with the requirements
of the revised British Columbia mathematics curriculum which will be
implemented in 1986 and phased in over a 3-year period. We are
pleased to see the amalgamation of Math 190 and Math 191 into a
4-credit course. This combination should provide a sound basis
for topics new to the school curriculum, such as transformational
geometry, probability and statistics, and increasing emphasis on
the use of calculators.

We look forward to the introduction of this course as soon
as is practicable.

Sincerely

Tom O'Shea
Faculty of Education

DEPARTMENT OF MATHEMATICS AND STATISTICS

M E M O R A N D U M

TO: Glen Geen   : FROM: A.R. Freedman, Chmn.
        Dean of Science   :   Math. & Stats.
                             :
SUB: MATH 190 - 4   : DATE: Oct. 9, 1986
                             :
                             :

    I have attached a rationale from Dr. H. Gerber for the new course Math 190-4 with the vector (4,1,1). It is true that we would not expect the full funding for TAs which this vector implies according to the "formula" which is used sometimes by your office. On the other hand, we are expecting the same enrolment numbers for the new 190 as we had for the old one. Thus the vector (4,1,0) would imply, by the formula, the same number of TAs as before for MATH 190 alone. But MATH 191 (which had TA funding) is being dropped and absorbed into the new course MATH 190-4 which will have one more lecture than before. This will necessitate the students receiving more assistance than was required for the old 190 and we wish them to spend some of the time in the workshop as well as attend a tutorial. This suggests that MATH 190-4 deserves at least a little additional TA support.

    With the above observations in mind, the department is willing to accept the (4,1,0) vector for the coming year in the hope that the vector and TA allocation mess can be straightened out by the following year. Since this course (i.e. MATH 190-4 (4,1,0)) passed the Faculty of Science UGCC, I hope you can expedite it to Senate without the inconvenience of another faculty meeting.
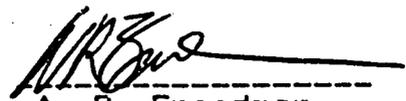
A. R. Freedman

DEPARTMENT OF MATHEMATICS AND STATISTICS

M E M O R A N D U M

TO: Dr. G.H. Geen   : FROM: H. Gerber
     Dean of Science   :   Math. & Stats.
                            :
SUB: **MATH 190**   : DATE: 8 October 1986
                            :
                            :

Dr. Allen Freedman thought that you might be interested in why we want to change Math 190-3, *Principles of Mathematics for Elementary School Teachers I* from a 3 credit course to a 4 credit course, and thereby remove from the calendar offering Math 191-3 *Principles of Mathematics for Elementary School Teachers II.* Before enumerating these reasons, I should state that the suggestion we change the present Math 190-3 course came from the Faculty of Education, in particular from Dr. Tom O'Shea. The curriculum of the proposed Math 190-4 course was formulated with the help of Prof. O'Shea.

The reasons for changing the current 3 credit course to a 4 credit course are as follows:

1) Because of the proposed changes to the elementary school curriculum, the material on geometry which is in Math 191-3 should be available to all of prospective elementary school teachers. Since Math 191-3 is not required by the Education Faculty, that material should appear in Math 190-3.

2) Some of the material on the arithmetic algorithms which we propose to remove from Math 190-3 to make room for goemetry, statistics, and probability, is currently taught in one of the Faculty of Education's methods courses. Moreover, this same material is being downgraded in the proposed changes to the elementary school curriculum.

3) The changing from a 3 credit to a 4 credit course will cause the Faculty of Education no difficulty since most of their offerings are 4 credit courses.

4) You will observe that with the proposed change the Mathematics and Statistics Department will be teaching 190-4

three times a year, for a total of 12 hours. At present we teach Math 190-3 three times a year and Math 191-3 once a year, for a total again of 12 hours. In short, there will be no increase in our Department's load with the proposed change.

The reasons for wanting to use the vector (4-1-1) are also simple to state:

1) The use of both a tutorial and the workshop was tried by Dr. Bernice Kastner one semester and was found to be vastly superior to the use of only the workshop.

2) The students in Math 190-3 currently spend, on the average, 4-6 hours a week working in the workshop. The workshop mainly serves only one aspect of the course — to try to find and describe mathematical patterns. The homework problems assigned take hours of work. The students use the workshop primarily to solve these problems. The other aspect of the course, to explain why the processes of elementary mathematics work, is best handled in a tutorial setting.

3) Finally, with the addition of an extra hour of class the workload becomes extremely difficult to handle without the extra help that the tutorial would provide.

If you want to see a more detailed description of the changes, I will be pleased to submit it.

H. Gerber

HG/bcl