

SIMON FRASER UNIVERSITY

S.79-43

MEMORANDUM

To... Senate

From... Norman R. Reilly, Chairman
Senate Committee on Undergraduate
Studies

Subject... Mathematics: Course Proposals

Date... 1979-04-18

Action taken by the Senate Committee on Undergraduate Studies at its meeting on Tuesday, April 10, 1979 gives rise to the following motion:

MOTION

That Senate approve and recommend approval to the Board of Governors of the following changes in the Mathematics Program as detailed in S79- :

- (1) Change in title, calendar description and prerequisite statement for MATH 190, Principles of Mathematics for Teachers I;
- (2) New course: MATH 191, Principles of Mathematics for Teachers II.

Subject to the approval of Senate and the Board of Governors of the new course MATH 191, the Senate Committee on Undergraduate Studies has approved of the waiver of the time lag requirement in order that this course can be offered in the semester 80-1.

Norman R. Reilly

SIMON FRASER UNIVERSITY

SCUS 79-8

MEMORANDUM

H.M. Evans

Secretary, SCUS

Subject New course proposal and course
revision

From N. Heath

Asst. to Dean of Science

Date 1979 03 28

At the meeting of 1979 03 13, the Faculty of Science approved the following motion,

" That the Faculty of Science approve the new course proposal, MATH 191-3, Principles of Mathematics for Teachers II, and the revision of the course title, calendar description and prerequisite of MATH 190-3, Principles of Mathematics for Teachers I, and forward these to SCUS for consideration and approval."

Supporting documents are attached. A statement from the Library is expected in due course.

nh

RECEIVED

MAR 30 1979

REGISTRAR'S OFFICE
MAIL DESK

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

COURSE PROPOSAL FORM

Calendar Information

Department: MATHEMATICS

Abbreviation Code: MATH Course Number: 191 Credit Hours: 3 Vector: 3-1-0

Title of Course: PRINCIPLES OF MATHEMATICS FOR TEACHERS II

Calendar Description of Course:

The mathematics behind both the concepts and techniques involved in the real number system, plane geometry, solid geometry, metric geometry, and motion geometry. Emphasis will be on those properties of the real numbers and geometry which appear in the elementary school curriculum.

Nature of Course Lecture/Tutorial

Prerequisites (or special instructions). MATH 190-3. Those students who are currently taking or have received credit for MATH 151-3 or MATH 154-3 or 157-3 (or 150-3) cannot take this course for further credit. This course cannot be counted towards Mathematics Major or Honors degree requirements.

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

Candidates for degree in the Faculty of Science may not use this course along with any of MATH 151-3, 154-3, 157-3 (or 150-3) toward the satisfaction of degree requirements.

2. Scheduling

How frequently will the course be offered? Once a year

Semester in which the course will first be offered? Spring 1980

Which of your present faculty would be available to make the proposed offering possible: Dr. Alspach, Gerber and others

Objectives of the Course

The course is a continuation of MATH 190-3. The course is designed to give prospective elementary school (and possible secondary school) teachers background in the theory and applications of arithmetic and geometry that is a usual part of the general grade school curriculum.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas:

Faculty }
Staff }
Library } NONE
Audio Visual }
Space }
Equipment }

NOTE: This course was taught in the Spring Semester 1978 (Math 292-3) and is being taught in the Spring Semester 1979 (Math 292-3) as part of the present faculty load.

5. Approval

Date: Feb. 19, 1979 1979 03 28

Mansoor Singh
Department Chairman

Harvey Broad
Dean

Chairman, SCUS

PRINCIPLES OF MATHEMATICS FOR TEACHERS II

I. Integers and Rational Numbers

- a) Study of the arithmetical operations of the integers and rationals.
- b) Closure.
- c) Applications - e.g. negative exponents and scientific notation.

II. Irrationals and Reals

- a) Proof that the rationals are dense.
- b) Proof that $\sqrt{2}$ is irrational.
- c) Completeness of the reals.
- d) Analysis of techniques for approximating square roots including Newton's method.
- e) Rates of convergence.

III. Plane and Solid Geometry

- a) Combinatorial problems concerning points and lines.
- b) Separation properties.
- c) The Jordan Curve theorem.
- d) Congruence and similarity.
- e) Straight-edge and compass constructions -- why they work.

IV. Metric Geometry

- a) Properties of measurement including the congruence property, the covering property, the additive property and Archimedes' axiom.
- b) Brief discussion of the metric system.
- c) Development of the area and volume formulas for various figures.

V. Motion Geometry

- a) Translations
- b) Reflections
- c) Rotations
- d) Study of various forms of symmetry.

As many of these topics will be covered as time permits. The topics will not necessarily be covered in the order indicated above.

PREREQUISITE. MATH 190-3. Students who are currently taking or have received credit for MATH 151-3 or MATH 154-3 or 157-3 (or 150-3) cannot take this course for credit. This course cannot be counted towards Minor, Major or Honors degree requirements. *Candidates for degrees in the Faculty of Science cannot use MATH 191-3 along with any of MATH 151-3, 154-3, 157-3 (or 150-3) toward satisfaction of degree requirements.*

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

CHANGE OF CALENDAR DESCR., PREREQUISITE AND TITLE ^{445E}

Calendar Information

Department: Mathematics

Abbreviation Code: MATH Course Number: 190 Credit Hours: 3 Vector: 3-1-0

Title of Course: PRINCIPLES OF MATHEMATICS FOR TEACHERS I

Calendar Description of Course:

The mathematics behind both the concepts and techniques involved in the whole number, fractional number, and rational number systems. Emphasis will be on those properties of the number systems which appear in the elementary school curriculum.

Nature of Course Same

Prerequisites (or special instructions): Those students who are currently taking or have received credit for MATH 151-3 or MATH 154-3 or 157-3 (or 150-3) cannot take this course for further credit. This course cannot be counted towards Mathematics Major or Honors degree requirements.

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

Candidates for degrees in the Faculty of Science may not use this course along with any of MATH 151-3, 154-3, 157-3 (or 150-3) toward the satisfaction of degree requirements.

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:

Same as present

Objectives of the Course

Change of course title to coincide with the introduction of the sequential course, MATH 191-3, Principles of Mathematics for Teachers II
There has been a slight modification of the Calendar Description.

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: Feb 19, 1979 1979 03 28

Mansoor Singh Department Chairman A.S. Hunt Acting Dean Chairman, SCUS

SIMON FRASER UNIVERSITY

MEMORANDUM

G.A.C. Graham, Chairman
Undergraduate Studies Committee
Mathematics Department

Subject: MATH 190-3, 290-3, PRINCIPLES OF
MATHEMATICS FOR TEACHERS I, II

From: H. Gerber
Mathematics Department

Date: January 22, 1979

Math 100-3 is a course for those student who have either never taken B.C. Grade 12 mathematics or its equivalent, or have taken Grade 12 math many years ago and have forgotten it. The course is offered to enable those students who enter with only Grade 11 math to make up their deficiencies and prepare them for the Calculus and more difficult courses.

The Math 190-3, 290-3 package covers material from Grades 1 - 8 in a more sophisticated form. The students in this course have already taken Grades 1 - 8. The only prerequisite for this course is University entrance, i.e. Grade 11 math. Therefore neither grade 12 math nor Math 100-3 are prerequisites for the 190-3, 290-3 package. Conversely, neither Math 190-3 nor 290-3 are prerequisites for Math 100-3. In fact, there is absolutely no overlap between these courses.

The reason for restricting enrollment in Math 190-3 and Math 290-3 is based on our experience with the course. When, in the past, we did not restrict enrollment, we found that the Science students could answer the questions we posed easily and perhaps more importantly, in a sophisticated manner. This had the immediate effect of frightening the majority of the students who were planning to enter the PDP program. There are two goals to the Math 190-3, 290-3 package. First we wish to increase the level of understanding of the students for the underlying concepts of the elementary school curriculum. What is perhaps equally important, we want to decrease the anxiety many of these students have towards mathematics and increase their enjoyment of the subject. As mentioned above, the presence of science students in the class was counter-productive. It may be worthwhile to have a course for science majors, and students who are good in mathematics, which covers the material they will need to teach in elementary school. Such a course will, however, be far more demanding.

H. Gerber
H. Gerber

SIMON FRASER UNIVERSITY

MEMORANDUM

Dr. G.A.C. Graham, Chairman
Undergraduate Studies Committee
Mathematics Department

From J.H. Easton, Departmental Assistant
Mathematics Department

Subject: ENROLLMENT DATA
MATH 190-3, 191-3

Date: January 31, 1979

As requested, this memo is to provide you with the enrollment data for previous offerings of the Principles of Mathematics for Teachers courses. The second half of the course sequence was first offered in the academic year 1977-78. Enrollment data for Math 190 is presented for the past five years.

<u>Course</u>	<u>75-1</u>	<u>76-1</u>	<u>76-3</u>	<u>77-3</u>	<u>78-3</u>	<u>78-1</u>	<u>79-1</u>
Math 190-3	43	51	57	102	133		
Math 191-3						28	31

*Offered as a selected topics course (292-3)

Math 190-3 has also been offered regularly at the request of Continuing Studies and the Faculty of Education in previous Inter and Summer sessions. Enrollments for those offerings are as follows:

<u>Course</u>	<u>75-2</u>	<u>76-2</u>	<u>77-2</u>	<u>78-2</u>
Math 190-3	13	52	23	47

JHE/dr


J.H. Easton

SIMON FRASER UNIVERSITY

MEMORANDUM

G.A.C. Graham, Chairman
Undergraduate Studies Committee
Mathematics Department

From Marvin F. Wldeen, Director

Undergraduate Programs

Subject

Date 2nd February, 1979

This is in response to your memorandum of January 26th, regarding Math 290-3,* Principles of Mathematics for Teachers II. I have circulated this proposed course to Professors Trivett and Dawson in our Faculty for their comments. Both were highly supportive of the proposal.

In terms of course overlap, it does not conflict with any course that we offer; rather, it is supportive of what we are attempting to do in our Faculty.

One further comment concerning the way in which the course is offered might be of some use to you. Much of the success of Math 190-3 has been due to the way in which the course has been taught. Not only have students learned a great deal about the mathematics in the elementary school curriculum, but their attitudes toward the subject have been changed in very favourable ways. I would think that the success of Mathematics 290-3* will depend on an approach similar to that used in Mathematics 190.

* Later it was agreed to designate the course MATH 191-3.



MFW:cc

SIMON FRASER UNIVERSITY

MEMORANDUM

To: Dr. M. Wideen, Director
Undergraduate Programs
Faculty of Education


From: G.A.C. Graham, Chairman
Undergraduate Studies Committee
Mathematics Department

Subject:

Date: January 26, 1979

This is to inform you that the Mathematics Department intends shortly to present for approval before the Faculty of Science Undergraduate Curriculum Committee the new course MATH 290-3, Principles of Mathematics for Teachers II (3-1-0) to supplement our current listing MATH 190-3.

If you have any objections or suggestions regarding this course, on the grounds of course overlap or otherwise, would you please let me know. Favourable comment is, of course, also very welcome. Further information is available on request.


G.A.C. Graham

GACG/dr

Encl. Course proposal forms for Math 190-3, 290-3
Syllabus for Math 290-3

cc: N. Heath, Assistant to the Dean of Science

NOTE: MATH 290-3 was later re-designated MATH 191-3.


N. Heath