

FACULTY OF SCIENCE

NEW COURSE PROPOSAL

I CALENDAR INFORMATION

Department: Mathematics

Course Number: 405-4 Title: Theory of
Computability

Sub-title or Description:

Theory of finite automata, sequential machines, recursive functions and computability.

Credit Hours: 4

Vector Description: (4-1-0)

Pre-requisite(s): 5th level standing in Mathematics or permission of the instructor.

II ENROLMENT AND SCHEDULING

Estimated Enrolment: 15 per offering.

Semester Offered (e.g. Yearly, every Spring; twice yearly, Fall and Spring):

Yearly; every Fall

When course will first be offered: Fall 1970

III JUSTIFICATION

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department and from courses in other departments in the University?

The course will include the topics listed in B (below). None of these are taught in lower level courses. The only topic considered elsewhere is that of recursive functions which is introduced in Math 451-3, "Mathematical Logic". However, the treatment there is very brief.

B. What is the range of topics that may be dealt with in the course?

Finite automata, Turing and other sequential machines, Godel numbering, unsolvability, halting problems, the theory of machine memory, algorithms, recursive functions and computability.

- C. How does this course fit the goals of the department?

The Mathematics Department has a substantial number of faculty interested in mathematical logic. It is expected that some of its undergraduates will wish to specialize in this area. The course also complements the present lower level courses in computer science and it would probably be part of a computer science option if one were offered.

- D. How does this course effect degree requirements?

It will not be required for any degree.

- E. What are the calendar changes necessary to reflect the addition of this course?

New entry.

- F. What course, if any, is being dropped from the calendar if this course is approved?

None.

- G. What is the nature of student demand for this course?

Students who intend to do graduate work in logic will probably take this course as preparation for such work. Also many students are interested in computer science and wish to take related material such as this course.

- H. Other reasons for introducing the course.

Several faculty members are anxious to teach such a course.

IV

BUDGETARY AND SPACE FACTORS

- A. Which faculty will be available to teach this course?

Dr. H. Gerber, Dr. R. Harrop, Dr. A. Lachlan and Dr. S. Thomason.

B. What are the special space and/or equipment requirements for this course?

None.

C. Any other budgetary implications of mounting this course:

None.

APPROVAL -

Faculty Undergraduate Curriculum Committee:

MARCH 31, 1970

Faculty:

APRIL 20, 1970

Senate:

SIMON FRASER UNIVERSITY

MEMORANDUM

To Dr. E.M. Shoemaker, Chairman

From Dr. J.S. Barlow

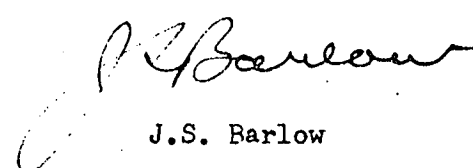
Department of Mathematics

Associate Dean

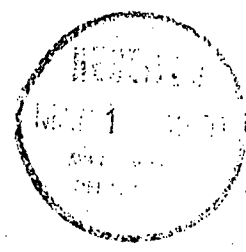
Subject

Date 13 March, 1970

As I pointed out on the phone on Friday, March 13, the introduction of five new courses in Mathematics does have budgetary implications in that some expansion of faculty will be necessary. I understand that the return of Dr. Harrop and the acquisition of a Statistician as presently approved will cover this, but information must be included in the material prepared for presentation to the Faculty and Senate Committees. Therefore, I am returning your submission of March 11, so that this information can be incorporated.



J.S. Barlow



SIMON FRASER UNIVERSITY

MEMORANDUM

To: Dr. J.S. Barlow

Associate Dean of Science

Subject: RE: YOUR MEMO DATED MARCH 13, 1970

From: Dr. E.M. Shoemaker
Acting Head
Mathematics Department

Date: March 17, 1970

Present plans are to offer each course once a year. Twelve of the seventeen hours (sixteen teaching plus one tutorial) will be supplied by the addition to the staff of a Statistician the Department is authorized to hire. Three hours are supplied by dropping Math 424-3 which is not to be offered next year. In addition we are currently reducing the number of graduate courses being offered but of course the exact course to be deleted (if required) cannot be determined until final graduate enrollment.

EMS/ses

SIMON FRASER UNIVERSITY

DEPARTMENT OF MATHEMATICS



BURNABY 2, BRITISH COLUMBIA

Telephone 291-3111 Area code 604

March 11, 1970

Faculty of Science Undergraduate
Curriculum Committee
Simon Fraser University
Burnaby, B.C.



Dear Sirs:

The Mathematics Department proposes to offer the following courses commencing in the 1970-71 academic year:

Math 100-3	Survey of College Mathematics
Math 150-3	Calculus for Social Sciences
Math 180-3	History of Mathematics
Math 190-3	Principles of Mathematics for Teachers
Math 405-4	Theory of Computability

Present plans are to offer each course once in the year. The faculty teaching hours required for these courses have been obtained by reducing the frequency of offering of certain upper level courses in which there is relatively low enrollment.

Three of the above courses (Math 100-3, Math 150-3, Math 190-3) are entirely service courses. Math 100-3 is designed for students with a weak mathematics background. It is intended both as a terminal course for students who do not need more advanced mathematics, and to prepare students who do need more mathematics for other mathematics offerings. Math 150-3 is intended to cover the topics in differential calculus most used by social scientists (particularly economists), and to do so in a manner more appropriate for them than that of the present calculus courses. Math 190-3 is designed for students in the Professional Development Program, particularly those who have weak backgrounds in mathematics but who will be expected to teach mathematics in elementary schools.

The History of Mathematics course (Math 180-3) is expected to provide students with a broad view of mathematics and its relationship to scientific and technological development.

Math 405-4 is a course covering aspects of logic related to computing machines. It is expected to be valuable for pure mathematics students interested in logic and for students interested in computer science.

Yours sincerely,

D. Mallory, Chairman
Mathematics Department
Undergraduate Curriculum Committee

DM/sh