

SIMON FRASER UNIVERSITY

S.80-40

MEMORANDUM

To... Senate

From... Senate Committee on Undergraduate
Studies

Subject... Mathematics-New Course Proposal

Date... 1980-03-27

Action taken by the Senate Committee on Undergraduate Studies at its meeting of March 25, 1980, gives rise to the following motion:

MOTION

That Senate approve and recommend approval to the Board of Governors as set forth in paper S80-40, the proposed new course MATH 445-3 (Introduction to Graph Theory) with adjustment to the syllabus for MATH 443-4 (Combinatorial Theory) to exclude topics on graph theory.

NOTE

MATH 443-4 is currently offered once each year. It and the proposed new course MATH 445-3 will each be offered once every two years. Thus the increase in courses is accommodated by a reduction in the frequency of offering.

Don R. Birch

SIMON FRASER UNIVERSITY

MEMORANDUM

SCUS 80-14

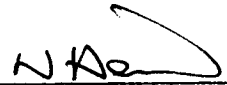
H. M. Evans
Registrar and Secretary
Senate Committee Undergraduate Studies
Subject New Course Proposal MATH 445-3

From N. Heath
Administrative Assistant
Faculty of Science
Date 1980 03 13

Yesterday, the Faculty of Science approved the following motion:

"That the proposed new course MATH 445-3, Introduction to Graph Theory... be approved and forwarded to SCUS & Senate for consideration and approval."

The supporting documentation is attached, together with memoranda relating to the questions of course overlap and library resources.


N. Heath

/rw

att.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

COURSE PROPOSAL FORM

Calendar Information

Department: MATHEMATICS

Abbreviation Code: MATH Course Number: 445 Credit Hours: 3 Vector: 3-0-0

Title of Course: INTRODUCTION TO GRAPH THEORY

Calendar Description of Course:

Connectivity, Eulerian graphs, Hamiltonian graphs, planar graphs, matchings, vertex coloring, and applications of graphs.

Nature of Course LECTURE

Prerequisites (or special instructions): MATH 243-3 or CMPT 205 -3

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 every two years (see attachment)

Semester in which the course will first be offered? SPRING 1981

Which of your present faculty would be available to make the proposed offering possible: B. Alspach and T. Brown

Objectives of the Course

(See attached)

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

MATH 445-3 is to be offered once every two years with Math 443-4, Combinatorial Theory, (which is currently offered once each year) alternating with the same frequency of offering as Math 445-3.

5. Approval

Date: January 28, 1980

17/3/80

MAR 25 '80

Manoufakis
Department Chairman

Dean

Chairman, SCUS

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

INTRODUCTION TO GRAPH THEORY

1. Graphs and subgraphs
Isomorphism, subgraphs, adjacency matrix, paths, cycles and vertex degrees
2. Trees
Cut-vertices, cut-edges and Cayley's formula.
3. Connectivity
Blocks and applications of connectivity.
4. Eulerian graphs
Euler tours, Hamiltonian cycles and applications.
5. Matchings
Matchings, coverings and the assignment problem.
6. Edge and vertex colorings
Chromatic number, Vizing's Theorem, Brook's Theorem and chromatic polynomials.
7. Independence
Independent sets, cliques, Ramsey's Theorem and applications.
8. Planar graphs
Plane and planar graphs, dual graphs, Euler's formula and Kuratowski's Theorem.

PREREQUISITE: MATH 243-3 or CMPT 205-3

SUGGESTED TEXTBOOK: GRAPH THEORY WITH APPLICATIONS
by Bondy and Murty
Published by MacMillan Press

SIMON FRASER UNIVERSITY

MEMORANDUM

o Dr. A. G. Sherwood, Chairman Faculty of Science Undergraduate Curriculum Committee, Department of Chemistry	From G.A.C. Graham, Chairman Undergraduate Studies Committee Department of Mathematics
Subject MATH 445-3, Introduction to Graph Theory (3-0-0)	Date January 29, 1980

At its meeting held on January 28, 1980 the Department of Mathematics approved the introduction of the course

MATH 445-3, Introduction to Graph Theory (3-0-0)
with the proviso that the syllabus for Math 443-4, Combinatorial Theory, be rewritten so as to exclude topics on Graph Theory.

Math 445-3 is to be offered once every two years with Math 443-4 (which is currently offered once each year) alternating with the same frequency of offering as Math 445-3.

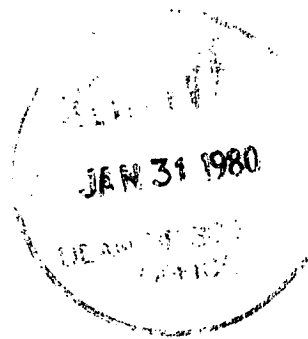
The proposal may now be taken before your committee.

Also, I am taking this opportunity to circulate the new course proposal to the other Faculties for the purposes of course overlap.

G.A.C. Graham
G.A.C. Graham

Encl: Course proposal form and
syllabus for Math 445-3

cc: Dr. E.W. Roberts, Chairman, Faculty of Arts UCC
Dr. M. Wideen, Chairman, Faculty of Education UCC
Dr. J. Dickinson, Chairman, Fids UCC
Mr. Nick Heath, Dean of Science Office ✓
Dr. M. Singh, Chairman, Mathematics



RATIONALE FOR PROPOSED COURSE INTRODUCTION TO GRAPH THEORY

Objectives of the course

There are two principal reasons for proposing this course. The first reason deals with our own graduate program. We now have a graduate level course (Math 820) in graph theory. This is due to the fact that there is considerable interest in our graduate program in discrete mathematics. Last Fall seven students took Math 820 and this Fall twelve students (ten for credit and two audits) are taking Math 820. Last Fall five of the seven students had never had a course in graph theory and of the twelve students this Fall, eleven have never had a course in graph theory. I shall leave it up to the reader's imagination the kinds of problems produced by this situation. It should be rectified.

The second reason deals with the increasing importance of graph theory as a subject worth studying. Basic ideas of the subject are being employed in a variety of other disciplines. It should be pointed out that of the twelve students taking Math 820 this Fall, six are graduate students from Computing Science. This is strong evidence that an undergraduate course in Graph Theory would attract Computing Science students as well as mathematics students.

written by Brian Alspach

Λ
SIMON FRASER UNIVERSITY

MEMORANDUM

U-80-5

o Mr. Larry Thomas
Library
Subject MATH 445-3, Introduction to
Graph Theory (3-0-0)

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

Date January 29, 1980

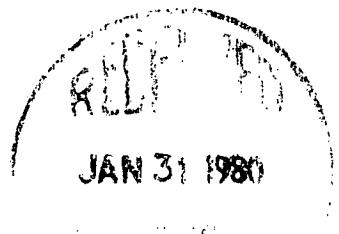
The Department of Mathematics has approved the introduction of the course
MATH 445-3, Introduction to Graph Theory (3-0-0).

This represents the extension to a full course of material that has previously
been partly covered in MATH 443-4, Combinatorial Theory and in future the latter
course will exclude topics in Graph Theory. I believe that the Library resources
are adequate to meet the needs of the new course. Would you please confirm this.
Thank you.

G.A.C. Graham
G.A.C. Graham

Encl: Course proposal form and
syllabus for Math 445-3

cc: Nick Heath, Dean of Science Office ✓



SIMON FRASER UNIVERSITY

U-80-5

MEMORANDUM

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

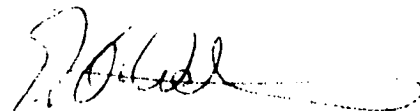
From..... E. A. Weinstein
..... Library - Sciences Division

Subject..... MATH 445-3

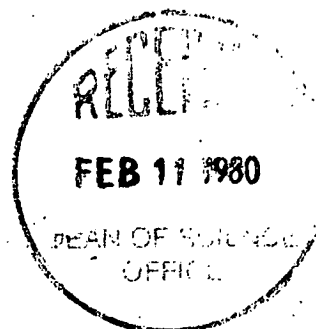
Date..... 80/02/08

This is to confirm that present library resources are
adequate to support the following new course:

MATH 445-3, Introduction to Graph Theory (3-0-0)



ah



MEMORANDUM

To Dr. A. G. Sherwood

From Marvin Wideen, Director
Undergraduate Programs
Faculty of Education

Subject Math 445-3

Date February 18, 1980

This is to indicate that there is no overlap between the course proposal Math 445-3 and any courses offered by the Faculty of Education.

MFW

MFW:kg