SIMON FRASER UNIVERSITY

S.80-40

MEMORANDUM

To...... Senate

From... Senate Commitee 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.

SIMON FRASER UNIVERSITY
MEMORANDUM

H. M. Evans .... | From N. Heath ....

Registrar and Secretary .... : | Administrative Assistant ....
Senate Committee Undergraduate Studies | Faculty of Science
Subject New Course Proposal MATH 445-3 .... | 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.

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 *NONE*
Space
Equipment

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*

MAR 25 '80

_____   _____   _____
Department Chairman   Dean   Chairman, SCUS

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

MATH 445-3

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

10/79

SIMON FRASER UNIVERSITY
MEMORANDUM

To. 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

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
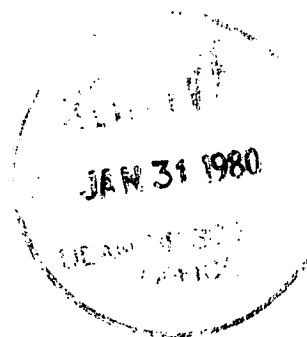
Objectives of the course

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**

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SIMON FRASER UNIVERSITY

MEMORANDUM

o. Mr. Larry Thomas

Library

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

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

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
MEMORANDUM

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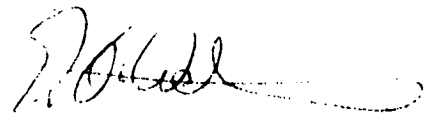
From..........E. A. Weinstein..............

..........Library - Sciences Division..........

Subject.....MATH 445-3..........................
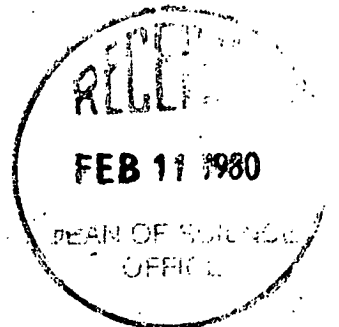
Date..........80/02/08..........................

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)

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MEMORANDUM

To........Dr. A. G. Sherwood................................

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Subject........Math 445-3.................................

From........Marvin Wideen, Director
Undergraduate Programs
Faculty of Education

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.

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