SIMON FRASER UNIVERSITY

MEMORANDUM

To .... SENATE

From .... SENATE GRADUATE STUDIES COMMITTEE

Subject .... 1. CHANGE IN PH.D. REGULATIONS, MATHEMATICS.
2. NEW COURSE PROPOSALS, MATH 820-4, 821-4

Date .... NOVEMBER 15, 1977

MOTION 1: "That Senate approve, and recommend approval to the Board of Governors, as set forth in S.77-170, the change in regulations covering language requirements for the Ph.D. in Mathematics."

MOTION 2: "That Senate approve, and recommend approval to the Board of Governors, as set forth in S.77-170, the new course proposals for
MATH 820-4 - Graph Theory
MATH 821-4 - Combinatorics."

To: Members of Senate.

From: Office of the Dean
of Graduate Studies

Subject: Graduate Calendar Changes

Date: November 15, 1977

The attached Graduate Calendar Changes from the Faculty of

Science were approved by the Senate Graduate Studies Committee

on November 14, 1977, and are now being recommended to Senate

for approval:

    1. Department of Mathematics

B. Clayman
Acting Dean of Graduate Studies

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encls.

SIMON FRASER UNIVERSITY

MEMORANDUM

To **M. McGinn, Secretary**
Senate Graduate Studies Committee

From **J.M. Webster**
Dean of Science

Subject **Mathematics Calendar Entry -**
Ph.D. Language Requirements

Date **September 13, 1977**

At its meeting of July 28, 1977, the Faculty of Science approved a change to the Mathematics graduate calendar entry regarding Ph.D. language requirements.

The following passage in the 1977-78 Graduate Calendar, page 167

"Candidates for the Ph.D. degree will normally be required to demonstrate proficiency in reading mathematical papers in either French, German or Russian. A student may be required by his Supervisory Committee to acquire proficiency in an additional language, not necessarily French, German or Russian which has special relevance for the student's program."
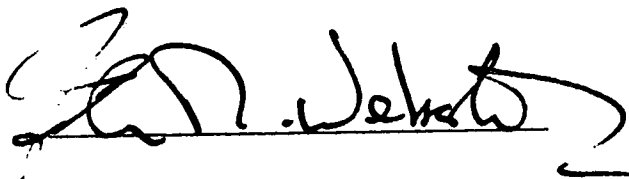
is to be replaced by

"Candidates for the Ph.D. degree may be required by his/her Supervisory Committee to acquire proficiency in reading mathematical papers in French, German or Russian."

RATIONALE

The proposed new policy is not in conflict with the recently approved language requirements for Ph.D. candidates in the Faculty of Science.

The predominance of English in the mathematical literature and the existence of translation services suggest a relaxation of these requirements.
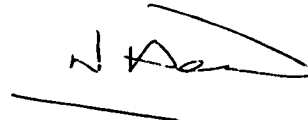
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MAIL DESK

SIMON FRASER UNIVERSITY

MEMORANDUM

To.... Marian McGinn, Secretary	From.... Nick Heath
Senate Graduate Studies Committee	Assistant to the Dean of Science
Subject.... New Course Proposals: MATH 820-4 and MATH 821-4	Date.... November 1, 1977

At its meeting of October 28, 1977, the Faculty of Science unanimously approved the proposals for two new courses, MATH 820-4 "Graph Theory" and MATH 821-4 "Combinatorics". The course proposal forms and supporting documentation are herewith forwarded to the Senate Graduate Studies Committee for further consideration.

N. Heath

/ad
Attachments

SIMON FRASER UNIVERSITY

New Graduate Course Proposal Form

CALENDAR INFORMATION:

Department: Mathematics   Course Number: 820-4

Title: Graph Theory

Description: A first graduate course in graph theory dealing with some of the
following: algebraic graph theory, external graph theory, coloring problems,
applications of graphs, hypergraphs, and current research topics.

Credit Hours: 4   Vector: 4-0-0   Prerequisite(s) if any:_____

ENROLLMENT AND SCHEDULING:

Estimated Enrollment: 2   When will the course first be offered: Fall 1978

How often will the course be offered: When required - not more than once per year.

JUSTIFICATION:

Covering memo.

RESOURCES:

Which Faculty member will normally teach the course: Drs. Alspach or Brown, as available

What are the budgetary implications of mounting the course: None

Number of hours of graduate courses offered each year will remain constant.

Are there sufficient Library resources (append details): Yes

Appended: a) Outline of the Course
           b) An indication of the competence of the Faculty member to give the course.
           c) Library resources

Approved: Departmental Graduate Studies Committee: _C. H. Lachlan_   Date: 11. X. 77

           Faculty Graduate Studies Committee: _____   Date: Nov. 1/77

           Faculty: _____ Date: Nov. 1/77
                                              Acting Dean
           Senate Graduate Studies Committee: _____ Date: 15 Nov 77

           Senate: _____ Date: _____

The course would normally consist of some of the following topics depending on the interest of the instructor and students.

1. Algebraic graph theory
   a) Incidence and adjacency matrices
   b) Eigenvalues of a graph
   c) Coloring problems from an algebraic viewpoint
   d) Automorphism groups of graphs

2. External graph theory
   a) Packing problems
   b) Covering problems
   c) Vertex and edge parameters
   d) Turan's Theorem
   e) Menger's Theorem
   f) Probabilistic methods

3. Coloring problems
   a) Four-color Theorem
   b) Chromatic number and chromatic polynomial

4. Applications of graphs
   a) Scheduling and coloring problems
   b) Graph modeling in the social sciences
   c) Tournaments and ranking problems
   d) Ising problems
   e) Graphical enumeration
   f) Networks and flows

5. Hypergraphs
   a) Uniform hypergraphs
   b) Matchings

6. Current research topics

SIMON FRASER UNIVERSITY

New Graduate Course Proposal Form

CALENDAR INFORMATION:

Department: _____Mathematics_____   Course Number: __821-4__

Title: __Combinatorics__

Description: __Transversal theory, enumeration, Ramsey theory, block designs,__
__and current research topics.__

Credit Hours: ____4____ Vector: __4-0-0__ Prerequisite(s) if any: _____

ENROLLMENT AND SCHEDULING:

Estimated Enrollment: _____ When will the course first be offered: __Spring 1979__

How often will the course be offered: __When required - not more than once per year__

JUSTIFICATION:

covering memo.

RESOURCES:

Which Faculty member will normally teach the course: __Drs. Alspach, Berggren or Brown, as available__

What are the budgetary implications of mounting the course: __None__

Number of hours of graduate courses offered each year will remain constant.

Are there sufficient Library resources (append details): __yes__

Appended: a) Outline of the Course
           b) An indication of the competence of the Faculty member to give the course.
           c) Library resources

Approved: Departmental Graduate Studies Committee: _A. H. Lachlan_ Date: _11. X 77_

Faculty Graduate Studies Committee: _____ Date: _Nov. 1/77_

Faculty: _____ Date: _Nov. 1/77_

Acting Dean

Senate Graduate Studies Committee: _____ Date: _15 Nov 77_

Senate: _____ Date: _____

OUTLINE OF MATHEMATICS 821-4

The course would normally consist of some of the following topics depending on the interest of the instructor and students.

1. Transversal theory
   a) Matchings and complete matchings
   b) Phillip Hall's Theorem
   c) Algorithms

2. Enumeration
   a) Polya's theory
   b) Generating functions
   c) Generalized inclusion-exclusion
   d) Applications of enumeration

3. Ramsey theory
   a) Ramsey's Theorem and generalizations
   b) Van der Waerden's Theorem

4. Block designs
   a) Latin squares
   b) Generalized Room squares
   c) BIBD's
   d) Bruck-Ryser-Chowla Theorem
   c) Hadamard matrices
   d) Regular graphs

5. Current research topics.

It has recently come to my attention that there are two undergraduate students on our campus who concluded there was no graduate level program available in discrete mathematics in our department because there were no graduate courses listed. Since students at other campuses may have reached the same conclusion, it is a problem that should be eliminated.

There certainly is activity at the graduate level in this area. Since the Fall of 1974 there have been four reading courses corresponding to 820, one regularly scheduled course corresponding to 820 (offered as a selected topics in algebra), one regularly scheduled course corresponding to 821, and an active seminar overlapping both courses. In addition, two students have completed their M.Sc.'s in the last three years and three students are currently enrolled in the Ph.D. program in the area of discrete mathematics.

There are sufficient library resources as our library has all the principal books in this area and subscribes to all but one of the important journals relating to discrete mathematics. Drs. Alspach and Brown both have published papers in the areas covered by the two courses. They are currently doing research in these areas as well. Dr. Berggren has published in the general area of combinatorics and has done extensive study in this area as well.