# SIMON FRASER UNIVERSITY S.85-54

## MEMORANDUM

**To:** Senate

**From:** Senate Committee on Undergraduate Studies

**Subject:** Department of Mathematics and Statistics - Calendar Changes

**Date:** November 6, 1985

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Action undertaken by the Senate Committee on Undergraduate Studies at its meeting of October 29, 1985 gives rise to the following motions:

MOTION 1:

"That Senate approve and recommend approval to the Board of Governors, as set forth in S.85-54, the proposed new courses

| | |
|---|---|
| MATH 110-3 | Mathematics for the Social and Management Sciences |
| MATH 161-0 | Honors Supplement for Calculus I |
| MATH 162-0 | Honors Supplement for Calculus II" |

Subject to the approval by Senate and the Board of Governors the Senate Committee on Undergraduate Studies approved waiver of the normal two-semester time lag requirement to permit first offering of these courses in Spring 86-1.

MOTION 2:

"That Senate approve and recommend approval to the Board of Governors, as set forth in S.85-54, the entry level requirements in Mathematics."

**FOR INFORMATION**

Acting under delegated authority at its meeting of October 29, 1985 the Senate Committee on Undergraduate Studies approved -

Change of prerequisites for MATH 190-3

Change of calendar description for MATH 262-4

Change of calendar description and prerequisites for MATH 263-4"

SCUS 85-27

# MEMORANDUM

To: R. Heath
Secretary to Senate

From: P.Dobud, Administrative Assistant to the Dean of Science

Subject: Calendar Changes: Department of MATHEMATICS &STATISTICS

Date: October 16,1985

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Please find attached the documentation related to the following calendar change for the Department of MATHEMATICS AND STATISTICS which were approved by the Faculty of Science meeting held on October 15,1985.

I would appreciate it very much if you would place these items on the agenda of the next SCUS meeting for consideration and approval.

1) Change of prerequisites :MATH 190-3 (PAPER: FSC-85-13)
That the prerequisite for MATH 190-3 be approved as follows:

*From: Prerequisites : Those students who are currently taking or have received credit for MATH 151 or 154 or 157 (or 150) may not take MATH 190 for further credit. This course may not be counted towards Mathematics Minor,Major or Honors degree requirements.Candidates for degrees in the Faculty of Science may not use MATH 191 along with any of MATH 151, 154, 157 (or 150) for the satisfaction of degree requirements.*

To: Prerequisites :B.C. High School Algebra 11 (or equivalent) . Students lacking this background may take the non-credit Basic Math Course offered through Continuing Studies. Students with a grade of P in B.C. High School Algebra 11 should take the Math Assessment Test.
Those students who are currently taking or have received credit for MATH 151 or 154 or 157 (or 150) may not take this course for further credit. This course may not be counted towards Mathematics Minor , Major or Honors degree requirements.
Candidates for degree in the Faculty of Science may not use this course along with any of MATH 151,154,157 (or 150) for the satisfaction of degree requirements.

2) Change of calendar description: a) MATH 262-4 and b) Change of calendar description and prerequisites of MATH 263-4. (PAPER: FSC-85-14)

a)To approve the Calendar description for MATH 262-4, Engineering Mechanics I ,as follows:

*From : Vectors. Reduction of force systems, equipollent systems of forces. Plane statics, free body diagram, trusses ,frames, friction. Statics in space. Beams and cables. Kinematics of particles.*

To : Vectors. Reduction of force systems, equipollent systems of forces. Plane statics, free body diagram, trusses,frames, friction. Statics in space. Beams and cables. Centroids. Second moments of areas.

b) To approve the calendar description and prerequisites of MATH 263-4, Engineering Mechanics II ,as follows:

*From: Centroids. Moments of inertia. Principles of dynamics; work and energy. Newton's laws. Kinematics and kinetics of rigid bodies, plane motion of rigid bodies. (Dynamics of Rigid Bodies is the main topic for this course).*
*Prerequisites : MATH 262; MATH 251 (or 253) must precede or be taken concurrently. Students may not count more than one of MATH 263 or PHYS 212 for credit.*

To: Newton's laws. Moments of inertia. Principles of dynamics; work and energy. Kinematics and kinetics of rigid bodies , plane motion of rigid bodies (Dynamics of rigid bodies is the topic of this course).
Prerequisites : MATH 262 ,MATH 251 (or 253) must precede or be taken concurrently. MATH 262 may be waived with the permission of the Department. Students may not count more than one of MATH 263 or PHYS 212 for credit.

3) New course proposals: a) MATH 110-3 and b) MATH 161-0 and MATH 162-0. (PAPER: FSC-85-15)

a) That the new course MATH 110-3, Introductory Mathematics for the Social and Management Sciences be approved as follows:

MATH 110-3, Mathematics for the Social and Management Sciences
Linear and quadratic functions, sequences and sums, compound interest, exponential and logarithmic functions, counting techniques, probability.
Prerequisites : B.C. High School Algebra 11 (or equivalent). This course may not be taken for credit by students who already have credit for any Mathematics course for which this course (or B.C. High School Algebra 12) is a prerequisite. Students may not count more than one of MATH 100 or MATH 110 for credit. MATH 110 may not be counted towards Mathematics Minor,Major or Honor degree requirements.

b) That the new courses , MATH 161-0 and MATH 162 -0 be approved as follows:

MATH 161-0,Honors Supplement for Calculus I
The class meets one hour each week. Student will spend most of the time working on challenging problems relating to the material of MATH 151, Calculus I.
Prerequisites: Concurrent registration for MATH 151 and a grade of A in Algebra 12. This course will be graded on a Pass/No Entry basis.

MATH 162-0, Honors Supplement for Calculus II
The class meets one hour each week.Student will spend most of the time working on challenging problems relating to the material of MATH 152 , Calculus II.
Prerequisites: Concurrent registration for MATH 152 and a grade of A- or better in MATH 151. This course will be graded on a Pass/No Entry basis.

4) Entry Level Requirements in Mathematics. (PAPER: FSC-85-16)

To approve the following calendar insertion related to the entry level requirement in Mathematics courses:

ENTRY LEVEL REQUIREMENTS IN MATHEMATICS

MATH 100,MATH 101,MATH 110, MATH 113 and MATH 190 all have B.C. High School Algebra 11 (or equivalent) as prerequisite. Students lacking this background may take the non-credit Basic Math Course offered through Continuing Studies. Students with a grade of P in B.C. High School Algebra 11 should take the Math Assessment Test.

The prerequisite for MATH 102 is B.C. High School Algebra 12 (or equivalent), or MATH 100 or MATH 110. Students with a grade of P in B.C. High School Algebra 12 should take the Math Assessment Test.

The prerequisite for MATH 144 is B.C. High School Algebra 12 (or equivalent) or MATH 100.

MATH 151 and MATH 154 have as prerequisite B.C. High School Algebra 12 (or equivalent ) with a grade of at least B (** ) or MATH 100 (not MATH 110).

MATH157 prerequisite is B.C. High School Algebra 12 (or equivalent) with a grade of at least B (**), or MATH 100 or MATH 110.

Students who are unsure of their level of preparation are encouraged to take the free Math Assessment Test at the Basic Math Lab, K 9507 ( or the Evening Resource Center P 9310 if the lab is closed).
Courses marked with an asterisk (*) are intended to be particularly accessible to students who are not specializing in Mathematics.

(**)Students with grades C or C+ in B.C. High School Algebra 12 (or equivalent) have the right to register concurrently in MATH 100 or MATH 110 and either MATH 151,154 or 157. However, this is usually unwise, and students are advised to consult with the Department before undertaking such concurrent registration.

(A DRAFT OF THE RESULTING CALENDAR ENTRIES FOR THE COURSES INVOLVED CAN BE FOUND IN THE SUPPORTING DOCUMENTATION).

Thank you.

c.c. Dr. R. Frint, Chairman, Faculty of Science Undergraduate Currilucum Committee.
Dr. G.A.C.Graham,Chairman,Department of Mathematics and Statistics.

# SIMON FRASER UNIVERSITY

## MEMORANDUM

To... R. HEATH
Registrar

From... C. JONES
Acting Dean of Science

Subject... NEW COURSES - MATHEMATICS

Date... NOVEMBER 6, 1985

In the last meeting of SCUS the following new courses

MATH 110-3 INTRODUCTORY MATH FOR THE SOCIAL AND MANAGEMENT SCIENCES
MATH 161-0 HONORS SUPPLEMENT IN CALCULUS I
MATH 162-0 HONORS SUPPLEMENT IN CALCULUS II

were approved. Since the Department wishes to offer these courses in the SPRING Semester 1986 (see attached document), we request that the 8 month lead time to offer new courses be waived.

Sincerely yours,

C. Jones, Acting Dean
of Science

cc: Dr. R. Frindt, Chairman Faculty of Science Undergraduate Curriculum Committee
Dr. C. Graham, Chairman Department of Mathematics and Statistics

/wy

Attachment (1)

# SIMON FRASER UNIVERSITY

## MEMORANDUM

| | |
|---|---|
| To: Dr. G. Geen, Dean<br>Faculty of Science | From: G.A.C. Graham, Chairman<br>Department of Mathematics & Statistics |
| Subject: | Date: 31 October 1985 |

RE: MATH 110-3, INTRODUCTORY MATHEMATICS FOR THE SOCIAL AND MANAGEMENT SCIENCES

MATH 161, 162-0 HONORS SUPPLEMENT IN CALCULUS I, II

/Waiver of normal delay period between approval of a new course by Senate and offering the new course.

These three courses are scheduled to be offered in Spring Semester 1986. In order to facilitate this I request that the normal delay period between approval by Senate and offering the course be waived by Senate. Would you please convey this request to Senate and SCUS.

G.A.C. Graham

GACG/bcl

c.c. Dr. R. Frindt, Chairman, Faculty of Science Undergraduate Curriculum Committee
Dr. E. Pechlaner, Chairman, Undergraduate Studies Committee, Math. & Stats.

# SIMON FRASER UNIVERSITY

FSC-85-13

**MEMORANDUM**

| | |
|---|---|
| To: Dr. R. Frindt, Chairman<br>Faculty of Science UGCC | From: E. Pechlaner<br>Dept. of Mathematics & Statistics |
| Subject: | Date: February 19, 1985 |

The Department of Mathematics and Statistics approved at the Departmental meeting on February 4, 1985 the following item :

1) New prerequisite for MATH 190, Principles of Mathematics for Teachers I

The proposed new prerequisite for MATH 190-3, Principles of Mathematics for Teachers I is: "B.C. High School Algebra 11 or equivalent."

Rationale:

This prerequisite, which was needed all along, closes a loophole for mature students; for all other students B.C. High School Algebra 11 is already part of the admission requirements.

NEW PREREQUISITE

Appendix $B_3$

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

COURSE PROPOSAL FORM

1. Calendar Information

Department: Mathematics and Statisti

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

Prerequisites (or special instructions):

See attached sheet.

What course (courses), if any, is being dropped from the calendar if this course is approved:

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:

3. Objectives of the Course

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

5. Approval

| Date: February 20/85 | 16-10-85 | |
|---|---|---|
| C.A.C. Graham | | |
| Department Chairman | Dean | Chairman, SCUS |

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

# MATH 190-3

Prerequisites:B.C. High School Algebra 11 (or equivalent) . Students lacking this background may take the non-credit Basic Math Course offered through Continuing Studies. Students with a grade of P in B.C. High School Algebra 11 should take the Math Assessment Test.
Those students who are currently taking or have received credit for MATH 151 or 154 or 157 (or 150) may not take this course for further credit. This course may not be counted towards Mathematics Minor , Major or Honors degree requirements.
Candidates for degrees in the Faculty of Science may not use this course along with any of MATH 151,154,157 (or 150) for the satisfaction of degree requirements.

# SIMON FRASER UNIVERSITY

FSC 85-14

**MEMORANDUM**

| | |
|---|---|
| To: Dr. R. Frindt, Chairman<br>Faculty of Science UGCC | From: E. Pechlaner<br>Dept. of Mathematics & Statistics |
| Subject: | Date: February 19, 1985 |

The Department of Mathematics and Statistics approved at the Departmental meeting on February 4, 1985 the following items:

2) a) Change of prerequisite for MATH 263, Engineering Mechanics II.

b) Change of calendar description for MATH 262 and 263, Engineering Mechanics I and II.

2a) We wish to change the prerequisite for MATH 263, Engineering Mechanics II

From: MATH 262; MATH 251 (or 253) must precede or be taken concurrently.

To: MATH 262; MATH 251 (or 253) must precede or be taken concurrently; ~~(Students with a CGPA of at least 2.8 are excused from the MATH 262 requirement).~~ MATH 262 may be waived with the permission of the Department.

Rationale:

Dean of Engineering Science Don George has indicated that it would be useful to remove MATH 262, Engineering Mechanics I, as a prerequisite for MATH 263, Engineering Mechanics II, since this would provide greater flexibility in scheduling for Engineering Science students. Our proposal does so for any student with a CGPA $\geq$ 2.8.

2b) We wish to change the course descriptions for MATH 262 and 263 as follows:

MATH 262 Engineering Mechanics I:

From: Vectors. Reduction of force systems, equipollent systems of forces. Plane statics, free body diagram, trusses, frames, friction. Statics in space. Beams and cables. Kinematics of particles.

To: Vectors. Reduction of force systems, equipollent systems of forces. Plane statics, free body diagram, trusses, frames, friction. Statics in space. Beams and cables. Centroids. Second moments of area.

MATH 263 Engineering Mechanics II:

From: Moments of inertia. Principles of dynamics; work and energy. Newton's laws. Kinematics and kinetics of rigid bodies, plane motion of rigid bodies. (Dynamics of Rigid Bodies is the main topic for this course.)

To: ~~Basic ideas of statics./~~ Newton's Laws. Moments of inertia. Principles of dynamics; work and energy. ~~Newton's law.~~ Kinematics and kinetics of rigid bodies, plane motion of rigid bodies (Dynamics of Rigid Bodies is the ~~main~~ topic for this course).

Rationale:

The material covered over both courses stays essentially the same with some material switched between MATH 262 and 263. The old order was dictated by the desire to delay topics requiring knowledge of integral calculus. This we find is no longer necessary. The new order of topics coincides with the order in the text, makes MATH 262 a course in Statics only, with increased value as a prerequisite for MATH 265, Engineering Mechanics III.

CHANGE OF CALENDAR DESCRIPTION ONLY

Appendix $B_3$

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

COURSE PROPOSAL FORM

1. Calendar Information

Department: Math & Statistics

Abbreviation Code: MATH Course Number: 262 Credit Hours: 4 Vector: 3-2-0

Title of Course: ENGINEERING MECHANICS I

Calendar Description of Course: Vectors. Reduction of force systems, equipollent systems of forces. Plane statics, free body diagram, trusses, frames, friction. Statics in space. Beams and cables. Centroids. Second moments of areas.

Nature of Course

Prerequisites (or special instructions):
MATH 152 (preferrably) or MATH 155 must precede or be taken concurrently; and Physics 120.

What course (courses), if any, is being dropped from the calendar if this course is approved:

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:

3. Objectives of the Course

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

5. Approval

Date: February 20/85 16/10/85

C.A.C. Graham

Department Chairman

Dean

Chairman, SCUS

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

CHANGE OF CALENDAR DESCRIPTION AND PREREQUISITE STATEMENT.

Appendix $B_3$

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

COURSE PROPOSAL FORM

1. Calendar Information

Department: Mathematics & Statistics

Abbreviation Code: MATH Course Number: 263 Credit Hours: 4 Vector: 3-2-0

Title of Course: ENGINEERING MECHANICS II

Calendar Description of Course:

Newton's laws. Moments of inertia. Principles of dynamics; work and energy. Kinematics and kinetics of rigid bodies, plane motion of rigid bodies (Dynamics of Rigid Bodies is the topic for this course.)

Nature of Course

Prerequisites (or special instructions): MATH 262; MATH 251 (or 253) must precede or be taken concurrently. MATH 262 may by waived with the permission of the Department. Students may not count more than one of MATH 263 or PHYS 212 for credit.

What course (courses), if any, is being dropped from the calendar if this course is approved:

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:

3) Objectives of the Course

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

5. Approval Original Signed Feb20/1985

Date: _____ 16/10/85 _____

_____ _____ _____

Department Chairman Dean Chairman, SCUS

Sept26/1985.

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

# SIMON FRASER UNIVERSITY

FSC-85-15 a)

**MEMORANDUM**

| | |
|---|---|
| To: Dr. R. Frindt, Chairman<br>Faculty of Science UGCC | From: E. Pechlaner<br>Dept. of Mathematics & Statistics |
| Subject: | Date: February 19, 1985 |

The Department of Mathematics and Statistics approved at the Departmental meeting on February 4, 1985 the following items:

Proposed new course MATH 110-3, Introductory Mathematics for the Social and Management Sciences, ~~(3-0-1)~~ (3-1-0). For details see enclosed course proposal form.

Rationale:

A course like MATH 110 was requested by the Department of Psychology since Trigonometry (which is part of MATH 100) is of very minor importance in the Social and Management sciences, while some elementary discrete mathematics is quite important. MATH 110 prepares students for most introductory statistics courses and for MATH 157, Calculus for Social Sciences I.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

COURSE PROPOSAL FORM

**Calendar Information**

Department: Mathematics and Statistics

Abbreviation Code: MATH Course Number: 110 Credit Hours: 3 Vector: ~~3-0-1~~ 3-1-0

Title of Course: INTRODUCTORY MATHEMATICS FOR THE SOCIAL AND MANAGEMENT SCIENCES

Calendar Description of Course:

Linear and quadratic functions, sequences and sums, compound interest, exponential and logarithmic functions, counting techniques, probability.

Nature of Course

Prerequisites (or special instructions):

SEE ATTACHED SHEET

What course (courses), if any, is being dropped from the calendar if this course is approved: None, but the frequency of offering of MATH 100 will be reduced.

2. Scheduling

How frequently will the course be offered? Two or three times per year.

Semester in which the course will first be offered? Fall 1986

Which of your present faculty would be available to make the proposed offering possible: All faculty in the Department

Objectives of the Course

To provide the mathematics preparation needed by social and management science students for further mathematics and statistics courses.

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: February 20/85 16-10-85

Department Chairman | Dean | Chairman, SCUS

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

## MATH 110-3

Prerequisites: B.C. High School Algebra 11(or equivalent)
This course may not be taken for credit by students who already have credit for any Mathematics course for which this course (or B.C. High School Algebra 12) is a prerequisite. Students may not count more than one of MATH 100 or MATH 110 for credit.MATH 110 may not be counted towards Mathematics Minor,Major or Honor degree requirements.

Math 110-3

# INTRODUCTORY MATHEMATICS FOR THE SOCIAL AND MANAGEMENT SCIENCES

Prerequisite knowledge assumed: Integer arithmetic; polynomial algebra; exponents and radicals; factoring; algebraic fractions; solution of linear, quadratic, fractional equations; cartesian graphing; graphs of linear equations in two variables.

1. **EQUATIONS AND INEQUALITIES:** sets and intervals; linear and quadratic inequalities in one variable; absolute value; straight lines and linear equations; slope; systems of linear equations; applications.

2. **FUNCTIONS:** terminology and notation; quadratic functions and parabolas; more simple functions; combinations of functions; implicit relations; inverse functions; applications.

3. **EXPONENTIAL AND LOGARITHMIC FUNCTIONS:** graphs; properties; base e; applications.

4. **SEQUENCES AND SUMS:** arithmetic and geometric progressions; compound interest; mathematics of finance; summation notation.

5. **COUNTING AND PROBABILITY:** sample spaces and events; probability; conditional probability; permutations and combinations; binomial probability.

**TEXTBOOK:** MATHEMATICAL ANALYSIS FOR BUSINESS AND ECONOMICS, (2nd edition), by J.C. Arya and R.W. Lardner,
PUB: Prentice-Hall.

**PREREQUISITES:** See Entry Level Requirements. This course may not be taken for credit by students who already have credit for any Mathematics course for which this course (or B.C. High School Algebra 12) is a prerequisite. Students may not count more than one of MATH 100 or MATH 110 for credit. MATH 110 may not be counted towards Mathematics minor, major or honor degree requirements.

III.4.4.2

# SIMON FRASER UNIVERSITY

## MEMORANDUM

**To**....Marion Jacques, Secretary.....
Faculty of Science
....Undergraduate Curriculum Committee.....

**From**....Stan Shapson, Director.....
Undergraduate Programs
....Faculty of Education.....

**Subject**...New Course Proposal: MATH 110-3.....

**Date**....April 2, 1985.....

The proposal for MATH 110-3 has been reviewed by the Undergraduate Programs Committee for the Faculty of Education.

We have no concerns of course overlap.

SS:mc

APR 04 1985

# SIMON FRASER UNIVERSITY

FSC-85-15 b)

**MEMORANDUM**

| | |
|---|---|
| To: Professor R. Frindt, Chairman<br>Faculty of Science UCC | From: E. Pechlaner, Chairman, UGSC<br>Mathematics & Statistics |
| Subject: NEW MATHEMATICS COURSES | Date: June 18, 1985 |

The Department of Mathematics and Statistics at its meeting of June 10, 1985 approved the two new courses:

| | | |
|---|---|---|
| | (0-1-0) | |
| **MATH 161-0** | ~~(0-0-1)~~ | **Honors Supplement for Calculus I** |
| **MATH 162-0** | ~~(0-0-1)~~ | **Honors Supplement for Calculus II** |
| | (0-1-0) | |

which I herewith submit to the faculty committee for approval.

Rationale: Like some other Universities, we want to offer "Honors Calculus" to the brighter students who are eager to learn the material in greater depth and to do more challenging problems. This has been done on an informal basis over the last few semesters; however students would like to get some kind of recognition for the extra work done. To this end we propose an Honors Supplement for Calculus I and II which in synchronicity with Calculus I and II (MATH 151 and 152), in weekly meetings, analyzes and solves more challenging problems and provides a deeper coverage of topics.

Course Outlines:

MATH 161/ **MATH 162**
HONORS SUPPLEMENT FOR CALCULUS I/ **CALCULUS II**

This course is a laboratory course offered each Fall/ **Spring** and meets one hour each week. The purpose of the lab is to cover at a deeper level the topics taught in the differential calculus/ **integral calculus.** Students spend most of each hour working on challenging problems relating to the material of MATH 151 (Calculus I)/ **MATH 152 (Calculus II)** under the lab instructor's guidance. Also members of the faculty give talks regularly, which provide the student with an enriched mathematical experience. The students are expected to continue working on the problems in the Calculus Lab. They are also expected to use and experiment with existing computer software--such as REDUCE and MACSYMA--as well as the system which comes with the textbook, to acquire and increase their intuition for calculus. (Time is specifically scheduled for this purpose). In addition the problems provide the students with enjoyment and valuable experiences. Working on hard problems greatly increases speed and accuracy when doing problems encountered in the students' other subjects.

MATH 161/ **MATH 162** carries no credit. It is graded on a pass (P)/~~withdrawn (W) basis.~~ No Entry basis.

Prerequisite for MATH 161: Concurrent registration for MATH 151 and a grade of A in Algebra 12.

Prerequisite for MATH 162: Concurrent registration for MATH 152 and a grade of A- or better in MATH 151.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

COURSE PROPOSAL FORM

**Calendar Information**

**Department:** Mathematics & Statistics

**Abbreviation Code:** MATH **Course Number:** 162 **Credit Hours:** 0 **Vector:** ~~0-0-1~~ 0-1-0

**Title of Course:** HONORS SUPPLEMENT FOR CALCULUS II

**Calendar Description of Course:**

The class meets one hour each week. Students will spend most of the time working on challenging problems relating to the material in MATH 152, Calculus II.

**Nature of Course** Enrichment course for integral calculus; marked on a PASS/~~WITHDRAWN~~ NO ENTRY basis.

**Prerequisites (or special instructions):**

Concurrent registration for MATH 152 and a grade of A- or better in MATH 151.

**What course (courses), if any, is being dropped from the calendar if this course is approved:**

2. **Scheduling**

**How frequently will the course be offered?** Once a year each Spring.

**Semester in which the course will first be offered?** Spring 8~~7~~ (8~~7~~-1)

**Which of your present faculty would be available to make the proposed offering possible:** Mrs. T. Berggren

3. **Objectives of the Course**

To train the students to analyse and solve more difficult problems relevant to MATH 152 and to provide a deeper coverage of topics taught in the integral calculus.

4. **Budgetary and Space Requirements** (for information only)

**What additional resources will be required in the following areas:**

**Faculty** None

**Staff**

**Library**

**Audio Visual**

**Space**

**Equipment**

5. **Approval**

**Date:** June 18, 1985 16-10-85

G.A.C. Graham — Department Chairman

Dean

Chairman, SCUS

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

# MATH 161

## HONORS SUPPLEMENT FOR CALCULUS I

This course is a ~~laboratory~~ tutorial course offered each Fall and meets one hour each week. The purpose of the lab is to cover at a deeper level the topics taught in the differential calculus. Students spend most of each hour working on challenging problems relating to the material of MATH 151 (Calculus I) under the lab instructor's guidance. Also members of the faculty give talks regularly, which provide the student with an enriched mathematical experience. The students are expected to continue working on the problems in the Calculus Lab and use the existing microcomputer software to acquire and increase their intuition for calculus. (Time is specifically scheduled for this purpose). In addition the problems provide the students with enjoyment and valuable experiences. Working on hard problems greatly increases speed and accuracy when doing problems encountered in the students' other subjects.

MATH 161 carries no credit . It is graded on a pass (P)/~~withdrawn (W) basis.~~ No Entry basis.

Prerequisite: Concurrent registration for MATH 151 and a grade of A in Algebra 12.

Textbook: No text.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

COURSE PROPOSAL FORM

1. **Calendar Information**

Department: Mathematics & Statistics

Abbreviation Code: MATH Course Number: 161 Credit Hours: 0 Vector: ~~0-0-1~~ 0-1-0

Title of Course: HONORS SUPPLEMENT FOR CALCULUS I

**Calendar Description of Course:**

The class meets one hour each week. Students will spend most of the time working on challenging problems relating to the material of MATH 151, Calculus I.

**Nature of Course** Enrichment course for differential calculus; marked on a PASS/~~WITHDRAWN~~ NO ENTRY basis.

**Prerequisites (or special instructions):**

Concurrent registration for MATH 151 and a grade of A in Algebra 12.

**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 a year each Fall

**Semester in which the course will first be offered?** Fall 1986

**Which of your present faculty would be available to make the proposed offering possible:** Mrs. T. Berggren

3. **Objectives of the Course**

To train the students to analyse and solve more difficult problems relevant to MATH 151 and to provide a deeper coverage of topics taught in the differential calculus.

4. **Budgetary and Space Requirements** (for information only)

**What additional resources will be required in the following areas:**

**Faculty** None

**Staff**

**Library**

**Audio Visual**

**Space**

**Equipment**

5. **Approval**

**Date:** June 18, 1985 16-10-85

G.A.C. Groh — Glen H. Lyon

~~Department Chairman~~ Dean Chairman, SCUS

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

# MATH 162

## HONORS SUPPLEMENT FOR CALCULUS II

This course is a ~~laboratory~~ tutorial course offered each Spring and meets one hour each week. The purpose of the lab is to cover at a deeper level the topics taught in the integral calculus. Students spend most of each hour working on challenging problems relating to the material of MATH 152 (Calculus II) under the lab instructor's guidance. Also members of the faculty give talks regularly, which provide the student with an enriched mathematical experience. The students are expected to continue working on the problems in the Calculus Lab and use the existing microcomputer software to acquire and increase their intuition for calculus. (Time is specifically scheduled for this purpose). In addition the problems provide the students with enjoyment and valuable experiences. Working on hard problems greatly increases speed and accuracy when doing problems encountered in the students' other subjects.

MATH 162 carries no credit. It is graded on a pass (P)/~~withdrawn (W) basis.~~ No Entry basis.

Prerequisite: Concurrent registration for MATH 152 and a grade of A- or better in MATH 151.

Textbook: No text.

FSC-85-16.

## MATHEMATICS (MATH) FACULTY OF SCIENCE

See also courses listed under Mathematics/Computing Science (MACM). Mathematics programs are listed on page 138.

### MINIMUM GRADE REQUIREMENT

Students wishing to register for Mathematics courses must normally have obtained grades of C- or better in prerequisite courses. Students will not normally be permitted to enrol in any MATH course for which a D grade or lower was obtained in any prerequisite.

### ENTRY LEVEL REQUIREMENTS IN MATHEMATICS

MATH 100, MATH 101, MATH 110, MATH 113 and MATH 190 all have B.C. High School Algebra 11 (or equivalent) as prerequisite. Students lacking this background may take the non-credit Basic Math Course offered through Continuing Studies, AQ 6050. Students with a grade of P in B.C. High School Algebra 11 should take the Math Assessment Test discussed below.

The prerequisite for MATH 102 is B.C. High School Algebra 12 (or equivalent), or MATH 100 or MATH 110. Students with a grade of P in B.C. High School Algebra 12 should take the Math Assessment Test.

The prerequisite for MATH 144 is B.C. High School Algebra 12 (or equivalent), or MATH 100.

MATH 151 and MATH 154 have as prerequisite B.C. High School Algebra 12 (or equivalent) with a grade of at least B**, or MATH 100 (not MATH 110).

MATH 157 prerequisite is B.C. High School Algebra 12 (or equivalent) with a grade of at least B**, or MATH 100 or MATH 110.

Students who are unsure of their level of preparation are encouraged to take the free Math Assessment Test at the Basic Math Lab, K 9507 (or the Evening Resource Center P 9310 if the Lab is closed).

Courses marked with an asterisk (*) are intended to be particularly accessible to students who are not specializing in Mathematics.

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**Students with grades of C or C+ in B.C. High School Algebra 12 (or equivalent) have the right to register concurrently in MATH 100 or MATH 110 and either MATH 151, 154 or 157. However, this is usually unwise, and students are advised to consult with the department before undertaking such concurrent registration.

***MATH 100-3 Precalculus**
Algebraic, exponential, logarithmic and trigonometric functions and their graphs. Conic sections, Applications. (3-0-1)

Prerequisite: See Entry Level Requirements. This course may not be taken for credit by students who already have credit for any Mathematics course for which this course (or B.C. High School Algebra 12) is a prerequisite. Students may not count more than one of MATH 100 or MATH 110 for credit. MATH 100 may not be counted towards Mathematics minor, major or honor degree requirements.

***MATH 101-3 Introduction to Statistics A**
An introductory course in random variables and their distributions, estimating and hypothesis testing. (3-0-1)

Prerequisite: See Entry Level Requirements. Students with credit for ARC. 376, BUEC 232 (formerly 332) or MATH 272 (formerly MATH 371) may not subsequently receive credit for MATH 101. Students with credit for MATH 102 may not take MATH 101 for further credit. Intending Criminology Majors and Honors students are advised that these programs require that they take CRIM 120 before taking either MATH 101 or 102.

**MATH 102-3 Introduction to Statistics B**
A course similar to MATH 101-3 but with more emphasis on simple statistical formulas. (3-0-1)

Prerequisite: See Entry Level Requirements. Students with credit for ARC. 376, BUEC 232 (formerly 332) or MATH 272 (formerly MATH 371) may not subsequently receive credit for MATH 102. Students with credit for MATH 101 may not take MATH 102 for further credit. Intending Criminology Majors and Honors students are advised that these programs require that they take CRIM 120 before taking either MATH 101 or 102.

***MATH 110-3 Introductory Mathematics for the Social and Management Sciences**
Linear and quadratic functions, sequences and sums, compound interest, exponential and logarithmic functions, counting techniques, probability. (3-1-0)

Prerequisite: See Entry Level Requirements. This course may not be taken for credit by students who already have credit for any Mathematics course for which this course (or B.C. High School Algebra 12) is a prerequisite. Students may not count more than one of MATH 100 or MATH 110 for credit. MATH 110 may not be counted towards Mathematics minor, major or honor degree requirements.

**MATH 113-3 Euclidean Geometry**
Plane Euclidean geometry, congruence and similarity. Theory of parallels. Polygonal areas. Pythagorean Theorem. Geometrical constructions. (3-1-0)

Prerequisite: See Entry Level Requirements. B.C. High School Algebra 11 or permission of the Department. Students with credit for MATH 194 or 195 may not take MATH 113 for further credit.

**MATH 144-3 Introduction to Pure Mathematics**
The fundamental notions of modern Pure Mathematics (logic, sets, functions, relations, etc.) are presented, and are applied in an investigation of the "counting numbers" 1,2,3 ... as an abstract axiomatic system. Other applications as time permits. (3-1-0)

Prerequisite: See Entry Level Requirements. Students will not be permitted to register concurrently for MATH 144 and MATH 100 or MATH 110. Students with credit for MATH 141 may not take MATH 144 for further credit.

**MATH 151-3 Calculus I**
Real numbers, functions and graphs, conic sections, limits and continuity, derivatives, techniques and applications of differentiation, trigonometric functions, logarithms and exponentials, extrema, the mean value theorem, polar coordinates and complex numbers. (3-1-0)

Prerequisite: See Entry Level Requirements. Students with credit for either MATH 154 or 157 (or 150) may not take MATH 151 for further credit.

**MATH 152-3 Calculus II**
Integrals, techniques and applications of integration, approximations, sequences and series, area and arc length in polar coordinates. (3-1-0)

Prerequisite: MATH 151 or 154; or MATH 157 (or 150) with a grade of A or B. Students with credit for MATH 155 or 158 may not take MATH 152 for further credit.

***MATH 154-3 Calculus I for the Biological Sciences**
This course is designed for students specializing in the biological and medical sciences. Topics include: limits; growth rate and the derivative; logarithmic; exponential and trigonometric functions and their applications in population study; optimization and approximation methods. (3-1-0)

Prerequisite: See Entry Level Requirements. Students with credit for either MATH 151 or 157 (or 150) may not take MATH 154 for further credit.

***MATH 155-3 Calculus II for the Biological Sciences**
The integral and its applications; partial derivatives; differential equations and their applications in ecology; mathematical models of biological processes. (3-1-0)

Prerequisite: MATH 151 or 154; or MATH 157 (or 150) with a grade of A or B. Students with credit for MATH 152 or 158 may not take MATH 155 for further credit.

***MATH 157-3 Calculus for Social Sciences I**
Introduction to those concepts of differential calculus that are of value in the social sciences. (3-0-1)

Prerequisite: See Entry Level Requirements. Students with credit for either MATH 151 or 154 (or 150) may not take MATH 157 for further credit.

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***MATH 190-3 Principles of Mathematics for Teachers 1**

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. (3-1-0)

Prerequisite: See Entry Level Requirements. Those students who are currently taking or have received credit for MATH 151 or 154 or 157 (or 150) may not take this course for further credit.
This course may not be counted toward Mathematics Minor, Major or Honors degree requirements.
Candidates for degrees in the Faculty of Science may not use this course along with any of MATH 151, 154, 157 (or 150) for the satisfaction of degree requirements.

II 4.15.

APPENDIX TO SCUS 85-27

# SIMON FRASER UNIVERSITY

## MEMORANDUM

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| To: P. Dobud, Admin. Ass't. to the Dean of Science. | From: J. Blanchet, Admin. Ass't., Faculty of Interdisciplinary Studies. |
| Subject: New Course Proposals. | Date: October 21/85. |

With regard to your memorandum of October 4/85, the new course proposals listed were discussed at a meeting of the Faculty of Applied Sciences Undergraduate Studies Committee held on Tuesday, October 15/85. Members of the Committee voiced concerns with regard to the two courses noted below, in particular with regard to the fact that they are proposed as non-credit courses.

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| MATH 161-0 | Honors Supplement for Calculus I |
| MATH 162-0 | Honors Supplement for Calculus II |

J. Blanchet

To: R. Heath, Secretary to SCUS
(PAPER: FSC 85-15)



OCT 2 1985