SFU OFFICE OF THE ASSOCIATE VICE-PRESIDENT, ACADEMIC AND
ASSOCIATE PROVOST

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MEMORANDUM

ATTENTION	Senate	**DATE**	December 2, 2011
FROM	Bill Krane, Chair	**PAGES**	1/2
	Senate Committee on		
	Undergraduate Studies		
RE:	Faculty of Science		

For information:

Acting under delegated authority at its meeting of December 1, 2011, SCUS approved the following curriculum revisions effective Fall 2012:

1. <u>Department of Biomedical Physiology and Kinesiology (SCUS 11-55a)</u>

(a) Changes to the Biomedical Physiology Major and Honors Programs removing CHEM 286 from the Lower Division requirements and adding CHEM 360 to the Upper Division requirements.

(b) Change to the admission requirements for the Biomedical Physiology and Kinesiology Honors degrees.

2. <u>Department of Chemistry (SCUS 11-55b)</u>

(a) Prerequisite changes to CHEM 452

3. <u>Department of Earth Sciences (SCUS 11-55c)</u>

(a) Prerequisite changes to EASC 204, 405, 410 and 416 (SCUS 11-55d)

4. <u>General Science Double Minor Program (SCUS 11-55e)</u>

(a) Requirement changes to the General Science Double Minor Program

SIMON FRASER UNIVERSITY   THINKING OF THE WORLD

5. Department of Mathematics

(a) Name change for Industrial Mathematics to Operations Research in the Major and Honours Programs (SCUS 11-40c)
(b) Deletion of the options from the Industrial Mathematics Major and Honours Programs
(c) Changes to the upper, lower and interdisciplinary requirements
(d) Title change to MATH 157, 158 (SCUS 11-55f)
(e) Deletion of MATH 208, 370

Senators wishing to consult a more detailed report of curriculum revisions may do so by going to Docushare: https://docushare.sfu.ca/dsweb/View/Collection-12682
If you are unable to access the information, please call 778-782-3168 or email shelley_gair@sfu.ca.

SFU

TO:	Bill Krane, Chair, SCUS	**FROM:**	G. Agnes, Associate Dean Faculty of Science
RE:	Faculty of Science Curriculum Items	**DATE:**	November 18, 2011

The Faculty of Science has approved the following, which must now be considered by SCUS.

Please place these items on the agenda of the next SCUS meeting.

1. **Biomedical Physiology and Kinesiology**
   a) Resubmission: Changes to the Biomedical Physiology Major & Honors Programs –
      Remove CHEM 286-2; add KIN 207-3
   b) Add CHEM 360-3 to list of BISC and MBB options in Biomedical Physiology Major and Honors
      Programs
   c) KIN 205-3 – Change of prerequisite
   d) Admission Requirements – change from completion of a minimum of **60** units to completion of
      a minimum of **90** units.

2. **Chemistry**
   CHEM 452-3 – Change of prerequisite

3. **Joint Major and Honors in Earth Sciences & Chemistry**
   Full program proposals

4. **Earth Sciences**
   EASC 204-3, 405-3, 410-3 and 416-3 – Prerequisite changes

5. **General Science Double Minor Program**
   Changes to the General Science Double Minor Program

6. **Mathematics**
   a) Course Changes
   Title Changes
   Math 157 Calculus for the Social Sciences I
   Math 158 Calculus for the Social Sciences II
   To be compatible with our other Calculus I and II courses.

b) Course Deletions

Math 208 Introduction to Operations Research
Math 370 The Art and Craft of Problem Solving
Non W versions only are being deleted as Math 208 and 370 have been developed and delivered as writing courses.

c) Prerequisite Change

MATH 370W The Art and Craft of Problem Solving

d) Prerequisite Changes

Course changes are submitted to reflect changes in the BC high school math curriculum, approved by Senate Committee on Undergraduate Studies, October 14, 2010 (memorandum SCUS 10-50). In addition, where grade B- has been changed to a grade of B, B- is not a school grade and confuses students. Also, as an arbitrary percentage, it does not reflect our expectations of students' knowledge.

MATH 100 Precalculus
MATH 113 Euclidean Geometry
MATH 130 Geometry for Computer Graphics
MATH 150 Calculus I with Review
MATH 151 Calculus I
MATH 154 Calculus I for Biological Sciences
MATH 157 Calculus for the Social Sciences 1
MATH 160W Mathematics in Action
MATH 178W Fractals and Chaos
MATH 190 Principles of Mathematics for Teachers
MATH 197 Hitchhiker's Guide to Everyday Math
MATH 198 Introduction to Quantitative Reasoning

G. Agnes

Enclosure

c.   J. Hinchliffe, C. Cupples

BPK

Biomedical Physiology Major and Honors Programs

1. a. Resubmission - from September 2011

BPK Motion : Remove CHEM 286 Organic Chemistry Laboratory II (2) from the Biomedical Physiology Major and Honors programs as a requirement.

Rationale : The content of this course is not required for our majors, but has been included in the past as it was a prerequisite for medical school. It is not required as a prerequisite for any courses in our program. UBC Medicine no longer requires this course as a pre-requisite.

1. b. Resubmission From July 2011

BPK MOTION : Add Kin 207 to Biomedical Physiology Major and Honors programs as a required course.

KIN 207-3 Human Motor Systems

Students are introduced to basic concepts in human motor systems underlying goal-direction movement. Topics including the problems of planning/control of movements, the role of the nervous system in integrating sensory and motor systems to produce movement, and motor learning are discussed. Taught from a behavioral and neurophysiological perspective and explores psychological influences on motor control. Research from a variety of distinct areas is integrated to provide a coherent picture of our understanding of human motor systems. Prerequisite: KIN 142 or permission of instructor.

Rationale :

KIN 207 has undergone significant changes recently under Dan Marigold. The course now includes neurophysiology of interest to our biomedical physiology majors. The new content leads very well into upper division physiology courses KIN 306-3 Human Physiology II (Principles of Physiological Regulation) and KIN 415-3 Neural Control of Movement. Content now covered in Kin 207 will allow the upper division courses to expand the depth of their coverage in similar areas.

Kin 207 was removed as a required as a required course in the biomedical physiology major in 2008, when the course focused on motor learning. The current physiological perspective will be of significant interest and benefit to

Biomedical Physiology Major and Honors students.

The lower division requirements in the Biomedical Physiology major are similar to our other major programs. We are also proposing to remove CHEM 286-2 as a requirement for these majors. If the removal of CHEM 266-2 is approved, the number of lower division courses requirement will not be altered by this addition.

Biomedical Physiology Major and Honors Programs

FROM :

Program Requirements

Students complete 120-121 units for this major program, as specified below.

Lower Division Requirements

A total of 54-56 lower division units in required, as follows.

Students complete all of

    CHEM 121-4 General Chemistry and Laboratory I
    CHEM 122-2 General Chemistry II
    CHEM 126-2 General Chemistry Laboratory II
    CHEM 281-5 Organic Chemistry I
    CHEM 282-2 Organic Chemistry II
    CHEM 286-2 Organic Chemistry Laboratory II
    KIN 142-3 Introduction to Kinesiology
    KIN 201-3 Biomechanics
    KIN 205-3 Introduction to Human Physiology
    STAT 201-3 Statistics for the Life Sciences
and both of

    BISC 101-4 General Biology
    BISC 102-4 General Biology 8 units
and one of

    MATH 150-4 Calculus I with Review
    MATH 151-3 Calculus I

MATH 154-3 Calculus I for the Biological Sciences
and one of

MATH 152-3 Calculus II
MATH 155-3 Calculus II for the Biological Sciences
and both of

MBB 222-3 Molecular Biology and Biochemistry
MBB 231-3 Cellular Biology and Biochemistry
and one of

PHYS 101-3 Physics for the Life Sciences I
PHYS 120-3 Modern Physics and Mechanics
PHYS 125-3 Mechanics and Special Relativity
PHYS 140-4 Studio Physics – Mechanics and Modern Physics
and one of

PHYS 102-3 Physics for the Life Sciences II
PHYS 121-3 Optics, Electricity and Magnetism
PHYS 126-3 Electricity, Magnetism and Light
PHYS 141-4 Studio Physics – Optics, Electricity and Magnetism

TO :

Program Requirements

Students complete 120-121 units for this major program, as specified below.

Lower Division Requirements

A total of 55-57 lower division units in required, as follows.

Students complete all of

CHEM 121-4 General Chemistry and Laboratory I
CHEM 122-2 General Chemistry II
CHEM 126-2 General Chemistry Laboratory II
CHEM 281-5 Organic Chemistry I
CHEM 282-2 Organic Chemistry II
KIN 142-3 Introduction to Kinesiology
KIN 201-3 Biomechanics

KIN 205-3 Introduction to Human Physiology
KIN 207-3 Human Motor Systems
STAT 201-3 Statistics for the Life Sciences
and both of

BISC 101-4 General Biology
BISC 102-4 General Biology 8 units
and one of

MATH 150-4 Calculus I with Review
MATH 151-3 Calculus I
MATH 154-3 Calculus I for the Biological Sciences
and one of

MATH 152-3 Calculus II
MATH 155-3 Calculus II for the Biological Sciences
and both of

MBB 222-3 Molecular Biology and Biochemistry
MBB 231-3 Cellular Biology and Biochemistry
and one of

PHYS 101-3 Physics for the Life Sciences I
PHYS 120-3 Modern Physics and Mechanics
PHYS 125-3 Mechanics and Special Relativity
PHYS 140-4 Studio Physics – Mechanics and Modern Physics
and one of

PHYS 102-3 Physics for the Life Sciences II
PHYS 121-3 Optics, Electricity and Magnetism
PHYS 126-3 Electricity, Magnetism and Light
PHYS 141-4 Studio Physics – Optics, Electricity and Magnetism

2. BPK MOTION : Add CHEM 360 to list of Biology and MBB options for upper division requirements in the Biomedical Physiology (BIF) major and Honors programs

RATIONALE : This course is considered an alternate for MBB 323 which is already on the list. As only one course from the list is required, we can just add CHEM 360-3 to the list.

CHEM 360-3 Thermodynamics and Chemical Kinetics

Elements of physical chemistry from the macroscopic point of view. Thermodynamics, and its applications to chemical equilibrium. Chemical kinetics and reaction rate theories. Prerequisite: CHEM 122, MATH 152 (or 155), PHYS 121 (or 102). Recommended: MATH 251. Credit will not be granted for both CHEM 360 and MBB 323. Quantitative.

FROM

Biomedical Physiology Major and Honors

Upper Division Requirements

and one of
   BISC 303 Microbiology (4)
   BISC 329 Introduction to Experimental Techniques (4)
   BISC 333 Developmental Biology (3)
   BISC 357 Gene Cloning (3)
   BISC 403 Current Topics in Cell Biology (3)
   BISC 405 Neurobiology (3)
   BISC 430 Microbe-Plant Interactions (3)
   MBB 308 Molecular Biology Laboratory (3)
   MBB 309 Biochemistry Laboratory (4)
   MBB 322 Molecular Physiology (3)
   MBB 323 Introduction to Physical Biochemistry (3)
   MBB 331 Molecular Biology (3)

TO

Biomedical Physiology Major and Honors

Upper Division Requirements

and one of
   BISC 303 Microbiology (4)
   BISC 329 Introduction to Experimental Techniques (4)
   BISC 333 Developmental Biology (3)
   BISC 357 Gene Cloning (3)
   BISC 403 Current Topics in Cell Biology (3)
   BISC 405 Neurobiology (3)
   BISC 430 Microbe-Plant Interactions (3)
   CHEM 360-3 Thermodynamics and Chemical Kinetics(3)
   MBB 308 Molecular Biology Laboratory (3)
   MBB 309 Biochemistry Laboratory (4)

MBB 322 Molecular Physiology (3)

MBB 323 Introduction to Physical Biochemistry (3)

MBB 331 Molecular Biology (3)

3. BPK MOTION: Add the following statement to the prerequisite for KIN 205. The course change form to alter the prerequisites for KIN 205 is attached.

- **Students who have taken BISC 305 can not take KIN 205 for further credit**

RATIONALE : There is significant overlap in material between BISC 305 and KIN 205, with BISC 305 being more advanced. Our intention with this motion is that students should not take BISC 305 followed by KIN 205 for credit, but could take KIN 205 followed by BISC 305, and receive credit for both. Julian Christians, Biological Sciences Undergraduate Chair was consulted and agrees with this rationale.

FROM: BISC 101, CHEM 281, PHYS 101 and 102. Kinesiology majors and honors students who have taken KIN 105 must also take KIN 205. For students taking both of these courses, credit will only be given for KIN 205.

TO: BISC 101, CHEM 281, PHYS 101 and 102. Kinesiology majors and honors students who have taken KIN 105 must also take KIN 205. For students taking both of these courses, credit will only be given for KIN 205. *Students who have taken BISC 305 can not take KIN 205 for further credit.*

4. BPK MOTION: For Biomedical Physiology (BIF) and KIN honors degrees, change the statements in the calendar regarding admission requirements.

FROM :
Admission Requirements

Application requires

- completion of a minimum of *60* units
- a minimum CGPA of 3.00
- submission of a completed program approval form, along with the student's most recent unofficial record, to the undergraduate advisor.

TO :
Admission Requirements

Application requires

- completion of a minimum of **_90_** units
- a minimum CGPA of 3.00
- submission of a completed program approval form, along with the student's most recent unofficial record, to the undergraduate advisor.

RATIONALE:

- KIN 497-3 Undergraduate Honors Thesis Proposal requires 90 units as a pre requisite, so students can not start their honors until they have at least 90 units.
- 90 units is an appropriate amount of background knowledge before engaging in honors level research. Students should complete a significant volume of upper division work in order to be evaluated effectively and be prepared thoroughly for research at the honors level.
- More junior undergraduates may volunteer in labs or utilize directed studies courses (minimum 75 units) to initiate earlier engagement in research.

CHEM
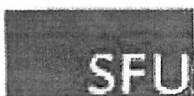
SENATE COMMITTEE ON
UNDERGRADUATE STUDIES

COURSE CHANGE/DELETION

OCTOBER 2011

EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s)

☐ Course number ☐ Credit ☐ Title Description X Pre-requisite ☐ Deletion

Indicate number of hours for: Lecture_____ Seminar _____ Tutorial _____ Lab _____

FROM :   **TO:**

Course Number ___CHEM 452___   Course Number _____CHEM 452_____   Credit

Hour _____3_____   Credit Hour _____3_____

TITLE

(1) Long title for calendar and schedule, no more than 100 characters including spaces and punctuation.

(2) Short title for enrollment and transcript. no more than 30 characters including spaces and punctuation.

DESCRIPTION

PREREQUISITE

CHEM 381 or permission of the department	CHEM 380 and MBB 222 or permission of the department

RATIONALE

The explicit addition of MBB 222 (which is already a required course for Chemistry Majors/Honours) ensures that all students have the requisite biochemistry background to take CHEM 452. Changing CHEM 381 (an elective) for CHEM 380 (a core course) allows all Chem. majors access to this course.

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses? If so, this should be **noted in the prerequisite**.

Effective term and year____Fall 2012

EASC

SFU DEPARTMENT OF
EARTH SCIENCES

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Canada V5A 1S6

MEMORANDUM ─────────────────────────────────

ATTENTION	Dr George Agnes
FROM	Glyn Williams-Jones
RE:	Earth Sciences UCC Agenda Item
DATE	November 2, 2011

Dear George,

I would like to bring the following housekeeping items forward to the UCC meeting on November 9.

1. Change of EASC 204 prerequisites
2. Change of EASC 405, 410, 416 prerequisites

Sincerely,

Glyn Williams-Jones
Undergraduate Chair
Department of Earth Sciences

SFU

EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number   ☐ Credit   ☐ Title   ☐ Description   ☑ Prerequisite   ☐ Course deletion

Indicate number of hours for: Lecture_____ Seminr _____ Tutorial_____ Lab _____

FROM

Course Number   **EASC 204** _____

Credit Hour **3**_____

TO

Course Number _____

Credit Hour _____

TITLE

(1) Long title for calendar and schedule, no more than 100 characters including spaces and punctuation.

Structural Geology I

(2) Short title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

Structural Geology I

DESCRIPTION _____   DESCRIPTION _____

PREREQUISITE EASC 102 or 210, and PHYS 102 or 121 or 126 or 141.

PREREQUISITE EASC 210 and PHYS 101 or 120 or 125 or 140.

RATIONALE

The course EASC 102 - Historical Geology was changed to EASC 210 in 2004 and the course number (102) was deleted by in 2008 (SCUS 08-52).

Due to a typographical error, PHYS 102, 121, 126 and 141 were entered. Rather, it should be PHYS 101, 120, 125 or 140.

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses? If so, this should be **noted in the prerequisite**.

Effective term and year ~~Spring~~ 2012
FALL

EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number   ☐ Credit   ☐ Title   ☐ Description   ■ Prerequisite   ☐ Course deletion

Indicate number of hours for: Lecture _____   Seminr _____   Tutorial _____   Lab _____

FROM   **TO**

Course Number __EASC 405_____   Course Number _____

Credit Hour __3_____   Credit Hour _____

TITLE

(1) Long title for calendar and schedule, no more than 100 characters including spaces and punctuation.

Water Cycles and Resources: Environmental

and Climate Change Impacts

(2) Short title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

Water, Environment, Climate

DESCRIPTION _____   DESCRIPTION _____

PREREQUISITE _EASC 304, 412, GEOG 311_____   PREREQUISITE _EASC 304, EASC 315 or 412,_
                                                                                       GEOG 311

RATIONALE

The course EASC 412 - Groundwater Geochemistry was changed to EASC 315 - Geochemistry of Natural Waters. The Prerequisite must be changed to reflect this.

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses? If so, this should be **noted in the prerequisite**.

Effective term and year _Fall 2012_____

EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number   ☐ Credit   ☐ Title   ☐ Description   ■ Prerequisite   ☐ Course deletion

Indicate number of hours for: Lecture_____   Seminr _____   Tutorial _____   Lab _____

FROM   **TO**

Course Number __EASC 410_____   Course Number _____

Credit Hour__3_____   Credit Hour _____

TITLE

(1) Long title for calendar and schedule, no more than 100 characters including spaces and punctuation.

Groundwater Contamination and Transport

(2) Short title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

Groundwater Contamination Transport

DESCRIPTION_____   DESCRIPTION _____

PREREQUISITE _EASC 412_____   PREREQUISITE _EASC 315 or 412_____

RATIONALE

The course EASC 412 - Groundwater Geochemistry was changed to EASC 315 - Geochemistry of Natural Waters. The Prerequisite must be changed to reflect this.

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses? If so, this should be **noted in the prerequisite**.

Effective term and year __Fall 2012_____

EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number   ☐ Credit   ☐ Title   ☐ Description   ☑ Prerequisite   ☐ Course deletion

Indicate number of hours for: Lecture_____   Seminr_____   Tutorial_____   Lab_____

FROM	**TO**
Course Number **EASC 416**	Course Number _____
Credit Hour **3**	Credit Hour _____

TITLE

(1) Long title for calendar and schedule, no more than 100 characters including spaces and punctuation.

Field Techniques in Hydrogeology

(2) Short title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

Field Techniques in Hydrogeology

DESCRIPTION_____   DESCRIPTION_____

PREREQUISITE **EASC 304 and 412**   PREREQUISITE **EASC 304, EASC 315 or 412**

RATIONALE

The course EASC 412 - Groundwater Geochemistry was changed to EASC 315 - Geochemistry of Natural Waters. The Prerequisite must be changed to reflect this.

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses? If so, this should be **noted in the prerequisite**.

Effective term and year ~~Spring~~ 2012

FALL

General Science Double Minor Program

Proposed Changes in the General Science Double Minor Program

Background
In response to a series of issues, especially requests from several Departments and the recent changes to the FASS BGS degree, a subcommittee of the Faculty of Science Undergraduate Studies Committee was struck to assess the current General Science Double Minor Program and propose revisions. The subcommittee was composed of D. Leznoff (Chemistry), R. Dill (BPK) and G. Williams-Jones (Earth Sciences).

Rationale
Upon discussion, the sub-committee proposed to change the requirements for the General Science Double Minor Degree. The sub-committee debated the merits of creating a BGS degree modeled after the original FASS BGS but decided that the students and the Faculty were better served by broadening the scope of the FacSci Double Minor instead, rather than create a new degree.

Key proposed global changes + rationales therefore:
1. Remove restrictions for combinations of minors within the Faculty of Science. This increases the flexibility of the program within the Faculty.

2. The list of required courses has been modified to reflect a broader scope within the Faculty of Science, while maintaining flexibility (e.g. only one required BISC course; PHYS lab is optional; several KIN course choices have been added). The STAT requirement has been tightened to specify science-student targeted STAT courses (in line with the Science Majors core courses). Flexibility has also been increased by noting that the courses do not need to all be taken in the first year of study.

3. Allow one of the two Minors to be from outside the Faculty of Science. Any Minor in the university can be counted as the second minor. This maximizes the flexibility of the program, allowing students to pair any non-Faculty of Science expertise with their Science background, which could allow for students to showcase some unique, distinctive blends of education, while maintaining their Science core (see #4 below).

4. In order to maintain the essence of a "B.Sc." degree, a general requirement that 80 credits minimum must be completed in the Faculty of Science, of which 28 must be UD credits, has also been added.

5. The requirement that all courses in the two minors must have minimum C- grades is more strict than the Majors requirements and thus this requirement has been removed. The general university requirement for an overall GPA of 2.0 remains, as well as a requirement for a UD-GPA of 2.0 in the courses for the two minors.

Documented below are the detailed proposed changes.

Present General Science (Proposed changes underlined)	Proposed changes Underlined
General Science Double Minor Program This degree program provides broad education in several fields with specialization in at least two. It requires two minors chosen from below, one of which must be in the Faculty of Science. Restrictions for the combination of minors is listed below.	**General Science Double Minor Program** This degree program provides broad education in several fields with specialization in at least two.
Students must have their selection of minors for the BSc general science program approved by the program advisor as early in their program as possible. Only one minor may be selected from each of the following six subject areas. • biological sciences, environmental toxicology, kinesiology • molecular biology and biochemistry, chemistry, environmental chemistry • mathematics, statistics, computing science • physics, nuclear science • earth science, physical geography	**Students must have their selection of minors for the BSc general science program approved by the program advisor as early in their program as possible.** Any two minors from the Faculty of Science may be combined to complete the B.Sc. in general science program. Alternatively, one minor from the Faculty of Science and one minor from outside the Faculty of Science can also be combined to complete the B.Sc. in general science program. Note the Faculty of Science minimum credit requirements below.

• archaeology, psychology Because of the proximity of subject matter, the following combinations of minors are not acceptable: • biological sciences, molecular biology and biochemistry • molecular biology and biochemistry, environmental toxicology • chemistry, nuclear science • kinesiology, molecular biology and biochemistry • environmental chemistry, environmental toxicology	
Writing, Quantitative, and Breadth Requirements Students completing degree programs must fulfill writing, quantitative and breadth requirements as part of their program.	**Writing, Quantitative, and Breadth Requirements** Students completing degree programs must fulfill writing, quantitative and breadth requirements as part of their program.
Lower Division Requirements Students complete all of BISC 101-4 General Biology BISC 102-4 General Biology CHEM 121-4 General Chemistry and Laboratory I CHEM 122-2 General Chemistry II CHEM 126-2 General Chemistry Laboratory II and all of PHYS 101-3 Physics for the Life Sciences I PHYS 102-3 Physics for the Life Sciences II PHYS 130-2 Physics for the Life Sciences Laboratory or all of PHYS 120-3 Mechanics and Modern Physics PHYS 121-3 Optics, Electricity and Magnetism PHYS 131-2 General Physics Laboratory I or all of PHYS 140-4 Studio Physics – Mechanics and Modern Physics PHYS 141-4 Studio Physics – Optics, Electricity and Magnetism and both of MATH 154-3 Calculus I for the Biological Sciences MATH 155-3 Calculus II for the Biological Sciences or both of MATH 151-3 Calculus I (or MATH 150) MATH 152-3 Calculus II and one of EASC 101-3 Physical Geology GEOG 111-3 Earth Systems and one lower or upper division statistics course	**Lower Division Requirements** Students complete one of BISC 101-4 General Biology BISC 102-4 General Biology and all of CHEM 121-4 General Chemistry and Laboratory I CHEM 122-2 General Chemistry II CHEM 126-2 General Chemistry Laboratory II and one of EASC 101-3 Physical Geology KIN 110-3 Human Nutrition: Current Issues KIN 140-3 Contemporary Health Issues KIN 142-3 Introduction to Kinesiology KIN 143-3 Exercise: Health and Performance and one of MATH 150-4 Calculus I with Review MATH 151-3 Calculus I MATH 154-3 Calculus I for the Biological Sciences and one of MATH 152-3 Calculus II MATH 155-3 Calculus II for the Biological Sciences and one of PHYS 101-3 Physics for the Life Sciences I PHYS 120-3 Mechanics and Modern Physics PHYS 140-4 Studio Physics – Mechanics and Modern Physics and one of PHYS 102-3 Physics for the Life Sciences II PHYS 121-3 Optics, Electricity and Magnetism PHYS 141-4 Studio Physics – Optics, Electricity and Magnetism

	and one of STAT 201-3 Statistics for the Life Sciences STAT 270-3 Introduction to Probability and Statistics
Other Requirements The following general requirements must be satisfied. • additional upper division courses (excluding EDUC 401-406) to total 44 units of upper division credit • a 2.0 GPA in upper division courses required for each of two subject area minors, with a minimum C- grade in all courses used for the subject area minors Consult departmental advisors about selection of upper division courses in subject minors. Students should include science-related courses such as PHIL 244, 341 and HIST 360, 361 in their programs. Students completing the general science program should contact the general science advisor as soon as possible to help with course planning.	**Other Requirements** The following general requirements must be satisfied. • additional upper division courses (excluding EDUC 401-406) to total 44 units of upper division credit. • A minimum of 80 credits in the Faculty of Science, of which at least 28 must be upper division. • a 2.0 CGPA in upper division courses required for each of two subject area minors. Note that some Departments have minimum grade requirements for prerequisite courses. Consult departmental advisors about selection of upper division courses in subject minors. Students completing the general science program should contact the general science advisor as soon as possible to help with course planning.
General Science Advisor Rosemary Hotell hotell@sfu.ca 778-782-3772 P9316 Shrum Science Bldg	**General Science Advisor** Rosemary Hotell hotell@sfu.ca 778-782-3772 P9316 Shrum Science Bldg

MATH

Summary of changes:

Motion ①

Name change: From Industrial Mathematics to Operations Research, both Major and Honours.

Motion ③

Reorganization of Requirements to provide for lower division, upper division, and interdisciplinary requirements. This removes terminology which previously identified **core and area** requirements.

Deletion of Options B and C from the Industrial Math program, both Major and Honours.

Motion ②   *AND A*

A few changes in sentences.
Changes indicated as underlined.

http://students.sfu.ca/calendar/mathematics/index.html

FROM:

Undergraduate Programs

The following undergraduate programs are offered.

Faculty of Arts and Social Sciences Mathematics Programs

* mathematics major (bachelor of arts)

* mathematics honours (bachelor of arts)

* mathematics minor

Faculty of Science Mathematics Programs

* applied mathematics major (bachelor of science)

* applied mathematics honours (bachelor of science)

* industrial mathematics major (bachelor of science)

* industrial mathematics honours (bachelor of science)

* mathematical physics honours (bachelor of science)

* mathematics major (bachelor of science)

* mathematics honours (bachelor of science)

* mathematics minor

* mathematics and computing science joint major (bachelor of science)

* mathematics and computing science joint honours (bachelor of science)

* co-operative education

TO:

Undergraduate Programs

The following undergraduate programs are offered.

Faculty of Arts and Social Sciences Mathematics Programs

* mathematics major (bachelor of arts)

* mathematics honours (bachelor of arts)

* mathematics minor

Faculty of Science Mathematics Programs

* applied mathematics major (bachelor of science)

* applied mathematics honours (bachelor of science)

* mathematical physics honours (bachelor of science)

* mathematics major (bachelor of science)

* mathematics honours (bachelor of science)

* mathematics minor

* mathematics and computing science joint major (bachelor of science)

* mathematics and computing science joint honours (bachelor of science)

* <u>operations research major (bachelor of science)</u>

* <u>operations research honours (bachelor of science)</u>

* co-operative education

From:

Industrial Mathematics Major Program

Department of Mathematics | Faculty of Science
Simon Fraser University Calendar 2011 Summer

This program prepares students for careers in industry.

Prerequisite Grade Requirement

To enrol in a course offered by the Department of Mathematics, a student must obtain a grade of C- or better in each prerequisite course. Some courses may require higher prerequisite grades. Check the MATH course's Calendar description for details.

Students will not normally be permitted to enrol in any course for which a D grade or lower was obtained in any prerequisite. No student may complete, for further credit, any course offered by the Department of Mathematics which is a prerequisite for a course the student has already completed with a grade of C- or higher, without permission of the department.

Program Requirements

The program requires the completion of 120 units which includes a Faculty of Science requirement of a minimum of 28 upper division units, and additional upper division units to total a minimum of 44 upper division units (excluding EDUC 401, 407).

The specific program requirements are divided into three parts: a common core of courses completed by all students, a choice of one of three area requirements (i.e option A, B or C), and completion of a minor program if the students is completing either the option B area requirement or the option C area requirement.

In addition to the program requirements set out below, general university and Faculty of Science regulations must be met.

Computing science courses that are completed in the industrial mathematics major program will count towards the requirement that 12 units must be completed from outside of the Faculty of Science.

A minimum program 2.00 cumulative grade point average (CGPA) must be obtained on the overall major program requirements, as well as a minimum program 2.00 grade point average in the upper division major courses.

Lower Division Core Requirements

Students complete a minimum total of 27 units, including either one of

- CMPT 126-3 Introduction to Computer Science and Programming
- CMPT 128-3 Introduction to Computing Science and Programming for Engineers

or both of

- CMPT 120-3 Introduction to Computing Science and Programming I
- CMPT 125-3 Introduction to Computing Science and Programming II

and all of

- CMPT 225-3 Data Structures and Programming
- MACM 101-3 Discrete Mathematics I
- MATH 251-3 Calculus III
- STAT 270-3 Introduction to Probability and Statistics
- STAT 285-3 Intermediate Probability and Statistics

and one of

- MATH 150-4 Calculus I with Review
- MATH 151-3 Calculus I
- MATH 154-3 Calculus I for the Biological Sciences*
- MATH 157-3 Calculus for the Social Sciences I*

and one of

- MATH 152-3 Calculus II
- MATH 155-3 Calculus II for the Biological Sciences*
- MATH 158-3 Calculus for the Social Sciences II*

and one of

- MATH 240-3 Algebra I: Linear Algebra
- MATH 232-3 Applied Linear Algebra*

*with a B grade or better

Area Requirements

Students complete the requirements for one of option A, B or C as follows.

Option A: Operations Research and Applied Statistics

(offered at Surrey campus)

Students who choose this option will complete a minimum of 43 units, including all of

- MACM 201-3 Discrete Mathematics II
- MATH 208-3 Introduction to Operations Research
- MATH 308-3 Linear Optimization
- MATH 309-3 Continuous Optimization
- MATH 348-3 Probabilistic Models in Operations Research
- MATH 402-4 Industrial Mathematics
- MATH 408-3 Discrete Optimization
- MATH 448-3 Network Flows

- STAT 350-3 Linear Models in Applied Statistics
- STAT 380-3 Introduction to Stochastic Processes
- TECH 101-3 Communication, Teamwork and Collaborative Process

and at least two additional courses from Table I below

- ACMA 445-3 Loss Models: Estimation and Selection*
- BUEC 433-5 Forecasting in Business and Economics†
- STAT 390-3 Selected Topics in Probability and Statistics
- STAT 400-3 Data Analysis
- STAT 402-3 Generalized Linear and Nonlinear Modelling
- STAT 410-3 Statistical Analysis of Sample Surveys
- STAT 430-3 Statistical Design and Analysis of Experiments
- STAT 460-3 Bayesian Statistics
- STAT 490-3 Selected Topics in Probability and Statistics

*students must meet the entry requirements for the actuarial science program to enrol in this course
†see BUEC courses for prerequisites

and at least one from Table II below

- CMPT 305-3 Computer Simulation and Modelling
- CMPT 307-3 Data Structures and Algorithms
- MACM 316-3 Numerical Analysis I
- MATH 343-3 Applied Discrete Mathematics
- MATH 345-3 Introduction to Graph Theory
- MATH 445-3 Graph Theory

Interdisciplinary Requirement

With advisor approval, students also complete at least 15 units **from application areas with advisor approval**. Application courses are chosen from ACMA, BUEC, BUS, ECON, MACM, MATH, REM and STAT courses. Courses used for Option A cannot be used to fulfil this requirement. If the industrial mathematics major is completed as part of a second bachelor's degree, then the interdisciplinary requirement may be waived if the previous degree contains an approved major. Approvals are given individually. Those majors that are approved will not be limited to the disciplines listed above.

Option B: Scientific Computing
Option C: Discrete Mathematics

Faculty of Science Requirements (etc...)

To:

Operations Research Major Program

This program prepares students for careers in industry or a variety of graduate and professional programs.

Prerequisite Grade Requirement

To enrol in a course offered by the Department of Mathematics, a student must obtain a grade of C- or better in each prerequisite course. Some courses may require higher prerequisite grades. Check the MATH course's Calendar description for details.

Students will not normally be permitted to enrol in any course for which a D grade or lower was obtained in any prerequisite. No student may complete, for further credit, any course offered by the Department of Mathematics which is a prerequisite for a course the student has already completed with a grade of C- or higher, without permission of the department.

Program Requirements

The program requires the completion of 120 units which includes a Faculty of Science requirement of a minimum of 28 upper division units, and additional upper division units to total a minimum of 44 upper division units (excluding EDUC 401, 407).

The specific program requirements are divided into three parts: required lower division courses, required upper division courses, and completion of an interdisciplinary requirement.

In addition to the program requirements set out below, general university and Faculty of Science regulations must be met.

Computing science courses that are completed in the operations research major program will count towards the requirement that 12 units must be completed from outside of the Faculty of Science.

A minimum program 2.00 cumulative grade point average (CGPA) must be obtained on the overall major program requirements, as well as a minimum program 2.00 grade point average in the upper division major courses.

Lower Division Requirements

Students complete a minimum total of 36 units, including either one of

- CMPT 126-3 Introduction to Computer Science and Programming
- CMPT 128-3 Introduction to Computing Science and Programming for Engineers

or both of

- CMPT 120-3 Introduction to Computing Science and Programming I
- CMPT 125-3 Introduction to Computing Science and Programming II

and all of

- CMPT 225-3 Data Structures and Programming

- MACM 101-3 Discrete Mathematics I
- MACM 201-3 Discrete Mathematics II
- MATH 208-3 Introduction to Operations Research
- MATH 251-3 Calculus III
- STAT 270-3 Introduction to Probability and Statistics
- STAT 285-3 Intermediate Probability and Statistics
- IAT 103W-3 Design Communication and Collaboration

and one of

- MATH 150-4 Calculus I with Review
- MATH 151-3 Calculus I
- MATH 154-3 Calculus I for the Biological Sciences*
- MATH 157-3 Calculus for the Social Sciences I*

and one of

- MATH 152-3 Calculus II
- MATH 155-3 Calculus II for the Biological Sciences*
- MATH 158-3 Calculus for the Social Sciences II*

and one of

- MATH 240-3 Algebra I: Linear Algebra
- MATH 232-3 Applied Linear Algebra*

*with a B grade or better

Upper Division Requirements

Students complete a minimum total of 34 units, including:

- MATH 308-3 Linear Optimization
- MATH 309-3 Continuous Optimization
- MATH 348-3 Probabilistic Models in Operations Research
- MATH 402W-4 Operations Research Clinic
- MATH 408-3 Discrete Optimization
- MATH 448-3 Network Flows
- STAT 350-3 Linear Models in Applied Statistics
- STAT 380-3 Introduction to Stochastic Processes

and at least two additional courses from Table I below

- ACMA 445-3 Loss Models: Estimation and Selection*
- BUEC 433-5 Forecasting in Business and Economics†
- STAT 390-3 Selected Topics in Probability and Statistics
- STAT 400-3 Data Analysis
- STAT 402-3 Generalized Linear and Nonlinear Modelling
- STAT 410-3 Statistical Analysis of Sample Surveys
- STAT 430-3 Statistical Design and Analysis of Experiments
- STAT 460-3 Bayesian Statistics
- STAT 490-3 Selected Topics in Probability and Statistics

SFU

MEMO

Department of Mathematics

LADISLAV STACHO
Chair, Undergraduate Studies
Committee

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ATTENTION Dr. Rolf Mathewes
Faculty of Science Undergraduate CurriculumCommittee

FROM Ladislav Stacho, Chair, Undergraduate Studies Committee

RE Calendar Changes

DATE 13 July 2011

Please find enclosed the following documents relating to undergraduate curriculum changes approved by Mathematics to be considered at the next Faculty of Science Undergraduate Curriculum Committee meeting.

I: Program Name Change:
From Industrial Mathematics to Operations Research, both Major and Honour.

II: Reorganization of Requirements
To provide for lower division, upper division, and interdisciplinary requirements. This removes terminology which previously identified **core** and **area** requirements.

III: Deletion of Area Requirements
Deletion of Options B and C from the Industrial Mathematics program, both Major and Honour.

IV: Course Changes
Math 402W
Title, description and prerequisite change.
Math 408
Prerequisite change.

Contact: Ms. Dale Yamaura, Manager, Academic and Administrative Services
Voice: 2-3799; Email: math_manager@sfu.ca

*students must meet the entry requirements for the actuarial science program to enrol in this course
†see BUEC courses for prerequisites

and at least one from Table II below

- CMPT 305-3 Computer Simulation and Modelling
- CMPT 307-3 Data Structures and Algorithms
- MACM 316-3 Numerical Analysis I
- MATH 343-3 Applied Discrete Mathematics
- MATH 345-3 Introduction to Graph Theory
- MATH 445-3 Graph Theory

Interdisciplinary Requirement

With advisor approval, students also complete at least 15 units **from application areas.** Application courses are chosen from ACMA, BUEC, BUS, ECON, MACM, MATH, REM and STAT courses. Courses used to fulfil upper division requirements cannot be used to fulfil this requirement. If the operations research major is completed as part of a second bachelor's degree, then the interdisciplinary requirement may be waived if the previous degree contains an approved major. Approvals are given individually. Those majors that are approved will not be limited to the disciplines listed above.

Faculty of Science Requirements (etc...)

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http://students.sfu.ca/calendar/mathematics/industrial_math_hon.html

From:

Industrial Mathematics Honours Program

Department of Mathematics | Faculty of Science
Simon Fraser University Calendar 2011 Summer

This program prepares students for careers in industry.

Prerequisite Grade Requirement

To enrol in a course offered by the Department of Mathematics, a student must obtain a grade of C- or better in each prerequisite course. Some courses may require higher prerequisite grades. Check the MATH course's Calendar description for details.

Students will not normally be permitted to enrol in any course for which a D grade or lower was obtained in any prerequisite. No student may complete, for further credit, any course offered by the Department of Mathematics which is a prerequisite for a course the student has already completed with a grade of C- or higher, without permission of the department.

Program Requirements

The program requires the completion of 132 units. The Faculty of Science stipulates that a minimum of 48 units must be in upper division, and that additional upper division units will be required to total a minimum of 60 (excluding EDUC 401, 407).

The specific requirements for this particular program are divided into three parts: a common core of courses completed by all students, a choice of one of three area requirements (i.e option A, B or C), and completion of a minor program if the student is completing either the option B area requirement or the option C area requirement.

In addition to the program requirements set out below, general university regulations must be met.

Computing science courses that are completed in the industrial mathematics major program will count towards the requirement that 12 units must be completed from outside of the Faculty of Science.

A minimum program 3.00 cumulative grade point average (CGPA) must be obtained on the overall major program requirements, as well as a minimum program 3.00 grade point average in the upper division major courses.

Lower Division Core Requirements

Students complete a minimum total of 30 units, including either one of

- CMPT 126-3 Introduction to Computer Science and Programming
- CMPT 128-3 Introduction to Computing Science and Programming for Engineers

or both of

- CMPT 120-3 Introduction to Computing Science and Programming I
- CMPT 125-3 Introduction to Computing Science and Programming II

and all of

- CMPT 225-3 Data Structures and Programming
- MACM 101-3 Discrete Mathematics I
- MATH 242-3 Introduction to Analysis I
- MATH 251-3 Calculus III
- STAT 270-3 Introduction to Probability and Statistics
- STAT 285-3 Intermediate Probability and Statistics

and one of

- MATH 150-4 Calculus I with Review
- MATH 151-3 Calculus I
- MATH 154-3 Calculus I for the Biological Sciences*
- MATH 157-3 Calculus for the Social Sciences I*

and one of

- MATH 152-3 Calculus II

- MATH 155-3 Calculus II for the Biological Sciences*
- MATH 158-3 Calculus for the Social Sciences I*

and one of

- MATH 240-3 Algebra I: Linear Algebra
- MATH 232-3 Applied Linear Algebra*

*with a B grade or better

Upper Division Requirements

Students complete a total of 48 units, including one of

- MATH 320-3 Introduction to Analysis II
- MATH 340-3 Algebra II: Rings and Field

and additional Table III courses to total 48 upper division units, of which at least four courses must be at the 400 division. One upper division MATH course that is not shown in Table I may be substituted.

and an area requirement as chosen from one of option A, B or C as follows.

Option A: Operations Research and Applied Statistics
Option B: Scientific Computing
Option C: Discrete Mathematics

To complete the required 48 upper division units, students complete additional Table III courses (see list below), of which at least four courses must be at the 400 division. One upper division MATH course that is not shown in Table III may be substituted.

- CMPT 305-3 Computer Simulation and Modelling
- CMPT 307-3 Data Structures and Algorithms
- CMPT 361-3 Introduction to Computer Graphics
- CMPT 405-3 Design and Analysis of Computing Algorithms
- CMPT 461-3 Advanced Computer Graphics
- MACM 316-3 Numerical Analysis I
- MACM 401-3 Introduction to Computational Algebra
- MACM 409-3 Numerical Linear Algebra
- MACM 416-3 Numerical Analysis II
- MACM 442-3 Cryptography
- MATH 309-3 Continuous Optimization
- MATH 310-3 Introduction to Ordinary Differential Equations
- MATH 314-3 Boundary Value Problems
- MATH 322-3 Complex Variables
- MATH 338-3 Advanced Linear Algebra
- MATH 342-3 Elementary Number Theory
- MATH 343-3 Applied Discrete Mathematics
- MATH 345-3 Introduction to Graph Theory
- MATH 348-3 Probability Models in Operations Research
- MATH 408-3 Discrete Optimization
- MATH 418-3 Partial Differential Equations
- MATH 438-3 Linear Algebra

- MATH 443-3 Combinatorial Theory
- MATH 445-3 Graph Theory
- MATH 447-4 Coding Theory
- MATH 448-3 Network Flows
- MATH 461-3 Continuous Mathematical Models
- MATH 462-3 Fluid Dynamics
- MATH 467-3 Dynamical Systems
- MATH 470-3 Variational Calculus
- PHYS 395-3 Computational Physics

Faculty of Science Requirements

To:

Operations Research Honours Program

Department of Mathematics | Faculty of Science
Simon Fraser University Calendar 2011 Summer

This program prepares students for careers in industry or a variety of graduate and professional programs.

Prerequisite Grade Requirement

To enrol in a course offered by the Department of Mathematics, a student must obtain a grade of C- or better in each prerequisite course. Some courses may require higher prerequisite grades. Check the MATH course's Calendar description for details.

Students will not normally be permitted to enrol in any course for which a D grade or lower was obtained in any prerequisite. No student may complete, for further credit, any course offered by the Department of Mathematics which is a prerequisite for a course the student has already completed with a grade of C- or higher, without permission of the department.

Program Requirements

The program requires the completion of 132 units. The Faculty of Science stipulates that a minimum of 48 units must be in upper division, and that additional upper division units will be required to total a minimum of 60 (excluding EDUC 401, 407).

The specific program requirements are divided into three parts: required lower division courses, required upper division courses, and completion of an interdisciplinary requirement.

In addition to the program requirements set out below, general university regulations must be met.

Computing science courses that are completed in the operations research honours program will count towards the requirement that 12 units must be completed from outside of the Faculty of Science.

A minimum program 3.00 cumulative grade point average (CGPA) must be obtained on the overall major program requirements, as well as a minimum program 3.00 grade point average in the upper division major courses.

Lower Division Requirements

Students complete a minimum total of <u>39 units</u>, including either one of

- CMPT 126-3 Introduction to Computer Science and Programming
- CMPT 128-3 Introduction to Computing Science and Programming for Engineers

or both of

- CMPT 120-3 Introduction to Computing Science and Programming I
- CMPT 125-3 Introduction to Computing Science and Programming II

and all of

- CMPT 225-3 Data Structures and Programming
- MACM 101-3 Discrete Mathematics I
- <u>MACM 201-3 Discrete Mathematics II</u>
- <u>MATH 208-3 Introduction to Operations Research</u>
- MATH 242-3 Introduction to Analysis I
- MATH 251-3 Calculus III
- STAT 270-3 Introduction to Probability and Statistics
- STAT 285-3 Intermediate Probability and Statistics
- <u>IAT 103W-3 Design Communication and Collaboration</u>

and one of

- MATH 150-4 Calculus I with Review
- MATH 151-3 Calculus I
- MATH 154-3 Calculus I for the Biological Sciences*
- MATH 157-3 Calculus for the Social Sciences I*

and one of

- MATH 152-3 Calculus II
- MATH 155-3 Calculus II for the Biological Sciences*
- MATH 158-3 Calculus for the Social Sciences I*

and one of

- MATH 240-3 Algebra I: Linear Algebra
- MATH 232-3 Applied Linear Algebra*

*with a B grade or better

Upper Division Requirements

<u>Students complete a total of 48 units, including all of</u>

- MATH 308-3 Linear Optimization
- MATH 309-3 Continuous Optimization
- MATH 320-3 Introduction to Analysis II
- MATH 348-3 Probabilistic Models in Operations Research
- <u>MATH 402W-4 Operations Research Clinic</u>
- MATH 408-3 Discrete Optimization
- MATH 448-3 Network Flows
- STAT 350-3 Linear Models in Applied Statistics
- STAT 380-3 Introduction to Stochastic Processes

and at least two additional courses from Table I below

- ACMA 445-3 Loss Models: Estimation and Selection*
- BUEC 433-5 Forecasting in Business and Economics†
- STAT 390-3 Selected Topics in Probability and Statistics
- STAT 400-3 Data Analysis
- STAT 402-3 Generalized Linear and Nonlinear Modelling
- STAT 410-3 Statistical Analysis of Sample Surveys
- STAT 430-3 Statistical Design and Analysis of Experiments
- STAT 460-3 Bayesian Statistics
- STAT 490-3 Selected Topics in Probability and Statistics

*students must meet the entry requirements for the actuarial science program to enrol in this course
†see BUEC courses for prerequisites

and at least one from Table II below

- CMPT 305-3 Computer Simulation and Modelling
- CMPT 307-3 Data Structures and Algorithms
- MACM 316-3 Numerical Analysis I
- MATH 343-3 Applied Discrete Mathematics
- MATH 345-3 Introduction to Graph Theory
- MATH 445-3 Graph Theory

To complete the required 48 upper division units, students complete additional Table III courses (see list below), of which at least four courses must be at the 400 division. One upper division MATH course that is not shown in Table III may be substituted.

- CMPT 305-3 Computer Simulation and Modelling
- CMPT 307-3 Data Structures and Algorithms
- CMPT 361-3 Introduction to Computer Graphics
- CMPT 405-3 Design and Analysis of Computing Algorithms
- CMPT 461-3 Advanced Computer Graphics
- MACM 316-3 Numerical Analysis I
- MACM 401-3 Introduction to Computational Algebra
- MACM 409-3 Numerical Linear Algebra
- MACM 416-3 Numerical Analysis II
- MACM 442-3 Cryptography
- MATH 309-3 Continuous Optimization
- MATH 310-3 Introduction to Ordinary Differential Equations
- MATH 314-3 Boundary Value Problems
- MATH 322-3 Complex Variables

- <u>MATH 338-3 Advanced Linear Algebra</u>
- MATH 342-3 Elementary Number Theory
- MATH 343-3 Applied Discrete Mathematics
- MATH 345-3 Introduction to Graph Theory
- MATH 348-3 Probability Models in Operations Research
- MATH 418-3 Partial Differential Equations
- MATH 443-3 Combinatorial Theory
- MATH 445-3 Graph Theory
- MATH 447-4 Coding Theory
- MATH 461-3 Continuous Mathematical Models
- MATH 462-3 Fluid Dynamics
- MATH 467-3 Dynamical Systems
- MATH 470-3 Variational Calculus
- PHYS 395-3 Computational Physics

Interdisciplinary Requirement

<u>With advisor approval, students also complete at least 15 units **from application areas.**</u> Application courses are chosen from ACMA, BUEC, BUS, ECON, MACM, MATH, REM and STAT courses. <u>Courses used to fulfil upper division requirements cannot be used to fulfil this requirement</u>. If the <u>operations research honours</u> is completed as part of a second bachelor's degree, then the interdisciplinary requirement may be waived if the previous degree contains an approved major. Approvals are given individually. Those majors that are approved will not be limited to the disciplines listed above.

Faculty of Science Requirements (etc...)

SFU

MEMO

Department of Mathematics

LADISLAV STACHO
Chair, Undergraduate Studies
Committee

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| ATTENTION Dr. George Agnes
Faculty of Science Undergraduate CurriculumCommittee

| FROM Ladislav Stacho, Chair, Undergraduate Studies Committee

| RE Calendar Changes

| DATE 28 October 2011

Please find enclosed the following documents relating to undergraduate curriculum changes approved by Mathematics to be considered at the next Faculty of Science Undergraduate Curriculum Committee meeting.

Course Changes
Title Changes
Math 157 Calculus for the Social Sciences I
Math 158 Calculus for the Social Sciences II
To be compatible with our other Calculus I and II courses.

Course Deletions
Math 208 Introduction to Operations Research
Math 370 The Art and Craft of Problem Solving
Non W versions only are being deleted as Math 208 and 370 have been developed and delivered as writing courses.

Prerequisite Change
MATH 370W The Art and Craft of Problem Solving

Prerequisite Changes
Course changes are submitted to reflect changes in the BC high school math curriculum, approved by Senate Committee on Undergraduate Studies, October 14, 2010 (memorandum SCUS 10-50).

MATH 100 Precalculus
MATH 113 Euclidean Geometry
MATH 130 Geometry for Computer Graphics
MATH 150 Calculus I with Review
MATH 151 Calculus I
MATH 154 Calculus I for Biological Sciences
MATH 157 Calculus for the Social Sciences I
MATH 160W Mathematics in Action
MATH 178W Fractals and Chaos
MATH 190 Principles of Mathematics for Teachers
MATH 197 Hitchhiker's Guide to Everyday Math
MATH 198 Introduction to Quantitative Reasoning

MATH 198 Introduction to Quantitative Reasoning has been a required course in the Integrated Studies program within the Bachelor of General Studies degree. At an October 8, 2010 meeting, the Senate Committee on University Priorities (SCUP) reviewed and approved the proposal to halt admission to the Integrated Studies Program within the Faculty of Arts and Social Sciences, effective Fall 2010 and that the program be discontinued upon the current cohort's completion in 2013. We will retain this course with a view to incorporating Math 198 in additional curricula as needs are identified.

Please contact myself or Ms. Dale Yamaura, Manager, Academic and Administrative Services (v: 2-3799; e: math_manager@sfu.ca) as required.
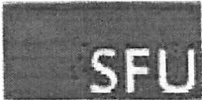
SFU

EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s)

☐Course number ☐Credit ☒Title ☐Description ☐Prerequisite Deletion☐

Indicate number of hours for: Lecture_____ Seminar _____ Tutorial _____ Lab _____

FROM :   **TO:**

Course Number __MATH 157-3_____ ____ Course Number _____ __MATH 157-3__ __ Credit

Hour___ __ _____ _____ Credit Hour _____

TITLE

(1) Long title for calendar and schedule, no more than 100 characters including spaces and punctuation.

| Calculus for the social sciences I | **Calculus I for the Social Sciences** |

(2) Short title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

| | |

DESCRIPTION

| | |

PREREQUISITE

| | |

RATIONALE

| This will follow our name-system in other calculus courses. |

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses? If so, this should be **noted in the prerequisite**.

Effective term and year ___1124 – S̶u̶m̶m̶e̶r̶ 2012_____

FALL

SFU

EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s)

☐ Course number ☐ Credit ■ Title ☐ Description ☐ Prerequisite Deletion ☐

Indicate number of hours for: Lecture_____ Seminar _____ Tutorial _____ Lab _____

FROM : **TO:**

Course Number __**MATH 158-3**_____ Course Number _____**MATH 158-3**____ Credit

Hour_____ Credit Hour _____

TITLE

(1) Long title for calendar and schedule, no more than 100 characters including spaces and punctuation.

| Calculus for the social sciences II | **Calculus II for the Social Sciences** |

(2) Short title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

| | |

DESCRIPTION

| | |

PREREQUISITE

| | |

RATIONALE

| This will follow our name-system in other calculus courses. |

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses? If so, this should be **noted in the prerequisite**.

Effective term and year ___1124 – ~~Summer~~ 2012_____
FALL

SFU

EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s)

☐Course number ☐Credit ☐Title ☐Description ☐Prerequisite Deletion ☑

Indicate number of hours for: Lecture_____ Seminar_____ Tutorial_____ Lab_____

FROM :   **TO:**

Course Number __**MATH 208-3**_____ Course Number _____ Credit

Hour _____ Credit Hour _____

TITLE

(1) Long title for calendar and schedule, no more than 100 characters including spaces and punctuation.

Introduction to Operations Research

(2) Short title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

DESCRIPTION

PREREQUISITE

RATIONALE

We are deleting the non-W version, since this course was developed as writing course, and will only be given as Math 208W.

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses? If so, this should be **noted in the prerequisite**.

Effective term and year ___1124 – ~~Summer~~ 2012___
FALL

SFU

EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s)

☐Course number ☐Credit ☐Title ☐Description ☐Prerequisite ☑ Deletion

Indicate number of hours for: Lecture_____ Seminar _____ Tutorial _____ Lab _____

FROM :   **TO:**

Course Number __**MATH 370-3**_____ Course Number _____ Credit

Hour_____ Credit Hour _____

TITLE

(1) Long title for calendar and schedule, no more than 100 characters including spaces and punctuation.

The Art and Craft of Problem Solving	

(2) Short title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

DESCRIPTION

PREREQUISITE

RATIONALE

We are deleting the non-W version, since this course was developed as writing course, and will only be given as Math 370W.

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

Effective term and year __1124 – ~~Summer~~ 2012_____
                                    FALL