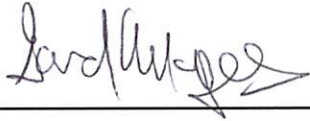




OFFICE OF THE ASSOCIATE VICE-PRESIDENT, ACADEMIC AND
ASSOCIATE PROVOST

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MEMORANDUM

| | | | |
|-----------|---|-------|---|
| ATTENTION | Senate | DATE | November 9, 2012 |
| FROM | Gordon Myers, Chair Senate Committee on Undergraduate Studies | PAGES | 1/2 |
| RE: | Faculty of Science (SCUS 12-41(iii)) | |  |

For information:

Acting under delegated authority at its meeting of November 8, 2012, SCUS approved the following curriculum revisions effective Summer 2013:

1. Department of Biomedical Physiology and Kinesiology (SCUS 12-41)

- (i) Continuance requirement for the Biomedical Physiology Major and Kinesiology Major

2. Management & Systems Science (SCUS 12-47a)

- (i) Requirement changes to the BSc Major in Management and Systems Science
- (ii) Requirement changes to the BSc Honours in Management and Systems Science

3. Earth Sciences (SCUS 12-47b) [effective Fall 2013]

- (i) Title and/or description and/or prerequisite changes for EASC 101, 206, 207, 210, 301, 306, 314, 403, 404, 411.
- (ii) W designation for EASC 315
- (iii) Change to course number, description and prerequisite for EASC 303W and 406
- (iv) New Course Proposal: EASC 311-3, Metamorphic Petrology, effective Spring 2014
- (v) Requirement changes to EASC Major Program and Geology and Environmental Geoscience Streams
- (vi) Requirement changes to EASC Honours Program and Geology and Environmental Geoscience Streams
- (vii) Requirement changes to EASC-CHEM Joint Major Program
- (viii) Requirement changes to EASC-CHEM Joint Major Honours Program

(ix) Requirement changes to the Earth Sciences Certificate Program

4. Department of Biological Sciences (SCUS 12-47c)

(i) Course number change to BISC 418

5. Department of Biomedical Physiology and Kinesiology (SCUS 12-47d)

(i) W Designation for KIN 451-3, Practicum III

6. Department of Math (SCUS 12-47e)

(i) Requirement changes to elective courses in the Mathematics Major and Honours Programs

(ii) Requirement changes to the Operations Research Major and Honours Programs

(iii) Prerequisite change to MATH 348

(iv) Deletion of MATH 402 (non-W)

7. Department of Statistics & Actuarial Science (SCUS 12-47f)

(i) Prerequisite changes to STAT 302, 403 and ACMA 320

8. Department of Physics (SCUS 12-47g)

(i) Prerequisite changes to PHYS 100 and 125

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](tel:778-782-3168) or email shelley_gair@sfu.ca.



Faculty of Science
Dean's Office
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8888 – University Drive
Burnaby, BC V5A 1S6

SCUS 12-41(iii) Revised

TO: G. Myers, Chair, SCUS

FROM: G. Agnes, Associate Dean
Faculty of Science

RE: SCUS 12-41

DATE: October 26, 2012

Attached is the resubmission of agenda item SCUS 12-41, 1, part iii - continuance requirement for the Biomedical Physiology Major and the Kinesiology Major.



G. Agnes

Enclosure

c. J. Hinchliffe, C. Cupples, R.Dill

Calendar Statement for Biomedical Physiology and Kinesiology Majors

After a student has completed 24 credits, a Science cumulative grade point average (CGPA) of not less than 2.20 is required for continuance in the major. Students, whose Science CGPA falls below 2.20, will be sent a warning letter and if in the subsequent term the Science CGPA is less than 2.20, these students shall be withdrawn from the BIF or KIN Major. Students who have completed 90 or more units and whose Science CGPA fall below a 2.20 but are at a minimum of 2.00 will be allowed to complete their Biomedical Physiology or Kinesiology major. Students must achieve a minimum of a C- grade in all required courses.

Additional Clarification will be posted on BPK's websites

http://www.sfu.ca/bpk/undergraduate/bsc_kin/

http://www.sfu.ca/bpk/undergraduate/biomedical_physiology_major/

Items for web site:

How will each student whose CGPA falls below the continuance requirement be advised?

- Students under warning will be advised to make use of university academic support systems such as the student learning commons.
- Withdrawn students will be advised about alternative programs including the B. Sc. General Science double minor program.


TO: G. Myers, Chair, SCUS**FROM:** G. Agnes, Associate Dean
Faculty of Science**RE:** Faculty of Science Curriculum
Items**DATE:** October 24, 2012

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. **Management & Systems Science**
 - a) Changes to the MSSC Major program
 - b) Changes to the MSSC Honours program
2. **Earth Sciences**
 - a) Changes to EASC 101, 206, 207, 210, 301, 306, 314, 315, 403, 404, 411
 - b) Changes to course number, description, prerequisites & learning outcomes to EASC 303W
 - c) Changes to course number, description, prerequisites & learning outcomes to EASC 406
 - d) New course proposal - EASC 311
 - e) Changes to EASC Majors/Honours programs – mainly reflects course changes above
 - f) Changes to EASC-CHEM Joint Majors/Honours programs – mainly reflects course changes above
 - g) Changes to EASC Earth Sciences Certificate – restructured for clarity
 - h) Changes to EASC Forestry Geoscience Certificate – renamed & restructured
3. **Biological Sciences**
 - a) Change to course number for BISC 418 to BISC 318
 - b) Change to program requirements for BISC Open Stream
4. **Biomedical Physiology & Kinesiology**
 - a) KIN 451W approval from the W office
 - b) Certificate of Occupational Ergonomics - Notice of Intent
5. **Mathematics**
 - a) Changes to Mathematics Major and Honours Programs
 - b) Changes to Operations Research Major and Honours Programs
 - c) Prerequisite change to MATH 348-3
 - d) Deletion of MATH 402-4
6. **Statistics & Actuarial Science**
Prerequisite Changes to STAT 302, STAT 403 and ACMA 320
7. **Physics**
Prerequisite Changes to PHYS 100 and PHYS 125-3


 G. Agnes

Enclosure

c. J. Hinchliffe, C. Cupples

a)

Proposed changes to the BSc Major in Management and Systems Science:

The Steering Committee for the Management and Systems Science (MSSC) program, administered in the Faculty of Science, proposes the following changes to the MSSC program and corresponding calendar listing. These changes were approved by the steering Committee by electronic vote on July 3, 2012. Steering Committee Members are: Tom Loughin, MSSC program director, Department of Statistics and Actuarial Science; Joe Peters, School of Computing Science; Abraham Punnen, Department of Mathematics; Dianne Cyr, Beedie School of Business, and Gord Myers, Department of Economics.

Summary of Changes:

- Explicitly listing CMPT 120 as a LD requirement, which had previously been implicitly required as it was a required course based on prerequisites.
- Change the sequence FROM CMPT (125 or 126) and 275, TO CMPT 120, 125, and 275.
- Added a new sequence of 3 courses, CMPT 130, 135, 276, as a series-option to list of LD requirements
- Add new course MATH 208 to list of LD requirements
- Correct an editorial error in the title of the course BUS 251
- Moved MSSC 180 from UD requirements list to LD requirements list
- In the list of recommended UD courses, the STAT 4xx courses were replaced with new list of STAT courses

Rationale for Changes:

- Computing Science has added a special stream of courses in Surrey taught using the computing language C++ rather than Java. These courses are CMPT 130, 135, 276. In Surrey they no longer offer the sequence CMPT 120, 125, 126, or 275, which are taught using the Java language. The content of either set of courses is essentially the same, so students may choose to take either sequence to fulfill program requirements.
- Within the current calendar description, the sequence of computing courses (CMPT 125 and 126) did not explicitly list CMPT 120. CMPT 120 was always however a prerequisite for CMPT 125. Therefore, this calendar change makes the requirement of CMPT 120 explicit.
- Mathematics has introduced a new course, MATH 208-3: Introduction to Operations Research, which teaches introductory-level material very close to the core of what students will take in upper-division courses. Exposure of students to this material at an introductory and very applied level early in the program should better prepare and motivate them for the more technical coursework that they take later in the program.
- This change is a correction to an editorial error in the calendar. The title of the course, BUS 251-3, currently had a typographical error in its title that is now deleted with this change.
- MSSC 180 is now listed among the lower-division courses. This is a seminar based, 1-credit, course where students get exposure to 10 presentations from individuals who are invited from the community. The intent of moving this course to the LD requirements is to stimulate student imagination and planning with respect to their undergraduate program.
- The Department of Statistics and Actuarial Science have recently revised their 300- and 400-level offerings, so changes need to be made reflecting these changes. All of the new courses teach data analysis for different types of data and/or different kinds of data-gathering studies. Therefore, all of these courses can be useful additions to a student's program in accordance with their interests.

Change **FROM** Current MSSC Calendar description:

Management and Systems Science Major Program

*Management and Systems Science Program | Faculty of Science
Simon Fraser University Calendar 2012 Summer*

The Faculty of Science, with the Departments of Mathematics, Statistics and Actuarial Science, Economics, the Beedie School of Business, and the School of Computing Science, offer a major in management and systems science (MSSC) at the Surrey campus leading to a bachelor of science (BSc) degree. This is a highly structured program providing a multidisciplinary approach to quantitative methods for business and industry in an environment of rapid changes in technology.

The program is managed by the Faculty of Science at the Surrey campus. A steering committee consisting of representatives from the above mentioned departments and faculty serve as liaison between participating departments and the program director. Where possible, the director and steering committee members will be based on the Surrey campus.

Students formally apply to be admitted into the program. Applications can be considered both for students entering Simon Fraser University, and for students already enrolled. Admission into the program is decided on a competitive basis. Students must maintain a 2.7 cumulative grade point average (CGPA) in MSSC program course work to remain in the program and to graduate. It is strongly recommended that students contact the Surrey science advisor or program director early about admission and scheduling.

Program Requirements

Students complete 120 units, as specified below.

Under program and University regulations, a general degree requires a total of 120 units, 44 of which are in upper division courses. Completion of all lower and upper division courses shown below is required. However, students should be aware of particular department requirements for course entry. Contact those departments for information.

Lower Division Requirements

Students complete a total of 51-52 units.

Business Administration

Students complete all of

- BUS 207-3 Managerial Economics*
- BUS 251-3 Financial Accounting I Computing Science
- BUS 272-3 Behavior in Organizations

*may be waived if the student has credit for ECON 301-4

Computing Science

Students complete one of

- CMPT 125-3 Introduction to Computing Science and Programming II
- CMPT 126-3 Introduction to Computing Science and Programming

and both of

- CMPT 225-3 Data Structures and Programming
- CMPT 275-4 Software Engineering

Economics

Students complete both of

- ECON 103-4 Principles of Economics (I) Microeconomics
- ECON 105-4 Principles of Economics (II) Macroeconomics

Mathematics and Computing Science

Students complete both of

- MACM 101-3 Discrete Mathematics I
- MACM 201-3 Discrete Mathematics II

Mathematics

Students complete 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 both of

- MATH 152-3 Calculus II
- MATH 251-3 Calculus III

and one of

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

Statistics

Students complete both of

- STAT 270-3 Introduction to Probability and Statistics
- STAT 285-3 Intermediate Probability and Statistics

Recommended Courses

The following course is recommended.

- CMPT 212-3 Object-oriented Applications Design in C++

Upper Division Requirements

Students complete a total of 43-44 units.

Students should note that the prerequisites for the following courses must also be completed. However, BUS 237 and 336 (prerequisite for BUS 440 and 473) are waived for MSSC majors and honours.

Business Administration

Students complete all of

- BUS 343-3 Introduction to Marketing
- BUS 360-4 Business Communication
- BUS 361-3 Project Management
- BUS 473-4 Operations Management

Computing Science

Students complete one of

- BUS 440-4 Simulation in Management Decision Making
- CMPT 305-3 Computer Simulation and Modelling

and all of

- CMPT 307-3 Data Structures and Algorithms
- CMPT 354-3 Database Systems I
- CMPT 370-3 Information System Design

Management and Systems Science

Students complete both of

- MSSC 180-1 Undergraduate Seminar in Management and Systems Science†
- MSSC 481-1 Undergraduate Seminar in Management and Systems Science†

†cannot be completed concurrently

Mathematics

Students complete both of

- MATH 308-3 Linear Optimization
- MATH 348-3 Probabilistic Models in Operations Research

and one of

- MACM 316-3 Numerical Analysis I
- MATH 310-3 Introduction to Ordinary Differential Equations
- MATH 343-3 Applied Discrete Mathematics
- MATH 345-3 Introduction to Graph Theory

Statistics

Students complete both of

- STAT 350-3 Linear Models in Applied Statistics
- STAT 380-3 Introduction to Stochastic Processes

Recommended Courses

- BUS 312-4 Business Finance
- BUS 445-3 Analysis of Data for Management
- BUS 488-3 Group Dynamics and Teamwork
- BUEC 396-3 The Structure of Industry
- CMPT 405-3 Design and Analysis of Computing Algorithms
- CMPT 417-3 Intelligent Systems
- ECON 431-5 Intermediate Mathematical Economics
- MATH 309-3 Continuous Optimization
- MATH 408-3 Discrete Optimization
- MATH 448-3 Network Flows
- STAT 300-3 Statistics Communication
- STAT 400-3 Data Analysis
- STAT 410-3 Statistical Analysis of Sample Surveys
- STAT 430-3 Statistical Design and Analysis of Experiments
- STAT 460-3 Bayesian Statistics

Change TO Proposed new Calendar description:

Management and Systems Science Major Program

*Management and Systems Science Program | Faculty of Science
Simon Fraser University Calendar 2012 Summer*

The Faculty of Science, with the Departments of Mathematics, Statistics and Actuarial Science, Economics, the Beedie School of Business, and the School of Computing Science, offer a major in management and systems science (MSSC) at the Surrey campus leading to a bachelor of science (BSc) degree. This is a highly structured program providing a multidisciplinary approach to quantitative methods for business and industry in an environment of rapid changes in technology.

The program is managed by the Faculty of Science at the Surrey campus. A steering committee consisting of representatives from the above mentioned departments and faculty serve as liaison between participating departments and the program director. Where possible, the director and steering committee members will be based on the Surrey campus.

Students formally apply to be admitted into the program. Applications can be considered both for students entering Simon Fraser University, and for students already enrolled. Admission into the program is decided on a competitive basis. Students must maintain a 2.7 cumulative grade point average (CGPA) in MSSC program course work to remain in the program and to graduate. It is strongly recommended that students contact the Surrey science advisor or program director early about admission and scheduling.

Program Requirements

Students complete 120 units, as specified below.

Under program and University regulations, a general degree requires a total of 120 units, 44 of which are in upper division courses. Completion of all lower and upper division courses shown below is required. However, students should be aware of particular department requirements for course entry. Contact those departments for information.

Lower Division Requirements

Students complete a total of 57-59 units.

Business Administration

Students complete all of

- BUS 207-3 Managerial Economics*
- BUS 251-3 Financial Accounting I
- BUS 272-3 Behavior in Organizations

*may be waived if the student has credit for ECON 301-4

Computing Science

Students complete all of[‡]

- **CMPT 120-3 Introduction to Computing Science and Programming I**
- **CMPT 125-3 Introduction to Computing Science and Programming II**
- **CMPT 275-4 Software Engineering**

or all of

- **CMPT 130-3 Introduction to Computer Programming I**
- **CMPT 135-3 Introduction to Computer Programming II**
- **CMPT 276-3 Introduction to Software Engineering**

and

- CMPT 225-3 Data Structures and Programming

[‡] **CMPT 126-3 Introduction to Computing Science and Programming can be substituted for CMPT 120 and CMPT 125.**

Economics

Students complete both of

- ECON 103-4 Principles of Economics (I) Microeconomics
- ECON 105-4 Principles of Economics (II) Macroeconomics

Mathematics and Computing Science

Students complete both of

- MACM 101-3 Discrete Mathematics I
- MACM 201-3 Discrete Mathematics II

Management and Systems Science

Students complete

- **MSSC 180-1 Undergraduate Seminar in Management and Systems Science**

Mathematics

Students complete 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 all of

- MATH 152-3 Calculus II
- MATH 208^W-3 Introduction to Operations Research
- MATH 251-3 Calculus III

and one of

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

Statistics

Students complete both of

- STAT 270-3 Introduction to Probability and Statistics
- STAT 285-3 Intermediate Probability and Statistics

Recommended Courses

The following course is recommended for students who took CMPT 125.

- CMPT 212-3 Object-oriented Applications Design in C++

The following course is recommended for students who took CMPT 135.

- CMPT 213-3 Object-oriented Design in Java

Upper Division Requirements

Students complete a total of 43-44 units.

Students should note that the prerequisites for the following courses must also be completed. However, BUS 237 and 336 (prerequisite for BUS 440 and 473) are waived for MSSC majors and honours.

Business Administration

Students complete all of

- BUS 343-3 Introduction to Marketing
 - BUS 360-4 Business Communication
 - BUS 361-3 Project Management
 - BUS 473-4 Operations Management
- BUS 360 W - 4*

Computing Science

Students complete one of

- BUS 440-4 Simulation in Management Decision Making
- CMPT 305-3 Computer Simulation and Modelling

and all of

- CMPT 307-3 Data Structures and Algorithms
- CMPT 354-3 Database Systems I
- CMPT 370-3 Information System Design

Management and Systems Science

Students complete

- MSSC 481-1 Undergraduate Seminar in Management and Systems Science†

† MSSC 180 and MSSC 481 cannot be taken concurrently

Mathematics

Students complete both of

- MATH 308-3 Linear Optimization
- MATH 348-3 Probabilistic Models in Operations Research

and one of

- MACM 316-3 Numerical Analysis I
- MATH 310-3 Introduction to Ordinary Differential Equations
- MATH 343-3 Applied Discrete Mathematics
- MATH 345-3 Introduction to Graph Theory

Statistics

Students complete both of

- STAT 350-3 Linear Models in Applied Statistics

- STAT 380-3 Introduction to Stochastic Processes

Recommended Courses

- BUS 312-4 Business Finance
- BUS 445-3 Analysis of Data for Management
- BUS 488-3 Group Dynamics and Teamwork
- BUEC 396-3 The Structure of Industry
- CMPT 405-3 Design and Analysis of Computing Algorithms
- CMPT 417-3 Intelligent Systems
- ECON 431-5 Intermediate Mathematical Economics
- MATH 309-3 Continuous Optimization
- MATH 408-3 Discrete Optimization
- MATH 448-3 Network Flows
- **STAT 300W-3 Statistics Communication**
- **STAT 340-3 Statistical Computing and Exploratory Data Analysis**
- STAT 410-3 Statistical Analysis of Sample Surveys
- STAT 430-3 Statistical Design and Analysis of Experiments
- **STAT 475-2 Applied Discrete Data**
- **STAT 445-2 Applied Multivariate Analysis**
- STAT 460-3 Bayesian Statistics
- **STAT 485-2 Applied Time Series Analysis**
- **STAT 490-3 Selected Topics in Probability and Statistics**

b)

Proposed changes to the BSc Honours in Management and Systems Science:

The Steering Committee for the Management and Systems Science (MSSC) program, administered in the Faculty of Science, proposes the following changes to the MSSC Honours program and corresponding calendar listing. These changes were approved by the steering Committee by electronic vote on July 3, 2012. Steering Committee Members are: Tom Loughin, MSSC program director, Department of Statistics and Actuarial Science; Joe Peters, School of Computing Science; Abraham Punnen, Department of Mathematics; Dianne Cyr, Beedie School of Business, and Gord Myers, Department of Economics.

Summary of Changes:

- Explicitly listing CMPT 120 as a LD requirement, which had previously been implicitly required as it was a required course based on prerequisites.
- Change the sequence FROM CMPT (125 or 126) and 275, TO CMPT 120, 125, and 275.
- Added a new sequence of 3 courses, CMPT 130, 135, 276, as a series-option to list of LD requirements that may be taken in lieu of the sequence CMPT 120, 125, and 275
- Add new course MATH 208 to list of LD requirements
- Correct an editorial error in the title of the course BUS 251
- Moved MSSC 180 from UD requirements list to LD requirements list
- In the list of recommended UD courses, the STAT 4xx courses were replaced with new list of STAT courses

Rationale for Changes:

- Computing Science has added a special stream of courses in Surrey taught using the computing language C++ rather than Java. These courses are CMPT 130, 135, 276. In Surrey they no longer offer the sequence CMPT 120, 125, 126, or 275, which are taught using the Java language. The content of either set of courses is essentially the same, so students may choose to take either sequence to fulfill program requirements.
- Within the current calendar description, the sequence of computing courses (CMPT 125 and 126) did not explicitly list CMPT 120. CMPT 120 was always however a prerequisite for CMPT 125. Therefore, this calendar change makes the requirement of CMPT 120 explicit.
- Mathematics has introduced a new course, MATH 208-3: Introduction to Operations Research, which teaches introductory-level material very close to the core of what students will take in upper-division courses. Exposure of students to this material at an introductory and very applied level early in the program should better prepare and motivate them for the more technical coursework that they take later in the program.
- This change is a correction to an editorial error in the calendar. The title of the course, BUS 251-3, currently had a typographical error in its title that is now deleted with this change.
- MSSC 180 is now listed among the lower-division courses. This is a seminar based, 1-credit, course where students get exposure to 10 presentations from individuals who are invited from the community. The intent of moving this course to the LD requirements is to stimulate student imagination and planning with respect to their undergraduate program.
- The Department of Statistics and Actuarial Science have recently revised their 300- and 400-level offerings, so changes need to be made reflecting these changes. All of the new courses teach data analysis for different types of data and/or different kinds of data-gathering studies. Therefore, all of these courses can be useful additions to a student's program in accordance with their interests.
-

Change FROM Current MSSC Calendar description:

Management and Systems Science Honours Program

*Management and Systems Science Program | Faculty of Science
Simon Fraser University Calendar 2012 Fall*

The Faculty of Science, with the Departments of Mathematics, Statistics and Actuarial Science, Economics, the Beedie School of Business, and the School of Computing Science, offer an honours in management and systems science (MSSC) at the Surrey campus leading to a bachelor of science (BSc) with honours degree. These are highly structured programs providing a multidisciplinary approach to quantitative methods for business and industry in an environment of rapid changes in technology.

The program is managed by the Faculty of Science at the Surrey campus. A steering committee consisting of representatives from the above mentioned departments and faculty serve as liaison between participating departments and the program director. Where possible, the director and steering committee members will be based on the Surrey campus.

Students formally apply to be admitted into the program. Applications can be considered both for students entering Simon Fraser University, and for students already enrolled. Admission into the program is decided on a competitive basis. Students must maintain a 2.7 cumulative grade point average (CGPA) in MSSC program course work to remain in the program and to graduate. It is strongly recommended that students contact the Surrey science advisor or program director early about admission and scheduling. Students who wish to combine the MSSC honours program with another major or minor should consult with the MSSC director.

Program Requirements

Students complete 132 units, as specified below.

Under University regulations, an honours degree requires completion of a minimum of 60 upper division units in courses numbered 300 and above, including at least 50 upper division units in the honours program, and completion of at least 132 units. honours students require a graduation grade point average of not less than 3.00.

Lower Division Requirements

Students complete a total of 54-55 units.

Business Administration

Students complete all of

- BUS 207-3 Managerial Economics*
- BUS 251-3 Financial Accounting I
- BUS 272-3 Behavior in Organizations

*may be waived if the student has credit for ECON 301

Computing Science

Students complete one of

- CMPT 125-3 Introduction to Computing Science and Programming II
- CMPT 126-3 Introduction to Computing Science and Programming

and both of

- CMPT 225-3 Data Structures and Programming
- CMPT 275-4 Software Engineering

Economics

Students complete both of

- ECON 103-4 Principles of Economics (I) Microeconomics
- ECON 105-4 Principles of Economics (II) Macroeconomics

Mathematics and Computing Science

Students complete both of

- MACM 101-3 Discrete Mathematics I
- MACM 201-3 Discrete Mathematics II

Mathematics

Students complete 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 both of

- MATH 152-3 Calculus II
- MATH 251-3 Calculus III

and one of

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

Statistics

Students complete both of

- STAT 270-3 Introduction to Probability and Statistics

- STAT 285-3 Intermediate Probability and Statistics

Recommended Courses

The following course is recommended.

- CMPT 212-3 Object-oriented Applications Design in C++

Upper Division Requirements

Students complete a total of 55-56 units.

Students should note that the prerequisites for the following courses must also be completed. However, BUS 336 is waived for MSSC majors and honours.

Business Administration, Economics

Students complete all of

- BUS 343-3 Introduction to Marketing
- BUS 360-4 Business Communication
- BUS 361-3 Project Management
- BUS 473-4 Operations Management

and at least three business administration or economics units at the 400 division.

Computing Science

Students complete one of

- BUS 440-4 Simulation in Management Decision Making
- CMPT 305-3 Computer Simulation and Modelling

and all of

- CMPT 307-3 Data Structures and Algorithms
- CMPT 354-3 Database Systems I
- CMPT 370-3 Information System Design

and one of

- CMPT 405-3 Design and Analysis of Computing Algorithms
- CMPT 417-3 Intelligent Systems

Management and Systems Science

Students complete both of

- MSSC 180-1 Undergraduate Seminar in Management and Systems Science†
- MSSC 481-1 Undergraduate Seminar in Management and Systems Science†

†cannot be completed concurrently

Mathematics

Students complete both of

- MATH 308-3 Linear Optimization
- MATH 348-3 Probabilistic Models in Operations Research

and one of

- MATH 309-3 Continuous Optimization
- MATH 408-3 Discrete Optimization
- MATH 445-3 Graph Theory
- MATH 448-3 Network Flows

and one of

- MACM 316-3 Numerical Analysis I
- MATH 310-3 Introduction to Ordinary Differential Equations
- MATH 343-3 Applied Discrete Mathematics
- MATH 345-3 Introduction to Graph Theory

Statistics

Students complete all of

- STAT 330-3 Introduction to Mathematical Statistics
- STAT 350-3 Linear Models in Applied Statistics
- STAT 380-3 Introduction to Stochastic Processes

Recommended Courses

- BUS 312-4 Business Finance
- BUS 445-3 Analysis of Data for Management
- BUS 488-3 Group Dynamics and Teamwork
- BUEC 396-3 The Structure of Industry
- CMPT 405-3 Design and Analysis of Computing Algorithms
- CMPT 417-3 Intelligent Systems
- ECON 431-5 Intermediate Mathematical Economics
- MATH 309-3 Continuous Optimization
- MATH 408-3 Discrete Optimization
- MATH 448-3 Network Flows
- STAT 300-3 Statistics Communication
- STAT 400-3 Data Analysis
- STAT 410-3 Statistical Analysis of Sample Surveys
- STAT 430-3 Statistical Design and Analysis of Experiments
- STAT 460-3 Bayesian Statistics

Change TO Proposed new Calendar description:

Management and Systems Science Honours Program

*Management and Systems Science Program | Faculty of Science
Simon Fraser University Calendar 2012 Fall*

The Faculty of Science, with the Departments of Mathematics, Statistics and Actuarial Science, Economics, the Beedie School of Business, and the School of Computing Science, offer an honours in management and systems science (MSSC) at the Surrey campus leading to a bachelor of science (BSc) with honours degree. These are highly structured programs providing a multidisciplinary approach to quantitative methods for business and industry in an environment of rapid changes in technology.

The program is managed by the Faculty of Science at the Surrey campus. A steering committee consisting of representatives from the above mentioned departments and faculty serve as liaison between participating departments and the program director. Where possible, the director and steering committee members will be based on the Surrey campus.

Students formally apply to be admitted into the program. Applications can be considered both for students entering Simon Fraser University, and for students already enrolled. Admission into the program is decided on a competitive basis. Students must maintain a 2.7 cumulative grade point average (CGPA) in MSSC program course work to remain in the program and to graduate. It is strongly recommended that students contact the Surrey science advisor or program director early about admission and scheduling. Students who wish to combine the MSSC honours program with another major or minor should consult with the MSSC director.

Program Requirements

Students complete 132 units, as specified below.

Under University regulations, an honours degree requires completion of a minimum of 60 upper division units in courses numbered 300 and above, including at least 50 upper division units in the honours program, and completion of at least 132 units. honours students require a graduation grade point average of not less than 3.00.

Lower Division Requirements

Students complete a total of 54-55 units.

Business Administration

Students complete all of

- BUS 207-3 Managerial Economics*
- BUS 251-3 Financial Accounting I
- BUS 272-3 Behavior in Organizations

*may be waived if the student has credit for ECON 301

Computing Science

Students complete all of‡

- **CMPT 120-3 Introduction to Computing Science and Programming I**
- CMPT 125-3 Introduction to Computing Science and Programming II
- **CMPT 275-4 Software Engineering**

or all of

- **CMPT 130-3 Introduction to Computer Programming I**
- **CMPT 135-3 Introduction to Computer Programming II**
- **CMPT 276-3 Introduction to Software Engineering**

and

- CMPT 225-3 Data Structures and Programming

‡ CMPT 126-3 Introduction to Computing Science and Programming can be substituted for CMPT 120 and CMPT 125.

Economics

Students complete both of

- ECON 103-4 Principles of Economics (I) Microeconomics
- ECON 105-4 Principles of Economics (II) Macroeconomics

Mathematics and Computing Science

Students complete both of

- MACM 101-3 Discrete Mathematics I
- MACM 201-3 Discrete Mathematics II

Management and Systems Science

Students complete

- **MSSC 180-1 Undergraduate Seminar in Management and Systems Science**

Mathematics

Students complete 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 both of

- MATH 152-3 Calculus II
- **MATH 208-3 Introduction to Operations Research**
- MATH 251-3 Calculus III

and one of

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

Statistics

Students complete both of

- STAT 270-3 Introduction to Probability and Statistics
- STAT 285-3 Intermediate Probability and Statistics

Recommended Courses

The following course is recommended for students who took CMPT 125.

- CMPT 212-3 Object-oriented Applications Design in C++

The following course is recommended for students who took CMPT 135.

- CMPT 213-3 Object-oriented Design in Java

Upper Division Requirements

Students complete a total of 55-56 units.

Students should note that the prerequisites for the following courses must also be completed. However, BUS 336 is waived for MSSC majors and honours.

Business Administration, Economics

Students complete all of

- BUS 343-3 Introduction to Marketing
- BUS 360-4 Business Communication *BUS 360 W-4*
- BUS 361-3 Project Management
- BUS 473-4 Operations Management

and at least three business administration or economics units at the 400 division.

Computing Science

Students complete one of

- BUS 440-4 Simulation in Management Decision Making
- CMPT 305-3 Computer Simulation and Modelling

and all of

- CMPT 307-3 Data Structures and Algorithms
- CMPT 354-3 Database Systems I
- CMPT 370-3 Information System Design

and one of

- CMPT 405-3 Design and Analysis of Computing Algorithms
- CMPT 417-3 Intelligent Systems

Management and Systems Science

Students complete †

- MSSC 481-1 Undergraduate Seminar in Management and Systems Science†

†MSSC 180 and MSSC 481 cannot be completed concurrently

Mathematics

Students complete both of

- MATH 308-3 Linear Optimization
- MATH 348-3 Probabilistic Models in Operations Research

and one of

- MATH 309-3 Continuous Optimization
- MATH 408-3 Discrete Optimization
- MATH 445-3 Graph Theory
- MATH 448-3 Network Flows

and one of

- MACM 316-3 Numerical Analysis I
- MATH 310-3 Introduction to Ordinary Differential Equations
- MATH 343-3 Applied Discrete Mathematics
- MATH 345-3 Introduction to Graph Theory

Statistics

Students complete all of

- STAT 330-3 Introduction to Mathematical Statistics
- STAT 350-3 Linear Models in Applied Statistics
- STAT 380-3 Introduction to Stochastic Processes

Recommended Courses

- BUS 312-4 Business Finance
- BUS 445-3 Analysis of Data for Management
- BUS 488-3 Group Dynamics and Teamwork
- BUEC 396-3 The Structure of Industry
- CMPT 405-3 Design and Analysis of Computing Algorithms
- CMPT 417-3 Intelligent Systems
- ECON 431-5 Intermediate Mathematical Economics
- MATH 309-3 Continuous Optimization
- MATH 408-3 Discrete Optimization
- MATH 448-3 Network Flows
- STAT **300W-3** Statistics Communication
- STAT **340-3** **Statistical Computing and Exploratory Data Analysis**
- STAT 410-3 Statistical Analysis of Sample Surveys
- STAT 430-3 Statistical Design and Analysis of Experiments
- **STAT 475-2 Applied Discrete Data**
- **STAT 445-2 Applied Multivariate Analysis**
- STAT 460-3 Bayesian Statistics
- **STAT 485-2 Applied Time Series Analysis**
- **STAT 490-3 Selected Topics In Probability and Statistics**



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion Learning Outcomes

Indicate number of hours for: Lecture 2 Seminar _____ Tutorial _____ Lab _____

FROM Course Subject/Number EASC 306 TO Course Subject/Number _____

Credits 3 Credits _____

TITLE

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

FROM: Field Geology II TO:

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

FROM: Field Geology II TO:

DESCRIPTION

FROM:

A 12 day field camp held after final exams in the spring term. Students will learn how to observe, record and interpret geological features, and will carry out geological mapping and analysis. Approximately five 1-hour lectures on field methods, equipment and safety will precede the field camp. Field locations may vary from year to year.

DESCRIPTION

TO:

A 10-14 day field camp held after final exams in the spring term. Students will learn how to observe, record and interpret geological features, and will carry out geological mapping and analysis. Approximately five 1-hour lectures on field methods, equipment and safety will precede the field camp. Field locations may vary from year to year.

PREREQUISITE

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.

PREREQUISITE

FROM: EASC 201, 204, 205, 206 and GEOG 213 TO: EASC 201, 204, 205, and 206

LEARNING OUTCOMES

Students successfully completing this course will be able to: 1) design and undertake a program of field investigation and undertake multi-day, mapping projects that integrate observations from all available scales; 2) map and interpret sedimentary, igneous and metamorphic rocks and processes as well as structural and surficial features; 4) understand rock movement within the crust over geologic time involving processes such as original deposition or emplacement, burial, metamorphism, hydrothermal activity and deformation, and exhumation; 5) understand the principle of the "metamorphic veil" in the context of protolith recognition and isotopic dating; 6) integrate knowledge from field observations, and derivative maps, columns, sections and diagrams, to define a series of geological events for a given project; 7) combine the knowledge gained from individual studies into a comprehensive regional geological history.

RATIONALE

The prerequisite and description change better address the content of the field school as it is currently taught.

Effective term and year

Spring 2014
FAU 2013



SCUS 12-47b(ii)

UNIVERSITY CURRICULUM & INSTITUTIONAL LIAISON
OFFICE OF THE VICE PRESIDENT ACADEMIC AND PROVOST

MEMO

ADDRESS
8888 UNIVERSITY DRIVE
BURNABY BC V5A 1S6
CANADA

| | |
|--|-----|
| ATTENTION Glyn Williams-Jones, EASC UCC Chair | TEL |
| FROM SUSAN RHODES, Assistant Director, University Curriculum and Institutional Liaison | |
| RE W designation approval for EASC 315 | |
| | |
| DATE October 26, 2012 | |
| | |
| TIME 11:13 AM | |

The University Curriculum Office has approved a W designation for:

EASC 315 Geochemistry of Natural Waters – effective 1134

Please forward this memo to the Faculty of Science Undergraduate Curriculum Committee and then SCUS for additional approval.



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion Learning Outcomes

Indicate number of hours for: Lecture 2 Seminar _____ Tutorial _____ Lab 3

FROM
Course Subject/Number EASC 315
Credits 3

TO
Course Subject/Number EASC 315W
Credits 3

TITLE

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

FROM: Geochemistry of Natural Waters
TO:

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

FROM: Geochemistry of Natural Waters
TO:

DESCRIPTION

FROM:

Emphasis is on the fundamentals of water-rock interactions and the chemistry of natural waters, developing an understanding of the physical and chemical principles that govern the geochemistry of water within Earth's crust. Topics will include water sample collection and analysis, chemical thermodynamics, gas-water-rock interactions and geochemical modeling. The applications range from weathering and recharge to acid rock drainage and diagenesis.

DESCRIPTION

TO:

Emphasis is on the fundamentals of water-rock interactions and the chemistry of natural waters, developing an understanding of the physical and chemical principles that govern the geochemistry of water within Earth's crust. Topics will include water sample collection and analysis, chemical thermodynamics, gas-water-rock interactions and geochemical modeling. The applications range from weathering and recharge to acid rock drainage and diagenesis. Writing.

PREREQUISITE

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**.

FROM: Prerequisite: CHEM 122 and 126. Corequisite or prerequisite: EASC 304.
TO:

LEARNING OUTCOMES

Students successfully completing this course will be able to: 1) show an understanding of the physical and chemical processes that control the geochemistry of water; 2) collect water samples and analyze them; 3) use chemical thermodynamics and knowledge of gas-water-rock interactions to develop geochemical models.

RATIONALE

This course already has a significant writing component and as such we are seeking certification as a Writing intensive course. Furthermore, this course will now meet upper division W requirements for students in the Environmental Geoscience stream.

**EXISTING COURSE, CHANGES RECOMMENDED**

Please check appropriate revision(s):

 Course number Credit Title Description Prerequisite Course deletion Learning Outcomes
Indicate number of hours for: Lecture 2 Seminar _____ Tutorial _____ Lab 3FROM Course Subject/Number EASC 303W TO Course Subject/Number EASC 209WCredits 3 Credits _____**TITLE**

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

FROM: TO:

Environmental Geoscience

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

FROM: TO:

Environmental Geoscience

DESCRIPTION

FROM:

Environmental geology is a branch of earth science that deals with the relationship of people to their geological habitat. Topics covered will include environmental impact of mineral extraction and logging; erosion and sedimentation in rural and urban environments; and mass movements in mountainous terrain. The course includes two 1-day field trips that usually occur on Saturdays. Writing.

DESCRIPTION

TO:

Environmental geology is a branch of Earth Science that deals with the relationship of people to their geological habitat. Topics covered will include environmental impact of mineral extraction and logging; erosion and sedimentation in rural and urban environments; and mass movements in mountainous terrain. The course includes two 1-day field trips that usually occur on Saturdays. This course is primarily designed for EASC program students and those pursuing degrees in other Departments and Faculties that require a strong foundational course in Environmental Geoscience. Writing.

PREREQUISITE

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**.

FROM: 60 units including six units in Earth Sciences and GEOG 213.

PREREQUISITE

TO: EASC 101. STUDENTS WITH CREDIT FOR EASC 303W MAY NOT TAKE THIS COURSE FOR CREDIT.

LEARNING OUTCOMES

Students successfully completing this course will be able to: 1) understand and use terrain and applied maps to solve geologic problems; 2) recognize and understand mitigation techniques for natural hazards such as floods, earthquakes, mass wasting and volcanic; 3) solve geologic problems and reduce risk in both the urban environment and associated with resource development; 4) communicate geologic knowledge via field notes and synthesizing geologic information for various stakeholders and other geologists.

RATIONALE

This course provides a broad introduction to environmental geoscience topics that we would like to move to the 200-level. Presently EASC students choose between the Geology or Environmental Geoscience streams at the end of second year without having been exposed to the field of environmental geoscience. Moving this course to second year will therefore allow students to make an informed choice and this addresses one of the suggestions from a recent departmental review. Furthermore, this course will now meet lower division W requirements.

Effective term and year

Fall 2013

JANUARY 2012



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion Learning Outcomes

Indicate number of hours for: Lecture 2 Seminar Tutorial Lab

FROM Course Subject/Number EASC 406 TO Course Subject/Number EASC 308 Credits 3

TITLE

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

FROM: Field Geology III TO:

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

FROM: Field Geology III TO:

DESCRIPTION

FROM:

An advanced field study course that provides real-world examples of major topics in the earth sciences. The course includes both a classroom component throughout the term and a field component of about 2-3 weeks. The field component is usually held shortly after the spring examination period (generally late April to early May). The field component is an excursion to a variety of field sites that change yearly. Prior to student enrollment, the faculty member, in consultation with the students, will determine the field course location, and determine the mandatory supplementary course fees for that offering. Some offerings of EASC 406 may require overseas travel and possibly a significant change in the timing and cost of the field component. Students should be aware that they must also cover the costs of food and personal items on the field course.

DESCRIPTION

TO:

A 10-14 day field school held at the end of the summer term. Students will observe and interpret sedimentary and glacial geomorphic features, investigate natural hazard mechanisms and become acquainted with environmental geoscience topics. Students will carry out geological, geotechnical and geophysical surveying and analysis. Field locations may vary from year to year.

PREREQUISITE

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.

FROM: EASC 306 and a minimum of nine other units in upper division earth science courses (or permission of the instructor). Recommended: EASC 309.

PREREQUISITE

TO: EASC 201, 206 and 209W. Recommended: EASC 207. Students with credit for EASC 406 may not take this course for credit.

LEARNING OUTCOMES

Students successfully completing this course will: 1) have acquired field skills and data analysis/interpretation relating to environmental geoscience, sedimentology, and applied geophysics; 2) be able to describe geologic units and sections, construct a terrain map, reconstruct glacial history, sample groundwater, and conduct a geophysical survey; 3) be able to integrate a variety of digital data sets into a simple graphical visualization.

RATIONALE

EASC 306 Field Geology II teaches a wide range of fundamental skills related to igneous, metamorphic and structural geology. However, due to logistical and time constraints, it cannot adequately cover material related to sedimentology, environmental geoscience and applied geophysics. As such, re-purposing EASC 406 as EASC 308 will ensure that all EASC students receive the breadth of field skills necessary to practice as Professional Geoscientists in the fields of Geology and Environmental Geoscience. Prerequisites reflect the new course content.

Effective term and year Summer 2013



SENATE COMMITTEE ON
UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL
I OF 3 PAGES

COURSE SUBJECT/NUMBER EASC 311

COURSE TITLE

LONG — for Calendar/schedule, no more than 100 characters including spaces and punctuation

Metamorphic Petrology

AND

SHORT — for enrollment/transcript, no more than 30 characters including spaces and punctuation

Metamorphic Petrology

CAMPUS where course will be taught: Burnaby Surrey Vancouver Great Northern Way Off campus

COURSE DESCRIPTION (FOR CALENDAR). 50-60 WORDS MAXIMUM. ATTACH A COURSE OUTLINE TO THIS PROPOSAL.

Investigation of the physicochemical processes responsible for the origin of metamorphic rocks. Integrated study of the mineralogy, textures and phase relations through examination of hand sample and petrographic thin sections.

LIBRARY RESOURCES

NOTE: Senate has approved (S.93-11) that no new course should be approved by Senate until funding has been committed for necessary library materials. Each new course proposal must be accompanied by a library report and, if appropriate, confirmation that funding arrangements have been addressed.

Library report status Completed and attached.

RATIONALE FOR INTRODUCTION OF THIS COURSE

In order to allow for a more in depth study of the material, this course is being split from EASC 301 Igneous and Metamorphic petrology. This will also better align with the curriculum structure set by APEGBC, the provincial professional registration body for geoscientists.

SCHEDULING AND ENROLLMENT INFORMATION

Indicate effective term and year course would first be offered and planned frequency of offering thereafter:

Spring 2014. To be offered every year.

Will this be a required or elective course in the curriculum? Required Elective

What is the probable enrollment when offered? Estimate: 15

CREDITS

Indicate number of credits (units): 3

Indicate number of hours for: Lecture Seminar Tutorial Lab Other 2 hrs lecture
2 hrs lab



FACULTY Which of your present CFL faculty have the expertise to offer this course?

Marshall, Thorkelson, Gibson, Cameron

WQB DESIGNATION (attach approval from Curriculum Office)

PREREQUISITE

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.

EASC 301 and 302

COREQUISITE

EASC 301 and 302

STUDENT LEARNING OUTCOMES

Upon satisfactory completion of the course students will be able to:

- 1) understand the processes of metamorphic rock formation at deeper crustal levels; 2) describe metamorphic rocks at the outcrop, hand specimen, and microscope scales; 3) understand interactions between metamorphic rocks, crustal fluids, and ore deposits; 4) utilize mineralogy, geochemistry and texture to understand formation and tectonic environments; 5) use mineral and bulk-rock chemical analyses with thermodynamic calculations to predict equilibrium temperatures and pressures for a variety of geological environments; 6) utilize the timing of mineral growth and geochronology in the context of crustal processes.

FEES

Are there any proposed student fees associated with this course other than tuition fees? YES NO

Up to \$200

RESOURCES

List any outstanding resource issues to be addressed prior to implementation: space, laboratory equipment, etc:

none

OTHER IMPLICATIONS

Articulation agreement reviewed? YES NO Not applicable
 Exam required: YES NO
 Criminal Record Check required: YES NO



APPROVALS

- 1 Departmental approval indicates that the Department or School has approved the content of the course, and has consulted with other Departments/Schools/Faculties regarding proposed course content and overlap issues.

James MacEachern 28/09/2012
 Chair, Department/School Date

[Signature] Oct. 26/2012
 Chair, Faculty Curriculum Committee Date

- 2 Faculty approval indicates that all the necessary course content and overlap concerns have been resolved, and that the Faculty/School/Department commits to providing the required Library funds.

Email Consultation

 Dean or designate Date

LIST which other Departments, Schools and Faculties have been consulted regarding the proposed course content, including overlap issues. Attach documentary evidence of responses.

Faculty of Science departments

Other Faculties approval indicated that the Dean(s) or Designate of other Faculties AFFECTED by the proposed new course support(s) the approval of the new course:

 Date _____

 Date _____

- 3 SCUS approval indicates that the course has been approved for implementation subject, where appropriate, to financial issues being addressed.

COURSE APPROVED BY SCUS (Chair of SCUS):

 Date _____

APPROVAL IS SIGNIFIED BY DATE AND APPROPRIATE SIGNATURE.

| Present Calendar Description | Proposed Calendar Description changes <u>Underlined</u> |
|--|---|
| <p>Earth Sciences Major Program The department offers a bachelor of science degree with three course stream options leading to course concentrations: geology stream, environmental geoscience stream, and general earth sciences stream.</p> <p>The geology stream and the environmental geoscience stream are designed to permit a student to enrol as a geologist or environmental geoscientist respectively, in the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC), the governing body that regulates geoscience practice in BC. All students intending to practice as a geoscientist in BC must be licensed by APEGBC, and are strongly advised to pursue one of these two streams. Many other Canadian provinces also require professional licensing.</p> <p>Students who are not intending to practice as professional geoscientists, or seek accreditation, may choose to pursue the general earth sciences stream. This stream may best accommodate students in some joint major programs.</p> <p>Students should seek the advice of a departmental program advisor.</p> | <p>Earth Sciences Major Program The department offers a bachelor of science (<u>BSc</u>) degree with three course stream options leading to course concentrations: geology stream, environmental geoscience stream, and general earth sciences stream.</p> <p>The <u>geology and environmental geoscience streams</u> are designed to permit a student to enrol as a geologist or environmental geoscientist respectively, in the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC), the governing body that regulates geoscience practice in BC. All students intending to practice as a geoscientist in BC must be licensed by APEGBC, and are strongly advised to pursue one of these two streams. Many other Canadian provinces also require professional licensing.</p> <p><u>Students who are not intending to practice as professional geoscientists, may choose to pursue the general earth sciences stream.</u> This stream may best accommodate students in some joint major programs.</p> <p>Students should seek the advice of a departmental program advisor.</p> |
| <p>Minimum Grade Requirement Students wishing to register for earth sciences courses must obtain a C- grade or better in prerequisite courses.</p> | <p>Minimum Grade Requirement Students wishing to enroll in <u>Earth Sciences</u> courses must obtain a C- grade or better in prerequisite courses.</p> |
| <p>Program Requirements Students complete 120 units, as specified below.</p> | <p>Program Requirements Students complete <u>a minimum of</u> 120 units, as specified below.</p> |
| <p>Lower Division Requirements All students, no matter which streams they will choose, will complete a minimum of 54 units including all of</p> <p>CHEM 121-4 General Chemistry and Laboratory I CHEM 122-2 General Chemistry II CHEM 126-2 General Chemistry Laboratory II EASC 101-3 Physical Geology EASC 201-3 Stratigraphy and Sedimentation EASC 202-3 Introduction to Mineralogy EASC 204-3 Structural Geology I EASC 205-3 Introduction to Petrology EASC 206-2 Field Geology I EASC 207-3 Introduction to Applied Geophysics EASC 208-3 Introduction to Geochemistry EASC 210-3 Historical Geology GEOG 213-3 Introduction to Geomorphology MATH 152-3 Calculus II</p> <p>and one of MATH 150-4 Calculus I with Review MATH 151-3 Calculus I</p> <p>and one of STAT 201-3 Statistics for the Life Sciences STAT 270-3 Introduction to Probability and Statistics</p> <p>and one of PHYS 101-3 Physics for the Life Sciences 1*</p> | <p>Lower Division Requirements All students, no matter which streams they will choose, will complete a minimum of 54 units including all of</p> <p>CHEM 121-4 General Chemistry and Laboratory I CHEM 122-2 General Chemistry II CHEM 126-2 General Chemistry Laboratory II <u>EASC 101-3 Dynamic Earth</u> EASC 201-3 Stratigraphy and Sedimentation EASC 202-3 Introduction to Mineralogy EASC 204-3 Structural Geology I EASC 205-3 Introduction to Petrology EASC 206-2 Field Geology I EASC 207-3 Introduction to Applied Geophysics EASC 208-3 Introduction to Geochemistry <u>EASC 209W-3 Environmental Geoscience</u> EASC 210-3 Historical Geology MATH 151-3 Calculus I or MATH 150-4 Calculus I with Review MATH 152-3 Calculus II</p> <p>and one of STAT 201-3 Statistics for the Life Sciences STAT 270-3 Introduction to Probability and Statistics</p> <p>and one of PHYS 101-3 Physics for the Life Sciences 1* PHYS 120-3 Mechanics and Modern Physics PHYS 125-3 Mechanics and Special Relativity PHYS 140-4 Studio Physics - Mechanics and Modern Physics</p> |

| | |
|--|---|
| <p>PHYS 120-3 Mechanics and Modern Physics PHYS 125-3 Mechanics and Special Relativity PHYS 140-4 Studio Physics - Mechanics and Modern Physics</p> <p>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</p> <p>and if not completing PHYS 140/141, one of PHYS 130-2 Physics for the Life Sciences Laboratory* PHYS 131-2 Physics Laboratory I</p> <p>*Students are encouraged to complete the standard stream (PHYS 120, 121, 131) or the advanced stream (PHYS 125, 126, 131). Students may also choose to complete the studio physics stream (PHYS 140, 141). Students who complete the life sciences stream (PHYS 101, 102, 130) (which has a corequisite of BISC 100 or 101 or 102) with a minimum B grade should have sufficient preparation for the major program.</p> | <p>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</p> <p>and if not completing PHYS 140/141, one of PHYS 130-2 Physics for the Life Sciences Laboratory* PHYS 131-2 Physics Laboratory I</p> <p>*Students are encouraged to complete the standard stream (PHYS 120, 121, 131) or the advanced stream (PHYS 125, 126, 131). Students may also choose to complete the studio physics stream (PHYS 140, 141). Students who complete the life sciences stream (PHYS 101, 102, 130) (which has a corequisite of BISC 100 or 101 or 102) with a minimum B grade should have sufficient preparation for the major program.</p> |
| <p>Upper Division Requirements Students are encouraged to select upper division elective courses in consultation with an academic advisor, as APEGBC has specific groupings of elective courses for each stream, respectively.</p> | <p>Upper Division Requirements Students are encouraged to select upper division elective courses in consultation with an academic advisor, as APEGBC has specific groupings of elective courses for each stream, respectively.</p> |
| <p>Geology Stream Students who choose this stream will complete a minimum of 41 units, including all of</p> <p>EASC 301-3 Igneous and Metamorphic Petrology EASC 302-3 Sedimentary Petrology EASC 306-3 Field Geology II EASC 309-3 Global Tectonics EASC 310W-3 Paleontology</p> <p>and at least one of EASC 303W-3 Environmental Geoscience EASC 304-3 Hydrogeology EASC 313-3 Introduction to Soil and Rock Engineering EASC 403-3 Quaternary Geology</p> <p>and at least one of EASC 406-3 Field Geology III EASC 416-3 Field Methods in Hydrogeology</p> <p>and at least 18 units chosen from EASC 300-3 Selected Topics in Earth Sciences EASC 303W-3 Environmental Geoscience EASC 304-3 Hydrogeology EASC 305-3 Quantitative Methods for the Earth Sciences EASC 307-3 Applied Geophysics EASC 312-3 Stratigraphy EASC 313-3 Introduction to Soil and Rock Engineering EASC 314-3 Principles of Glaciology EASC 315-3 Geochemistry of Natural Waters EASC 317-3 Global Geophysics EASC 400-3 Selected Topics in Earth Sciences EASC 401-3 Mineral Deposits</p> | <p>Geology Stream Students who choose this stream will complete a minimum of <u>45 units</u>, including</p> <p>all of <u>EASC 301-3 Igneous Petrology</u> <u>EASC 302-3 Sedimentary Petrology</u> <u>EASC 306-3 Field Geology II</u> <u>EASC 308-3 Field Geology III</u> <u>EASC 309-3 Global Tectonics</u> <u>EASC 310W-3 Paleontology</u> <u>EASC 311-3 Metamorphic Petrology</u></p> <p>and at least one of EASC 304-3 Hydrogeology EASC 313-3 Introduction to Soil and Rock Engineering EASC 403-3 Quaternary Geology</p> <p>and at least <u>21 units</u> chosen from EASC 300-3 Selected Topics in Earth Sciences EASC 304-3 Hydrogeology EASC 305-3 Quantitative Methods for the Earth Sciences EASC 307-3 Applied Geophysics EASC 312-3 Stratigraphy EASC 313-3 Introduction to Soil and Rock Engineering EASC 314-3 Principles of Glaciology EASC 315W-3 Geochemistry of Natural Waters EASC 317-3 Global Geophysics EASC 400-3 Selected Topics in Earth Sciences EASC 401-3 Mineral Deposits EASC 402-3 Sedimentology EASC 403-3 Quaternary Geology EASC 404-3 Structural Geology II</p> |

| | |
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| <p>EASC 402-3 Sedimentology EASC 403-3 Quaternary Geology EASC 404-3 Structural Geology II EASC 405-3 Water Cycles and Resources: Environmental and Climate Change Impacts EASC 406-3 Field Geology III EASC 408-3 Regional Geology of Western Canada EASC 410-3 Groundwater Contaminant and Transport EASC 411-3 Terrain Analysis EASC 413-3 Resource Geotechnics EASC 416-3 Field Techniques in Hydrogeology EASC 420-3 Petroleum Geology EASC 421-3 Volcanology EASC 491-1 Directed Reading* EASC 492-2 Directed Reading* EASC 493-3 Directed Reading*</p> <p>Other Requirements: Students in the geology stream must also complete at least two additional units in the Faculty of Science or physical geography at the upper division. These courses may be used toward the minor requirements in another department. Some of these courses may also satisfy APEGBC requirements.</p> | <p>EASC 405-3 Water Cycles and Resources: Environmental and Climate Change Impacts EASC 408-3 Regional Geology of Western Canada EASC 410-3 Groundwater Contaminant and Transport EASC 411-3 Terrain Analysis EASC 413-3 Resource Geotechnics EASC 416-3 Field Techniques in Hydrogeology EASC 420-3 Petroleum Geology EASC 421-3 Volcanology EASC 491-1 Directed Reading* EASC 492-2 Directed Reading* EASC 493-3 Directed Reading*</p> |
| <p>Environmental Geoscience Stream Students who choose this stream will complete all of</p> <p>EASC 303W-3 Environmental Geoscience EASC 304-3 Hydrogeology EASC 306-3 Field Geology II EASC 313-3 Introduction to Soil and Rock Engineering EASC 403-3 Quaternary Geology</p> <p>and one of GEOG 311-4 Hydrology GEOG 317-4 Soil Science</p> <p>and at least one of EASC 301-3 Igneous and Metamorphic Petrology EASC 302-3 Sedimentary Petrology EASC 309-3 Global Tectonics EASC 310W-3 Paleontology</p> <p>and at least one of EASC 406-3 Field Geology III EASC 416-3 Field Techniques in Hydrogeology</p> <p>and a minimum of 19 units chosen from EASC 300-3 Selected Topics in Earth Sciences EASC 301-3 Igneous and Metamorphic Petrology EASC 302-3 Sedimentary Petrology EASC 305-3 Quantitative Methods for the Earth Sciences EASC 307-3 Applied Geophysics EASC 309-3 Global Tectonics EASC 310W-3 Paleontology EASC 312-3 Stratigraphy EASC 314-3 Principles of Glaciology EASC 317-4 Global Geophysics EASC 400-3 Selected Topics in Earth Sciences EASC 401-3 Mineral Deposits EASC 402-3 Sedimentology EASC 404-3 Structural Geology II</p> | <p>Environmental Geoscience Stream Students who choose this stream will complete <u>a minimum of 45 units, including</u></p> <p>all of EASC 304-3 Hydrogeology EASC 306-3 Field Geology II <u>EASC 308-3 Field Geology III</u> EASC 313-3 Introduction to Soil and Rock Engineering <u>EASC 315W-3 Geochemistry of Natural Waters</u> EASC 403-3 Quaternary Geology</p> <p>and at least one of <u>EASC 301-3 Igneous Petrology</u> EASC 302-3 Sedimentary Petrology EASC 309-3 Global Tectonics EASC 310W-3 Paleontology</p> <p>and a minimum of <u>24 units</u> chosen from EASC 300-3 Selected Topics in Earth Sciences <u>EASC 301-3 Igneous Petrology</u> EASC 302-3 Sedimentary Petrology EASC 305-3 Quantitative Methods for the Earth Sciences EASC 307-3 Applied Geophysics EASC 309-3 Global Tectonics EASC 310W-3 Paleontology <u>EASC 311-3 Metamorphic Petrology</u> EASC 312-3 Stratigraphy EASC 314-3 Principles of Glaciology EASC 317-3 Global Geophysics EASC 400-3 Selected Topics in Earth Sciences EASC 401-3 Mineral Deposits EASC 402-3 Sedimentology EASC 404-3 Structural Geology II EASC 405-3 Water Cycles and Resources: Environmental and Climate Change Impacts EASC 408-3 Regional Geology of Western Canada EASC 410-3 Groundwater Contaminant and Transport</p> |

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| <p>EASC 405-3 Water Cycles and Resources: Environmental and Climate Change Impacts EASC 406-3 Field Geology III EASC 408-3 Regional Geology of Western Canada EASC 410-3 Groundwater Contaminant and Transport EASC 411-3 Terrain Analysis EASC 412-3 Groundwater Geochemistry (Inactive) EASC 413-3 Resource Geotechnics EASC 416-3 Field Techniques in Hydrogeology EASC 420-3 Petroleum Geology EASC 421-3 Volcanology EASC 491-1 Directed Readings* EASC 492-2 Directed Readings* EASC 493-3 Directed Readings* GEOG 311-4 Hydrology GEOG 313-4 River Geomorphology GEOG 317-4 Soil Science GEOG 412-4 Glacial Processes and Environments</p> <p>*students may only complete a maximum of three units from a combination of EASC 491, 492, or 493</p> | <p>EASC 411-3 Terrain Analysis EASC 413-3 Resource Geotechnics EASC 416-3 Field Techniques in Hydrogeology EASC 420-3 Petroleum Geology EASC 421-3 Volcanology EASC 491-1 Directed Readings* EASC 492-2 Directed Readings* EASC 493-3 Directed Readings* GEOG 311-4 Hydrology GEOG 313-4 River Geomorphology GEOG 317-4 Soil Science GEOG 412W-4 Glacial Processes and Environments</p> <p>*students may only complete a maximum of <u>3 units</u> from a combination of EASC 491, 492, or 493</p> |
| <p>General Earth Sciences Stream Students who choose this stream will complete</p> <p>EASC 306-3 Field Geology II</p> <p>and at least one of EASC 406-3 Field Geology III EASC 416-3 Field Techniques in Hydrogeology</p> <p>and at least 30 other upper division EASC units.*</p> <p>*students may only complete a maximum of three units from a combination of EASC 491, 492, or 493</p> <p>and at least eight additional units in the Faculty of Science or physical geography. These courses may be used toward the minor requirements in another department.</p> | <p>General Earth Sciences Stream Students who choose this stream will complete <u>a minimum of 45 units, including all of</u></p> <p>EASC 306-3 Field Geology II <u>EASC 308-3 Field Geology III</u></p> <p><u>and one of</u> <u>EASC 310W-3 Paleontology</u> <u>EASC 315W-3 Geochemistry of Natural Waters</u></p> <p>and at least <u>36 units of upper division EASC or related courses that are approved by the department.*</u></p> <p>*students may only complete a maximum of <u>3 units</u> from a combination of EASC 491, 492, or 493.</p> |
| <p>Faculty of Science Requirements In addition to the above requirements, students must also satisfy Faculty of Science major program requirements to complete a total of 120 units including</p> <p>additional upper division units to total a minimum of 44 upper division units (excluding EDUC 401, 406)</p> <p>students who were enrolled at Simon Fraser University between fall 1991 and summer 2006 are required to complete a minimum of 12 units in subjects outside the Faculty of Science (excluding EDUC 401 to 406) including six units minimum to be completed in the Faculty of Arts and Social Sciences</p> | <p>Faculty of Science Requirements In addition to the above requirements, students must also satisfy Faculty of Science major program requirements to complete a total of 120 units including</p> <p>additional upper division units to total a minimum of 44 upper division units (excluding EDUC 401, 406)</p> <p>students who were enrolled at Simon Fraser University between fall 1991 and summer 2006 are required to complete a minimum of 12 units in subjects outside the Faculty of Science (excluding EDUC 401 to 406) including six units minimum to be completed in the Faculty of Arts and Social Sciences</p> |
| <p>Writing, Quantitative, and Breadth Requirements Students admitted to Simon Fraser University beginning in the fall 2006 term must meet writing, quantitative and breadth requirements as part of any degree program they may undertake. See Writing, Quantitative, and Breadth Requirements for university-wide information.</p> | <p>Writing, Quantitative, and Breadth Requirements Students admitted to Simon Fraser University beginning in the fall 2006 term must meet writing, quantitative and breadth requirements as part of any degree program they may undertake. See Writing, Quantitative, and Breadth Requirements for university-wide information.</p> |

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| Residency Requirements and Transfer Credit The University's residency requirement stipulates that, in most cases, total transfer and course challenge credit may not exceed 60 units, and may not include more than 15 units as upper division work. | Residency Requirements and Transfer Credit The University's residency requirement stipulates that, in most cases, total transfer and course challenge credit may not exceed 60 units, and may not include more than 15 units as upper division work. |
| Elective Courses In addition to the courses listed above, students should consult an academic advisor to plan the remaining required elective courses. | |

| Present Calendar Description | Proposed Calendar Description changes <u>Underlined</u> |
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| <p>Earth Sciences Honours Program This bachelor of science (BSc) with honours program offers a wide cross-section of discipline-related courses while providing an opportunity for independent research. The program has three course stream options leading to course concentrations: geology stream, environmental geoscience stream, and general earth sciences stream.</p> | <p>Earth Sciences Honours Program This bachelor of science (BSc) with honours program offers a wide cross-section of discipline-related courses while providing an opportunity for independent research. The program has three course stream options leading to course concentrations: geology stream, environmental geoscience stream, and general earth sciences stream.</p> <p><u>The geology and environmental geoscience streams are designed to permit a student to enrol as a geologist or environmental geoscientist respectively, in the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC), the governing body that regulates geoscience practice in BC. All students intending to practice as a geoscientist in BC must be licensed by APEGBC, and are strongly advised to pursue one of these two streams. Many other Canadian provinces also require professional licensing.</u></p> <p><u>Students who are not intending to practice as professional geoscientists, may choose to pursue the general Earth Sciences stream. This stream may best accommodate students in some joint major programs.</u></p> <p><u>Students should seek the advice of a departmental program advisor.</u></p> |
| <p>Admission Requirements Entry to the program requires a 3.00 or higher (B standing) cumulative grade point average (CGPA), and departmental permission.</p> | <p>Admission Requirements Entry to the program requires a 3.00 or higher (B standing) cumulative grade point average (CGPA), and departmental permission.</p> |
| | <p><u>Minimum Grade Requirement</u> <u>Students wishing to enroll in Earth Sciences courses must obtain a C- grade or better in prerequisite courses.</u></p> |
| <p>Program Requirements Students complete 132 units, as specified below including a minimum 3.00 cumulative grade point average.</p> | <p>Program Requirements Students complete <u>a minimum of 132 units</u>, as specified below including a minimum 3.00 cumulative grade point average <u>to be awarded an honours degree.</u></p> |
| <p>Lower Division Requirements All students, no matter which streams they will choose, will complete a minimum of 54 units including all of</p> <p>CHEM 121-4 General Chemistry and Laboratory I CHEM 122-2 General Chemistry II CHEM 126-2 General Chemistry Laboratory II EASC 101-3 Physical Geology EASC 201-3 Stratigraphy and Sedimentation EASC 202-3 Introduction to Mineralogy EASC 204-3 Structural Geology I EASC 205-3 Introduction to Petrology EASC 206-2 Field Geology I EASC 207-3 Introduction to Applied Geophysics EASC 208-3 Introduction to Geochemistry EASC 210-3 Historical Geology GEOG 213-3 Introduction to Geomorphology MATH 152-3 Calculus II</p> <p>and one of MATH 150-4 Calculus I with Review MATH 151-3 Calculus I</p> <p>and one of STAT 201-3 Statistics for the Life Sciences STAT 270-3 Introduction to Probability and Statistics</p> <p>and one of</p> | <p>Lower Division Requirements All students, no matter which streams they will choose, will complete a minimum of 54 units including</p> <p>all of CHEM 121-4 General Chemistry and Laboratory I CHEM 122-2 General Chemistry II CHEM 126-2 General Chemistry Laboratory II <u>EASC 101-3 Dynamic Earth</u> EASC 201-3 Stratigraphy and Sedimentation EASC 202-3 Introduction to Mineralogy EASC 204-3 Structural Geology I EASC 205-3 Introduction to Petrology EASC 206-2 Field Geology I EASC 207-3 Introduction to Applied Geophysics EASC 208-3 Introduction to Geochemistry <u>EASC 209W-3 Environmental Geoscience</u> EASC 210-3 Historical Geology MATH 151-3 Calculus I or MATH 150-4 Calculus I with Review MATH 152-3 Calculus II</p> <p>and one of STAT 201-3 Statistics for the Life Sciences STAT 270-3 Introduction to Probability and Statistics</p> <p>and one of PHYS 101-3 Physics for the Life Sciences I*</p> |

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| <p>PHYS 101-3 Physics for the Life Sciences I* PHYS 120-3 Mechanics and Modern Physics PHYS 125-3 Mechanics and Special Relativity PHYS 140-4 Studio Physics - Mechanics and Modern Physics</p> <p>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</p> <p>and if not completing PHYS 140/141, one of PHYS 130-2 Physics for the Life Sciences Laboratory* PHYS 131-2 Physics Laboratory I</p> <p>*Students are encouraged to complete the standard stream (PHYS 120, 121, 131) or the advanced stream (PHYS 125, 126, 131). Students may also choose to complete the studio physics stream (PHYS 140, 141). Students who complete the life sciences stream (PHYS 101, 102, 130) (which has a corequisite of BISC 100 or 101 or 102) with a minimum B grade should have sufficient preparation for the major program.</p> | <p>PHYS 120-3 Mechanics and Modern Physics PHYS 125-3 Mechanics and Special Relativity PHYS 140-4 Studio Physics - Mechanics and Modern Physics</p> <p>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</p> <p>and if not completing PHYS 140/141, one of PHYS 130-2 Physics for the Life Sciences Laboratory* PHYS 131-2 Physics Laboratory I</p> <p>*Students are encouraged to complete the standard stream (PHYS 120, 121, 131) or the advanced stream (PHYS 125, 126, 131). Students may also choose to complete the studio physics stream (PHYS 140, 141). Students who complete the life sciences stream (PHYS 101, 102, 130) (which has a corequisite of BISC 100 or 101 or 102) with a minimum B grade should have sufficient preparation for the major program.</p> |
| <p>Upper Division Requirements Students will complete 60 units minimum of 300 and 400 division EASC or physical geography courses, or related courses that are approved by the department. Students are encouraged to select upper division elective courses in consultation with an academic advisor, as APEGBC has specific groupings of elective courses for each stream, respectively.</p> | <p>Upper Division Requirements Students will complete 60 units minimum of 300 and 400 division <u>EASC or related courses</u> that are approved by the department. Students are encouraged to select upper division elective courses in consultation with an academic advisor, as APEGBC has specific groupings of elective courses for each stream, respectively.</p> |
| <p>Geology Stream Students who choose this stream will complete a minimum of 50 units, including all of</p> <p>EASC 301-3 Igneous and Metamorphic Petrology EASC 302-3 Sedimentary Petrology EASC 306-3 Field Geology II EASC 309-3 Global Tectonics EASC 310W-3 Paleontology EASC 499-9 honours Thesis</p> <p>and at least one of EASC 303W-3 Environmental Geoscience EASC 304-3 Hydrogeology EASC 313-3 Introduction to Soil and Rock Engineering EASC 403-3 Quaternary Geology</p> <p>and at least one of EASC 406-3 Field Geology III EASC 416-3 Field Methods in Hydrogeology</p> <p>and at least 18 units chosen from EASC 300-3 Selected Topics in Earth Sciences EASC 303W-3 Environmental Geoscience EASC 304-3 Hydrogeology EASC 305-3 Quantitative Methods for the Earth Sciences EASC 307-3 Applied Geophysics EASC 312-3 Stratigraphy EASC 313-3 Introduction to Soil and Rock Engineering EASC 314-3 Principles of Glaciology</p> | <p>Geology Stream Students who choose this stream will complete a minimum of <u>51 units</u>, including all of</p> <p><u>EASC 301-3 Igneous Petrology</u> <u>EASC 302-3 Sedimentary Petrology</u> <u>EASC 306-3 Field Geology II</u> <u>EASC 308-3 Field Geology III</u> <u>EASC 309-3 Global Tectonics</u> <u>EASC 310W-3 Paleontology</u> <u>EASC 311-3 Metamorphic Petrology</u> <u>EASC 499-9 Honours Thesis</u></p> <p>and at least one of EASC 304-3 Hydrogeology EASC 313-3 Introduction to Soil and Rock Engineering EASC 403-3 Quaternary Geology</p> <p>and at least 18 units chosen from EASC 300-3 Selected Topics in Earth Sciences EASC 304-3 Hydrogeology EASC 305-3 Quantitative Methods for the Earth Sciences EASC 307-3 Applied Geophysics EASC 312-3 Stratigraphy EASC 313-3 Introduction to Soil and Rock Engineering EASC 314-3 Principles of Glaciology EASC 315W-3 Geochemistry of Natural Waters EASC 317-3 Global Geophysics EASC 400-3 Selected Topics in Earth Sciences EASC 401-3 Mineral Deposits</p> |

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| <p>EASC 315-3 Geochemistry of Natural Waters EASC 317-3 Global Geophysics EASC 400-3 Selected Topics in Earth Sciences EASC 401-3 Mineral Deposits EASC 402-3 Sedimentology EASC 403-3 Quaternary Geology EASC 404-3 Structural Geology II EASC 405-3 Water Cycles and Resources: Environmental and Climate Change Impacts EASC 406-3 Field Geology III EASC 408-3 Regional Geology of Western Canada EASC 410-3 Groundwater Contaminant and Transport EASC 411-3 Terrain Analysis EASC 413-3 Resource Geotechnics EASC 416-3 Field Techniques in Hydrogeology EASC 420-3 Petroleum Geology EASC 421-3 Volcanology EASC 491-1 Directed Reading* EASC 492-2 Directed Reading* EASC 493-3 Directed Reading*</p> <p>and at least two additional units in the Faculty of Science or physical geography. These courses may be used toward the minor requirements in another department. Some of these courses may also satisfy APEGBC requirements.</p> | <p>EASC 402-3 Sedimentology EASC 403-3 Quaternary Geology EASC 404-3 Structural Geology II EASC 405-3 Water Cycles and Resources: Environmental and Climate Change Impacts EASC 408-3 Regional Geology of Western Canada EASC 410-3 Groundwater Contaminant and Transport EASC 411-3 Terrain Analysis EASC 413-3 Resource Geotechnics EASC 416-3 Field Techniques in Hydrogeology EASC 420-3 Petroleum Geology EASC 421-3 Volcanology EASC 491-1 Directed Reading* EASC 492-2 Directed Reading* EASC 493-3 Directed Reading*</p> |
| <p>Environmental Geoscience Stream Students who choose this stream will complete all of</p> <p>EASC 303W-3 Environmental Geoscience EASC 304-3 Hydrogeology EASC 306-3 Field Geology II EASC 313-3 Introduction to Soil and Rock Engineering EASC 403-3 Quaternary Geology EASC 499-9 honours Thesis</p> <p>and one of GEOG 311-4 Hydrology GEOG 317-4 Soil Science</p> <p>and at least one of EASC 301-3 Igneous and Metamorphic Petrology EASC 302-3 Sedimentary Petrology EASC 309-3 Global Tectonics EASC 310W-3 Paleontology</p> <p>and at least one of EASC 406-3 Field Geology III EASC 416-3 Field Techniques in Hydrogeology</p> <p>and a minimum of 19 units chosen from EASC 300-3 Selected Topics in Earth Sciences EASC 301-3 Igneous and Metamorphic Petrology EASC 302-3 Sedimentary Petrology EASC 305-3 Quantitative Methods for the Earth Sciences EASC 307-3 Applied Geophysics EASC 309-3 Global Tectonics EASC 310W-3 Paleontology EASC 312-3 Stratigraphy EASC 314-3 Principles of Glaciology EASC 315W-3 Geochemistry of Natural Waters</p> | <p>Environmental Geoscience Stream Students who choose this stream will complete <u>a minimum of 51 units, including all of</u></p> <p>EASC 304-3 Hydrogeology EASC 306-3 Field Geology II EASC 308-3 Field Geology III EASC 313-3 Introduction to Soil and Rock Engineering <u>EASC 315W-3 Geochemistry of Natural Waters</u> EASC 403-3 Quaternary Geology EASC 499-9 <u>Honours</u> Thesis</p> <p>and at least one of <u>EASC 301-3 Igneous Petrology</u> EASC 302-3 Sedimentary Petrology EASC 309-3 Global Tectonics EASC 310W-3 Paleontology</p> <p>and a minimum of <u>21 units</u> chosen from EASC 300-3 Selected Topics in Earth Sciences <u>EASC 301-3 Igneous Petrology</u> EASC 302-3 Sedimentary Petrology EASC 305-3 Quantitative Methods for the Earth Sciences EASC 307-3 Applied Geophysics EASC 309-3 Global Tectonics EASC 310W-3 Paleontology <u>EASC 311-3 Metamorphic Petrology</u> EASC 312-3 Stratigraphy EASC 314-3 Principles of Glaciology EASC 317-3 Global Geophysics EASC 400-3 Selected Topics in Earth Sciences EASC 401-3 Mineral Deposits EASC 402-3 Sedimentology EASC 404-3 Structural Geology II EASC 405-3 Water Cycles and Resources: Environmental and</p> |

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| <p>EASC 317-4 Global Geophysics EASC 400-3 Selected Topics in Earth Sciences EASC 401-3 Mineral Deposits EASC 402-3 Sedimentology EASC 404-3 Structural Geology II EASC 405-3 Water Cycles and Resources: Environmental and Climate Change Impacts EASC 406-3 Field Geology III EASC 408-3 Regional Geology of Western Canada EASC 410-3 Groundwater Contaminant and Transport EASC 411-3 Terrain Analysis EASC 413-3 Resource Geotechnics EASC 416-3 Field Techniques in Hydrogeology EASC 420-3 Petroleum Geology EASC 421-3 Volcanology EASC 491-1 Directed Readings* EASC 492-2 Directed Readings* EASC 493-3 Directed Readings* GEOG 311-4 Hydrology GEOG 313-4 River Geomorphology GEOG 317-4 Soil Science GEOG 412-4 Glacial Processes and Environments</p> <p>*students may only complete a maximum of three units from a combination of EASC 491, 492, or 493</p> | <p>Climate Change Impacts EASC 408-3 Regional Geology of Western Canada EASC 410-3 Groundwater Contaminant and Transport EASC 411-3 Terrain Analysis EASC 413-3 Resource Geotechnics EASC 416-3 Field Techniques in Hydrogeology EASC 420-3 Petroleum Geology EASC 421-3 Volcanology EASC 491-1 Directed Readings* EASC 492-2 Directed Readings* EASC 493-3 Directed Readings* GEOG 311-4 Hydrology GEOG 313-4 River Geomorphology GEOG 317-4 Soil Science GEOG 412W-4 Glacial Processes and Environments</p> <p>*students may only complete a maximum of <u>3 units</u> from a combination of EASC 491, 492, or 493</p> |
| <p>General Earth Sciences Stream Students who choose this stream will complete</p> <p>EASC 306-3 Field Geology II</p> <p>and at least one of EASC 406-3 Field Geology III EASC 416-3 Field Techniques in Hydrogeology EASC 499-9 honours Thesis</p> <p>and at least 30 other upper division EASC units.*</p> <p>*students may only complete a maximum of three units from a combination of EASC 491, 492, or 493</p> <p>and at least eight additional units in the Faculty of Science or physical geography. These courses may be used toward the minor requirements in another department.</p> | <p>General Earth Sciences Stream Students who choose this stream will complete <u>a minimum of 51 units, including all of</u></p> <p>EASC 306-3 Field Geology II <u>EASC 308-3 Field Geology III</u> <u>EASC 499-9 Honours Thesis</u></p> <p><u>and one of</u> <u>EASC 310W-3 Paleontology</u> <u>EASC 315W-3 Geochemistry of Natural Waters</u></p> <p>and at least 33 other upper division EASC units*</p> <p>*students may only complete a maximum of <u>3 units</u> from a combination of EASC 491, 492, or 493.</p> |
| <p>Elective Courses To achieve a final total of at least 132 units, students will complete at least 12 additional units from outside the Faculty of Science.</p> | |
| <p>Faculty of Science Requirements In addition to the above requirements, students must also satisfy Faculty of Science honours program requirements as follows.</p> <p>students are required to complete additional upper division units to total a minimum of 60 upper division units (excluding EDUC 401 to 406)</p> <p>students who were enrolled at Simon Fraser University between fall 1991 and summer 2006 are required to complete a minimum of 12 units in subjects outside the Faculty of Science (excluding EDUC 401 to 406) including six units minimum to be completed</p> | <p>Faculty of Science Requirements In addition to the above requirements, students must also satisfy Faculty of Science honours program requirements as follows.</p> <p>students are required to complete additional upper division units to total a minimum of 60 upper division units (excluding EDUC 401 to 406)</p> <p>students who were enrolled at Simon Fraser University between fall 1991 and summer 2006 are required to complete a minimum of 12 units in subjects outside the Faculty of Science (excluding EDUC 401 to 406) including six units minimum to be completed</p> |

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| <p>in the Faculty of Arts and Social Sciences</p> | <p>in the Faculty of Arts and Social Sciences</p> |
| <p>Writing, Quantitative, and Breadth Requirements Students admitted to Simon Fraser University beginning in the fall 2006 term must meet writing, quantitative and breadth requirements as part of any degree program they may undertake. See Writing, Quantitative, and Breadth Requirements for university-wide information.</p> | <p>Writing, Quantitative, and Breadth Requirements Students admitted to Simon Fraser University beginning in the fall 2006 term must meet writing, quantitative and breadth requirements as part of any degree program they may undertake. See Writing, Quantitative, and Breadth Requirements for university-wide information.</p> |
| <p>Residency Requirements and Transfer Credit The University's residency requirement stipulates that, in most cases, total transfer and course challenge credit may not exceed 60 units, and may not include more than 15 units as upper division work.</p> | <p>Residency Requirements and Transfer Credit The University's residency requirement stipulates that, in most cases, total transfer and course challenge credit may not exceed 60 units, and may not include more than 15 units as upper division work.</p> |

| Present Calendar Description | Proposed Calendar Description changes <u>Underlined</u> |
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| Chemistry and Earth Sciences Joint Major Program This Bachelor of Science (BSc) program is offered jointly by the Departments of Chemistry and Earth Sciences. Entry requires permission of both. | Chemistry and Earth Sciences Joint Major Program This Bachelor of Science (BSc) program is offered jointly by the Departments of Chemistry and Earth Sciences. Entry requires permission of both <u>departments</u> . |
| Minimum Grade Requirement Students wishing to enroll in Chemistry, Physics, and Earth Sciences courses must obtain a C- grade or better in prerequisite courses. | Minimum Grade Requirement Students wishing to enroll in Chemistry <u>and Earth Sciences</u> courses must obtain a C- grade or better in prerequisite courses. |
| Program Requirements Students complete at least 122 units, as specified below. | Program Requirements Students complete <u>a minimum of</u> 122 units, as specified below. |
| Lower Division Requirements Students will complete a minimum of 68 units including all of CHEM 121-4 General Chemistry and Laboratory I CHEM 122-2 General Chemistry II CHEM 126-2 General Chemistry Laboratory II CHEM 215-4 Introduction to Analytical Chemistry CHEM 230-3 Inorganic Chemistry CHEM 236W-3 Inorganic Chemistry Laboratory CHEM 281-4 Organic Chemistry I EASC 101-3 Physical Geology EASC 201-3 Stratigraphy and Sedimentation EASC 202-3 Introduction to Mineralogy EASC 204-3 Structural Geology I EASC 205-3 Introduction to Petrology EASC 206-2 Field Geology I EASC 207-3 Introduction to Applied Geophysics EASC 208-3 Introduction to Geochemistry EASC 210-3 Historical Geology GEOG 213-3 Introduction to Geomorphology MATH 151-3 Calculus I MATH 152-3 Calculus II STAT 270-3 Introduction to Probability and Statistics and all of PHYS 120-3 Mechanics and Modern Physics PHYS 121-3 Optics, Electricity and Magnetism PHYS 131-2 Physics Laboratory I or all of PHYS 125-3 Mechanics and Special Relativity PHYS 126-3 Electricity, Magnetism and Light PHYS 131-2 Physics Laboratory I or both of PHYS 140-4 Studio Physics-Mechanics and Modern Physics PHYS 141-4 Studio Physics-Optics, Electricity and Magnetism | Lower Division Requirements Students will complete a minimum of 68 units including all of CHEM 121-4 General Chemistry and Laboratory I CHEM 122-2 General Chemistry II CHEM 126-2 General Chemistry Laboratory II CHEM 215-4 Introduction to Analytical Chemistry CHEM 230-3 Inorganic Chemistry CHEM 236W-3 Inorganic Chemistry Laboratory CHEM 281-4 Organic Chemistry I <u>EASC 101-3 Dynamic Earth</u> EASC 201-3 Stratigraphy and Sedimentation EASC 202-3 Introduction to Mineralogy EASC 204-3 Structural Geology I EASC 205-3 Introduction to Petrology EASC 206-2 Field Geology I EASC 207-3 Introduction to Applied Geophysics EASC 208-3 Introduction to Geochemistry <u>EASC 209W-3 Environmental Geoscience</u> EASC 210-3 Historical Geology MATH 151-3 Calculus I <u>or</u> MATH 150-4 Calculus I with Review MATH 152-3 Calculus II <u>and one of</u> <u>STAT 201-3 Statistics for the Life Sciences</u> <u>STAT 270-3 Introduction to Probability and Statistics</u> and all of PHYS 120-3 Mechanics and Modern Physics PHYS 121-3 Optics, Electricity and Magnetism PHYS 131-2 Physics Laboratory I or all of PHYS 125-3 Mechanics and Special Relativity PHYS 126-3 Electricity, Magnetism and Light PHYS 131-2 Physics Laboratory I or both of PHYS 140-4 Studio Physics-Mechanics and Modern Physics PHYS 141-4 Studio Physics-Optics, Electricity and Magnetism |
| Upper Division Requirements Students will complete a minimum of 42 units including all of CHEM 316-4 Introductory Instrumental Analysis CHEM 317-2 Analytical Environmental Chemistry | Upper Division Requirements Students will complete a minimum of 42 units including all of CHEM 316-4 Introductory Instrumental Analysis CHEM 317-2 Analytical Environmental Chemistry |

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| <p>CHEM 332-3 The Chemistry of Transition Metals CHEM 360-3 Thermodynamics and Chemical Kinetics CHEM 371-3 Chemistry of the Aqueous Environment CHEM 372-3 Chemistry of the Atmospheric Environment</p> <p>and 3 units of 400-level CHEM not including CHEM 481-5 or CHEM 483-5</p> <p>EASC 303W-3 Environmental Geosciences EASC 306-3 Field Geology II</p> <p>Environmental Stream Students who choose this stream will complete all of EASC 304-3 Hydrogeology EASC 403-3 Quaternary Geology</p> <p>Geology Stream Students who choose this stream will complete all of EASC 301-3 Igneous and Metamorphic Petrology EASC 302-3 Sedimentary Petrology</p> <p>and 6 additional units of upper division EASC courses</p> <p>and one of NUSC 341-3 Introduction to Radiochemistry NUSC 344-3 Nucleosynthesis and Distribution of the Elements PHYS 346-3 Energy and the Environment</p> <p>Note: at least 3 units of upper division EASC courses must be 400-level</p> | <p>CHEM 332-3 The Chemistry of Transition Metals CHEM 360-3 Thermodynamics and Chemical Kinetics CHEM 371-3 Chemistry of the Aqueous Environment CHEM 372-3 Chemistry of the Atmospheric Environment</p> <p>and 3 units of 400-level CHEM not including CHEM 481-5 or CHEM 483-5</p> <p>EASC 306-3 Field Geology II <u>EASC 308-3 Field Geology III</u></p> <p>Environmental Stream Students who choose this stream will complete all of EASC 304-3 Hydrogeology EASC 403-3 Quaternary Geology</p> <p>Geology Stream Students who choose this stream will complete all of <u>EASC 301-3 Igneous Petrology</u> EASC 302-3 Sedimentary Petrology</p> <p><u>and one of</u> <u>EASC 315W-3 Geochemistry of Natural Waters</u> <u>EASC 310W-3 Paleontology</u></p> <p><u>and 3 additional units of 400-level EASC courses</u></p> <p>and one of NUSC 341-3 Introduction to Radiochemistry NUSC 344-3 Nucleosynthesis and Distribution of the Elements PHYS 346-3 Energy and the Environment</p> |
| <p>Upper Division Electives Upper division units must total a minimum of 44 upper division units (excluding EDUC 401-406)</p> | <p>Upper Division Electives Upper division units must total a minimum of 44 upper division units (excluding EDUC 401-406)</p> |
| <p>Faculty of Science Requirements To satisfy Faculty of Science requirements, students complete additional upper division credit to total 44 units. Job practicum courses, STAT 302 and 403 may not be used to fulfill this requirement.</p> | <p>Faculty of Science Requirements To satisfy Faculty of Science requirements, students complete additional upper division credit to total 44 units. Job practicum courses, STAT 302 and 403 may not be used to fulfill this requirement.</p> |
| <p>Writing, Quantitative, and Breadth Requirements Students admitted to Simon Fraser University beginning in the fall 2006 term must meet writing, quantitative and breadth requirements as part of any degree program they may undertake. See Writing, Quantitative, and Breadth Requirements for university-wide information.</p> | <p>Writing, Quantitative, and Breadth Requirements Students admitted to Simon Fraser University beginning in the fall 2006 term must meet writing, quantitative and breadth requirements as part of any degree program they may undertake. See Writing, Quantitative, and Breadth Requirements for university-wide information.</p> |
| <p>Residency Requirements and Transfer Credit The University's residency requirement stipulates that, in most cases, total transfer and course challenge credit may not exceed 60 units, and may not include more than 15 units as upper division work.</p> | <p>Residency Requirements and Transfer Credit The University's residency requirement stipulates that, in most cases, total transfer and course challenge credit may not exceed 60 units, and may not include more than 15 units as upper division work.</p> |
| <p>Elective Courses In addition to the courses listed above, students should consult an academic advisor to plan the remaining required elective courses.</p> | <p>Elective Courses In addition to the courses listed above, students should consult an academic advisor to plan the remaining required elective courses.</p> |

| Present Calendar Description | Proposed Calendar Description changes <u>Underlined</u> |
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| <p>Chemistry and Earth Sciences Joint Honours Program This Bachelor of Science (BSc) program is offered jointly by the Departments of Chemistry and Earth Sciences. Entry requires permission of both.</p> | <p>Chemistry and Earth Sciences Joint Honours Program This Bachelor of Science (BSc) program is offered jointly by the Departments of Chemistry and Earth Sciences. Entry requires permission of both <u>departments</u>.</p> |
| <p>Minimum Grade Requirement Students wishing to enroll in Chemistry, Physics, and Earth Sciences courses must obtain a C- grade or better in prerequisite courses.</p> | <p>Minimum Grade Requirement Students wishing to enroll in <u>Chemistry and Earth Sciences</u> courses must obtain a C- grade or better in prerequisite courses.</p> |
| <p>Program Requirements Students complete at least 132 units, as specified below including a minimum 3.00 cumulative grade point average to be awarded an honours degree.</p> | <p>Program Requirements Students complete a <u>minimum of 132</u> units, as specified below including a minimum 3.00 cumulative grade point average to be awarded an honours degree.</p> |
| <p>Lower Division Requirements Students will complete a minimum of 68 units including all of</p> <p>CHEM 121-4 General Chemistry and Laboratory I CHEM 122-2 General Chemistry II CHEM 126-2 General Chemistry Laboratory II CHEM 215-4 Introduction to Analytical Chemistry CHEM 230-3 Inorganic Chemistry CHEM 236W-3 Inorganic Chemistry Laboratory CHEM 281-4 Organic Chemistry I EASC 101-3 Physical Geology EASC 201-3 Stratigraphy and Sedimentation EASC 202-3 Introduction to Mineralogy EASC 204-3 Structural Geology I EASC 205-3 Introduction to Petrology EASC 206-2 Field Geology I EASC 207-3 Introduction to Applied Geophysics EASC 208-3 Introduction to Geochemistry EASC 210-3 Historical Geology GEOG 213-3 Introduction to Geomorphology MATH 151-3 Calculus I MATH 152-3 Calculus II STAT 270-3 Introduction to Probability and Statistics</p> <p>and all of</p> <p>PHYS 120-3 Mechanics and Modern Physics PHYS 121-3 Optics, Electricity and Magnetism PHYS 131-2 Physics Laboratory I</p> <p>or all of</p> <p>PHYS 125-3 Mechanics and Special Relativity PHYS 126-3 Electricity, Magnetism and Light PHYS 131-2 Physics Laboratory I</p> <p>or both of</p> <p>PHYS 140-4 Studio Physics-Mechanics and Modern Physics PHYS 141-4 Studio Physics-Optics, Electricity and Magnetism</p> | <p>Lower Division Requirements Students will complete a minimum of 68 units including</p> <p>all of</p> <p>CHEM 121-4 General Chemistry and Laboratory I CHEM 122-2 General Chemistry II CHEM 126-2 General Chemistry Laboratory II CHEM 215-4 Introduction to Analytical Chemistry CHEM 230-3 Inorganic Chemistry CHEM 236W-3 Inorganic Chemistry Laboratory CHEM 281-4 Organic Chemistry I <u>EASC 101-3 Dynamic Earth</u> EASC 201-3 Stratigraphy and Sedimentation EASC 202-3 Introduction to Mineralogy EASC 204-3 Structural Geology I EASC 205-3 Introduction to Petrology EASC 206-2 Field Geology I EASC 207-3 Introduction to Applied Geophysics EASC 208-3 Introduction to Geochemistry <u>EASC 209W-3 Environmental Geoscience</u> EASC 210-3 Historical Geology MATH 151-3 Calculus I <u>or</u> MATH 150-4 Calculus I with Review MATH 152-3 Calculus II</p> <p><u>and one of</u></p> <p><u>STAT 201-3 Statistics for the Life Sciences</u> <u>STAT 270-3 Introduction to Probability and Statistics</u></p> <p>and all of</p> <p>PHYS 120-3 Mechanics and Modern Physics PHYS 121-3 Optics, Electricity and Magnetism PHYS 131-2 Physics Laboratory I</p> <p>or all of</p> <p>PHYS 125-3 Mechanics and Special Relativity PHYS 126-3 Electricity, Magnetism and Light PHYS 131-2 Physics Laboratory I</p> <p>or both of</p> <p>PHYS 140-4 Studio Physics-Mechanics and Modern Physics PHYS 141-4 Studio Physics-Optics, Electricity and Magnetism</p> |

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| <p>Upper Division Requirements Upper division units must total a minimum of 50 units in CHEM and EASC, including at least 26 units in upper division CHEM, and all of</p> <p>CHEM 316-4 Introductory Instrumental Analysis CHEM 317-2 Analytical Environmental Chemistry CHEM 332-3 The Chemistry of Transition Metals CHEM 360-3 Thermodynamics and Chemical Kinetics CHEM 371-3 Chemistry of the Aqueous Environment CHEM 372-3 Chemistry of the Atmospheric Environment</p> <p>and 6 units of 400-level CHEM (which can include CHEM 481-5)</p> <p>EASC 303W-3 Environmental Geosciences EASC 306-3 Field Geology II</p> <p>Environmental Stream Students who choose this stream will complete all of EASC 304-3 Hydrogeology EASC 403-3 Quaternary Geology</p> <p>Geology Stream Students who choose this stream will complete all of EASC 301-3 Igneous and Metamorphic Petrology EASC 302-3 Sedimentary Petrology</p> <p>and 3 additional units of upper division EASC courses</p> <p>and one of EASC 499-9 Honours Thesis CHEM 481-5 Undergraduate Research</p> <p>and one of NUSC 341-3 Introduction to Radiochemistry NUSC 344-3 Nucleosynthesis and Distribution of the Elements PHYS 346-3 Energy and the Environment</p> | <p>Upper Division Requirements Upper division units must total a minimum of 50 units in CHEM and EASC, including at least 26 units in upper division CHEM, and all of</p> <p>CHEM 316-4 Introductory Instrumental Analysis CHEM 317-2 Analytical Environmental Chemistry CHEM 332-3 The Chemistry of Transition Metals CHEM 360-3 Thermodynamics and Chemical Kinetics CHEM 371-3 Chemistry of the Aqueous Environment CHEM 372-3 Chemistry of the Atmospheric Environment</p> <p>and 6 units of 400-level CHEM (which can include CHEM 481-5)</p> <p>EASC 306-3 Field Geology II <u>EASC 308-3 Field Geology III</u></p> <p>Environmental Stream Students who choose this stream will complete all of EASC 304-3 Hydrogeology EASC 403-3 Quaternary Geology</p> <p>Geology Stream Students who choose this stream will complete all of <u>EASC 301-3 Igneous Petrology</u> EASC 302-3 Sedimentary Petrology</p> <p><u>and one of</u> <u>EASC 315W-3 Geochemistry of Natural Waters</u> <u>EASC 310W-3 Paleontology</u></p> <p>and one of EASC 499-9 Honours Thesis CHEM 481-5 Undergraduate Research</p> <p>and one of NUSC 341-3 Introduction to Radiochemistry NUSC 344-3 Nucleosynthesis and Distribution of the Elements PHYS 346-3 Energy and the Environment</p> |
| <p>Upper Division Electives Upper division units must total a minimum of 60 units overall (not including EDUC 401-406)</p> | <p>Upper Division Electives Upper division units must total a minimum of 60 units overall (not including EDUC 401-406)</p> |
| <p>Faculty of Science Requirements To satisfy Faculty of Science requirements, students complete additional upper division credit to total 44 units. Job practicum courses, STAT 302 and 403 may not be used to fulfill this requirement.</p> | <p>Faculty of Science Requirements To satisfy Faculty of Science requirements, students complete additional upper division credit to total 44 units. Job practicum courses, STAT 302 and 403 may not be used to fulfill this requirement.</p> |
| <p>Writing, Quantitative, and Breadth Requirements Students admitted to Simon Fraser University beginning in the fall 2006 term must meet writing, quantitative and breadth requirements as part of any degree program they may undertake. See Writing, Quantitative, and Breadth Requirements for university-wide information.</p> | <p>Writing, Quantitative, and Breadth Requirements Students admitted to Simon Fraser University beginning in the fall 2006 term must meet writing, quantitative and breadth requirements as part of any degree program they may undertake. See Writing, Quantitative, and Breadth Requirements for university-wide information.</p> |
| <p>Residency Requirements and Transfer Credit The University's residency requirement stipulates that, in most cases, total transfer and course challenge credit may not exceed 60 units, and may not include more than 15 units as upper division</p> | <p>Residency Requirements and Transfer Credit The University's residency requirement stipulates that, in most cases, total transfer and course challenge credit may not exceed 60 units, and may not include more than 15 units as upper division</p> |

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| Elective Courses In addition to the courses listed above, students should consult an academic advisor to plan the remaining required elective courses. | Elective Courses In addition to the courses listed above, students should consult an academic advisor to plan the remaining required elective courses. |

| Present Calendar Description | Proposed Calendar Description changes <u>Underlined</u> |
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| <p>Earth Sciences Certificate Program</p> <p>This program provides both part-time and full-time students with the opportunity to understand the fundamentals of earth sciences without necessarily specializing in earth sciences.</p> | <p>Earth Sciences Certificate Program</p> <p>This program provides both part-time and full-time students with the opportunity to understand the fundamentals of Earth Sciences without necessarily specializing in Earth Sciences.</p> |
| | <p>Minimum Grade Requirement <u>Students wishing to enroll in Earth Sciences courses must obtain a C- grade or better in prerequisite courses.</u></p> |
| <p>Program Requirements This certificate requires completion of at least 23 units of required course work and electives as follows, including one of</p> <p>EASC 101-3 Physical Geology GEOG 111-3 Earth Systems</p> <p>and one of EASC 106-3 Earth Through Time EASC 210-3 Historical Geology</p> <p>and EASC 206-2 Field Geology I</p> <p>and at least 15 units selected from EASC 103-3 The Rise and Fall of the Dinosaurs EASC 104-3 Geohazards — Earth in Turmoil EASC 107-3 Economic Geological Resources GEOG 213-3 Introduction to Geomorphology REM 100-3 Global Change</p> <p>and any other 200, 300 or 400 division EASC course.</p> <p>This certificate allows students to pursue their 15 elective units in specific course concentrations. Some suggested electives grouping are as follows.</p> <p>Environmental Focus EASC 104-3 Geohazards — Earth in Turmoil EASC 107-3 Economic Geological Resources EASC 208-3 Introduction to Geochemistry EASC 303W-3 Environmental Geoscience EASC 304-3 Hydrogeology REM 100-3 Global Change</p> <p>General Earth Sciences Breadth Courses EASC 103-3 The Rise and Fall of the Dinosaurs EASC 104-3 Geohazards — Earth in Turmoil EASC 107-3 Economic Geological Resources REM 100-3 Global Change</p> <p>Geology Focus EASC 201-3 Stratigraphy and Sedimentation EASC 202-3 Introduction to Mineralogy EASC 204-3 Structural Geology I EASC 208-3 Introduction to Geochemistry</p> <p>Hazards Focus EASC 104-3 Geohazards — Earth in Turmoil EASC 303W-3 Environmental Geoscience</p> | <p>Program Requirements This certificate requires completion of at least <u>24</u> units of required course work and electives as follows</p> <p><u>EASC 101-3 Dynamic Earth</u></p> <p>and one of EASC 106-3 Earth Through Time EASC 210-3 Historical Geology</p> <p><u>and at least 18 units selected from</u> EASC 103-3 The Rise and Fall of the Dinosaurs EASC 104-3 Geohazards — Earth in Turmoil EASC 107-3 Economic Geological Resources <u>EASC 108-3 Exploring the Solar System</u> <u>EASC 206-2 Field Geology I*</u> <u>EASC 209W Environmental Geoscience</u> REM 100-3 Global Change</p> <p>and any other 200, 300 or 400 division EASC course.</p> <p>*Students considering taking EASC 206 Field Geology I must take EASC 210 Historical Geology.</p> |

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| <p>EASC 207-3 Introduction to Geophysics GEOG 213-3 Introduction to Geomorphology</p> | |
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| <p>Paleontology Focus EASC 103-3 The Rise and Fall of the Dinosaurs EASC 201-3 Stratigraphy and Sedimentation EASC 210-3 Historical Geology EASC 310W-3 Paleontology</p> | |
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SCUS 12-47d(i)

UNIVERSITY CURRICULUM & INSTITUTIONAL LIAISON
OFFICE OF THE VICE PRESIDENT ACADEMIC AND PROVOST

MEMO

ADDRESS
8888 UNIVERSITY DRIVE
BURNABY BC V5A 1S6
CANADA

ATTENTION Darleen Bemister, Dr. Richard Ward,
Biomedical Physiology and Kinesiology | TEL

FROM SUSAN RHODES, Assistant Director, University Curriculum and
Institutional Liaison

RE W designation approval for KIN 451 (Co-op)

DATE October 3, 2012

TIME 2:12 PM

The University Curriculum Office has approved a W designation for:

KIN 451-3 Practicum III – effective 1134

Please forward this memo to the Faculty of Science Undergraduate Curriculum
Committee and then SCUS for additional approval.

Proposal for W designation for Kin 451

Richard Ward & Anne-Kristina Arnold

May 2012

The objective of this proposal for a **KIN 451W Course** is to allow students to fulfill their upper division W credit through the writing components from their Co-op practicum. Students complete substantial writing components within each Co-op practicum including reflective, career, technical, professional, and academic writing. This proposal intends that the W designation be an option for students in their third work semester (KIN 451) for the writing completed related to the discipline and profession. This would be assessed by a qualified W instructor and meet all current W guidelines and learning outcomes. Prior to KIN 451, BPK Co-op students will have already completed:

- two Co-op preparatory courses; Bridging Online courses
- two written Co-op Practicum Projects

The addition of a W designation for KIN 451 requires that students' written work meet explicit criteria; receive appropriate feedback and response that is directed at improving the quality of writing for the forms and purposes of the discipline and the profession; and that student integrate the feedback in to the revision of their written work. The writing will be graded and iterative; the graded components will comprise more than 50% of the course grade and students are required to implement feedback on their writing and resubmit for further grading. KIN 451W will be a graded course which will be different from the other practicum courses which are presently graded as PASS/FAIL.

The graded components for KIN 451W with mark breakdown are as follows:

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| Reflective writing piece | |
| 1 st Submission | 10% |
| Resubmission | 5% |
| Project | |
| 1 st Submission | 40% |
| Resubmission | 20% |
| Symposium Presentation | 25% |

REFLECTIVE WRITING PIECE

For the KIN 451W Reflective Writing Piece, students will set learning objectives (learning explorations) for their Co-op practicum, inclusive of both discipline and professional objectives, at the beginning of their Co-op practicum. During the third week of the Co-op practicum, students will use writing to reflect on the plausibility and attainability of their learning explorations based on the actual experiences; discussions with their Workplace Supervisor; and dialogue with Co-op Staff or Coordinator. By referring to the examples of writing within the profession and standards accepted for this course, students will incorporate their reflection into a written proposal that outlines how the student will realize their learning objectives in the KIN 451W Project. Student will receive feedback on their proposal and re-submit the KIN 451W Reflective Writing Piece. Discussions with respect to learning objectives and the proposal will continue in person between the student, Co-op Coordinator and the employer/supervisor at the work place site visit.

PROJECT

For the KIN 451W Project, students will use writing to demonstrate their discipline specific learning by using forms and purposes that are typical of the professions. Examples of writing within the profession and standards accepted for this course include:

- Case study Article (e.g. read and critique article, write an abstract in your own words)
- Documentation and problem solving (e.g.: medical notes on the patient's injury history, safe return to work plan, patient care activities, exercise progressions, charting notes, job demand analysis, patient work place evaluation)
- Research Projects
- Lab Reports
- Advocacy Papers
- Short essays of physical exams
- Client Summary Papers
- Writing to a physician and/or lawyer or ICBC/ Work Safe Agent regarding patient's progress with treatment and recommended return to work plan
- Scientific abstract or Journal submission
- Scientific poster submissions

Each accepted standard will have detailed requirements, purposes and guidelines that facilitate the understanding of typical structures, models of reasoning, styles of address, and the use of language as well as examples to support the instruction.

Student will submit a final draft of the KIN451W Project for feedback from an employer (the professional lens, no academic weight) and marker (for academic lens) and the resubmit the KIN 451W Project for final grading.

Symposium Presentation

A symposium for all Kin 451W students will be held during the examination period at the end of the semester. Students are required to give a 15-minute Visual & Oral Presentation about their KIN 451W Project and provide the audience with handouts. For grading, students will submit the visual presentation, and outline of their oral speaking/ preparation notes, and the audience handouts.

The Symposium will be graded by the designated BPK faculty member, Co-op Co-ordinator and Workplace Supervisor (if available) on components of appropriate visuals, oral presentation, balance, and written notes and handouts.

Grading Procedure

The BPK Undergraduate Program Committee (UPC) remains committed to the integrity of grading in courses. Since this grading will occur outside of the usual classroom grading situation the UPC has implemented a double grading supervisory format. The marking of the written components of the course will be under double supervision. The reflective piece and the project will be marked by a trained W marker paid by the \$75 per student allocation for Writing T.A.s. This will be supervised by

BPK Co-op Coordinator Darleen Bemister who has undergone the Faculty of Science Writing training workshops and a BPK Faculty member. In addition a BPK faculty member will also supervise the process for the project. The symposium presentation will be marked by the BPK faculty member and the employer (if appropriate). BPK faculty member Richard Ward (KIN 304W) and Anne-Kristina Arnold (KIN 180W) have committed to fulfill this role.

Currently the **BPK Co-op Requirements** are:

- Completion of 45 credit hours prior to the start of the first work term.
- Registered as a full-time student (minimum of 9 credit hours)
- KIN 142, plus two other Kinesiology courses
- Good written, verbal, and interpersonal communication skills
- GPA: good academic standing (recommended 2.50)
- Undergraduate work and study semesters normally alternate.
- Successful completion of at least four work terms is required for a Co-operative Education degree designation; however, undergraduate students are eligible for a Co-op certificate upon successful completion of three work terms.
- Students register for work terms as KIN 351, 352, 451, 452 & 453.

KIN 351-3 Practicum I

The first term of work experience in the Kinesiology Co-operative Education Program. Units from this course do not count towards the units required for an SFU degree. Prerequisite: students must complete Bridging Online (visit www.sfu.ca/coop/bol for further details) at least two terms before their anticipated co-op placement. Students must then apply to the Kinesiology Co-op Program by the first week of the term preceding the work term. Normally, students will have completed a minimum of 45 units by the end of the term of application, KIN 142, plus at least two other kinesiology courses and have a minimum GPA of 2.50. Work terms are graded as pass/fail (P/F).

KIN 352-3 Practicum II

The second term of work experience in the Kinesiology Co-operative Education Program. Units from this course do not count towards the units required for an SFU degree. Prerequisite: KIN 351. Work terms are graded as pass/fail (P/F).

KIN 451-3 Practicum III

The third term of work experience for students in the Kinesiology Co-operative Education Program. Units from this course do not count towards the units required for an SFU degree. Prerequisite: KIN 352. Work terms are graded as pass/fail (P/F).

KIN 452-3 Practicum IV

The fourth term of work experience for students in the Kinesiology Co-operative Education Program. Units from this course do not count towards the units required for an SFU degree. Prerequisite: KIN 451. Work terms are graded as pass/fail (P/F).

It is proposed that the third in the sequence of Coop Practicum courses KIN 451 be designated with a Writing Intensive option. After completion of this third semester the student is eligible for a Co-op Certificate. Should the student complete a fourth or fifth co-op work term, the student is eligible for a Co-op Degree Designation. KIN 451W will be graded based upon completion of required components comprised of at least 50% of the grade being achieved from written components that are submitted, marked, edited, returned and then resubmitted for further marks.

KIN 451W-3 Practicum III

The third term of work experience for students in the Kinesiology Co-operative Education Program. Units from this course do not count towards the units required for an SFU degree.

This course may be used as upper division W credit, and will be graded as such.

Prerequisite: KIN 352.



MEMO

**Department of
Mathematics**

LADISLAV STACHO
Chair, Undergraduate Studies
Committee

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Simon Fraser University
8888 University Drive
Burnaby BC V5A 1S6
Canada

CONTACT INFO
Voice: 778.782.4816
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Email: lstacho@math.sfu.ca

ATTENTION Dr. George Agnes
Faculty of Science Undergraduate Curriculum Committee

FROM Ladislav Stacho, Chair, Undergraduate Studies Committee

RE Calendar Changes

DATE 2 October 2012

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.

Program Changes

I Mathematics Major and Honours Programs

Update Elective Courses section

II Operations Research Major and Honours Programs

- Delete IAT 103W Design Communication and Collaboration from Lower Division Core Requirements
- Minor Revision to Upper Division Requirements

III Course Changes

Deletion

Math 402-4 Industrial Mathematics Project

Prerequisite Change

Math 348-3 Probabilistic Models in Operations Research

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

Mathematics Curriculum Changes

I Update Elective Courses section in our Mathematics Major and Honours Programs

Justification: We do not want students taking the excluded courses to satisfy the requirement.

From (current description):

In addition to the courses listed above, students should consult an academic advisor to plan the remaining required elective courses.

Students obtain at least six units in courses offered by the Faculty of Science outside the Department of Mathematics, and the Department of Statistics and Actuarial Science. Students will also obtain at least six units in Faculty of Arts and Social Sciences courses. (The two required CMPT courses and the Faculty of Arts and Social Sciences six-unit requirement fulfill the Faculty of Science requirement that students complete 12 units from outside the Faculty of Science.)

To (new description):

In addition to the courses listed above, students should consult an academic advisor to plan the remaining required elective courses.

Students obtain at least six units in courses offered by the Faculty of Science outside the Department of Mathematics, and the Department of Statistics and Actuarial Science. Courses PHYS 100, BISC 100 and CHEM 110/111 cannot be used to satisfy this requirement. Students will also obtain at least six units in Faculty of Arts and Social Sciences courses. (The two required CMPT courses and the Faculty of Arts and Social Sciences six-unit requirement fulfill the Faculty of Science requirement that students complete 12 units from outside the Faculty of Science.)

II Operations Research Major and Honours Programs

A Delete IAT103W Design Communication and Collaboration from the OR Major and Honors Lower Division Core Requirements

Justification: IAT 103W was initially included in the OR program, years before development of MATH 208W Introduction to Operations Research. Both courses are currently required for the major and honours programs. MATH 208W fulfills the required lower division writing component and supersedes IAT 103W. Students do not find the course IAT 103W useful for the OR programs.

From (current description - Major and Honours Programs are the same):

Lower Division Core 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
- IAT 103W-3 Design Communication and Collaboration
- MACM 101-3 Discrete Mathematics I
- MACM 201-3 Discrete Mathematics II
- MATH 208W-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

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 I for the Social Sciences *
- and one of
- MATH 152-3 Calculus II
 - MATH 155-3 Calculus II for the Biological Sciences*
 - MATH 158-3 Calculus II for the Social Sciences *
- and one of
- MATH 240-3 Algebra I: Linear Algebra
 - MATH 232-3 Applied Linear Algebra*
- *with a B grade or better

To (new description - Major and Honours Programs are the same):

Lower Division Core Requirements

Students complete a minimum total of 33 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 208W-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

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 I for the Social Sciences *

and one of

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

and one of

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

*with a B grade or better

B Revision to Upper Division requirements for Operations Research Major and Honours programs

Justification:

Change 1: Students have scheduling problems to take all courses required from the first 8 courses in the original requirement for the OR major program, and from the first 9 courses in the original requirement for the honours program. We slightly weakened the requirement, which should accommodate most students.

Change 2: Statistics is no longer offering STAT 400, as per SCUS Document #12-21. As suitable replacements, they offer either STAT 340 or STAT 475, thus implementing them in the revisions below.

Change 3: Clarification on selection of 400 level courses from Table III.

From (current description for Major Program):

Upper Division Requirements

Students will complete a minimum of 34 units, including all of

- 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 Modeling
- 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 enroll in this course

†see BUEC courses for prerequisites

and at least one from Table II below

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

To (new description for Major Program):

Upper Division Requirements

Students will complete a minimum of 34 units, including all of

- MATH 308-3 Linear Optimization
- MATH 348-3 Probabilistic Models in Operations Research
- MATH 402W-4 Operations Research Clinic

and four of

- MATH 309-3 Continuous Optimization
- 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 340-3 Statistical Computing and Exploratory Data Analysis
- STAT 390-3 Selected Topics in Probability and Statistics
- STAT 402-3 Generalized Linear and Nonlinear Modeling
- STAT 410-3 Statistical Analysis of Sample Surveys
- STAT 430-3 Statistical Design and Analysis of Experiments
- STAT 460-3 Bayesian Statistics
- STAT 475-3 Applied Discrete Data Analysis
- STAT 490-3 Selected Topics in Probability and Statistics

*students must meet the entry requirements for the actuarial science program to enroll in this course

†see BUEC courses for prerequisites

and at least one from Table II below

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

From (current description for Honours Program):

Students complete a total of 48 units, including all of

- 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
- 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

*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 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 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 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

To (new description for Honours Program):

Students will complete a minimum of 48 units, including all of

- MATH 308-3 Linear Optimization
- MATH 348-3 Probabilistic Models in Operations Research
- MATH 402W-4 Operations Research Clinic

and five of

- MATH 309-3 Continuous Optimization
- MATH 320-3 Introduction to Analysis II
- 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 340-3 Statistical Computing and Exploratory Data Analysis
- STAT 390-3 Selected Topics in Probability and Statistics
- 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 475-3 Applied Discrete Data Analysis
- 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). At least four courses from Table III 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 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 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 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



SENATE COMMITTEE ON
UNDERGRADUATE STUDIES

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 348

Course Number _____

Credit Hour 3.0

Credit Hour _____

TITLE: Probabilistic Models in Operations Research

(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

STAT 270, MATH 308.

STAT 270. Pre- or Co-requisite: MATH 308.

RATIONALE

This is primarily a scheduling problem. MATH 308 was prerequisite to ensure students did not take MATH 348 too early. There is some discussion of optimization in MATH 348, so MATH 308 as a co-requisite will be appropriate. The simplex method, main topic of MATH 308, is not a required topic in 348.

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 1134 -- Summer 2013



SENATE COMMITTEE ON
UNDERGRADUATE STUDIES

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 402

Course Number _____

Credit Hour 4.0

Credit Hour _____

TITLE: Industrial Mathematics Project

(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

RATIONALE

MATH 402-4 is not required in the Operations Research or other programs and we do not plan to offer it in future. This is mainly a "clean up" step. We will keep MATH 402W-4 Operations Research Clinic.

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 1134 – Summer 2013



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion Learning Outcomes

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

FROM Course Subject/Number STAT 302 TO Course Subject/Number STAT 302
Credits 3 Credits 3

TITLE

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

FROM: _____ TO: _____

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

FROM: _____ TO: _____

DESCRIPTION

FROM: _____

DESCRIPTION

TO: _____

PREREQUISITE

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**.

FROM: Students cannot obtain credit for STAT 302 if they already have credit for STAT 350, or if they are simultaneously enrolled in STAT 302 and STAT 350.

PREREQUISITE

TO: Students cannot obtain credit for STAT 302 if they already have credit for STAT 305 and/or STAT 350, ~~or if they are simultaneously enrolled in STAT 302 and STAT 350.~~

LEARNING OUTCOMES

RATIONALE

STAT 302 and STAT 305 are similar courses but for different audiences and students should not be allowed to get credit for both.

Effective term and year



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion Learning Outcomes

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

FROM Course Subject/Number ACMA 320 **TO** Course Subject/Number _____

Credits 3 Credits _____

TITLE

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

FROM: _____ **TO:** _____

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

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____ **DESCRIPTION** **TO:** _____

PREREQUISITE

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**.

FROM: MATH 232, STAT285, and ACMA210 (with a grade of C+ or higher)

PREREQUISITE

TO: STAT285 and ACMA210 (with a grade of C+ or higher)

LEARNING OUTCOMES

RATIONALE

MATH 232 is a prerequisite for STAT 285.



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion Learning Outcomes

Indicate number of hours for: Lecture 3 Seminar _____ Tutorial 1 Lab _____

FROM
Course Subject/Number PHYS 100-3
Credits 3

TO
Course Subject/Number _____
Credits _____

TITLE

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

FROM: _____ **TO:** _____

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

FROM: _____ **TO:** _____

DESCRIPTION
FROM: _____

DESCRIPTION
TO: _____

PREREQUISITE

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.**

FROM: BC Principles of Mathematics 12 (or equivalent)

PREREQUISITE

TO: BC Pre-Calculus 12 (or equivalent)

LEARNING OUTCOMES

RATIONALE

The provincial government changed the name of highschool math and our physics calendar entries need updating.

Effective term and year Spring 2013

2012 april

