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**MEMORANDUM**

**ATTENTION** Senate  
**FROM** Wade Parkhouse, Chair  
Senate Committee on  
Undergraduate Studies  
**RE:** Program Changes

**DATE** January 11, 2019  
**PAGES** 1/2

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**For information:**

Acting under delegated authority at its meeting of January 10, 2019 SCUS approved the following curriculum revisions effective Fall 2019.

**a. Faculty of Environment (SCUS 19-04)**

1. Department of Geography

- (i) Upper and lower division requirement changes to the Geography Major program
- (ii) Lower division requirement changes to the Geography Minor program
- (iii) Requirement changes to the Certificate in Spatial Information Systems program

2. School of Environmental Science

- (i) Upper and lower division requirement changes to the:
  - Environmental Science Honours program
    - Applied Biology Concentration
    - Environmental Earth Systems Concentration
    - Environmetrics Concentration
    - Water Science Concentration
  - Environmental Science Major program
    - Applied Biology Concentration
    - Environmental Earth Systems Concentration
    - Environmetrics Concentration
    - Water Science Concentration

Senators wishing to consult a more detailed report of curriculum revisions may do so on the Senate Docushare repository at <https://docushare.sfu.ca/dsweb/View/Collection-12682>.

**Calendar Entry Change****Name of Program or Name of Faculty****Rationale for change:**

The change is part of a series of modifications the Department of Geography is making to its undergraduate programming. The following rationale is quite lengthy because these changes are tightly linked, and are being undertaken because they make sense together. These changes are part of an effort to (a) rationalize/streamline the programs we offer so they make more sense to current and prospective students, (b) meet student demand and communicate our programs to students, and (c) accurately reflect our faculty members' current and anticipated teaching capacities and expertise.

**(a) Rationalizing/streamlining:** Like many other departments of geography, the SFU Dept. of Geography has long offered both B.A. and B.Sc. degrees, which presents its own set of programming challenges. Students come to the program to study subjects as varied as, on the one hand, cultural and sacred spaces, and glaciology on the other. Over time, attempts to meet these extremely varied responsibilities and demands have been piecemeal and less than optimally strategic. A rather traditional general Geography B.A., combining the human and physical aspects of the discipline, was augmented with a B.A. (Environmental Specialty) degree to accommodate a growing environmental (but not hard science) interest among students. These sat alongside more specialized B.Sc.s in Physical Geography and GIS. More recently, this group of four programs has been joined by a fifth, the BEnv in Global Environmental Systems.

A long-term strategic planning process has led the Department to the conclusion that there are too many programs. Specifically, the B.A. (Env.) and the BEnv are redundant. The deletion of the former and modifications to the latter to accommodate the (dwindling) number of students who might continue to be attracted to the former are the subject of separate Calendar Entry Change applications.)

The subject of the present Calendar Entry Change application is the B.A., which our strategic planning process suggests, needs to become a fully social science degree, thus reflecting the expertise of fully 50% (9 of 18) of our current faculty and the interests of a large proportion of our students. The proposed changes achieve the following:

- 1) focus the program on social science oriented geography by requiring students to explore the whole discipline (physical, GIS, and human) at the Lower Division but to focus on human (social science) and allied GIS courses at the Upper Division
- 2) 'clean up' the program by removing courses that are no longer taught (already approved by Senate) or are no longer appropriate
- 3) modernize it by adding new courses that are being taught (or already Senate-approved and soon to be taught)





- 4) contribute to the University-wide effort to bring Indigenous concerns and histories to the centre of our conversations by adding a required Indigenous component to our B.A. program.

Together with the existing B.Sc. programs, the creation of the B.A. Human Geography and the revision of the B.Env. GES create four clear programs for students, and does so in a manner that meets the historic and current nature of student demand: a B.A. program for social-science oriented human geographers, a B.Sc. for biophysical science oriented physical geographers, a joint B.Sc. (with Computing Science) in Geographic Information Systems, and a fourth (B.Env.) for those interested in explicitly bridging the divide to think at a systems level about their interaction.

**(b) Student demand and communication:** This program modification is part of our effort to create clearly distinct and accessible programs for the diversity of students attracted to the discipline of geography. With the creation and growing popularity of the B.Env. GES, the B.A. programs in the Dept. need to respond to declining demand for an “environmental” B.A. and a steady demand for a B.A. in human geography (currently 115 majors). The program name change to “Human Geography” clearly articulates this change.

**(c) Match areas of teaching expertise/capacity:** As mentioned above, as in almost all other geography departments in North America, 50% (of Geography’s full-time faculty members who teach (9 of 18)) are social scientists. These faculty members have international reputations and it is one of the reasons the Dept. has such a high ranking. These faculty members teach both the lower division introductory classes (100- and 200-level) but also the upper division more specialized classes. Consequently, 50% of our course offerings are social science classes, and a program that emphasizes that aspect of the discipline not only makes sense from the perspective of students learning from experts in the field, but also insofar as this is the kind of program the Dept. is actually in a position to deliver from a practical perspective.

Effective term and year:  
Fall 2019

The following program(s) will be affected by these changes:  
Geography Major

**Calendar Change:** “to” and “from” sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

Students complete 120 units, as specified below.



## Lower Division Requirements

Students complete a total of 18 units, including all of

### Complete all of

GEOG 100 - Our World: Introducing Human Geography (3)

GEOG 111 - Earth Systems (3)

GEOG 221 - Economic Worlds (3)

GEOG 241 - People, Place, Society (3)

**GEOG 261 - Encountering the City (3)**

**GEOG 266W - Geography in Practice (3)**

and one of

GEOG 213 - Introduction to Geomorphology (3)

GEOG 214 - Weather and Climate (3)

GEOG 215 - Biogeography (3)

and ~~one~~ **both** of

GEOG 251 - Quantitative Geography (3)

~~GEOG 253 - Introduction to Remote Sensing (3)~~

GEOG 255 - Geographical Information Science I (3)

**and one of**

**FNST 101 - Introduction to First Nations Studies (3)**

**FNST 286 - Indigenous Peoples and British Columbia: An Introduction (3)**

In addition, GEOG 261-3 is strongly recommended to students who intend to take upper division courses in urban geography.

## Upper Division Requirements

Students complete 32 units of 300 and 400 division courses in geography within one of the following two concentrations.

### ~~SOCIETY AND ENVIRONMENT CONCENTRATION~~

Students choosing this concentration complete two of

~~GEOG 325 - Geographies of Consumption (4)~~

~~GEOG 362 – Geography of Urban Built Environments (4)  
 GEOG 363 – Urban Planning and Policy (4)  
 GEOG 377 – Environmental History (4)  
 GEOG 381 – Territory, Power, State (4)  
 GEOG 382 – World on the Move (4)  
 GEOG 386 – Health Geography (4)  
 GEOG 387 – Geography and Gender (4)~~

and one of

~~GEOG 311 – Hydrology (4)  
 GEOG 312 – Geography of Natural Hazards (4)  
 GEOG 313 – River Geomorphology (4)  
 GEOG 314 – The Climate System (4)  
 GEOG 315 – World Ecosystems (4)  
 GEOG 316 – Global Biogeochemical and Water Cycles (4)  
 GEOG 317 – Soil Science (4)  
 GEOG 318 – Soils in Our Environment (4)~~

and one of

~~GEOG 420 – Cultural Geography (4)  
 GEOG 432 – Problems in Environmental History (4)  
 GEOG 440 – Property, Land, Society (4)  
 GEOG 442 – A World of Cities (4)  
 GEOG 449 – City and Environment (4)  
 GEOG 486 – Health Care Geographies (4)~~

and any four other courses from the full list of 300 and 400 level geography courses

and any additional courses, in geography and across the University, to complete the required total of 45 upper division units.

~~RESOURCES, ECONOMY, AND ENVIRONMENT CONCENTRATION~~

Students choosing this concentration complete two of

~~GEOG 321 – Geographies of Global Capitalism (4)  
 GEOG 322 – World Resources (4)  
 GEOG 323 – Industrial Location (4)  
 GEOG 324 – Geography of Transportation (4)  
 GEOG 327 – Geography of Tourism (4)  
 GEOG 328 – Labour Geographies (4)  
 GEOG 383 – Regional Development and Planning (4)~~





~~GEOG 385 – Food and the City (4)~~  
~~GEOG 389W – Nature and Society (4)~~

and one of

~~GEOG 311 – Hydrology (4)~~  
~~GEOG 312 – Geography of Natural Hazards (4)~~  
~~GEOG 313 – River Geomorphology (4)~~  
~~GEOG 314 – The Climate System (4)~~  
~~GEOG 315 – World Ecosystems (4)~~  
~~GEOG 316 – Global Biogeochemical and Water Cycles (4)~~  
~~GEOG 317 – Soil Science (4)~~  
~~GEOG 318 – Soils in Our Environment (4)~~

and one of

~~GEOG 421 – Geographical Political Economy (4)~~  
~~GEOG 424 – Cities, Transportation, Infrastructure (4)~~  
~~GEOG 428 – World Forests (4)~~  
~~GEOG 445 – Resource Planning (4)~~

**At least one upper division course must be a 400-level course. One of the choices must also be a W course to satisfy the student's upper division Writing requirement.**

**Economy & Politics (choose 3)**

**GEOG 321 – Geographies of Global Capitalism (4)**  
**GEOG 322W - World Resources (4)**  
**GEOG 328 – Labour Geographies (4)**  
**GEOG 381W – Territory, Power, State (4)**  
**GEOG 389W – Nature and Society (4)**  
**GEOG 421 – Geographical Political Economy (4)**  
**GEOG 423 – Capitalist Natures (4)**  
**GEOG 428 – World Forests (4)**  
**GEOG 440 – Property, Land, Society (4)**

**Society & Space (choose 3)**

**GEOG 312 – Geography of Natural Hazards (4)**  
**GEOG 325 – Geographies of Consumption (4)**  
**GEOG 327 – Geography of Tourism (4)**  
**GEOG 377 – Environmental History (4)**  
**GEOG 382 – World on the Move (4)**  
**GEOG 386 – Health Geography (4)**



GEOG 387 - Geography and Gender (4)  
GEOG 432 - Problems in Environmental History (4)  
GEOG 486 - Health Care Geographies (4)

Urbanization & Urbanism (choose 3)

GEOG 324 - Geography of Transportation (4)  
GEOG 362W - Geography of Urban Built Environments (4)  
GEOG 363 - Urban Planning and Policy (4)  
GEOG 364 - Cities and Crisis (4)  
GEOG 385 - Food and the City (4)  
GEOG 424 - Cities, Transportation, Infrastructure (4)  
GEOG 442 - A World of Cities (4)  
GEOG 449 - City and Environment (4)

Methods & Analysis (choose 1)

GEOG 351 - Multimedia Cartography (4)  
GEOG 352 Spatial Analysis (4)  
GEOG 355 - Geographical Information Science II (4)  
GEOG 356 - 3D Geovisualization (4)

~~and any four other courses from the full list of 300 and 400 level geography courses~~

and any additional upper division courses, in geography ~~and~~ **or** across the University, **will be required** to complete ~~the required~~ **a minimum** of 45 upper division units.

**Calendar Entry Change  
Department of Geography**

Rationale for change:

Changes align the minor requirements with those of the physical geography minor, which does not require a 200-level human geography course. This change also equates the number of units required for the minor with that of the physical geography minor.

Effective term and year:

Fall 2019

The following program(s) will be affected by these changes:

Geography Minor

**Calendar Change:** “to” and “from” sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

~~This minor program requires a total of 27 units as shown below.~~

~~Students are expected to consult with a departmental advisor when they formally declare a minor in geography. Those who do not seek advice from the department run the risk of prolonging their programs.~~

## Program Requirements

### Lower Division Requirements

~~Students complete a total of 12 units, including both of~~

GEOG 100 - Our World: Introducing Human Geography (3)

GEOG 111 - Earth Systems (3)

and one of

GEOG 221 - Economic Worlds (3)

GEOG 241 - People, Place, Society (3)

**GEOG 261 - Encountering the City (3)**





and one of

~~GEOG 251 – Quantitative Geography (3)~~

~~GEOG 253 – Introduction to Remote Sensing (3)~~

~~GEOG 255 – Geographical Information Science I (3)~~

### Upper Division Requirements

Students complete a minimum of 15 units in 300 and 400 division GEOG courses, of which at least seven must be completed at Simon Fraser University.

**Calendar Entry Change**

**Name of Program or Name of Faculty: Geography, F. Env.**

Rationale for change:

- (a) to reduce the length and credit requirements of the program to match SFU's directive that certificates are oriented toward lower division courses, and to increase accessibility and flexibility by enabling smoother and simpler movement through the certificate program. This is also intended to increase enrolments in the certificate, since existing courses are increasingly required of other majors in the faculty (e.g. B.Sc. in EVSC, B.Env.);
- (b) to remove obstacles to completion (400-level course in particular);
- (c) clarify student skill set for employers; feedback from employers through our Co-op Co-ordinator is that the current title ("Spatial Information Systems" or "SIS") is unrecognizable and does not communicate a student's technical capacity. The Co-op Co-ordinator already has students add "GIS" to the certificate name on job applications to try to address this problem, thus the name change addresses this communication problem for job search;
- (d) to attract more students to the program, by naming the program with the common term "GIS" with which more students will be familiar, thus increasing enrolments further;
- (e) the certificate was created before the COMPSCI-GEOG joint B.Sc. in GIS, and no longer needs to stand as a full GIS program.

Effective term and year: Fall 2019

The following program(s) will be affected by these changes:

Certificate in Spatial Information Systems

**Calendar Change:** "to" and "from" sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

~~Spatial~~ **Geographic** Information Systems ~~Science~~

Certificate

Admission Requirements

Consult with the advisor as early as possible for program admission. Formal approval is required before completion of the certificate.

Units applied to one certificate may not be applied to another Simon Fraser University certificate or diploma.

Program Requirements



Students complete the following courses (~~or their equivalents from another department or institution~~) including all of

- GEOG 251 - Quantitative Geography (3)
- GEOG 253 - Introduction to Remote Sensing (3)
- GEOG 255 - Geographical Information Science I (3)

and ~~five~~ **three** of the following (~~at least one of which must be at the 400 division~~)

- GEOG 351 - Multimedia Cartography (4)
- GEOG 352 - Spatial Analysis (4)
- GEOG 353 - Advanced Remote Sensing (4)
- GEOG 355 - Geographical Information Science II (4)
- GEOG 356 - 3D Geovisualization (4)
- GEOG 451 - Spatial Modeling (4)
- GEOG 453 - Theoretical and Applied Remote Sensing (4)
- GEOG 455 - Theoretical and Applied GIS (4)
- GEOG 457 - Geovisualization Interfaces (4)



**Calendar Entry Change**  
**School of Environmental Science**

Rationale for change:

Inclusion of MATH 150 (4) as it is an equivalent course to MATH 151 and is programmed in the Academic progress report.

REM 356W replaces REM 356, which is not currently offered.

Removal of GEOG 389W because prerequisites have changed. Environmental Science students do not take the prerequisites.

Addition of REM 370, REM 375, and REM 423 to list of courses for students in the Environmental Earth Systems and Water Science Concentrations. They will be included in an anticipated revision of the Applied Biology Concentration.

Correct an error in the honors requirements for Applied Biology. Students should take either three BISC courses (BISC 490, 491, and 492W) or EVSC 490.

Effective term and year:

Fall 2019

The following program(s) will be affected by these changes:

Environmental Science Honours:

Applied Biology Concentration

Environmental Earth Systems Concentration

Envirometrics Concentration

Water Science Concentration

**Calendar Change:** "to" and "from" sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

Common for all four concentrations:

**LOWER DIVISION REQUIREMENTS**



and one of

**MATH 150 – Calculus I with Review (4)**

MATH 151 - Calculus I (3)

MATH 154 - Calculus I for the Biological Sciences (3)

**UPPER DIVISION REQUIREMENTS**

and two of

REM 319 - Environmental Law (3)

ENV 320W - Ethics and the Environment (3)

GEOG 389W – Nature and Society (4)

REM 321 - Ecological Economics (4)

REM 356 - Institutional Arrangements for Sustainable Environmental Management (3)

**REM 356W – Institutional Arrangements for Sustainable Environmental Management (3)**

Applied Biology Area of Concentration

**UPPER DIVISION REQUIREMENTS**

Students complete all of

BISC 316 - Vertebrate Biology (4)

BISC 337 - Plant Biology (4)

BISC 490 - Research Design (5)

BISC 491 - Research Technique (5)

BISC 492W - Research Reporting (5) or EVSC 490 - Environmental Science Thesis (4)

EVSC 300 - Seminar in Environmental Science (3)

EVSC 305 - Methods in Environmental Science (3)

EVSC 400 - Environmental Science Capstone (4)

GEOG 316 - Global Biogeochemical and Water Cycles (4)

REM 311 - Applied Ecology and Sustainable Environments (3)

REM 445 - Environmental Risk Assessment (3)

**And either all of:**

**BISC 490 - Research Design (5)**

**BISC 491 - Research Technique (5)**

**BISC 492W - Research Reporting (5)**

or

**EVSC 490 - Environmental Science Thesis (4)**

Environmental Earth Systems Area of Concentration

*UPPER DIVISION REQUIREMENTS*

and one of

BISC 309 - Conservation Biology (3)

BISC 420 - Community Ecology (3)

REM 311 - Applied Ecology and Sustainable Environments (3)

**REM 370 - Global Resource Issues in Oceanography (3)**

**REM 375 - Ecology and Conservation of Coastal BC (3)**

**REM 423 - Research Methods in Fisheries Assessment (4)**

Water Science Area of Concentration

*UPPER DIVISION REQUIREMENTS*

and three of, with at least one from the 400 division

EASC 314 - Principles of Glaciology (3)

EASC 405 - Water, Environment, and Climate Change (3)

EASC 410 - Groundwater Contamination and Transport (3)

EASC 416 - Field and Lab Techniques in Hydrogeology (3)

GEOG 310 - Physical Geography Field Course (4)

GEOG 314 - The Climate System (4)

GEOG 317 - Soil Science (4)

GEOG 411 - Advanced Hydrology (4)

GEOG 412W - Glacial Processes and Environments (4)

GEOG 414 - Climate Change (4)

GEOG 417W - Advanced Soil Science (4)

**REM 370 - Global Resource Issues in Oceanography (3)**

**REM 375 - Ecology and Conservation of Coastal BC (3)**

**REM 423 - Research Methods in Fisheries Assessment (4)**

REM 412 - Environmental Modeling (3)

REM 445 - Environmental Risk Assessment (3)



**Calendar Entry Change  
Environmental Science Major  
School of Environmental Science**

Rationale for change:

Inclusion of MATH 150 (4) as it is an equivalent course to MATH 151 and is programmed in the Academic progress report.

REM 356W replaces REM 356, which is not currently offered.

Removal of GEOG 389W because prerequisites have changed. Environmental Science students do not take the prerequisites.

Addition of REM 370, REM 375, and REM 423 to list of courses for students in the Environmental Earth Systems and Water Science Concentrations. They will be included in an anticipated revision of the Applied Biology Concentration.

Effective term and year:

Fall 2019

The following program(s) will be affected by these changes:

Environmental Science Major:

Applied Biology Concentration

Environmental Earth Systems Concentration

Envirometrics Concentration

Water Science Concentration

**Calendar Change:** "to" and "from" sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

Common for all four concentrations:

**LOWER DIVISION REQUIREMENTS**

and one of

**MATH 150 – Calculus I with Review (4)**

MATH 151 - Calculus I (3)

MATH 154 - Calculus I for the Biological Sciences (3)

**UPPER DIVISION REQUIREMENTS**

and two of

REM 319 - Environmental Law (3)

ENV 320W - Ethics and the Environment (3)

GEOG 389W - Nature and Society (4)

REM 321 - Ecological Economics (4)

REM 356 - Institutional Arrangements for Sustainable Environmental Management (3)

**REM 356W – Institutional Arrangements for Sustainable Environmental Management (3)**

**Environmental Earth Systems Area of Concentration**

**UPPER DIVISION REQUIREMENTS**

And one of

BISC 309 - Conservation Biology (3)

BISC 420 - Community Ecology (3)

REM 311 - Applied Ecology and Sustainable Environments (3)

REM 370 - Global Resource Issues in Oceanography (3)

REM 375 - Ecology and Conservation of Coastal BC (3)

REM 423 - Research Methods in Fisheries Assessment (4)

REM 445 - Environmental Risk Assessment (3)

REM 471 - Forest Ecosystem Management (3)

**Water Science Area of Concentration**

**UPPER DIVISION REQUIREMENTS**

and three of, with at least one from the 400 division

EASC 314 - Principles of Glaciology (3)

EASC 405 - Water, Environment, and Climate Change (3)

EASC 410 - Groundwater Contamination and Transport (3)

EASC 416 - Field and Lab Techniques in Hydrogeology (3)



GEOG 310 - Physical Geography Field Course (4)  
GEOG 314 - The Climate System (4)  
GEOG 317 - Soil Science (4)  
GEOG 411 - Advanced Hydrology (4)  
GEOG 412W - Glacial Processes and Environments (4)  
GEOG 414 - Climate Change (4)  
GEOG 417W - Advanced Soil Science (4)  
**REM 370 - Global Resource Issues in Oceanography (3)**  
**REM 375 - Ecology and Conservation of Coastal BC (3)**  
REM 412 - Environmental Modeling (3)  
**REM 423 - Research Methods in Fisheries Assessment (4)**  
REM 445 - Environmental Risk Assessment (3)



**Calendar Entry Change**

**Name of Program or Name of Faculty:** Earth Sciences Major/Honours

Rationale for change: Addition of SCI 301 Science Communication: An Introduction as an upper division elective for our Majors students
Effective term and year: Fall 2019
The following program(s) will be affected by these changes:  EASC Major

**Calendar Change:** “to” and “from” sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

Upper Division Requirements  GEOLOGY STREAM  and at least 21 units chosen from  <b>SCI 301 Science Communication: An Introduction (3)</b>  ENVIRONMENTAL GEOSCIENCE STREAM  and a <del>minimum of</del> <u>at least</u> 24 units (with a maximum of 12 units from GEOG) chosen from  <b>SCI 301 Science Communication: An Introduction (3)</b>
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### Calendar Entry Change

**Name of Program or Name of Faculty:** Earth Sciences Major/Honours

Rationale for change: Addition of SCI 301 Science Communication: An Introduction as an upper division elective for our Honours students
Effective term and year: Fall 2019
The following program(s) will be affected by these changes:  EASC Honours

**Calendar Change:** “to” and “from” sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

Upper Division Requirements  GEOLOGY STREAM  and at least 18 units chosen from  <b>SCI 301 Science Communication: An Introduction (3)</b>  ENVIRONMENTAL GEOSCIENCE STREAM  and <del>a minimum of</del> <u>at least</u> 21 units (with a maximum of 12 units from GEOG) chosen from  <b>SCI 301 Science Communication: An Introduction (3)</b>
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### Calendar Entry Change

Name of Program or Name of Faculty: Earth Sciences Certificate

Rationale for change: Simplification and clarification of certificate requirements.
Effective term and year: Fall 2019
The following program(s) will be affected by these changes:  EASC Certificate

**Calendar Change:** "to" and "from" sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

<p>CERTIFICATE</p> <p>This program provides both part-time and full-time students with the opportunity to understand the fundamentals of <del>earth sciences</del> <b>Earth Sciences</b> without necessarily specializing in <del>earth sciences</del> <b>Earth Sciences</b>.</p> <p>Minimum Grade Requirement</p> <p><del>Students wishing to enroll in Earth Sciences courses must obtain a C- grade or better in prerequisite all courses.</del></p> <p><b>Students enrolled in this certificate program must have a grade of C- or better in all prerequisite and required courses.</b></p> <p>Program Requirements</p> <p><del>This certificate requires completion of</del></p> <p><b>Students complete</b> <del>and at least 24 units of required course work and electives as follows</del></p> <p>EASC 101 - Dynamic Earth (3)</p> <p>and one of</p> <p><del>EASC 106 - Earth Through Time (3)</del> <del>EASC 210 - Historical Geology (3)</del></p>
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and at least ~~18~~ **21** units selected from **EASC courses\*** or **SCI 301 Science Communication: An Introduction**.

**\*together with all prerequisites.**

~~EASC 103 – The Rise and Fall of the Dinosaurs (3)~~

~~EASC 104 – Geohazards – Earth in Turmoil (3)~~

~~EASC 107 – Economic Geological Resources (3)~~

~~EASC 108 – Exploring the Solar System (3)~~

~~EASC 206 – Field Geology I (2) \*~~

~~EASC 209W – Environmental Geoscience (4)~~

~~REM 100 – Global Change (3)~~

and any other 200, 300 or 400 division EASC courses.



# Earth Sciences

## CERTIFICATE

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.

## Minimum Grade Requirement

Students enrolled in this certificate program must have a grade of C- or better in all required courses.

## Program Requirements

Students complete

[EASC 101 - Dynamic Earth \(3\)](#)

and at least 21 units selected from EASC courses\* or SCI 301 Science Communication: An Introduction.

\*together with all prerequisites



**Calendar Entry Change:** increase in the total number of units

**Name of Program or Name of Faculty:** Molecular Biology and Biochemistry (MBB)

**Rationale for change:** One of the required courses for this program, MBB 331 (Molecular Biology) has been increased from 3 to 4 units.

**Effective term and year:** Fall 2019

**The following program(s) will be affected by these changes:** Genomics Certificate Program

**Calendar Change:** “to” and “from” sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

The Genomics Certificate Program includes ~~30~~ **31** units, ~~21~~ **22** of which are required with the remaining 9 selected from a list of electives.