

8888 University Drive,  
Burnaby, BC  
Canada V5A 1S6TEL: 778.782.4636  
FAX: 778.782.5876avpcio@sfu.ca  
www.sfu.ca/vpacademic**MEMORANDUM**

---

ATTENTION	Senate	DATE	December 3, 2010
FROM	Bill Krane, Chair Senate Committee on Undergraduate Studies	PAGES	1/1
RE:	Faculty of Science (SCUS 10-57)		

---

**For information:**

Acting under delegated authority at its meeting of December 2, 2010, SCUS approved the following curriculum revisions effective Fall 2011:

1. Department of Biological Sciences (SCUS 10-57a)

- (i) Minimum Grade requirement change in Biological Sciences Major and Honours
- (ii) Addition to Upper Division requirements Major/Honours
- (iii) Description changes to the streams: Cells, Molecules and Physiology; and Ecology, Evolution and Conservation and Open Stream
- (iv) Course description changes for BISC 497W, 498, 499, 302/302W, 303
- (v) Prerequisite changes for 307/307W, 367/367W, and 418

2. Department of Chemistry (SCUS 10-57b)

- (i) New course proposal: CHEM 391-3, Industrial Chemistry

3. Department of Earth Sciences (SCUS 10-57c)

- (i) Prerequisite change for EASC 304
- (ii) Course number, description and prerequisite changes for EASC 412

4. Department of Molecular Biology & Biochemistry (SCUS 10-57d)

- (i) New Course Proposal: MBB 461-3, Comparative Genomics (effective Spring 2012)
- (ii) Prerequisite changes to MBB 231, 422 and 444

**Senators wishing to consult a more detailed report of curriculum revisions may do so on the Web at [http://www.sfu.ca/senate/Senate\\_agenda.html](http://www.sfu.ca/senate/Senate_agenda.html) following the posting of the agenda. If you are unable to access the information, please call 778-782-3168 or email [shelley\\_gair@sfu.ca](mailto:shelley_gair@sfu.ca).**

The logo for Simon Fraser University (SFU) is displayed in white text on a black rectangular background.

**TO:** Bill Krane, Chair, SCUS

**FROM:** Rolf Mathewes, Associate Dean  
Faculty of Science

**RE:** Faculty of Science  
Undergraduate Curriculum  
Items

**DATE:** November 9, 2010

---

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.

**Biological Sciences**

- a) Change to the minimum grade requirement to obtain a major in Biological Sciences
  - Add a requirement that students must achieve a C- or higher in all required upper level BISC courses.
- b) Changes to stream descriptions
- c) Course description changes to BISC497W, BISC498, BISC499
- d) Course description changes to BISC302/302W and BISC303
- e) Prerequisite changes to BISC307/307W, BISC367/367W and BISC418

**Chemistry**

CHEM 391-3 – New course proposal

**Earth Sciences**

Prerequisite change for EASC 304

Course number, description and prerequisite change EASC 412

**Molecular Biology & Biochemistry**

MBB 461-3 – New course proposal

Prerequisite changes – MBB 231, MBB 422, MBB 444

A handwritten signature in black ink, appearing to read 'R. Mathewes', is written over a horizontal line.

R. Mathewes

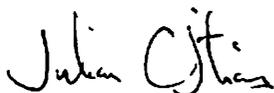
Enclosure

c. J. Hinchliffe, C. Cupples

June 29, 2010

I would like to bring forward four motions for proposed calendar changes that were approved by the Department of Biological Sciences at a meeting held on May 25, 2010:

1. That a proposed change to the minimum grade requirement to obtain a major in Biological Sciences be approved.
  - Add a requirement that students must achieve a C- or higher in all required upper level BISC courses.
2. That proposed changes to the stream descriptions be approved.
  - Increase the number of research intensive courses that may be used towards requirements from 2 to 3.
3. That course description changes to BISC497W, BISC498, BISC499 be approved.
  - Remove the restriction that students may not take BISC498 and BISC499 with the same supervisor.
  - Change the statement that "A maximum of six units in research courses can be applied towards the degree" to be consistent with change (2) above.
4. That course description changes to BISC302/302W and BISC303 be approved.
  - Add the following text to course description: "Students are required to come into the lab on average of 2 hours per week in addition to the 4 hour scheduled lab each week for project work."
5. That prerequisite changes to BISC307/307W, BISC367/367W and BISC418 be approved.
  - Change the prerequisites of BISC307 and BISC307W from BISC305 and BISC329 to BISC305.
  - Change the prerequisites of BISC367 and BISC367W from BISC366 and BISC329 to BISC366.
  - Change the prerequisite for BISC418 from BISC204. Recommended: BISC 300 and BISC 306.  
to  
BISC101 and BISC102 and BISC204 or HSCI 212 and completion of 75 credit hours. Recommended: BISC 300 and BISC 306.



Julian Christians  
Chair, Departmental Undergraduate Curriculum Committee  
Department of Biological Sciences

---

**Re: Biological Sciences**

---

**From :** Julian Christians <jkchrist@sfu.ca>

Fri, 26 Nov, 2010 09:09

**Subject :** Re: Biological Sciences

**To :** Jo Hinchliffe <joah@sfu.ca>

**Cc :** Rosemary Hotell <rosemary\_hotell@sfu.ca>, Rolf Mathewes <mathewes@sfu.ca>

Hi

Yes, please, it should apply to majors and honours.

Cheers

Julian

----- Original Message -----

From: "Jo Hinchliffe" <joah@sfu.ca>

To: "Rolf Mathewes" <mathewes@sfu.ca>

Cc: "Julian Christians" <jkchrist@sfu.ca>, "Rosemary Hotell" <rosemary\_hotell@sfu.ca>

Sent: Friday, 26 November, 2010 8:20:11 AM

Subject: Re: Biological Sciences

If it does apply to all, you can make that change at the meeting. Unfortunately if it is not specified then the people working on the Calendar and the DPR don't change the honours - and then it has to come back to SCUS for correction and delays everything.

Thanks for checking.

From: "Rolf Mathewes" <mathewes@sfu.ca>

To: "Jo Hinchliffe" <joah@sfu.ca>

Cc: "Julian Christians" <jkchrist@sfu.ca>, "Rosemary Hotell" <rosemary\_hotell@sfu.ca>

Sent: Thursday, 25 November, 2010 20:09:41

Subject: Re: Biological Sciences

Jo:

I am quite sure that it should apply to both majors and honours, but I copy this reply to Julian Christians who would correct me if wrong. I can change at the next SCUS if you prefer. Cheers, Rolf

----- Original Message -----

From: "Jo Hinchliffe" <joah@sfu.ca>

To: "Rolf Mathewes" <mathewes@sfu.ca>

Sent: Thursday, 25 November, 2010 16:15:20

Subject: Biological Sciences

Hi Rolf, the minimum grade requirement change that is coming forward from Biological Sciences states to that is just for the major. Does it also apply to the honours degree? If so, it should state that, can you please change at the meeting?

--

Jo Hinchliffe

**Proposed change to Minimum Grade Requirement for Biological Sciences Major Program**

**FROM:**

**Minimum Grade Requirement**

A grade of C- or better is required on all prerequisite BISC and MBB courses.

**TO:**

**Minimum Grade Requirement**

A grade of C- or better is required on all prerequisite BISC and MBB courses, and in each of BISC 300-3 Evolution and BISC 333-3 Developmental Biology, one of BISC 305-3 Animal Physiology or BISC 366-3 Plant Physiology, and one of BISC 303-4 Microbiology, or BISC 306-4 Invertebrate Biology, or BISC 316-4 Vertebrate Biology, or BISC 317-3 Insect Biology, or BISC 326-3 Biology of Algae and Fungi, or BISC 337-4 Plant Biology, or BISC 418-3 Parasitology.

**Rationale**

Currently, a student could get D in core BISC courses required of all majors, and still get a BSc in Biology if their GPA in all BISC courses was 2.00 or above.

**Proposed addition to the “Upper Division Requirements” of the Biological Sciences Major Program**

For graduation, a grade of C- or better is required for all upper division requirements, i.e., a grade of C- or better must be achieved in each of BISC 300-3 Evolution and BISC 333-3 Developmental Biology, one of BISC 305-3 Animal Physiology or BISC 366-3 Plant Physiology, and one of BISC 303-4 Microbiology, or BISC 306-4 Invertebrate Biology, or BISC 316-4 Vertebrate Biology, or BISC 317-3 Insect Biology, or BISC 326-3 Biology of Algae and Fungi, or BISC 337-4 Plant Biology, or BISC 418-3 Parasitology.

**Rationale**

Currently, a student could get D in core BISC courses required of all majors, and still get a BSc in Biology if their GPA in all BISC courses was 2.00 or above.

### **Proposed change to stream descriptions**

In the descriptions of the Cells, Molecules and Physiology Stream and the Ecology, Evolution and Conservation Stream, the proposed change in each section is as follows (i.e., the same text appears separately in each section):

#### **FROM:**

Normally no more than two courses from other units may be used to satisfy stream requirements and additional upper division biology course requirements. Students complete a total of five lab courses (which may include one of BISC 497W, 498, 499) among their upper division courses.

#### **TO:**

Normally no more than two courses from other units and no more than three research intensive courses (BISC 490, 491, 492, 497W, 498, or 499) may be used to satisfy stream requirements and additional upper division biology course requirements. Students complete a total of five lab courses (which may include one of BISC 497W, 498, 499) among their upper division courses.

In the descriptions of the Open Stream, the proposed change is as follows:

#### **FROM:**

Normally no more than two courses from other units may be used to satisfy upper division biology course requirements. Students complete a total of five lab courses (which may include one of BISC 497W, 498, 499) among their upper division courses.

#### **TO:**

Normally no more than two courses from other units and no more than three research intensive courses (BISC 490, 491, 492, 497W, 498, or 499) may be used to satisfy upper division biology course requirements. Students complete a total of five lab courses (which may include one of BISC 497W, 498, 499) among their upper division courses.

#### **Rationale:**

We propose increasing the number of research intensive courses that may be used towards requirements from 2 to 3, so that students are not discouraged from taking more research courses.



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

Indicate number of hours for: Lecture Seminar Tutorial Lab

FROM TO Course Number BISC497W Course Number

Credit Hour Credit Hour

TITLE

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

Undergraduate Research: Writing Intensive

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

DESCRIPTION A student may enrol in this course only with prior written agreement of a faculty member to act as research supervisor, who will also provide instruction and feedback on the writing and presentation of results from the research. A maximum of six units in research courses can be applied towards the degree.

PREREQUISITE

RATIONALE

We propose increasing the number of research intensive courses that may be used towards requirements from 2 to 3, to encourage students to take more research courses.

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

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title [X] Description Prerequisite Course deletion

Indicate number of hours for: Lecture Seminar Tutorial Lab

FROM TO Course Number BISC498 Course Number Credit Hour Credit Hour

TITLE

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

Undergraduate Research I

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

DESCRIPTION A student will be permitted to enrol in this course only if he/she obtains the prior written agreement of a faculty member to act as research advisor. A different advisor is required than for BISC 499, but a student may take BISC 497W with the same advisor either following or concurrently with BISC 498. A maximum of six units in research courses can be applied towards the degree.

PREREQUISITE

RATIONALE

We propose removing the restriction from taking BISC498 and BISC499 with the same research advisor since some fields of research require a substantial amount of time to learn techniques. We propose increasing the number of research intensive courses that may be used towards requirements from 2 to 3, to encourage students to take more research courses.

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

Effective term and year Fall 2010





**EXISTING COURSE, CHANGES RECOMMENDED**

Please check appropriate revision(s):

Course number     Credit     Title     Description     Prerequisite     Course deletion

Indicate number of hours for: Lecture \_\_\_\_\_ Seminar \_\_\_\_\_ Tutorial \_\_\_\_\_ Lab \_\_\_\_\_

**FROM** **TO**  
Course Number BISC302 and BISC302W Course Number \_\_\_\_\_

Credit Hour \_\_\_\_\_ Credit Hour \_\_\_\_\_

**TITLE**

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

Genetic Analysis \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

\_\_\_\_\_

**DESCRIPTION** \_\_\_\_\_ **DESCRIPTION** \_\_\_\_\_  
Discussion and manipulations of some of the organisms and techniques applicable to genetic analysis. \_\_\_\_\_ Discussion and manipulations of some of the organisms and techniques applicable to genetic analysis. Students are required to come into the lab on average of 2 hours per week in addition to the 4 hour scheduled lab each week for project work.  
\_\_\_\_\_  
\_\_\_\_\_

**PREREQUISITE** \_\_\_\_\_ **PREREQUISITE** \_\_\_\_\_  
\_\_\_\_\_

**RATIONALE**

Students are not always required to stay for the entire duration of the 4 hour scheduled lab, but do have to come in periodically outside of scheduled hours to monitor the growth and development of organisms as part of experiments.

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

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

Indicate number of hours for: Lecture Seminar Tutorial Lab

FROM TO Course Number BISC303 Course Number Credit Hour Credit Hour

TITLE

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

Microbiology

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

DESCRIPTION The biology of micro-organisms and their significance in the understanding of cellular processes. The biology of micro-organisms and their significance in the understanding of cellular processes. Students are required to come into the lab on average of 2 hours per week in addition to the 4 hour scheduled lab each week for project work.

PREREQUISITE

RATIONALE

Students are not always required to stay for the entire duration of the 4 hour scheduled lab, but do have to come in periodically outside of scheduled hours to monitor the growth and development of organisms as part of experiments.

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

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description X Prerequisite Course deletion

Indicate number of hours for: Lecture Seminar Tutorial Lab

FROM TO Course Number BISC307 and BISC307W Credit Hour

TITLE

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

Animal Physiology Laboratory

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

DESCRIPTION DESCRIPTION

PREREQUISITE PREREQUISITE BISC305 and BISC329 BISC305

RATIONALE

The course has changed such that BISC329 is no longer necessary as a 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.

Effective term and year Fall 2010



**EXISTING COURSE, CHANGES RECOMMENDED**

Please check appropriate revision(s):

Course number     Credit     Title     Description     Prerequisite     Course deletion

Indicate number of hours for: Lecture \_\_\_\_\_ Seminar \_\_\_\_\_ Tutorial \_\_\_\_\_ Lab \_\_\_\_\_

<b>FROM</b>	<b>TO</b>
Course Number <u>BISC367 and BISC367W</u>	Course Number _____
Credit Hour _____	Credit Hour _____

**TITLE**

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

<u>Plant Physiology Laboratory</u>	_____
_____	_____
_____	_____

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

DESCRIPTION _____	DESCRIPTION _____
_____	_____
_____	_____

PREREQUISITE _____	PREREQUISITE _____
<u>BISC366 and BISC329</u>	<u>BISC366</u>

**RATIONALE**

The course has changed such that BISC329 is no longer necessary as a 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**.

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description X Prerequisite Course deletion

Indicate number of hours for: Lecture Seminar Tutorial Lab

FROM TO Course Number BISC418 Course Number Credit Hour Credit Hour

TITLE

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

Parasitology

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

DESCRIPTION DESCRIPTION

PREREQUISITE PREREQUISITE BISC204. Recommended: BISC 300 and BISC 306. BISC101 and BISC102, and BISC204 or HSCI 212 and completion of 75 credit hours. Recommended: BISC 300 and BISC 306.

RATIONALE

The rationale for the addition of BISC101 and BISC102 is that GEOG 215 is sometimes used as a prerequisite instead of BISC204; GEOG 215 is considered equivalent to BISC204 (you can't get credit for both), but does not have first year biology prerequisites (i.e., a student could get into BISC418 without having taken BISC101 and BISC102 if they took GEOG 215 instead of BISC204).

The rationale for adding HSCI 212 as an alternate prerequisite to BISC204 is to enable HSCI students to take the course.

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

Effective term and year Fall 2010



FACULTY SCIENCE  
Department of Chemistry

8888 University Drive, Burnaby, BC  
Canada V5A 1S6

TEL 778.782.4887  
FAX 778.782.3765

dleznoff@sfu.ca  
www.chemistry.sfu.ca

**MEMORANDUM**

---

<b>ATTENTION</b>	Rolf Mathewes, Chair, Faculty of Science Curriculum Committee	<b>DATE</b>	September 8, 2010
<b>FROM</b>	Daniel Leznoff, Chair, Chemistry Undergraduate Studies Committee	<b>PAGES</b>	1/1
<b>RE:</b>	New Course Proposal: CHEM 391-3 Industrial Chemistry		

---

The Department of Chemistry has submitted a new course proposal (see attached proposal, sample outline and library assessment) for CHEM 391-3, Industrial Chemistry. The course will cover direct applications of chemical principles to large-scale chemical industry, the chemical processes and compounds that dominate the industry and, by extension, impact society at large. This is currently not covered in detail in the chemistry curriculum but should be hugely beneficial to chemistry students, many of whom end up in industrial chemistry careers.

The proposed new course is not part of the Chemistry core curriculum (i.e. it is an elective) and has 2<sup>nd</sup> year prerequisites of CHEM 215, CHEM 230 and CHEM 282 (or dept. permission).

**SIMON FRASER UNIVERSITY**  
**Senate Committee for Undergraduate Studies**  
**NEW COURSE PROPOSAL**

Course Number: CHEM 391-03

Course Title: Industrial Chemistry

Long - for calendar/schedule no more than 100 characters including spaces/punctuation: Industrial Chemistry

**AND**

Short - for registration/transcript no more than 30 characters including spaces/punctuation

Industrial Chemistry

Indicate number of hours for Lect ( 3 ) Sem ( 0 ) Tut ( 1 ) Lab ( 0 )

**Course Description (for Calendar). Attach a course outline to this proposal.**

A survey of industrial chemistry. Topics include the production of raw petrochemical and mineral materials, bulk organic and inorganic chemicals that drive the economy, industrially relevant polymers, and health and hygiene products. Green approaches to industrial chemistry are discussed.

Prerequisite:

CHEM 215, 230 and 282 or permission of the department.

Corequisite: None

Special Instructions

That is, 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 pre-requisite.

No similar courses exist.

Course(s) to be dropped if this course is approved:

None.

**Rationale for Introduction of this Course:**

The chemistry course offerings, for the most part, focus on fundamental aspects of chemistry. Direct applications to large-scale chemical industry, the chemical processes and compounds that dominate the industry and, by extension, impact society at large are not covered in detail in the chemistry curriculum. This course will bridge the gap between "textbook/laboratory" chemistry and the reactions, materials and processes that make up the chemical industry. This linkage is expected to be particularly invaluable to undergraduate chemistry majors, most of whom end up working in the chemical industry and would hugely benefit from this exposure in advance of starting their careers.

**Scheduling and Registration Information:**

Indicate effective semester/year course would be first offered and planned frequency of offering thereafter.

03/2011. Once every 3 to 6 semesters (depending on demand)

---

**Note: There is a two-semester(term) wait for implementation of any new course.**

Indicate if there is a Waiver required YES \_\_\_\_\_ NO  X

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

ELECTIVE

What is the probable enrolment when offered? Estimate 20-40 students

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

Since the course material is very broad, encompassing all areas of chemistry, any faculty member could teach it. In particular, faculty with organic or inorganic chemistry expertise would likely be the most appropriate. Selected faculty that could offer the course material include G. Mund, D. Leznoff, T. Storr, R. Britton and V. Williams.

Are there any proposed student fees associated with this course other than tuition fees? (if so, attach mandatory supplementary fee approval form) NO

**Resource Implications:**

**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.**

Campus where course will be taught: \_\_\_\_\_ Burnaby \_\_\_\_\_

Library report status \_\_\_\_\_ Attached

Provide details on how existing instructional resources will be redistributed to accommodate this new course. For instance, will another course be eliminated or will the frequency of offering of other courses be reduced; are there changes in pedagogical style or class sizes that allow for this additional course offering?

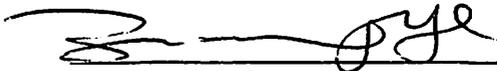
The course will be offered a maximum of once per year and many faculty have the expertise to teach it. Current resources can be allocated to cover this offering with minimal disruption. No special issues regarding class size or pedagogical style exist.

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

None.

**Approvals**

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

 \_\_\_\_\_ Oct. 26, 2010, \_\_\_\_\_

Chair, Dept./School

Date

 \_\_\_\_\_ Nov. 12, 2010 \_\_\_\_\_

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/Department commits to providing the required Library funds.

\_\_\_\_\_ Date: \_\_\_\_\_  
Dean or Designate

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

**NONE needed**

---

---

---

**Other Faculties approval** indicates 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.**

## CHEM 391-3

### Industrial Chemistry

#### **General Course Description:**

Industrial chemistry plays a crucial role in the high standard of living enjoyed by industrialized nations. The course provides an introduction to industrial chemistry. A wide range of both inorganic and organic chemicals and industrial chemical processes will be discussed. Important inorganic industrial chemicals include ammonia, an essential ingredient in fertilizers; chlorine used as a disinfectant of drinking water; metals and alloys; cement. Important organics include polymers; detergents; pharmaceuticals; gasoline; solvents, all of which are used in industries from petrochemicals to health and hygiene. Topics will not only include the production of these chemicals from raw materials, but also the social and environmental impact of the production (e.g., acid rain, heavy-metal pollution, ocean pollution). Efforts to make these current processes "green" form will also be discussed (e.g., use of liquid carbon dioxide and ionic liquids as environmentally-friendly solvents).

A small research project (report and presentation) on some aspect of modern industrial chemistry will be required.

**Prerequisite:** CHEM 215, CHEM 230 and CHEM 282 (3 lecture hours/week; 1 tutorial hours/week; 0 lab hours/week).

#### **Weeks 1-11: Lecture Topics**

- The Chemical Economy.
- Raw and Bulk Materials (e.g. petrochemicals, minerals, surfactants etc.)
- Industrial Polymers (e.g. plastics, elastomers, fibers etc.)
- Industrial Chemistry (organic). The industrial processes involved in the production of common aliphatic and aromatic compounds.
- Industrial Chemistry (inorganic). Non-metals and their compounds: industrial gases (e.g. production of hydrogen and nitrogen for ammonia synthesis), boron, carbon, and silicon compounds. Metals and their compounds: The alkali metals, alkaline earth metals, aluminum (e.g. production of aluminum), production of steel etc.
- Eco-Friendly Synthesis of Chemicals: The Next Wave in Chemical Industry: Catalysis in non-conventional reaction media (e.g. organocatalysis in green solvents). The contribution of photochemistry as a green procedure.
- Health and Hygiene Products.

#### **Weeks 12-13: Research Presentations**

The research project is designed to give students an opportunity to apply what they have learned from the course. Students will be expected to write a report about an industrial chemical process (from instructor selected topics) and then present it to the class (students will be expected to do research on their own time). The report should not only emphasize the chemistry behind the industrial process but should also seek to explain why the industrial process is important and what purpose it serves. Furthermore, the report should also present some of the drawbacks of the industrial process. For example, is the process environmentally acceptable? What is the energy cost of the industrial process? Is the industry undergoing any changes to make it more energy efficient and/or environmentally friendly?

### **Selected Lecture Topics in More Detail:**

#### The Chemical Economy

The chemical industry serves a major role in all industrialized economies. For example, the industry provides synthetic drugs, fertilizers, clothing, building materials etc. This section of the course will look at the quantity and cost of some common chemicals produced worldwide from the three general classes of products:

- 1) Basic chemicals such as acids, salts etc.
- 2) Chemicals to be used in further manufacturing such as synthetic fibers, plastic materials and pigments etc.
- 3) Finished chemical products to be used for consumption as drugs, cosmetics etc. or to be used as materials or supplies in other industries such as paints, fertilizers and explosives etc.

#### Raw and Bulk Materials (e.g. petrochemicals)

The chemical processes by which liquid and gaseous fuels are obtained from petroleum will be investigated in this section. Furthermore, the demand for a greater yield of gasoline from petroleum (crude oil) is ever increasing. The cracking of longer C-chain hydrocarbons (e.g. kerosene) into smaller C-chain hydrocarbons (gasoline) is a major industrial process that will be investigated in this section.

#### Industrial Polymers

About 80% of the output of the world organic chemical industry is used in the production of synthetic polymers such as polyethylene and nylon. In industry, some millions of tons of polyethylene and polypropylene are synthesized by Ziegler-Natta catalysts (i.e. titanium salts and aluminum alkyls) and their derivatives annually. The ease of synthesis and utility of these polymers are the reasons why plastics are so ubiquitous in modern life. In the same respect, nylons are some of the most important fibers produced commercially (e.g. clothing, rope, tents, toothbrush bristles etc.). This section will focus on the industrial processes used to produce some common synthetic polymers and a mechanistic look at how the polymers are produced.

#### Industrial Chemistry (organic)

Petroleum is the key ingredient in most of the products of industrial organic chemistry. Some of the important petrochemicals are ethylene, acetylene, propylene, butadiene, benzene and toluene. The process by which some of these common organic compounds are produced will be investigated.

#### Eco-Friendly Synthesis of Chemicals

The field of organocatalysis has been developing at an exponential rate. The major benefit arising from the use of organocatalysts is the absence of metal impurities in the final product. Despite the fact that there are still several drawbacks when it comes to using these catalysts in industry (e.g. solvent limitations), the use of "greener" alternatives (e.g. ionic liquids) gives the field potential and will be investigated further in this course.

#### Health and Hygiene Products

In this section we will investigate the synthesis of common household health and hygiene products. For example, the industrial process by which soap, toothpaste etc. are produced will be explored.

#### **Grading:**

The course will be evaluated based on one midterm (30%) and final exam (50%). In addition, each student will be responsible for a research project (report and presentation) that is designed to illustrate practical applications of industrial chemistry (20%).

#### **Textbook:**

J. Phillip Chenier., *Survey of Industrial Chemistry*, 3<sup>rd</sup> Edition, Springer-Verlag. 2002.

**SIMON FRASER UNIVERSITY  
Course Change Form**

Existing Course Number/Title:

EASC 304-3 Hydrogeology

Please check appropriate revision(s) being recommended:

Course Number: \_\_\_\_\_ Credit Hour: \_\_\_\_\_ Title: \_\_\_\_\_  
 Description: \_\_\_\_\_ Prerequisite: \_\_\_\_\_ X \_\_\_\_\_ Vector: \_\_\_\_\_

Prerequisite From:

From:

Prerequisites: One of EASC 101 or GEOG 111, and PHYS 126 or 121 (or PHYS 102 with a grade of B or higher).

Corequisites: none

Recommended: none

To:

Prerequisites: EASC 101 and PHYS 102 or 121 or 126 or 141; and 12 additional units in Earth Sciences, Physical Geography or Environmental Science.

Recommended: none

Rationale:

**Traditionally, EASC 304 has been taken by students during their 3<sup>rd</sup> or 4<sup>th</sup> year. However, in recent years, due to the current 100 level pre-requisites, some students have been taking this course at the beginning of their second year. While there are no specific second year courses as pre-requisites, this 300 level course demands a higher level of academic maturity (a term project is central to the course). Requiring a total of 5 units (courses) in Earth sciences, Physical Geography, or Environmental Science will meet this requirement.**

**EASC 101 is required because EASC 304 is required for EASC 412, which relies on basic concepts of mineralogy. The choice of 4 additional courses in EASC or Physical GEOG or EVSC will ensure that EASC majors, Physical GEOG majors can continue to take this course, while allowing for the EVSC students enrolled in the new Water Science concentration to take this course as a degree requirement.**

Does this course duplicate the content of a previously approved course to such an extent that students should not receive credit for both courses.

**No**

**Effective date: 2008/2009 Calendar or 16<sup>th</sup> September 2010**

**Passed by the EASC Undergraduate Committee:**



**RATIONALE:**

Course serves as a pre-requisite for several 4<sup>th</sup> year courses (EASC 405, 410 and 416) so is better as a third year course. Course content will be modified slightly so that students from other Departments may take this course without having to take EASC 208.

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 pre-requisite.

Effective semester and year Fall 2011

## MEMO

Department of  
Molecular Biology &  
Biochemistry

8888 University Drive  
Burnaby BC V5A 1S6

T: 778.782.5630  
F: 778-782-5583

www.sfu.ca/mbb

ATTENTION **Rolf Mathewes**

TEL

FROM **Ingrid Northwood; undergrad prog. coordinator-MBB**

RE **1 New Course Proposal and 3 course pre-requisite changes**

DATE **October 18, 2010**

**A new course, MBB461-3, Comparative Genomics, is being proposed:**

As the Era of Genomics emerges, comparison of genome data is having impacts on medicine and many other fields of the life sciences. This is an elective course designed to expose students to the emerging field of comparative genomics. Since the completion of the Human Genome project in 2003, the number of sequenced genomes has been increasing exponentially. A course that takes students from the basics of sequence technology and genomic elements through to the analysis of entire genomes and comparisons within and among species is of increasing value to today's molecular biology and genetic students. The external review of the MBB Department recommended that more upper division, specialized elective courses be made available to MBB majors and this course is part of that mandate. The course is also expected to become part of the anticipated Genomics B.Sc. program for which a notice of intent has been approved. No additional library resources will be required. A course outline is also attached.

**Three Course Prerequisite changes are being proposed:**

- i) **MBB231:** the addition of "Chem282 with a minimum grade of C-" to be added. Currently students who have completed MBB222 with a minimum grade of C- can enroll in MBB231 even if they received a D or lower in CHEM282. This change in prereq to MBB231 will eliminate that loophole.
- ii) **MBB422:** the removal of MBB323 or CHEM360 as pre-reqs. Instructor no longer considers these necessary pre-reqs for the course material.
- iii) **MBB444:** the removal of BISC333 as a pre-req. While BISC333 is useful and will continue to be recommended, having a non-required MBB program course from another department as a pre-req limits the availability of the course for MBB majors.



**COURSE NUMBER** MBB 461

**COURSE TITLE**

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

**Comparative Genomics**

**AND**

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

**Comparative Genomics**

**CREDITS**

Indicate number of credits for: Lecture 3hrs Seminar \_\_\_\_\_ Tutorial 1hr Lab \_\_\_\_\_

**COURSE DESCRIPTION (FOR CALENDAR). 3-4 LINES (50-60 WORDS) MAXIMUM. ATTACH A COURSE OUTLINE TO THIS PROPOSAL**

**Examination of the fundamentals of comparative genomics, identification and activity of functional elements in genomes, inter- and intra-species comparisons, relationship of genomic to phenotypic variation, and personalized genomics are among the topics to be explored. Comparison of genome data has impacts on medicine and many other fields of the life sciences.**

**PREREQUISITE**            **MBB 331**

**COREQUISITE**            **none**

**SPECIAL INSTRUCTIONS**

That is, 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.

**This course will have previously been taught as a special topics course, MBB440, so students will not receive credit for MBB461 and the special topics course MBB 440 entitled Comparative Genomics.**

**COURSES(S) TO BE DELETED IF THIS COURSE IS APPROVED**

**NOTE: APPROPRIATE DOCUMENT FOR DELETION MUST BE SUBMITTED TO SCUS**

none

**RATIONALE FOR INTRODUCTION OF THIS COURSE**

**This is an elective course designed to expose students to the emerging field of comparative genomics. Since the completion of the Human Genome project in 2003, the number of sequenced genomes has been increasing exponentially due to the research demands of fields that include medicine, agriculture, aquaculture, forestry and evolution. A course that takes students from the basics of sequence technology and genomic elements through to the analysis of entire genomes and comparisons within and among species is of increasing value to today's molecular biology and genetic students. The external review of the MBB Department recommended that more upper division, specialized elective courses be made available to MBB majors and this course is part of that mandate. The course is also expected to become part of the anticipated Genomics B.Sc. program for which a notice of intent has been approved.**



**SCHEDULING AND ENROLLMENT INFORMATION**

Indicate effective term and year course would first be offered and planned frequency of offering thereafter: **Spring 2012 (1121)**

(NOTE: There is a two-term wait for implementation of any new course.)

Indicate if there is a waiver required:  YES  NO

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

What is the probable enrollment when offered? Estimate **25 - 35**

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

The course will be taught by **Dr. Jack Chen, a regular MBB faculty member. Other MBB faculty that could potentially teach this course are Dr. Brinkman and Dr. Holt**

Are there any proposed student fees associated with this course other than tuition fees?  YES  NO  
(If yes, attach mandatory supplementary fee approval form.)

**RESOURCE IMPLICATIONS**

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.

Campus where course will be taught **Burnaby**

Library report status **No additional library resources will be required see <http://www.lib.sfu.ca/collections/course-assesments>**

Provide details on how existing instructional resources will be redistributed to accommodate this new course. For example, will another course be eliminated or will the frequency of offering of other courses be reduced; are there changes in pedagogical style or class sizes that allow for this additional course offering?

**No courses will be eliminated. Dr. Chen will teach this course as part of his regular teaching duties. This course will fill a need for an increase in 400 level specialized elective courses.**

List any outstanding resource issues to be addressed prior to implementation: space, laboratory equipment, etc: **none**

Articulation agreement reviewed?  YES  NO  Not applicable

**OTHER IMPLICATIONS NONE**



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.

[Signature] Oct 18, 2010
Chair, Department/School Date

[Signature] Nov. 12, 2010
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.

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.

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.

# Course Outline

## MBB 461: Comparative Genomics

**Calendar Description:** Examination of the fundamentals of comparative genomics, identification and activity of functional elements in genomes, inter- and intra-species comparisons, relationship of genomic to phenotypic variation, and personalized genomics are among the topics to be explored. Comparison of genome data has impacts on medicine and many other fields of the life sciences. Prerequisite: MBB331.

### Module 1: Fundamentals

Lecture 1: Comparative genomics: an emerging field  
Lecture 2: DNA sequencing technologies: the driving force  
Lecture 3: Bioinformatics: the enabling force  
Lecture 4: Resources for comparative genomics  
Lecture 5: The Human Genome Project

### Module 2: Functional elements: identification and function

Lecture 6: Gene  
Lecture 7: Ultraconserved elements  
Lecture 8: Functional elements: cis-regulatory elements  
Lecture 9: ENCODE & MOD-ENCODE projects  
Lecture 10: Synteny blocks  
Lecture 11: Genome rearrangement events and genome evolution

### Module 3: Intra-species comparison

Lecture 12: Genomic variations  
Lecture 13: From SNP to HapMap  
Lecture 14: Structural variations  
Lecture 15: Loss-of-function variations  
Lecture 16: GWAS (genome-wide association studies)  
Lecture 17: Personalized genomes and The 1000 Genome Project

### Module 4: Inter-species comparison

Lecture 18: Genome family expansion and contraction  
Lecture 19: Transcription factor and gene battery  
Lecture 20: Horizontal gene transfer  
Lecture 21: Virulence factors and drug targets  
Lecture 22: Metagenomics  
Lecture 23: What makes us human?  
Lecture 24: The Genome 10K Project

**Grading:** Quizzes 25%; Presentation 25%; Participation 10%; Report 40%

**Required text:** None

**Recommended text:** TBA

**Prerequisite:** MBB331

"Students requiring accommodations as a result of a disability, must contact the Centre for Students with Disabilities (778-782-3112 or e-mail: [csdo@sfu.ca](mailto:csdo@sfu.ca))."

All students are subject to and responsible for being familiar with the SFU academic integrity policy which can be found on-line at <http://students.sfu.ca/academicintegrity/index.html>

Students are advised to review the plagiarism tutorial found at

<http://www.lib.sfu.ca/help/tutorials/plagiarism-tutorial>

For help with writing, learning and study strategies please contact the Student Learning Commons at

<http://learningcommons.sfu.ca/>

SFU Connect

inorthwo@sfu.ca

± Font size ±

**Fwd: Proposal and Course outline for a new MBB course:  
MBB461 Comparative Genomics**

**From :** Ingrid Northwood <inorthwo@sfu.ca>

Mon, Oct 18, 2010 02:27 PM

**Subject :** Fwd: Proposal and Course outline for a new MBB course: MBB461 Comparative Genomics

**To :** inorthwo <inorthwo@sfu.ca>

On 2010-10-14, at 9:56 AM, Leslie Rimmer <lsrimmer@sfu.ca > wrote:

Dear Ingrid,

I have completed reviewing the proposal for MBB 461, Comparative Genomics,, and have determined that no additional library resources will be required to support it.

I have added the course to the appropriate list at <http://www.lib.sfu.ca/collections/course-assessments> . This will be adequate proof of library sign-off.

If you have any questions, please do not hesitate to contact me.

Best,

Leslie

~~~~~

Leslie Rimmer  
Collections Librarian  
Liaison Librarian for Biological Sciences

WAC Bennett Library  
Simon Fraser University  
8888 University Drive  
Burnaby, B.C. V5A 1S6 Canada

Email: [lsrimmer@sfu.ca](mailto:lsrimmer@sfu.ca) / Tel: 778-782-4962 / Fax: 778-782-3023  
\*\*I am on campus Tuesdays through Thursdays and alternate Fridays\*\*

--  
Ingrid C. Northwood, Ph.D.  
Senior Lecturer and Undergraduate Program Coordinator  
Department of Molecular Biology and Biochemistry





Existing Course, Changes Recommended

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

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

FROM

TO

Course Number MBB 422 Course Number MBB 422
Credit Hour 3 Credit Hour 3

TITLE

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

Biomembranes Biomembranes

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

Biomembranes Biomembranes

DESCRIPTION

DESCRIPTION

A review of recent research on the structure, dynamics, function and biosynthesis of membranes, membrane lipids and proteins

A review of recent research on the structure, dynamics, function and biosynthesis of membranes, membrane lipids and proteins

PREREQUISITE

PREREQUISITE

MBB 322 and either MBB323 or CHEM360

MBB322

RATONALE

MBB323 and CHEM360 are no longer considered necessary pre-requisites for the course material. Instead MBB423 will be recommended as a Co or 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 NO

Effective term and year Fall, 2011 (1117)

Approvals:

Chair, Department/School Oct 18, 2010 Date

Chair, Faculty Curriculum Committee Nov. 12/2010 Date

Chair, SCUS Date



Existing Course, Changes Recommended

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

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

FROM

TO

Course Number MBB 444

Course Number MBB 444

Credit Hour 3

Credit Hour 3

TITLE

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

Developmental Neurobiology

Developmental Neurobiology

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

Developmental Neurobiology

Developmental Neurobiology

DESCRIPTION

Examination of recent literature on neuronal growth cones and axonal guidance. Cell cultural, biochemical, and molecular genetic approaches will be emphasized in assessing guidance cues.

DESCRIPTION

Examination of recent literature on neuronal growth cones and axonal guidance. Cell cultural, biochemical, and molecular genetic approaches will be emphasized in assessing guidance cues.

PREREQUISITE

MBB 331 and Bisc 333

PREREQUISITE

MBB 331

RATONALE

Bisc 333 is being removed as a pre-requisite since it is not an MBB course and limits availability of MBB students to take MBB444. It will instead be recommended to students that they take Bisc333 before taking MBB444

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 NO

Effective term and year Fall, 2011(1117)

Approvals:

[Signature]

[Signature]

Chair, SCUS

Chair, Department/School

Chair, Faculty Curriculum Committee

Oct 18, 2010

Nov. 12, 2010

Date

Date

Date