

THE UNIVERSITY OF BRITISH COLUMBIA

Vancouver Senate 15 Dec 2010
Item 8 p.1



Vancouver Senate Curriculum Committee

c/o

Enrolment Services | Senate & Curriculum Services

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3 December 2010

To: Vancouver Senate
From: Senate Curriculum Committee
RE: December Curriculum Proposals (approval)

The Senate Curriculum Committee has reviewed the material forwarded to it by the Faculties, and encloses those proposals it deems as ready for approval.

As such, the following is recommended to Senate:

Motion: *That the new and changed courses and programs brought forward by the Faculties of Applied Science, Arts, Forestry, and Science be approved.*

Respectfully submitted,

Dr. Peter Marshall, Chair
Senate Curriculum Committee



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3 December 2010

To: Senate

From: Senate Curriculum Committee

Re: **CURRICULUM PROPOSALS FROM THE APPLIED FACULTIES**

Attached please find submitted Category 1 undergraduate curriculum proposals from the Faculties of Applied Science and Forestry for your consideration.

Applied Science

The following **new course**:

MECH 358 (3)

The following **new subject code**:

IGEN

Forestry

The following **new courses**:

CONS 210 (3)

CONS 350 (3)

CONS351 (3)

CONS 352 (3)

CONS 353 (3)

CONS 354 (3)

The following **program statement**:

Haida Gwaii Semester

Faculty of Applied Science

Undergrad Engineering Curriculum Report ~ Category 1 ~ Fall 2010

Faculty: Applied Science Department: Mechanical Engineering Faculty Approval Date: 3 November 2010 Effective Session: September 2011	Date: September 15, 2010 Contact Person: Gary Schajer Phone: 604-822-6004 Email: schajer@mech.ubc.ca
MECH: Undergraduate Course Change	
<p>Proposed Calendar Entry:</p> <p>MECH 358 (3) ENGINEERING ANALYSIS Fourier series; auto- and cross-correlation; power spectra; discrete Fourier transform; boundary-value problems; numerical methods; partial differential equations; heat, wave, Laplace, Poisson, and wave equations. Applications to mechanical engineering and practical computing emphasized. [3-2*-0] <i>Credit will be granted for only one of MECH 358 and MATH 358.</i></p> <p>Prerequisite: All of MECH 224, MECH 225.</p>	<p>Present Calendar Entry: None</p> <p>Type of Action: New Course.</p> <p>Rationale: A review within the Mechanical Engineering Department at UBC has found students suffer in senior Mechanical Engineering courses as a result of not being previously introduced to advanced topics in mathematics. A recent survey comparing curricula from Mechanical Engineering at UBC to other Canadian departments of Mechanical Engineering has shown that UBC covers the same basic math courses (generally taken in first and second year), but lacks an advanced math course (generally taken in the third or fourth year).</p> <p>This course is intended primarily for Mechanical Engineering students, with some limited access also for students outside of Mechanical Engineering who need a partial differential equations course. The course will be co-listed as MATH 358, according to an agreement between MATH and MECH, with teaching support provided by both MATH and MECH.</p> <p>Category 1</p> <p>■ <i>Not available for Cr/D/F grading.</i> <i>(Check the box if the course is NOT eligible for Cr/D/F grading. Note: Not applicable to graduate-level courses.)</i></p> <p><input type="checkbox"/> <i>Pass/Fail or</i> <input type="checkbox"/> <i>Honours/Pass/Fail grading</i> <i>(Check one of the above boxes if the course will be graded on a P/F or H/P/F basis. Default grading is percentage.)</i></p>

Faculty of Applied Science

Undergrad Engineering Curriculum Report ~ Category 1 ~ Fall 2010

Faculty: Applied Science Department: IGEN Faculty Approval Date: 3 November 2010 Effective Session: September 2011	Date: Monday, October 7, 2010 Contact Person: William Dunford Phone: 822-6660 Email: wgd@ece.ubc.ca
IGEN: Create New Course Codes	
Proposed Calendar Entry: IGEN – Integrated Engineering Faculty of Applied Science	Present Calendar Entry: None Type of Action: Create new course code IGEN. Rationale: The Integrated Engineering program includes courses from many different departments, including APSC. However, there are some courses that are taken exclusively by Integrated Engineering students. The Board of Study has recommended that all such courses be re-coded to IGEN to better reflect the program's individual status, provide better visibility to IGEN course contents in student's transcripts and to address registration issues. Courses that will be coded IGEN are the integrating components -- the glue that will hold the program together. This program takes disparate components and shows how they are mutually complementary. Having one unifying course code will help reinforce the cohesive nature of the program. Category 1

UBC Curriculum Proposal Form Change to Courses

Category 1

Faculty: Forestry Department: Dean's Office Faculty Approval Date: May 12, 2010 Effective Session for Change: 2011W	Date: May 6, 2010 Contact Person: Peter Marshall Phone: (604) 822-4454 Email: peter.marshall@ubc.ca
Proposed Calendar Entry: CONS 210 (3) Visualizing Climate Change Exploration of different future scenarios that provide an overview of the science of climate change and potential solutions.	URL: Present Calendar Entry: None Type of Action: New course. Rationale: This course is being developed to address an important aspect of climate change – what impact it might have on broad landscape systems. This course uses visual media such as 3D visualization and other interactive learning tools to bring into focus possible futures with climate change, and stimulate thinking by students about the pros and cons of societal choices. It explores different future scenarios that provide an overview of the science of climate change by integrating not just the impacts of climate change but also its causes and solutions. This course has no pre-requisites and is intended primarily for students who wish to improve both their science literacy on climate change and their understanding of socio-cultural issues around climate change solutions. It is open to all students with a general interest in climate change and visual media for communicating science. There is no similar course available at UBC. Documentation: Forestry-2010-1

<p>Faculty: Forestry Department: Dean's Office Faculty Approval Date: May 12, 2010</p> <p>Effective Session for Change: 2010W, Term 2</p>	<p>Date: May 6, 2010 Contact Person: Peter Marshall Phone: (604) 822-4454 Email: peter.marshall@ubc.ca</p>
<p>Proposed Calendar Entry:</p> <p>CONS 350 (3) Case Studies in Haida Gwaii. Integration of concepts of history, politics, First Nations, rural development, and forest ecology in natural resources management in Haida Gwaii. A core element of the <i>Haida Gwaii Semester</i>. Co-requisites: CONS 351, 352, 353, 354.</p>	<p>URL: Present Calendar Entry: None</p> <p>Type of Action: New course.</p> <p>Rationale: This course is one of five 3-credit courses designed to be completed as a package during a one-term residential experience in Haida Gwaii.</p> <p>Documentation: Forestry-2010-2</p>
<p>Proposed Calendar Entry:</p> <p>CONS 351 (3) History and Politics of Resource Management. Historical examination of resource management in Canada and conflicts arising therefrom, with emphasis on forests. A core element of the <i>Haida Gwaii Semester</i>. Co-requisites: CONS 350, 352, 353, 354.</p>	<p>URL: Present Calendar Entry: None</p> <p>Type of Action: New course.</p> <p>Rationale: This course is one of five 3-credit courses designed to be completed as a package during a one-term residential experience in Haida Gwaii.</p> <p>Documentation: Forestry-2010-3</p>
<p>Proposed Calendar Entry:</p> <p>CONS 352 (3) First Nations and Natural Resources. Overview of the relationship of First Nations with natural resources, with emphasis on First Nations involvement in forest management, past and present. A core element of the <i>Haida Gwaii Semester</i>.</p>	<p>URL: Present Calendar Entry: None</p> <p>Type of Action: New course.</p> <p>Rationale: This course is one of five 3-credit courses designed to be completed as a package during a one-term residential experience in</p>

Co-requisites: CONS 350, 351, 353, 354.	Haida Gwaii. Documentation: Forestry-2010-4
Proposed Calendar Entry: CONS 353 (3) Rainforest Ecology and Management Ecology of the temperate rainforests of Haida Gwaii. A core element of the <i>Haida Gwaii Semester</i> . Co-requisites: CONS 350, 351, 352, 354.	URL: Present Calendar Entry: None Type of Action: New course. Rationale: This course is one of five 3-credit courses designed to be completed as a package during a one-term residential experience in Haida Gwaii. Documentation: Forestry-2010-5
Proposed Calendar Entry: CONS 354 (3) Diversifying Resource-Dependent Communities. Examination of the forces that restructure local economies, both historically and contemporarily; link between rural economic development and the legacy of resource development in Aboriginal communities across British Columbia. A core element of the <i>Haida Gwaii Semester</i> . Co-requisites: CONS 350, 351, 352, 353.	URL: Present Calendar Entry: None Type of Action: New course. Rationale: This course is one of five 3-credit courses designed to be completed as a package during a one-term residential experience in Haida Gwaii. Documentation: Forestry-2010-6

UBC Curriculum Proposal Form Change to Calendar Statement

Category 1

<p>Faculty: Forestry Department: Dean's Office Faculty Approval Date: May 12, 2010 Effective Session for Change: 2010W, Term 2</p>	<p>Date: May 6, 2010 Contact Person: Peter Marshall Phone: (604) 822-4454 Email: peter.marshall@ubc.ca</p>
<p>Proposed Calendar Entry: (Add after the section of Program Approval and Advising)</p> <p>Haida Gwaii Semester</p> <p>This term-long educational opportunity is offered by the Haida Gwaii Higher Education Society. It comprises five courses (CONS 350 through CONS 354) taken on-site in Haida Gwaii from January through April in any given year. More details on the Haida Gwaii Semester and its constituent courses are available on the Faculty of Forestry website: www.forestry.ubc.ca.</p>	<p>URL: http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,203,327,0 Present Calendar Entry: None</p> <p>Type of Action: New statement</p> <p>Rationale: The Haida Gwaii semester is a unique opportunity for students to participate in an academically rigorous, community-based experience delivered on Haida Gwaii. The course material is designed so that it will be of benefit to university students with approximately two years of post-secondary experience, coming from a variety of academic backgrounds, with interests in ecology, resource-dependent communities, and aboriginal cultures. Classroom facilities are housed in the Kaii Cultural Centre located just outside of the community of Skidegate. The intent is to deliver the program to 15-20 students from a variety of universities and programs.</p> <p>The program is set up so that CONS 351 through CONS 354 will run as a series of four 2-3 week modules, with the case studies course (CONS 350) running throughout the period from January to mid-April. UBC Faculty of Forestry will approve instructors, conduct and assess teaching evaluations, and deal with any academic logistical issues. The Haida Gwaii Higher Education Society will cover</p>

	<p>instructor's expenses and provide stipends.</p> <p>This semester was offered as a pilot project last year with academic credit provided via directed studies courses. It was taken by 8 students, 7 from outside UBC, and was very well-received by the students, the instructors, and the community. We are intending on building on this success through formalizing arrangements. At least 15 students have already committed to attending the semester starting in January.</p>
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3 December 2010

To: Senate

From: Senate Curriculum Committee

Re: **CURRICULUM PROPOSALS FROM THE FACULTY OF ARTS**

Attached please find the submitted Category 1 undergraduate curriculum proposals from the Faculty of Arts for your consideration.

New courses

LING 222 (3)
SOWK 450 (3)
FIPR 269 (3/6) D

Changed courses

FIPR 338 (3)

Arts Parchment

Co-operative Education Program

**UBC Curriculum Proposal Form
Change to Course or Program****Category: (1)**

Faculty: ARTS Department: LINGUISTICS Faculty Approval Date: 12 October 2010 Effective Session WINTER Term 2_ Year 2010 for Change	Date: 20 June 2010 Contact Person: Eric Vatikiotis-Bateson Phone: 604 827 5468 Email: evb@interchange.ubc.ca
Proposed Calendar Entry: LING 222 (3): Language Acquisition Audition and speech perception, phonological organization, word learning, syntax, and pragmatics.	URL: N/A Present Calendar Entry: N/A Type of Action: NEW COURSE Rationale: Language acquisition is a topic of broad appeal and is particularly relevant to students of language, psychology, and early education. Within the Linguistics Department curriculum, LING 222 provides a strong foundation for the upper-level courses in the acquisition of phonology and syntax, LING 451 and 452, respectively. LING 222 completes the reorganization of the Linguistics Department undergraduate curriculum mandated by the UIF grant awarded in 2008. The course complements the Clinical Topics course, LING 209, and coincides nicely with the arrival in the Department of Carla Hudson Cam, a Tier 2 Canada Research Chair in Language Acquisition.
Faculty: Arts Department: Social Work Faculty Approval Date: 12 October 2010 Effective Session 2010 - 11__ Term __2_ Year_2010__ for Change	Date: May 25, 2010 Contact Person: Elizabeth Jones Phone: 604-822-6220/604-738 0506 Email: elizabethjones@telus.net
Proposed Calendar Entry:	URL: N/A



<p>SOWK 450 (3) Social Work Practice in Community Mental Health</p> <p>On-line course providing overview of social work services to persons with a mental illness.</p> <p>Prerequisite: 4th year standing in SOWK</p>	<p>Present Calendar Entry: N/A</p> <p>Type of Action: New Course</p> <p>Rationale: This course was previously offered as a 'Topics in ...' course. We hope to offer it in the future as a regular on-line course.</p> <p><input checked="" type="checkbox"/> Not available for Cr/D/F grading. (Check the box if the course is NOT eligible for Cr/D/F grading. Note: Not applicable to graduate-level courses.)</p>
<p>Faculty: Arts Department: Theatre and Film Faculty Approval Date: 12 October 2010</p> <p>Effective Session W Term 1 Year 2010 for Change</p>	<p>Date: April 25, 2010 Contact Person: Sharon McGowan Phone: 604-720-9629 Email: sharon.mcgowan@ubc.ca</p>
<p>Proposed Calendar Entry:</p> <p>FIPR 269 (3/6) D Special Topics in Film Production</p> <p>A topic of current interest in film production. Topic will change from year to year.</p>	<p>URL: Not applicable – new course</p> <p>Present Calendar Entry: Not applicable – new course</p> <p>Type of Action: New Course</p> <p>Rationale: There are many topics in the field of film production that are of interest to an increasingly wider range of UBC students and that could be taught in a large lecture format by our current full time and adjunct faculty. At present, the Film Production Program only has a Special Topics course set at the 400 level. The creation of a Special Topics at the 200 level would enable us to serve a wider range of students in the first years of their degree at UBC.</p> <p>A sample outline for a course that could be offered under this number, entitled, The Art and Craft of a Television Series Director, is</p>



	<p>attached to this proposal. A more complex version of this course was developed by Adjunct Professor Bobby Roth, an expert in the field, and was offered as a lecture course under our FIPR 469 Special Topics number in summer 2009 and was very successful. The material translates very well to a lower level course and would be of great interest to many newer students at UBC. Other courses could be developed for this FIPR 269 Special Topics number and offered on a year by year basis, depending on availability of faculty and budget.</p>
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<p>Faculty: Arts Department: Theatre and Film Faculty Approval Date: 12 October 2010 Effective Session W Term 1 2011 for Change</p>	<p>Date: April 25, 2010 Contact Person: Sharon McGowan Phone: 604-720-9629 Email: sharon.mcgowan@ubc.ca</p>
<p>Proposed Calendar Entry:</p> <p>FIPR 338 (3) Motion Picture Sound</p> <p>An introduction to the technique and aesthetics of creating production and post-production sound for film and video.</p>	<p>URL: FIPR</p> <p>Present Calendar Entry:</p> <p>FIPR 338 (3) Sound Recording for Film and Video</p> <p>An introduction to the technique and aesthetics of recording sound for motion pictures.</p> <p>Type of Action: Change of course name and broadening of description and content.</p> <p>Rationale: The current name and description of this course is too narrow for optimum teaching and learning in the discipline. The current course focuses exclusively on the recording of sound during production. The revised course will provide for recording sound</p>



	both during production and post-production as well as editing the sound that has been recorded. The principles of creating quality sound for film and video are similar at each phase so this change will allow for broader application and exploration of the central concepts as well as provide students with a wider range of essential technical skills.
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**MEMORANDUM****Forwarded to:** Senate Curriculum Committee

To: Gernot Weiland, Chair, Arts Curriculum Committee Date: August 27, 2010

From: Julie Walchli, Director

Re: Approval to add Co-op designation to Arts parchment

CC:

Request to Curriculum Committee:

The Arts Co-operative Education program would like to have “Co-operative Education Program” added as a designation on line 3 of the parchment of graduates from the Arts Co-operative Education Program at UBC-V. This addition to parchments of Arts Co-operative Education Program graduates will make the Arts parchment consistent with those of co-op graduates from the other co-op faculties at UBC-V: Applied Science, Forestry, Science, and Human Kinetics. We request that the Arts Curriculum Committee support this request and forward it to Chris Eaton, Academic Governance Officer, in Enrolment Services, for approval and implementation in advance of the November 2010 convocation if possible.

Background and Rationale:

Chris Eaton has confirmed that currently the parchment for the B.A. degree uses only two lines (of the three lines available) to describe the degree (line 1) and denote an Honours program where appropriate (line 2). There is currently nothing indicated on line 3.

Students in Arts have expressed, through the Arts Co-op Students' Association, their desire to see completion of requirements for the Arts Co-op Program recognized on their parchments. The Arts Co-operative Education Program was approved by Senate in 1999; it is open to students in the Bachelor of Arts, Bachelor of Fine Arts, and Bachelor of Music undergraduate programs. Students complete a minimum of 3 and up to 6 co-operative education work terms each of which is 4 months in length—along with pre-employment training prior to their first work term—to fulfill the requirements for the co-op program. Thus, co-op graduates add between 12 and 24 months to their degree programs.

Each co-op work term is indicated on their transcripts as an Arts Studies course (ASTU 310, 311, 410, 411, 412, 413). Approximately 50-80 Arts co-op students graduate each year; this number will increase as the program is in a growth phase.



In the past 3 years, most other UBC-V faculties with co-op programs have changed their parchments to add “Co-operative Education Program.” Over 1500 students participate in Applied Science co-op terms each year, and approximately 1200 students participate in Science co-op programs. Further, when the Senate approved the newest UBC-V co-op program in Human Kinetics in 2009, the approval included recognition of co-op completion on the parchment as part of the overall program approval. Arts students are keen to have their commitment to the most substantive experiential learning program in the Faculty of Arts similarly recognized, bringing their parchments in line with those of other co-op faculties.

Additional Documentation:

Included with this request is an email from Rella Ng, Manager, Registration Services, confirming that there is room on the Arts parchment for this addition. I can provide documentation the other faculties put forward to Senate if you require it.

Further Information:

Please feel free to contact me if you require any further information or have questions. I can be reached at 7.5194 or julie.walchli@ubc.ca.

We appreciate the Curriculum Committee’s timely attention to this request.



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3 December 2010

To: Senate

From: Senate Curriculum Committee

Re: **GRADUATE CURRICULUM PROPOSALS FROM THE FACULTY OF APPLIED
SCIENCE**

Attached please find the submitted Category 1 graduate curriculum proposals from the Faculty of Applied Science for your consideration.

New courses:

CEEN 580 (1-6) C

CEEN 590 (1-6) D



THE UNIVERSITY OF BRITISH COLUMBIA
FACULTY OF APPLIED SCIENCE (Engineering)

Vancouver Senate 15 Dec 2010
Item 8 p.18

Category: (1)

Faculty: Applied Science Department: CERC Faculty Approval Date: March 11, 2010 Effective Session 2010 Winter (Term 1) Year for Change: 2010	Date: January 7, 2010 Contact Person: Deb Feduik Phone: 604-822-8386 Email: deb.feduik@ubc.ca
Proposed Calendar Entry: CEEN 580 (1-6) c Directed Studies in Clean Energy Engineering Work not related to project or thesis.	URL: http://www.students.ubc.ca/calendar/courses.cfm?code=CEEN Present Calendar Entry: None Action: New course Rationale: CEEN 580 will be used as a variable credit course for directed studies on topics in support of student projects, or to examine special topics of interest for a small group of students. Document ID#: G 11mar10 - 3
Proposed Calendar Entry: CEEN 590 (1-6) d Topics in Clean Energy Engineering	URL: http://www.students.ubc.ca/calendar/courses.cfm?code=CEEN Present Calendar Entry: None Action: New course Rationale: CEEN 590 will be used as a variable credit course for pilot courses on new or emerging topics, or to develop new courses on topics of growing importance as CEEN's educational objectives evolve. Document ID#: G 11mar10 - 3

THE UNIVERSITY OF BRITISH COLUMBIA



Vancouver Senate Curriculum Committee
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3 December 2010

To: Senate
From: Senate Curriculum Committee
RE: Faculty of Science

Attached please find proposals for new and changed courses and program changes from the Faculty of Science for your consideration.

New and Changed Courses

CHEM 213 (3)
CHEM 245 (1)
CHEM 304 (3)
CHEM 305 (3)
CHEM 307 (3)
CHEM 309 (3)
CHEM 310 (3)
CHEM 311 (3)
CHEM 445 (3)
MATH 264 (1)
MATH 358 (3)
MATH 360 (3)
MICB 424 (3)
PHYS 333 (3)
ENPH 253 (3)
ENPH 257 (2)
ENPH 259 (2)
ENPH 270 (2)
ENPH 352 (2)

New Subject Code

ENPH – Engineering Physics

New and Changed Programs and Specializations

Bachelor of Science > Biology > Combined Honours
Bachelor of Science > Chemistry > Combined Honours > Chemical Biology
Bachelor of Science > Earth and Ocean Sciences > Combined Major > Oceanography
and Biology
Bachelor of Science > Earth and Ocean Sciences > Combined Major > Oceanography
and Physics
Bachelor of Science > Earth and Ocean Sciences > Minor > Oceanography

Contact: Dr. Bill Ramey Phone: 822-3300		Faculty Approval Date: November 2, 2010 Email: wramey@interchange.ubc.ca	
CHEMISTRY			
Effective Date for Change: 11W Proposed Calendar Entry: CHEM 213 (3) Organic Chemistry Spectroscopy of organic compounds. Mechanistic analysis of chemical reactivity of common functional groups with a focus on carbon-carbon bond formation; functional group interconversion. Preference will be given to students in Chemistry or Biochemistry specializations. [3-0-0] Prerequisite: CHEM 203 or a score of 76% or higher in CHEM 233.		Present Calendar Entry: Type of Action: Add new course Rationale: The lecture and laboratory components of CHEM 204 are being separated to form a standalone laboratory course, CHEM 245, and a standalone lecture course, CHEM 213. This separation increases flexibility by allowing the Department to offer organic chemistry in a lecture setting without incurring a concomitant increase in laboratory enrolment (labs have stringent resource needs that limit enrolment). Allowing the prerequisite of CHEM 233 provides an additional path by which students can enter Chemistry or Biochemistry specializations (currently CHEM 233 is a terminal course for these specializations). It also opens the possibility for non-Chemistry students, such as those in Combined Major in Science, to access the organic chemistry stream through to upper year courses. The course number is consistent with the numeric identifier used for other organic courses (CHEM 203, 233, 313, 330, etc.). CHEM 204 will be delisted when appropriate. Supporting Documents: SCI-10-1-CHEM 213	

<p>Effective Date for Change: 11W</p> <p>Proposed Calendar Entry:</p> <p>CHEM 245 (1) Intermediate Organic Chemistry Laboratory</p> <p>Techniques in organic chemistry. Open only to students in Chemistry or Biochemistry specializations. [0-3-0]</p> <p>Prerequisite: CHEM 203 or all of CHEM 233, CHEM 235.</p> <p>Corequisite: CHEM 213</p>	<p>Present Calendar Entry:</p> <p>Type of Action: Add new course</p> <p>Rationale: The lecture and laboratory components of CHEM 204 are being separated to form a standalone laboratory course, CHEM 245, and a standalone lecture course, CHEM 213. This separation increases flexibility by allowing the Department to offer organic chemistry in a lecture setting without incurring a concomitant increase in laboratory enrolment (labs have stringent resource needs that limit enrolment). Adding the prerequisite of CHEM 233 and 235 provides an additional path by which students can enter Chemistry and Biochemistry specializations (currently CHEM 233 and 235 are terminal courses for these specializations).</p> <p>Supporting Documents: SCI-10-1-CHEM 425</p>
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<p>Effective Date for Change: 11W</p> <p>Proposed Calendar Entry:</p> <p>CHEM 304 (3) Fundamentals of Physical Chemistry</p> <p>Review of thermodynamics concepts; introduction to statistical mechanics; solution thermodynamics; phase equilibria; electrochemistry. [3-0-0]</p> <p>Prerequisites: CHEM 201 and one of MATH 200, MATH 217, MATH 226, MATH 253, MATH 263.</p>	<p>Present Calendar Entry:</p> <p>CHEM 304 (3) Fundamentals of Physical Chemistry</p> <p>Review of thermodynamics concepts; introduction to statistical mechanics; solution thermodynamics; phase equilibria; electrochemistry. [2-4*-1]</p> <p>Prerequisites: CHEM 201 and one of MATH 200, MATH 217, MATH 226, MATH 253, MATH 263.</p> <p>Type of Action: Change contact vector. Rationale: The laboratory component of this course is being removed to allow for introduction of integrated third-year laboratory courses. The course number is being preserved because this course has a long history and is widely referenced by number even by colleagues from other universities in Canada. Careful adjudication for the next few years will ensure the old and new versions of the course are distinguished appropriately. The tutorial is being removed and the contact vector changed to [3-0-0] to allow for more in-depth coverage of the course content.</p> <p>Supporting Documents: SCI-10-1-CHEM 304</p>
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<p>Effective Date for Change: 11W Proposed Calendar Entry:</p> <p>CHEM 305 (3) BIOPHYSICAL CHEMISTRY</p> <p>Diffusion and transport phenomena; interaction of radiation and matter. Methods for determining molecular weight, size and shape of molecules in solution. [3-0-0]</p> <p>Prerequisite: One of MATH 200, MATH 217, MATH 226, MATH 253, MATH 263 and either (a) CHEM 201 or (b) a score of 76% or higher in CHEM 205.</p>	<p>Present Calendar Entry:</p> <p>CHEM 305 (3) BIOPHYSICAL CHEMISTRY</p> <p>Diffusion and transport phenomena; interaction of radiation and matter. Methods for determining molecular weight, size and shape of molecules in solution. [2-4*-11]</p> <p>Prerequisite: CHEM 304 and one of MATH 200, MATH 217, MATH 226, MATH 253, MATH 263.</p> <p>Type of Action: Rearrange and broaden prerequisites. Change contact vector. Rationale: The laboratory component of this course is being removed to allow for introduction of integrated third-year laboratory courses. The course number is being preserved because this course has a long history and is referenced by number even by colleagues from other universities in Canada. The prerequisites have been changed to allow access for students with sufficient standing in CHEM 205. This opens a path for non-Chemistry students, especially those in the Combined Major in Science specialization. The tutorial is being removed and the contact vector changed to [3-0-0] to allow for more in-depth coverage of the course content. CHEM 304 was previously a prerequisite based partially on the need for laboratory continuity between the two courses. With the separation of the laboratory from CHEM 304 and CHEM 305, this constraint is no longer in effect and CHEM 305 may thus be entered directly with appropriate calculus and second-year physical chemistry backgrounds.</p> <p>Supporting Documents: SCI-10-1-CHEM 305</p>
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<p>Effective Date for Change: 11W</p> <p>Proposed Calendar Entry:</p> <p>CHEM 307 (3) Surface Chemistry and Surface Analysis</p> <p>Introduction to surfaces and phenomena occurring at surfaces and interfaces: adsorption, thermodynamic treatments, technological applications. Methods for characterization and modification of surfaces. Dynamic electrochemistry and its application to understanding fuel cells. [3-0-0]</p> <p>Prerequisite: CHEM 304 and one of MATH 200, MATH 217, MATH 226, MATH 253, MATH 263.</p>	<p>Present Calendar Entry:</p> <p>CHEM 307 (3) Introduction to Surface Chemistry and Surface Analysis</p> <p>Phenomena at surfaces and interfaces: adsorption, thermodynamic treatments, technological applications. Methods for characterization and modification of surfaces. Electrochemistry and fuel cells. [2-4*-1]</p> <p>Prerequisite: CHEM 304 and one of MATH 200, MATH 217, MATH 226, MATH 253, MATH 263.</p> <p>Type of Action: Change contact vector, and update course description.</p> <p>Rationale: The laboratory component is being removed to introduce integrated third-year laboratory courses. The course number is being preserved because it has a long history and is widely referenced, even by colleagues from other Canadian universities. The course description is being updated to better reflect the course content. The tutorial is being removed and the contact vector changed to [3-0-0] to allow for more in-depth coverage of the course content.</p> <p>Supporting Documents: SCI-10-1-CHEM 307</p>
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<p>Effective Date for Change: 11W</p> <p>Proposed Calendar Entry:</p> <p>CHEM 309 (3) s- and p-Block Elements: Chemistry and Applications</p> <p>Synthesis, structures, bonding and characterization of compounds of the s- and p-block elements. Industrial uses discussed include: hydrogen-based fuels, materials and high performance polymers. [3-0-0]</p> <p>Prerequisite: CHEM 202.</p>	<p>Present Calendar Entry:</p> <p>CHEM 309 (3) Foundations of Inorganic Chemistry</p> <p>Molecular structure and bonding in compounds of main-group and transition elements. Solid state chemistry. Acid-base chemistry; inorganic chemistry in non-aqueous media. [2-4*-1]</p> <p>Prerequisite: CHEM 202.</p> <p>Type of Action: Change course title, description, and contact vector.</p> <p>Rationale: The laboratory component of this course is being removed to allow for introduction of integrated third-year laboratory courses. The course number is being preserved because this course has a long history and is widely referenced by number even by colleagues from other universities. The title and description are being modified to better reflect the content in the course which concerns mainly s- and p-block chemistry. The tutorial is being removed and the contact vector changed to [3-0-0] to allow for more in-depth coverage of the course content.</p> <p>The course description is being updated to reflect current teaching practice, i.e. discussion of the chemistry of s- and p-block elements in this course and the chemistry of d- and f-block elements in the continuation of this course (CHEM 310).</p> <p>Supporting Documents: SCI-10-1-CHEM 309</p>
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<p>Effective Date for Change: 11W Proposed Calendar Entry:</p> <p>CHEM 310 (3) d- and f-Block Elements: Chemistry and Applications</p> <p>Representative chemistry of d- and f-block elements interpreted in terms of structure, mechanisms and theoretical principles. Applications discussed include: organometallic catalysis, bioinorganic chemistry and materials. [3-0-0]</p> <p>Prerequisite: CHEM 309.</p>	<p>Present Calendar Entry:</p> <p>CHEM 310 (3) Chemistry of the Elements</p> <p>Representative chemistry of s-, p-, d-, and f- block elements interpreted in terms of structure, mechanisms, and theoretical principles. [2-4*-1]</p> <p>Prerequisite: CHEM 309.</p> <p>Type of Action: Change course title, description, and contact vector. Rationale: The laboratory component of this course is being removed to allow for introduction of integrated third-year laboratory courses. The course number is being preserved because this course has a long history and is widely referenced by number even by colleagues from other universities. Careful adjudication for the next few years will ensure the old and new versions of the course are distinguished appropriately. The title and description are being modified to better reflect the content in the course which concerns mainly of d- and f- block chemistry. The tutorial is being removed and the contact vector changed to [3-0-0] to allow for more in-depth coverage of the course content. The course description is being updated to reflect current teaching practice, i.e. discussion of the chemistry of d- and f- block elements in this course and the chemistry of s- and p-block elements in the prerequisite of this course (CHEM 309).</p> <p>Supporting Documents: SCI-10-1-CHEM 310</p>
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<p>Effective Date for Change: 11W</p> <p>Proposed Calendar Entry:</p> <p>CHEM 311 (3) Instrumental Analytical Chemistry</p> <p>Theory, design and application of instrumental methods of chemical analysis including spectroscopy, mass spectrometry, electrochemical detection methods and chromatography. [3-0-0]</p> <p>Prerequisite: CHEM 211</p>	<p>Present Calendar Entry:</p> <p>CHEM 311 (4) Instrumental Analytical Chemistry</p> <p>Instrumental methods of chemical analysis including spectroscopic methods, mass spectrometry, radiochemical methods, surface analysis, chromatography. [2-4-1]</p> <p>Prerequisite: CHEM 211.</p> <p>Type of Action: Change contact vector, credit value, and update course description.</p> <p>Rationale: The laboratory component of this course is being removed to allow for introduction of integrated third year laboratory courses. The course number is being preserved because this course has a long history and is widely referenced by number even by colleagues from other universities in Canada. Careful adjudication will ensure the old and new versions of the course are distinguished appropriately. The course description is being updated to better reflect the course content. The tutorial is being removed and the contact vector changed to [3-0-0] to allow for more in-depth coverage of the course content.</p> <p>Supporting Documents: SCI-10-1-CHEM 311</p>
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<p>Effective Date for Change: 11W</p> <p>Proposed Calendar Entry:</p> <p>CHEM 445 (3) Projects in Experimental Chemistry</p> <p>Principles of experimental design, practice and problem-solving in chemistry, including the opportunity to pursue projects in a research setting. [0-8-0]</p> <p>Prerequisite: CHEM 345.</p>	<p>Present Calendar Entry:</p> <p>Type of Action: Add new course</p> <p>Rationale: This new laboratory course will replace CHEM 415 and 425 as the required fourth- year offering for Major students. This course will build upon laboratory techniques developed in lower years by focusing on the design of experiments to solve specific problems in Chemistry. Students will be required to perform literature searches and design experimental procedures necessary for completing their projects. Most of this preparatory work will be done outside the scheduled laboratory periods (which will be used for wet lab experiments) hence the allocation of three credits for this course to reflect this additional time commitment. The course includes the option to pursue experimental projects in research laboratories and gain experience in a research setting. CHEM 415 and 425 will be delisted when appropriate.</p> <p>Supporting Documents: SCI-10-1-CHEM 445</p>
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MATHEMATICS	
<p>Effective Date For Change: 11W Proposed Calendar Entry:</p> <p>MATH 264 (1) VECTOR CALCULUS FOR ELECTRICAL ENGINEERING</p> <p>Divergence, gradient, curl, theorems of Gauss and Stokes. Applications to Electrostatics and Magnetostatics. MATH 264 content is closely coupled to the exercises in EECE 261 so both courses must be taken concurrently.</p> <p>Prerequisite: MATH 253.</p> <p>Co requisite: EECE 261.</p>	<p>Present Calendar Entry:</p> <p>Action: New Course. Rationale: This course provides the mathematical background for electrostatics and magnetostatics. As presented, it will be tightly coupled to EECE 261, in a complementary fashion. Applications will be taken from electrostatics and magnetostatics, in consultation with the EECE instructor for EECE261. Such integration is beneficial to the students and represents an excellent example of interdisciplinary teaching between two faculties and two departments.</p> <p>X Not available for Cr/D/F grading. (Check the box if the course is NOT eligible for Cr/D/F grading. Note: Not applicable to graduate-level courses.)</p> <p>The course is not available for Cr/D/F grading as it is a core course in EECE and is used in computation of averages for scholarships and awards and general standing in the Department of EECE.</p> <p>Supporting Documents: SCI-10-1-MATH 264</p>

<p>Effective Date For Change: 11W Proposed Calendar Entry:</p> <p>MATH 358 (3) ENGINEERING ANALYSIS</p> <p>Fourier series; auto- and cross-correlation; power spectra; discrete Fourier transform; boundary-value problems; numerical methods; partial differential equations; heat, wave, Laplace, Poisson, and wave equations. Applications to mechanical engineering and practical computing applications emphasized. Credit may be given for only one of MECH 358 and MATH 358. [3-2*-0]</p> <p>Prerequisite: All of MECH 224, MECH 225. Equivalency: MECH 358.</p>	<p>Present Calendar Entry:</p> <p>Type of Action: New Course Rationale: A review within the Mechanical Engineering Department at UBC has found students suffer in senior Mechanical Engineering courses as a result of not being previously introduced to advanced topics in mathematics. A recent survey comparing curricula from Mechanical Engineering at UBC to other Canadian departments of Mechanical Engineering has shown that UBC covers the same basic math courses (generally taken in first and second year), but lacks an advanced math course (generally taken in the third or fourth year). This course is intended primarily for Mechanical Engineering students, with some limited access also for students outside of Mechanical Engineering who need a partial differential equations course. The course will be co-listed as MECH 358, according to an agreement between MATH and MECH, with teaching support provided by both MATH and MECH.</p> <p>Supporting Documents: SCI-10-1-MATH 358</p>
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<p>Effective Date for Change: 11W Proposed Calendar Entry:</p> <p>MATH 360 (3) Mathematical Modeling in Science</p> <p>Principles of model selection and basic modeling techniques in biology, earth science, chemistry and physics. Optimization, dynamical systems and stochastic processes. [3-0-0]</p> <p>Prerequisite: MATH 101 or equivalent</p>	<p>Present Calendar Entry:</p> <p>Action: Create course. Rationale: The proposed MATH 360 is a new course that reflects the need for an applied course on quantitative methods in the Combined Major in Science Program. It will provide students with an overview of the role of mathematics in deepening our understanding of natural phenomena through models and analysis. The main emphasis will be on models in the Life Sciences, because one of the intended target audiences are students in the Combined Major in Science Program, many of whom have a large Life Sciences component in their curriculum. It is expected that a substantial proportion of all 3rd and 4th year Combined Major in Science students will take this course as part of their three-discipline curriculum. In particular, the course may be useful to satisfy the “Generalist Requirement” of the Combined Major in Science program. The course could also be valuable for Mathematics Majors with an applied interest, for whom it could serve as a preparation for the more advanced courses MATH 361, MATH 441 and MATH 445. Finally, the course will likely also be of interest to students in the Integrated Sciences Program.</p> <p>Supporting Documents: SCI-10-1-MATH 360</p>
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MICROBIOLOGY & IMMUNOLOGY	
<p>Effective Date for Change: 11S</p> <p>Proposed Calendar Entry:</p> <p>MICB 424 (3) Cellular Dynamics of Pathogenic and Environmental Bacteria</p> <p>Regulatory and signalling networks in bacterial cells with emphasis on how cellular and environmental cues are detected and integrated during different growth or life history stages of important pathogenic and environmental bacteria. [3-0-0]</p> <p>Prerequisite: MICB 301 or all of MICB 201 and MICB 325.</p>	<p>Present Calendar Entry:</p> <p>Type of Action: Create new course</p> <p>Rationale: Education in microbial physiology is an essential part of the degree program in Microbiology and Immunology. It is a fundamental background for understanding modern issues in microbial disease and environmental remediation. For a number of years this area was offered as the required MICB 324. As part of a reorganization of the MBIM specializations we combined basic microbial physiology concepts with the former microbial diversity course MICB 300 to form the current MICB 301. The remaining advanced concepts and methods for microbial physiology analysis were transferred to and augmented to form the new course MICB 424. This course is aimed at the students who want to specialize in this area in their 4th year.</p> <p>Supporting Documents: SCI-10-1-MICB 424</p>

PHYSICS & ASTRONOMY	
<p>Effective Session: 10W</p> <p>Proposed Calendar Entry:</p> <p>PHYS 333 (3) Energy and Climate</p> <p>The fundamental physics behind global issues of energy use and climate change.</p> <p>Not to be used to satisfy an upper level specialization requirement in any Physics & Astronomy major or honours specialization.</p> <p>[3-0-0]</p> <p>Prerequisite: Either (a) one of MATH 101, MATH 103, MATH 105, MATH 121 and one of PHYS102, PHYS 108, PHYS 153; or (b) SCIE 001.</p>	<p>Present Calendar Entry:</p> <p>Action: Add new course.</p> <p>Rationale: We do not currently have an “energy course” that deals with the larger implications of the basic physics. Such courses are popular in many other universities. As we already have a classical thermodynamics course (PHYS 203) we need a separate course for non-physicists that concentrates on the consequences of the physics rather than the concepts only. PHYS 333 will be a course in energy and climate physics for general science students and majors in sciences other than physics.</p> <p>Supporting Documents: SCI-10-1-PHYS 333</p>

<p>Effective Session: 11W Proposed Calendar Entry:</p> <p>ENPH – Engineering Physics Faculty of Science</p>	<p>Present Calendar Entry:</p> <p>Type of Action: Create new course code ENPH Rationale: The Engineering Physics specialization includes courses from many different departments, including PHYS. However, within Physics department there are several courses that are taken exclusively by Engineering Physics students. The Board of Study has recommended that all such courses be re-coded to ENPH to reflect the specialization's individual status, provide better visibility to ENPH course contents in student's transcripts and to address registration issues.</p> <p>Supporting Documents: SCI-10-1-ENPH</p>
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<p>Effective Session: 11W Proposed Calendar Entry:</p> <p>ENPH 253 (3) Introduction to Instrument Design</p> <p>Practical laboratory exposure to instrument bread-boarding including simple mechanical and electrical design, and communications with sensors, actuators. Micro-controller implementation and design. [1-6-0]</p> <p>Prerequisite: One of ENPH 259, PHYS 259, PHYS 209</p>	<p>Present Calendar Entry:</p> <p>PHYS 253 (3) Introduction to Instrument Design</p> <p>Practical laboratory exposure to instrument bread-boarding including simple mechanical and electrical design, and communications with sensors, actuators. Micro-controller implementation and design. [1-6-0]</p> <p>Prerequisite: One of PHYS 259, PHYS 209.</p> <p>Action: Change subject codes. Rationale: The Engineering Physics specialization includes courses from many different departments, including PHYS. However, within Physics department there are several courses that are taken exclusively by Engineering Physics students. The Board of Study has recommended that all such courses be re-coded to ENPH to reflect the specialization's individual status, provide better visibility to ENPH course contents in student's transcripts and to address registration issues. There are no library or budget issues because it is the same specialization.</p>
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<p>Effective Session: 11W Proposed Calendar Entry:</p> <p>ENPH 257 (2) Heat and Thermodynamics</p> <p>Thermometry, thermal properties of matter; heat transfer by conduction; convection and radiation; kinetic theory of gases and gas laws; heat engines; refrigeration; change of state; first and second laws of thermodynamics. [1-3-1]</p> <p>Prerequisite: Either (a) SCIE 001 or (b) one of MATH 200, MATH 217, MATH 226, MATH 255, MATH 263 and either (a) all of PHYS 108, PHYS 109 or (b) one of PHYS 102, PHYS 153.</p>	<p>Present Calendar Entry:</p> <p>PHYS 257 (2) Heat and Thermodynamics</p> <p>Thermometry, thermal properties of matter; heat transfer by conduction; convection and radiation; kinetic theory of gases and gas laws; heat engines; refrigeration; change of state; first and second laws of thermodynamics. [1-3-1]</p> <p>Prerequisite: Either (a) SCIE 001 or (b) one of MATH 200, MATH 217, MATH 226, MATH 255, MATH 263 and either (a) all of PHYS 108, PHYS 109 or (b) one of PHYS 102, PHYS 153.</p> <p>Action: Change subject code. Rationale: The Engineering Physics specialization includes courses from many different departments, including PHYS. However, within Physics department there are several courses that are taken exclusively by Engineering Physics students. The Board of Study has recommended that all such courses be re-coded to ENPH to reflect the specialization's individual status, provide better visibility to ENPH course contents in student's transcripts and to address registration issues. There are no library or budget issues because it is the same specialization.</p>
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<p>Effective Session: 11W Proposed Calendar Entry:</p> <p>ENPH 259 (2) Experimental Techniques</p> <p>Basic experimental techniques in acquisition, analysis and presentation of data. [1-3-0]</p> <p>Prerequisite: Either (a) all of PHYS 108, PHYS 109 or (b) one of PHYS 102, PHYS 153 or (c) SCIE 001.</p>	<p>Present Calendar Entry:</p> <p>PHYS 259 (2) Experimental Techniques</p> <p>Basic experimental techniques in acquisition, analysis and presentation of data. [1-3-0]</p> <p>Prerequisite: Either (a) all of PHYS 108, PHYS 109 or (b) one of PHYS 102, PHYS 153 or (c) SCIE 001.</p> <p>Action: Change subject code. Rationale: The Engineering Physics specialization includes courses from many different departments, including PHYS. However, within Physics department there are several courses that are taken exclusively by Engineering Physics students. The Board of Study has recommended that all such courses be re-coded to ENPH to reflect the specialization's individual status, provide better visibility to ENPH course contents in student's transcripts and to address registration issues. There are no library or budget issues because it is the same specialization.</p>
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<p>Effective Session: 11W Proposed Calendar Entry:</p> <p>ENPH 270 (2) Mechanics II Dynamics: systems of particles, kinematics and kinetics of rigid bodies (plane motion), energy and momentum, rotating coordinates. [2-0-1]</p> <p>Prerequisite: PHYS 170.</p>	<p>Present Calendar Entry:</p> <p>PHYS 270 (2) Mechanics II Dynamics: systems of particles, kinematics and kinetics of rigid bodies (plane motion), energy and momentum, rotating coordinates. [2-0-1]</p> <p>Prerequisite: PHYS 170.</p> <p>Action: Change subject codes. Rationale: The Engineering Physics specialization includes courses from many different departments, including PHYS. However, within Physics department there are several courses that are taken exclusively by Engineering Physics students. The Board of Study has recommended that all such courses be re-coded to ENPH to reflect the specialization's individual status, provide better visibility to ENPH course contents in student's transcripts and to address registration issues. There are no library or budget issues because it is the same specialization.</p>
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<p>Effective Session: 11W Proposed Calendar Entry:</p> <p>ENPH 352 (2) Laboratory Techniques in Physics</p> <p>Some of the experiments will be based on the lecture material for PHYS 301. Other techniques and subjects will also be covered. [0-3-0]</p> <p>Corequisite: PHYS 301.</p>	<p>Present Calendar Entry:</p> <p>PHYS 352 (2) Laboratory Techniques in Physics</p> <p>Some of the experiments will be based on the lecture material for PHYS 354. Other techniques and subjects will also be covered. [0-3-0]</p> <p>Corequisite: PHYS 354.</p> <p>Action: Change subject code. Update the prerequisite. Change PHYS 354 to PHYS 301 in the course description and corequisite list.</p> <p>Rationale: The Engineering Physics specialization includes courses from many different departments, including PHYS. However, within Physics department there are several courses that are taken exclusively by Engineering Physics students. The Board of Study has recommended that all such courses be re-coded to ENPH to reflect the specialization's individual status, provide better visibility to ENPH course contents in student's transcripts and to address registration issues.</p> <p>PHYS 354 has been renumbered as another section of PHYS 301. PHYS 354 is no longer offered.</p> <p>There are no library or budget issues because it is the same specialization.</p>
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Contact: Dr. Bill Ramey
Phone: 822-3300

Faculty Approval Date: November 2, 2010
Email: wramey@interchange.ubc.ca

BIOLOGY

Effective Date for Change: 11W

Proposed Calendar Entry:

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Combined Honours

Combined Honours (0057): Chemical Biology,
see [link-to Chemistry section].

<http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,215,410,418>

Present Calendar Entry:

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Combined Honours

~~Combined Honours (0057): Biology and Chemistry (BIOL, CHEM)~~

~~First Year~~

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~~⁸ To be chosen from 400-level CHEM lecture courses.~~

Type of Action: Move the description of the Combined Honours (0057): Biology and Chemistry specialization to the Chemistry section of the calendar. Put a pointer in place of the description in the Biology section. Revise the title of the specialization.

Rationale: The listing for the Combined Honours (0057): Biology and Chemistry (BIOL, CHEM) specialization is being moved from the Biology to the Chemistry section of the calendar to change the visibility of the specialization. There are no library or budget issues because the specialization has not changed.

CHEMISTRY

Effective Date for Change: 11W

Proposed Calendar Entry:

Combined Honours (0057): **Chemical** Biology
(BIOL, CHEM)

First Year

Communication Requirement¹ 6

BIOL 112 3

BIOL 121 3

BIOL 140 2

CHEM 121, 123 (111, 113) 8

MATH 100 or 102 or 104² 3

MATH 101 or 103 or 105³ 3

PHYS 101⁴ 3

Electives⁵ 3

Total Credits **34**

Second Year

BIOL 200 3

BIOL 201 3

BIOL 234 3

CHEM 201 3

CHEM 202 3

CHEM 203⁶ 4

CHEM 211 4

CHEM 213, 245 4

MATH 200 3

PHYS 102⁴ 3

Total Credits **33**

Third Year

<http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,215,410,420>

Present Calendar Entry:

The current entry is in the Biology section of the calendar. To clarify editorial changes, the current description of the Combined Honours (0057): Biology and Chemistry specialization from the Biology section of the calendar has been included below.

The revised entry will be placed in the Chemistry section of the calendar. The previous entry in the Biology section will be deleted and a "POINTER" inserted.

Combined Honours (0057): Biology ~~and~~
~~Chemistry~~ (BIOL, CHEM)

First Year

~~ENGL 100-level~~¹ 6

~~BIOL 111~~² ~~0-3~~

BIOL 112 3

BIOL 121 3

BIOL 140 2

CHEM 121, 123 (111,113) 8

MATH 100 or 102 or 104 ~~(or 180~~

~~or 184 or 120)~~⁺ 3 ~~(4)~~

MATH 101 or 103 or 105 ~~(or 121)~~ 3 ~~(4)~~

~~PHYS 100 or 200-level~~ 3

Elective^{2,3} 3 ~~0~~

Total Credits ~~35~~

Second Year

~~BIOL 200, 201~~ 6

~~BIOL 240~~⁴ ~~(0)1~~

~~CHEM 201, 202~~ 6

~~CHEM 203, 204~~ 8

CHEM 211 4

MATH 200 3

~~PHYS 100 or 200-level~~ 3

~~Arts Elective~~ 6

Total Credits ~~36~~

Third Year

BIOC 302 ⁷	3	BIOL 334, 335	6
BIOL 300 ⁸	3	All of BIOL 360, 361, 362 ⁵	7
CHEM 305	3	CHEM 305	3
CHEM 309	3	CHEM 312	3
CHEM 313	3	CHEM 313	4
CHEM 325	2		
CHEM 333	3	CHEM 333	3
Two of BIOL 337, 340, 341, 351, 352, 360, CHEM 345 ⁹	4-6		
BIOL Electives ¹⁰	3	BIOL Electives ⁶	3(4)
Electives ^{5, 11}	6-4	Arts Elective	6
Total Credits	33	Total Credits	38(39)
Fourth Year		Fourth Year	
		BIOC 303	6
		BIOL Electives ⁷	6
BIOL 449 or CHEM 449	6	BIOL or CHEM 449	6
BIOL and CHEM Electives ¹²	18	CHEM 309, 310	6
Electives ^{5, 11}	8	CHEM 311	4
Total Credits	32	CHEM Elective ⁸	3
		Total Credits	31
Total Credits for Degree	132	Minimum Credits for Degree	138
¹ A total of 6 credits of course work is required to meet the Communication Requirement. ENGL 112 is recommended. For a full list of acceptable courses see Communication Requirement. [Link-to Communication Requirement in Faculty of Science] SCIE 113 or SCIE 300 may be used to satisfy part of the Communication Requirement but not part of the Arts Requirement. [Link-to Science, Arts, and Breath Requirements in Faculty of Science]		¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. 3 credits of first year English may be deferred until second year. MATH 110 may substitute for any of the specified differential calculus courses listed by decreasing the electives by 3 credits.	
² MATH 180 or 184 or 120 may substitute for any of the specified differential calculus courses listed by decreasing the electives by 1 credit. MATH 110 may substitute for any of the specified differential calculus courses listed by decreasing the electives by 3 credits.		² Students must take BIOL 111 as an elective if they lack the prerequisites for either BIOL 112 or 121. BIOL 112 can be used as a prerequisite to BIOL 121 if students have Chemistry 12 and Biology 11 or 12. Students who do not need BIOL 111 are encouraged to take 3 credits of 100-level Arts or science courses or 200-level BIOL courses. BIOL 112, 121, and 140 are required of all students.	
³ MATH 121 may substitute for any of the specified integral calculus courses listed by decreasing the electives by 1 credit.		³ Chosen from 100-level Arts or science courses or 200-level BIOL courses.	
⁴ PHYS 107, 108, and 109 may substitute for		⁴ BIOL 240 is highly recommended but not	

<p>PHYS 101 and 102 by decreasing the electives by 1 credit. Students without Physics 12 must take PHYS 100 prior to PHYS 101 or 107.</p> <p>⁵ There are a number of elective credits in this specialization. Even though these electives are assigned in a specific manner over each of the four years of study, they may be redistributed, and thus any extra elective credit taken in first or second year can be applied to the later elective credit requirements. The year level of an elective does not need to correspond to the year level of the specialization. Note that students in honours specializations must complete a minimum of 30 credits in each Winter session. Students who do not have credit for Biology 11 or 12 must take 3 credits of 100-level BIOL (usually BIOL 111). Students with credit for Biology 11 or 12 must successfully complete 3 credits of an ASTR, BIOL, EOSC, or GEOB lecture course. At least 18 credits must be from the Faculty of Arts, which may include Arts credits used to satisfy the Faculty of Science Communication Requirement.</p> <p>⁶ Students with CHEM 235 and a score of 76% or higher in CHEM 233 may apply for admission to this specialization and will be allowed to use CHEM 233 and 235 in place of CHEM 203.</p> <p>⁷ BIOC 303 may substitute for BIOC 302 by decreasing the third-year unspecified electives by 3 credits.</p> <p>⁸ STAT 200 may replace BIOL 300.</p> <p>⁹ BIOL 326, 363, 404, 409, 437, and 444 may also be included in this list of courses.</p> <p>¹⁰ Chosen from 300- and 400-level BIOL lecture courses. Recommended BIOL electives include BIOL 335, 361, 435, 436, 463.</p> <p>¹¹ Recommended electives include BIOC 402, 410, BIOL 435 and MICB 405.</p> <p>¹² Chosen from 300- and 400-level BIOL and CHEM lecture courses. At least 6 credits must be chosen from 400-level BIOL lecture courses</p>	<p>required.</p> <p>⁵ Must be taken in third year. Students are not permitted to take more than one of BIOL 351, 360, and 363.</p> <p>⁶ Organismal: 3 or 4 credits from: BIOL 204, 205, 209, 210, MICB 202, BIOL 317-324, and 332.</p> <p>⁷ Biology courses pertaining to organisms suggested.</p> <p>⁸ To be chosen from 400-level CHEM lecture courses.</p> <p>Type of Action: Move the description of the Combined Honours (0057): Biology and Chemistry specialization from the Biology section of the calendar and insert it immediately before the Combined Honours (0206): Chemistry and Mathematics specialization entry in the Chemistry section of the calendar. Change the title of the specialization and update the description, the credits and the footnotes. To clarify editorial changes, the current description of the Combined Honours (0057): Biology and Chemistry specialization from the Biology section of the</p>
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and at least 6 credits must be chosen from 400-level CHEM lecture courses. Recommended BIOL electives include BIOL 335, 361, 435, 436, 463. Recommended CHEM electives include CHEM 411, 413, 435.

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calendar has been included above.

Rationale: The listing for the Combined Honours (0057): Biology and Chemistry specialization is being moved from the Biology to the Chemistry section of the calendar. The enrolment in this specialization has dropped to low numbers in recent years and it is hoped the move of the description to Chemistry, along with a title change and description update, will reverse this trend. The specialization now incorporates the Faculty of Science Communication requirement. The specialization has been updated to increase flexibility and mesh with the new specializations in Biology. In particular, the present specialization focuses on a number of core courses, both in BIOL and CHEM, and contains ample selection credits for students to tailor their course selections from among the wide range of BIOL and CHEM courses available.

The name of the specialization was chosen after due consideration. It will help students to recognize the distinctions between biochemistry and this specialization. There are many Departments of Chemistry and Chemical Biology, whereas there are no Departments of Chemistry and Biological Chemistry (in fact a Google search for them actually returns Departments of Chemistry and Biochemistry). *Chemical Biology* is a journal published by the American Chemical Society and *The Journal of Chemical Biology* is published by Springer and on their website it states “Chemical biology was established initially as an interdisciplinary approach that employed chemical synthesis to address biological questions. However, this research area is now growing and evolving, quickly absorbing more and more aspects of physical sciences (experimental as well as theoretical tools and techniques) that can be used to elucidate research problems in the life sciences (biological and medical).” In contrast, the term “Biological Chemistry” is strongly associated with Biochemistry and a combined honours program emphasizing that area of research already exists. Alternatively, the term “Chemical Biology” is strongly associated with Chemistry and refers to research at the boundary between Chemistry and Biology. Thus, a combined program between Chemistry and Biology is quite naturally and

	<p>properly named “Chemical Biology” which we hope will be appealing to the students that we are trying to attract to this combined specialization. A slight reduction in the required biochemistry content is appropriate for this specialization. Footnote direction and recommended electives in the subject area allow additional biochemistry for students interested in further study in that field. A background in electricity and magnetism is important for all spectroscopic and related studies within the specialization. The majority of students in the specialization already take the needed physics courses. The inclusion of PHYS 102 (or PHYS 108) in the specialization ensures that all students will now have met this material. There are no library or budget issues because it is the same specialization.</p>
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EARTH & OCEAN SCIENCES

Effective Date for Change: 11W

Proposed Calendar Entry:

Majors Specializations

Combined Major (xxxx): Oceanography and Biology

First Year

Communication Requirement ¹	3
PHYS 101 or 107 ²	3
CHEM 121, 123 (or 111, 113)	8
EOSC 112 ³	3
BIOL 112, 121 ⁴	6
MATH 100 or 102 or 104 ⁵	3
MATH 101 or 103 or 105 ⁶	3
Electives ⁷	1
Total Credits	30

Second Year

Communication Requirement ¹	3
BIOL 200, 230, 234, 260 ⁸	12
One of BIOL 203, 204, 205, 209 or MICB 201 ⁹	3(4)
EOSC 211, 270	6
CHEM 233	3
Electives ^{9, 11}	3(2)
Total Credits	30

Third Year

BIOL 300, 336, 351	10
EOSC 372, 373	6
Two of BIOL 340, 341, 363	4
Electives ^{10, 11}	10
Total Credits	30

Fourth Year

BIOL 402	3
EOSC 470, 472	6
One of EOSC 475, 478	3
One of EOSC 448, 473	3
Electives ^{10, 11}	15
Total Credits	30
Total credits for degree	120

¹ A total of 6 credits of coursework is required to meet the Communication Requirement. ENGL 112 is recommended. For full list of

<http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,215,410,422>

Present Calendar Entry:

Action: Add new specialization after preamble but before "Honours Specializations".

Rationale: Oceanography has traditionally offered Combined Honours specializations to students interested in pursuing graduate degrees in oceanography. The Majors specialization in Earth and Ocean Sciences is available for students broadly interested in oceanography. However, between these two is missing a specialization for students wishing to seek employment as oceanographic or environmental technical scientists. Many of these students cannot qualify for honours degrees.

We have seen a sharp decrease in the number of oceanography students and this specialization will be attractive to a larger cross-section of students. Breadth has been included in the specialization as it includes both Life Science Courses (e.g. BIOL 336, 351, 402) and Earth Science Courses (e.g. EOSC 211, 372, 373).

Supporting Documents: SCI-10-1-Combined Major Oceanography and Biology

acceptable courses see Communication Requirement [link to: <http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,215,410,1463#18434>]

² Students without credit for Physics 12 will be required to take PHYS 100 prior to PHYS 101. PHYS 100 will count as an elective. Students requiring PHYS 100 or MATH 110 may delay PHYS 101/107 until second year. Qualified students are encouraged to take PHYS 107.

³ Students who enter the specialization after second year may substitute EOSC 340.

⁴ Students without credit for Chemistry 12 and at least one of BIOL 11 or Biology 12 will be required to take BIOL 111 prior to BIOL 112 and those without credit for at least one of BIOL 111 or Biology 12 will be required to take BIOL 112 prior to BIOL 121. BIOL 111 will count as an elective. Students requiring BIOL 111 can delay BIOL 112 until second year.

⁵ MATH 180 or 184 or 120 may substitute for any of the specified differential calculus courses listed by decreasing the electives by 1 credit. MATH 110 may substitute for any of the specified differential calculus courses listed by decreasing the electives by 3 credits.

⁶ MATH 121 may substitute for any of the specified integral calculus courses listed by decreasing the electives by 1 credit.

⁷ Recommended electives are EOSC 111 (1 credit) or BIOL 140 (2 credits).

⁸ Up to 3 credits of BIOL 200, 230, 234, and 260 may be deferred until third year to allow space for additional electives.

⁹ Students who take 4 credits of organismal diversity courses (BIOL 203, 204, 205, 209) should take 2 credits of electives. Students who take 3 credits of organismal diversity courses (MICB 201) should take 3 credits of electives. Surplus elective credit taken in first or second year can be applied to third or fourth year as elective credit.

¹⁰The computation requirement and breadth requirement of the Faculty of Science are satisfied by the combination of courses in the combined major. However, the electives must be selected to ensure that the following Faculty of Science requirements are met: a) at least 18 credits must be from the Faculty of Arts, including Arts credits used to satisfy the Faculty of Science Communication Requirement; b) at least 48 upper-level credits including specialization requirements.

¹¹Students interested in Fisheries Oceanography should consider ECON 101 (Arts credit) and LAW 356 as electives.

For details of specialization objectives and learning goals, see ____ (link to Faculty of Science website).

<p>Effective Date for Change: 11W</p> <p>Proposed Calendar Entry:</p> <p>Combined Major (xxxx): Oceanography and Physics</p> <p>First Year</p> <table> <tr> <td>Communication Requirement¹</td> <td>3</td> </tr> <tr> <td>PHYS 101, 102 or (107, 108, 109)²</td> <td>6(7)</td> </tr> <tr> <td>CHEM 121, 123 (or 111, 113)</td> <td>8</td> </tr> <tr> <td>EOSC 112³</td> <td>3</td> </tr> <tr> <td>MATH 100 or 102 or 104⁵</td> <td>3</td> </tr> <tr> <td>MATH 101 or 103 or 105⁶</td> <td>3</td> </tr> <tr> <td>Electives^{4,7,8}</td> <td>4(3)</td> </tr> <tr> <td>Total Credits</td> <td>30</td> </tr> </table> <p>Second Year</p> <table> <tr> <td>Communication Requirement¹</td> <td>3</td> </tr> <tr> <td>MATH 200, 215, 221</td> <td>9</td> </tr> <tr> <td>PHYS 200, 209, 216</td> <td>10</td> </tr> <tr> <td>EOSC 211</td> <td>3</td> </tr> <tr> <td>Electives^{8,9}</td> <td>5</td> </tr> <tr> <td>Total Credits</td> <td>30</td> </tr> </table> <p>Third Year</p> <table> <tr> <td>PHYS 312 or MATH 316</td> <td>3</td> </tr> <tr> <td>MATH 317</td> <td>3</td> </tr> <tr> <td>PHYS 203</td> <td>4</td> </tr> <tr> <td>PHYS 309 or PHYS 319</td> <td>3</td> </tr> <tr> <td>EOSC 372, 373</td> <td>6</td> </tr> <tr> <td>Electives^{8,9}</td> <td>8</td> </tr> </table> <p>Third or Fourth Year¹⁰</p> <table> <tr> <td>ATSC 409</td> <td>3</td> </tr> <tr> <td>EOSC 477</td> <td>3</td> </tr> </table> <p>Fourth Year</p> <table> <tr> <td>PHYS 301, 304, 314, 409</td> <td>12</td> </tr> <tr> <td>EOSC 354</td> <td>3</td> </tr> <tr> <td>EOSC 473 or EOSC 448</td> <td>3</td> </tr> <tr> <td>Electives^{8,9}</td> <td>9</td> </tr> <tr> <td>Total Credits for Third and Fourth Year</td> <td>60</td> </tr> </table> <p>Total Credits for Degree 120</p> <p>¹ A total of 6 credits of coursework is required to meet the Communication Requirement. ENGL 112 is recommended. For full list of</p>	Communication Requirement ¹	3	PHYS 101, 102 or (107, 108, 109) ²	6(7)	CHEM 121, 123 (or 111, 113)	8	EOSC 112 ³	3	MATH 100 or 102 or 104 ⁵	3	MATH 101 or 103 or 105 ⁶	3	Electives ^{4,7,8}	4(3)	Total Credits	30	Communication Requirement ¹	3	MATH 200, 215, 221	9	PHYS 200, 209, 216	10	EOSC 211	3	Electives ^{8,9}	5	Total Credits	30	PHYS 312 or MATH 316	3	MATH 317	3	PHYS 203	4	PHYS 309 or PHYS 319	3	EOSC 372, 373	6	Electives ^{8,9}	8	ATSC 409	3	EOSC 477	3	PHYS 301, 304, 314, 409	12	EOSC 354	3	EOSC 473 or EOSC 448	3	Electives ^{8,9}	9	Total Credits for Third and Fourth Year	60	<p>http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,215,410,422</p> <p>Present Calendar Entry:</p> <p>Action: Add new specialization following Combined Major Oceanography and Biology.</p> <p>Rationale: Oceanography has traditionally offered Combined Honours specializations to students interested in pursuing graduate degrees in oceanography. The Majors specialization in Earth and Ocean Sciences is available for students broadly interested in oceanography. However, between these two is missing a specialization for students wishing to seek employment as oceanographic or environmental technical scientists. Many of these students cannot qualify for honours degrees. We have seen a sharp decrease in the number of oceanography students and this specialization will be attractive to a larger cross-section of students.</p> <p>Supporting Documents: SCI-10-1-Combined Major Oceanography and Physics</p>
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² Students without credit for Physics 12 will be required to take PHYS 100 prior to PHYS 101. PHYS 100 will count as an elective. Qualified students are encouraged to take PHYS 107, 108, 109.

³ Students who enter the specialization after second year may substitute EOSC 340.

⁴ Students without Biology 11 or 12 must take 3 credits of 100-level BIOL.

⁵ MATH 180 or 184 or 120 may substitute for any of the specified differential calculus courses listed by decreasing the electives by 1 credit. MATH 110 may substitute for any of the specified differential calculus courses listed by decreasing the electives by 3 credits.

⁶ MATH 121 may substitute for any of the specified integral calculus courses listed by decreasing the electives by 1 credit.

⁷ A recommended one credit elective is EOSC 111. Students who take 6 credits of first year physics (PHYS 101, 102) should take 4 credits of electives. Students who take 7 credits of first year physics (PHYS 107, 108, 109) should take 3 credits of electives.

⁸ Surplus elective credit taken in first or second year can be applied to third or fourth year as elective credit.

⁹ The computation requirement and breadth requirement of the Faculty of Science are satisfied by the combination of courses in the combined major. However, the electives must be selected to ensure that the following Faculty of Science requirements are met: a) at least 18 credits must be from the Faculty of Arts, including Arts credits used to satisfy the Faculty of Science Communication Requirement; b) at least 48 upper-level credits including specialization requirements.

¹⁰These courses are offered every second winter session.

For details of specialization objectives and learning goals, see ____ (link to Faculty of Science website).

<p>Effective Date for Change: 11W</p> <p>Proposed Calendar Entry:</p> <p>Minor (xxxx): Oceanography (OCGY)</p> <p>The minor consists of 18 credits, including all of EOSC 340, 372, 373, and three of EOSC 470-489 including at least two of EOSC 470, 472 and 477. See Minor in Science [link to http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,215,410,410]</p>	<p>http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,215,410,422</p> <p>Present Calendar Entry:</p> <p>Action: Add new specialization after oceanography honours specializations.</p> <p>Rationale: Provide students with a clear list of courses to form an Oceanography minor.</p> <p>Supporting Documents: SCIE-10-1-Minor: Oceanography (OCGY)</p>
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