Notice of Meeting
Tuesday, February 12, 2019
at 3:00pm – 4:30pm
306 Lumbers

Agenda

1. Call to Order and Approval of Agenda
2. Chair’s Remarks
3. Approval of Minutes of December 11, 2018 meeting
4. Business Arising
5. Inquiries and Communications
   • Senate Synopsis: meeting of December 13, 2018
   • Senate Synopsis: meeting of January 24, 2019
6. Dean’s Report to Council
7. Associate Deans’ and Head of Bethune College Remarks
8. Reports from Science Representatives on Senate Committees
9. Reports from Standing Committees of Council
   9.1 Executive Committee
      9.1.1 Ratification of nomination: Standing Committee of Council
      9.1.2 Call for Expressions of Interest in Membership on Senate Committees and Other
          Positions Elected by Senate
   9.2 Curriculum Committee (consent agenda items)
10. Other Business
    • Update on the FSc Decanal Search
Minutes
Tuesday, December 11, 2018
at 3:00pm – 4:30pm
306 Lumbers


Guests: H. McLellan, B. Sheeller & M. Hough

1. Call to Order and Approval of Agenda
   The Chair of Council, P. Wilson called the meeting to order and the Agenda was adopted as presented.

2. Chair’s Remarks
   P. Wilson welcomed Council members and thanked them for their hardwork during the fall term. She went on to wish them all a pleasant holiday season.

3. Approval of Minutes of November 13, 2018 meeting
   The Minutes were approved.

4. Business Arising
   There were no Business Arising.

5. Inquiries and Communications
   Council noted the Senate Synopsis of November 22, 2018.
6. **Dean’s Report to Council**

Don Hastie presented the Dean’s report on behalf of EJ Janse van Rensburg, the interim Dean who was away.

Don Hastie reported that Paul Sanberg, Bryden winner and Science alumnus visited the Faculty on Nov. 19, 2018. He toured the YSciCore Analytical Facility led by Derek Wilson and the Psychology lab for Jennifer Steeves.

The annual BeeCon conference by the Faculties of Science and Environmental Studies was held on Nov. 23, 2018.

Don Hastie congratulated the following faculty members;

- Steven Connor (Biology) received a Canada Research Chair in Neurophysiology (Tier 2).
- George Zoidl (Biology) had his Canada Research Chair in Molecular and Cellular Neuroscience (Tier 1) renewed.

The Associate Dean reminded Council of the following;

- That applications for the third batch of York Science Fellowships was now online and the deadline was January 4, 2019.
- The deadline for the President’s Staff Recognition Awards was January 15, 2019.

He invited everyone to the Faculty of Science Holiday Reception to be held on December 19, 2018, at the Schulich Dining Hall.

Don Hastie announced and encouraged Council members to attend the Honours and Awards Evening to be held on January 16, 2019. He added that the keynote speaker was Samer Bishay, President and CEO of Iristel & Ice Wireless. Samer is a graduate of the Space & Communications program at York University, with an Honours Bachelor of Science Degree.

He concluded his report to Council by wishing everyone a merry holiday season.

7. **Associate Deans’ and Head of Bethune College Remarks**

John Amanatides invited Council members to the Bethune College end of year celebration on December 21st.

8. **Reports from Science Representatives on Senate Committees**

Associate Dean Don Hastie reminded faculty members on the AEF deadline of December 15th and the anomalies exercise deadline for the Dean’s Office, January 10th.

9. **Reports from Standing Committees of Council**

9.1 Executive Committee

Curriculum Committee (consent agenda items)
Council approved the Curriculum Committee items.

10. Other Business

10.1 FSc Decanal Search: Position profile

Council noted the feedback from Lyndon Martin, Chair, FSc Search Committee.

10.2 Regarding the Markham Campus, faculty members expressed concern on the wisdom of pursuing the Markham campus construction through fundraising when the campus’s current laboratories’ problems have not been solved.

Motion was moved, seconded and carried to adjourn the meeting.

Chair of Council, P. Wislon

S. Siyatshana, Assistant Secretary of Council
The Senate of York University
Synopsis

The 652nd Meeting of Senate
held on Thursday, December 13, 2018

Remarks

On behalf of Senate, the Chair, Professor Franck van Breugel, thanked Senior Assistant Secretary of the University Bob Everett, who is retiring from the Secretariat after 31 years of service, for his decades of shepherding Senate’s governance. The Chair highlighted Dr. Everett’s unwavering support for Chairs of Senate, Senate committees, Faculty Councils, and faculty and staff across all corners of the University.

Adding her thanks and appreciation, President Lenton highlighted that Dr. Everett is the embodiment of a great governance professional, which is manifested through his ability to bring together diverse points of view, his respect for collegial governance and his thoughtful advice. In recognition of Dr. Everett’s service, President Lenton announced that the Senate Chamber will be renamed the Dr. Robert Everett Senate Chamber, thereby embodying his presence for years to come.

Reflecting on the 2018 year, President Lenton acknowledged that it had been a challenging one and the holiday break provides a much-needed opportunity for members of the community to rest and recharge before resuming efforts to move York’s vision forward in the New Year.

Other comments made by President Lenton included the following:

- regarding the development of a pan-university internationalization strategy, the plans to distribute the call for expressions of interest to participate in the President’s Council on Internationalization and Global Engagement in the New Year
- regarding public policy matters, an update on the COU-led sector-wide advocacy with the provincial government, focused on relationship building with government and mitigating possible budget cuts to universities
- the status of the pan-university budget consultations, which have helped to bring about a stronger shared understanding of the budget and have provided the administration with an opportunity to receive input from the community on budget priorities
- the ongoing discussions with the provincial government, Metrolinx, York Regional Transit, and GO Transit regarding their decision to cease public transit bus service to the Keele Campus
- the recent announcement of the appointment of Professor Lorne Sossin, Osgoode, to the Ontario Superior Court of Justice
Synopsis

Approvals

Senate approved the recommendations of its Executive Committee to:

- approve the Statement of Policy on Free Speech, satisfying the provincial government’s requirement that every publicly-assisted college and university develop and implement a free speech policy by January 1, 2019
- appoint Professor David Mutimer, LA&PS, as Interim Vice-Chair of Senate from January 1 to June 30, 2019, for the duration of Vice-Chair Alison Macpherson’s six-month sabbatical

Committee Information Reports

Executive (Professor Alison Macpherson, Vice-Chair)

The Executive Committee’s information item was the following:

- with respect to the Committee’s monitoring of the academic disruption, an update on the status of course completions and grades submissions from the FW 2017-2018 session

Academic Policy, Planning and Research (Professor Les Jacobs, Chair)

APPRC provided information on these items:

- efforts to revise the Principles and Procedures Governing Non-Degree Studies, centred on clarifying the governance process and enhancing oversight of non-degree programming
- consultations regarding the establishment of a new / “revisioned” faculty composed of Geography, the Faculty of Environmental Studies and other possible units
- the Committee’s feedback on the Statement of Policy on Free Speech which had been shared with the Free Speech Policy Working Group
- update on plans for Markham Centre Campus following the announcement of the cancellation of provincial funding for the Campus
- the status of initiatives in progress under the Provost’s purview, including the pan-university budget consultations, enrolment planning with Faculties for FW 2019-2020, the plans to develop an internationalization strategy, the complement renewal strategy, and the decanal searches underway
The Senate of York University

Synopsis

Additional Information about this Meeting

Please refer to the full Senate agenda and supplementary material posted online with the December 13, 2018 meeting for details about these items.

http://secretariat.info.yorku.ca/senate/meeting-agendas-and-synopses/

January Meeting of Senate

Senate’s next meeting will be held at 3:00 p.m. on Thursday, January 24, 2019.
The Senate of York University

Synopsis

The 653rd Meeting of Senate
held on Thursday, January 24, 2018

Remarks

The Chair welcomed Professor David Mutimer, LA&PS, who was attending his first Senate meeting in his capacity as Interim Vice-Chair of Senate.

In her report, President Rhonda Lenton referenced the provincial government announcements to:

- cut tuition fees by 10% in 2019-20, followed by a tuition freeze in 2020-21
- introduce changes to the Ontario Student Assistance Program (OSAP) that will affect eligibility, the balance between grants and loans, and some aspects of repayment
- introduce a requirement that some student fees be made optional

Vice-President Finance and Administration Carol McAulay summarized the financial impact of the tuition reduction, estimated to be $46.7M in 2019-2020 and $60.4M in 2020-2021, representing a 4.5% budget cut. As a result, there will be two additional years of deficit in the operating budget through to 2020-2021, when the plan approved by the Board was to achieve a balanced budget by 2019-2020.

President Lenton then turned to an update on applications for Fall 2019, with Provost and Vice-President Academic Lisa Philipps presenting an overview of application statistics from the Ontario Universities’ Application Centre (OUAC). Overall, the total number of direct entry applications to York has decreased by 4.2%, while they have increased across the system by 4.9%, with the biggest drops in first choice and second choice applications. In contrast, international applications to York have increased by 22% (versus a 14.5% increase in the system). Currently, York is eighth in the province in terms of the share of first choice applications, continuing the downward trend in its position over the past ten years, a period during which three major labour disruptions occurred. To restore prospective students’ confidence in choosing to attend York, Provost Philipps highlighted the need for the University community to engage in dialogue about the underlying issues producing tensions and consider approaches to working together collectively to move forward.

President Lenton outlined the next steps to begin overcoming the challenges presented by the tuition reduction – including identifying efficiencies and ways to drive new revenue, and the undertaking of a comprehensive financial analysis – highlighting that the impact of the cut will be shared among all units. With respect to the OSAP changes, President Lenton underlined the importance of York remaining steadfast to its commitment to access, a foundational value for the University.
Other comments made by President Lenton included the following:

- the importance of making as much progress as possible on the 2015-2020 University Academic Plan (UAP) as planning begins for the next iteration, especially as the UAP ties into the government consultations on the third round of Strategic Mandate Agreements

- explorations to proceed with Markham Centre Campus continue and an update will be provided at an upcoming Senate meeting

Reports

Academic Colleague to the Council of Ontario Universities

In her first report of the year, the Academic Colleague to the Council of Ontario Universities, Professor Andrea Davis, reported that the focus of its most recent meeting was on free speech on university campuses with various guest speakers contributing to the discussion, including two students from the McMaster Students Union. The student guests highlighted to the Colleagues that faculty should be prepared to broaden free speech considerations to the classroom, in addition to protests and events, as speech occurs in classrooms daily. The Colleagues also explored the concept of safe spaces in the classroom and suggested an alternative option of accountable, brave and courageous spaces, where students may express themselves freely and be socially responsible and accountable for engagement with others.

Approvals

Senate approved recommendations of its Academic Standards, Curriculum and Pedagogy Committee to:

- establish a Stream in Cognitive Neuropsychology within the BA and BSc (Honours) programs in Psychology, Glendon
- establish a full-time option for the Master of Public Policy, Administration & Law, School of Public Policy & Administration, LA&PS / Graduate Studies
- approve changes to the degree requirements for the Master of Design, AMPD / Graduate Studies

Committee Information Reports

Executive (Professor David Mutimer, Interim Vice-Chair)

The Executive Committee presented for discussion a draft proposal for a Special Joint Senate-Board Working Group on Jurisdiction Related to the Cancellation / Suspension of Classes during a Labour Disruption. Senators shared views on the proposal at the meeting and are invited to submit feedback via email to Cheryl Underhill (underhil@yorku.ca) by Friday, February 8 for transmittal to Senate Executive.
The Senate of York University

Synopsis

The Executive Committee’s information items included the following:

- the Committee’s monitoring of the academic disruption, including the status of course completions and grades submission from the FW 2017-2018 session
- encouragement for Senators to suggest individuals to serve as external members of the Board of Governors for consideration by the Board Governance and Human Resources Committee; suggestions may be made to the Senators serving on the Board, currently Senators Mutimer and Tourlakis, or to Maureen Armstrong, Secretary to Senate and the Board
- its efforts to establish a review cycle for Senate policies
- a reminder that the call for expressions of interest in membership on Senate committees and other positions elected by Senate has been issued, with the upcoming vacancies on Senate committees and the form to submit nominations available on the Senate webpage under the title Senate Elections

Academic Policy, Planning and Research (Professor Les Jacobs, Chair)

APPRC provided information on these items:

- a reminder of the upcoming ASCP-APPRC Forum of Ideas on Thursday, February 7, with panels to address the various forms of institutional support and resource planning for program development and a keynote address from Alex Usher
- its tracking of 2015-2020 UAP progress and preparations for discussions with the Deans / Principal over spring and fall 2019 on their respective successes and challenges in advancing UAP goals, as well as progress on their Integrated Resource Plans
- the efforts of the Faculty Blue Facilitating Group, which continues to work closely with Geography, the Faculty of Environmental Studies and other relevant parties to cement the Faculty vision, identify options, address hurdles and tackle resource questions
- the work underway on the VPRI-led initiative to develop and implement an Electronic CV (ECV) tool for York Faculty members

Academic Standards, Curriculum and Pedagogy (Professor K. Michasiw, Chair)

ASCP provided an update on its efforts in collaboration with the Registrar’s Office to implement the move from the 9-point to 4-point grading scale, approved in principle by Senate in November 2017. A significant number of policy and operational tasks follow on from this change, including defining the required GPA for progression and graduation
The Senate of York University

Synopsis

and reviewing the current approach to Honours progression through the lens of enhancing student support and success. Broad consultation will be forthcoming.

ASCP also provided information on the following items:

- Minor changes to the degree requirements for the MSc and PhD programs in Biology, Science / Graduate Studies
- Minor change to the admission requirements for the Professional LLM in International Business Law, Osgoode / Graduate Studies

Appeals (Professor Simone Pisana, Chair)

The Appeals Committee presented its annual report on Faculty- and Senate-level petitions and appeals decisions. The Chair noted trends in the petitions and appeals received by Faculties and the Committee, such as the increase in appeals related to academic integrity cases. As the appeals in many academic integrity cases relate to the penalty levied rather than the finding, the Chair encouraged Faculties to provide a clear rationale for their decisions to augment the Appeals Committee’s understanding of the files.

Additional Information about this Meeting

Please refer to the full Senate agenda and supplementary material posted online with the January 24, 2019 meeting for details about these items.

http://secretariat.info.yorku.ca/senate/meeting-agendas-and-synopses/

February Meeting of Senate

Senate’s next meeting will be held at 3:00 p.m. on Thursday, February 28, 2019
Executive Committee Report to Council

Ratification of Nomination

February 5, 2019

Curriculum Committee

Professor Steven Connor: Term: 2019 -2020
Department of Biology
A gentle reminder that this process is still in progress. Your assistance in spreading the word and encouraging nominations is greatly appreciated.

FACULTY COUNCIL COLLEAGUES: The Executive Committee has issued its annual call for expressions of interest in, and nominations for, Senate-elected positions. For details, please see the dedicated "Elections" page accessible from the Senate Website at:

http://secretariat.info.yorku.ca/senate/senate-elections/

Senate nomination guidelines require that Faculty Councils are among those canvassed for suggestions for all positions, even those that are not designated by Faculties. Suggestions would be most welcome from Council committees or individual members of Council.

Expressions of personal interest and nominations of other individuals can be transmitted by means of a form created for this round of elections. Nominators and nominees are asked to review the specific criteria for each of the positions before submitting forms.

Questions about any aspect of the nomination and election process may be addressed to Cheryl Underhill of the University Secretariat (underhil@yorku.ca).

<table>
<thead>
<tr>
<th>Senate Committee or Position*</th>
<th>Vacancies for terms beginning July 1, 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senator on the Board of Governors</td>
<td>1 full-time faculty member</td>
</tr>
<tr>
<td>Academic Standards, Curriculum and Pedagogy</td>
<td>2 full-time faculty members</td>
</tr>
<tr>
<td></td>
<td>1 contract faculty member</td>
</tr>
<tr>
<td>Senate Appeals Committee</td>
<td>5 full-time faculty members</td>
</tr>
<tr>
<td>Awards</td>
<td>5 full-time faculty members</td>
</tr>
<tr>
<td>Tenure and Promotions Appeals Committee</td>
<td>3 full-time faculty members</td>
</tr>
<tr>
<td>Tenure and Promotions Committee</td>
<td>3 full-time faculty members</td>
</tr>
</tbody>
</table>

*Senate Executive, Academic Policy, Planning and Research, and the Sub-Committee
on Honorary Degrees and Ceremonials are populated by a process leading to nominations by Faculty Councils.

With thanks,

Cheryl Underhill  
Assistant Secretary of the University  
Office of the University Secretary & General Counsel  
York University  
1050 Kanef Tower  
416 736-2100 Ext 30335
The Faculty of Science Curriculum Committee has reviewed proposals for changes to course information and degree requirements and recommends to the Executive Committee that the following changes be submitted to Council for approval.

Details regarding these proposals (and regarding other minor changes to Calendar/Repository course descriptions and prerequisites which were approved by the Committee but are not reported here) are included in the working papers of January 29, 2019, meeting of the Curriculum Committee, which are on file for your inspection in the Office of the Dean, with all members of the Curriculum Committee or by contacting the Secretary of the Committee at tinar@yorku.ca

Agenda

1. **Mathematics and Statistics**
   
   1.1 Change in calendar description: SC/MATH 2565 3.0 "Introduction to Applied Statistics"

2. **Physics & Astronomy**
   
   2.1 Change to retire/expire: SC/PHYS 4110 3.0 "Dynamics of Space Vehicles"
   
   2.2 Change in pre-requisite/co-requisite: SC/PHYS 1801 3.0 "Electricity, Magnetism & Optics for Engineers"
   
   2.3 Change to retire/expire: SC/PHYS 1410 6.0 "Physical Science"
   
   2.4 Change to retire/expire: SC/PHYS 1420 6.0 "Physics with Applications for Life Sciences"
   
   2.5 Change to retire/expire: SC/PHYS 1010 6.0 "Physics"

3. **Integrated Science**
   
   3.1 Change in calendar description and pre-requisite/co-requisite: SC/ISCI 1110 6.0 "Integrated Science (Biology)"
   
   3.2 Change in calendar description and pre-requisite/co-requisite: SC/ISCI 1101 3.0 "Integrated Science I (Biology)"
   
   3.3 Change in calendar description and pre-requisite/co-requisite: SC/ISCI 1102 3.0 "Integrated Science II (Biology)"
   
   3.4 Change in calendar description, degree credit exclusions and pre-requisite/co-requisite: Integrated Science "SC/ISCI 1210 6.0 (Chemistry)"
   
   3.5 Change in calendar description and pre-requisite/co-requisite: SC/ISCI 1201 3.0 "Integrated Science I (Chemistry)"
   
   3.6 Change in calendar description and pre-requisite/co-requisite: SC/ISCI 1202 3.0 "Integrated Science II (Chemistry)"
   
   3.7 Change in calendar description and course credit exclusions: SC/ISCI 1310 6.0 "Integrated Science (Physics)"
3.8 Change in calendar description, degree credit exclusions and pre-requisite/co-requisite:
   SC/ISCI 1301 3.0 "Integrated Science (Physics I)"
3.9 Change in calendar description, degree credit exclusions and pre-requisite/co-requisite:
   SC/ISCI 1302 3.0 "Integrated Science (Physics II)"
3.10 Change in calendar description and pre-requisite/co-requisite: "SC/ISCI 1410 6.0
   "Integrated Science (Mathematics)"
3.11 Change in calendar description and pre-requisite/co-requisite: "SC/ISCI 1401 3.0
   "Integrated Science (Mathematics I)"
3.12 Change in calendar description and pre-requisite/co-requisite: "SC/ISCI 1402 3.0
   "Integrated Science (Mathematics II)"
# Changes to Existing Course

**Faculty:**

<table>
<thead>
<tr>
<th>Department</th>
<th>Date of Submission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics and Statistics</td>
<td>November 15, 2018</td>
</tr>
</tbody>
</table>

**Course Number:** MATH 2565

**Course Title:** Introduction to Applied Statistics

**Effective Session:** FW 2019/2020

<table>
<thead>
<tr>
<th>Type of Change:</th>
</tr>
</thead>
<tbody>
<tr>
<td>in prerequisite(s)/co-requisite(s)</td>
</tr>
<tr>
<td>in course number/level</td>
</tr>
<tr>
<td>in credit value</td>
</tr>
<tr>
<td>in title (max. 40 characters for short title)</td>
</tr>
<tr>
<td>in Calendar description (max. 40 words or 200 characters)</td>
</tr>
<tr>
<td>other (please specify):</td>
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</tbody>
</table>

**Change From:**

The aim of this course is to give students in various disciplines some fundamental tools in statistical inference. Through a mixture of theory given in lecture hours and practice acquired during lab time, the student will understand when and how to use statistical tools such as the z, t or chi-squared tests, regression analysis, analysis of variance and various other techniques.

**To:**

The aim of this course is to give students in various disciplines some fundamental tools in statistical inference. Students will understand when and how to use statistical tools such as the z, t or chi-squared tests, regression analysis, analysis of variance and various other techniques. Students will learn how to use the statistical software R for data analysis.
Rationale: As requested by the ITEC undergraduate program director, the change is to emphasize the use of statistical software R in the course.

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an online delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised ‘Course Design’ and ‘Method of Instruction’ information.
Changes to Existing Course

Faculty: SCIENCE
Department: Physics and Astronomy
Course Number: PHYS4110 3.0
Course Title: Dynamics of Space Vehicles
Date of Submission: October 23, 2018
Effective Session: Fall 2019

Type of Change:
- in pre-requisite(s)/co-requisite(s)
- in course number/level
- in credit value
- in title (max. 40 characters for short title)
- in Calendar description (max. 40 words or 200 characters)
- other (please specify): PHYS 4110 3.0 is replaced by LE/ESSE 4110 3.0
- in cross-listing
- in degree credit exclusion(s)
- regularize course (from Special Topics)
- in course format/mode of delivery *
- retire/expire course

Change From:
SC/PHYS 4110 3.0 course has been taught for years by faculty members from Earth Science and Space Engineering

To:
PHYS 4110 3.0 is to be replaced by LE/ESSE 4110 3.0 which will be cross listed as PHYS 4110 3.0.
Rationale: The course has been taught for years by faculty members from Earth Science and Space Engineering who are now part of the Lassonde School. PHYS 4110 3.0 is to be replaced by LE/ESSE 4110 3.0 which will be cross listed as PHYS 4110 3.0.

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an online delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised "Course Design" and "Method of Instruction" information.
## New Course Proposal Form

### Faculty
Indicate all relevant Faculty(ies) i.e. LAPS/SC/LE

### Department
Indicate department and course prefix (e.g. Languages, GER)

### Course Number
Special Topics courses Include variance (e.g. HUMA 3000C 6.0, Variance is "C")

### Accreditation Unit Breakdown:
Indicate the proposed accreditation unit breakdown as a percentage and unit(s) in the appropriate subject matter areas. Definitions are provided in Appendix A.

<table>
<thead>
<tr>
<th>Accreditation Unit Breakdown</th>
<th>Math</th>
<th>Natural Science</th>
<th>Compl Studies</th>
<th>Eng. Science</th>
<th>Eng. Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>33.3%</td>
<td>33.3%</td>
<td></td>
<td>33.3%</td>
<td>33.3%</td>
</tr>
<tr>
<td>Units</td>
<td>12</td>
<td>12</td>
<td></td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

If the sum of engineering science and engineering design exceeds 50% of the total, indicate which P.Eng. faculty could be possible instructors for this course.

- Jinjun Shin
- Regina Lee
- John Moore
- Hugh Cheezer
- Franz Newland

### Course Title:
The official name of the course as it will appear in the Undergraduate Calendar and on the Repository.

Dynamics of Space Vehicles

### Short Title:
Appears on any documents where space is limited - e.g. transcripts and lecture schedules - maximum 40 characters

Dynamics of Space Vehicles
Expanded Course Description:

Please provide a detailed course description, including topics/theories and learning objectives, as it will appear in supplemental calendars.

Expanded Description including topics and theories:

This course presents a coherent and unified framework for mathematical modeling and analysis of space vehicles. The course can be divided into two main parts: orbit dynamics and attitude dynamics and control. The topics covered by this course include two-body problem, coordinate transformation, orbital elements, perturbation theory, orbital maneuvers, relative motion and rendezvous, interplanetary trajectories, rocket dynamics, and attitude dynamics and control. Spacecraft dynamics and control problems of practical interests are treated from a dynamical systems point of view. This course will focus on a comprehensive treatment of spacecraft dynamics and control problems and their practical solutions.

Course Outline (approximate number of lectures, subject to change)

PART I: Orbital Dynamics
1. Overview and Introduction
2. Particle dynamics/dynamics of point mass (~2 lectures)
3. Two body problem (~3 lectures)
4. Orbital elements (~1 lecture)
5. Coordinate transformations (~1 lecture)
6. Orbital perturbation theory (~1 lecture)
7. Orbital maneuvers (~3 lectures)
8. Relative motion and rendezvous (~1 lecture)
9. Interplanetary trajectories and launch windows (~4 lectures)
10. Rocket vehicle dynamics (~1 lecture)

PART II: Attitude Dynamics and Control
11. Rigid-body dynamics (~2 lectures)
12. Spacecraft attitude dynamics and Control (~2-3 lectures)
### Course Learning Outcomes:

List the course learning outcomes/indicators that will be achieved by the end of this course, and map these to the appropriate CEAB graduate attributes and UDEEs.

These course learning outcomes will be assessed and measured in the course for accreditation purposes.

### Please select those Degree Level Expectations that will be addressed in the course

<table>
<thead>
<tr>
<th>Undergraduate Degree Level Expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth and breadth of knowledge</td>
</tr>
<tr>
<td>Knowledge of methodologies</td>
</tr>
<tr>
<td>Application of knowledge</td>
</tr>
<tr>
<td>Communication skills</td>
</tr>
<tr>
<td>Awareness of limits of knowledge</td>
</tr>
<tr>
<td>Autonomy and professional capacity</td>
</tr>
</tbody>
</table>

### Learning outcomes articulate what the student will achieve by the end of the course. They provide a framework for assessment by stating what you expect the learners to be able to demonstrate after completing the course.

A succinct learning outcome specifies the tasks students are expected to be able to perform and the level of competence expected for the tasks.

1. Apply Newton's gravitational law to derive two-body equation for orbit motion [GA2; GA3]
2. Apply momentum conservation law to derive the equations of attitude motion [GA2; GA3]
3. Understand fundamental concepts such as orbital elements, orbital perturbations, interplanetary trajectory design procedure, orbital maneuvers [GA1]
4. Perform coordinate transformations [GA2; GA3]
5. Design and analyze satellite orbits with/without computer software [GA4; GA5]
6. Select and design spacecraft attitude controllers [GA2; GA3; GA4; GA5]
Bibliography:

A READING LIST MUST BE INCLUDED FOR ALL NEW COURSES

The Library has requested that the reading list contain complete bibliographical information, such as full name of author, title, year of publication, etc., and that you distinguish between required and suggested readings. A statement is required from the bibliographer responsible for the discipline to indicate whether resources are adequate to support the course.

Also please list any online resources.

If the course is to be integrated (graduate/undergraduate), a list of the additional readings to be required of graduate students must be included. If no additional readings are to be required, a rationale should be supplied.

LIBRARY SUPPORT STATEMENT MUST BE INCLUDE

Required Textbook:


Recommended References


A statement from Engineering Librarian, John Dupuis has been attached to this proposal.
Faculty and Department/Division Approval for Cross-listings:

If the course is to be cross-listed with another department/division this section needs to be signed by all parties. In some cases there may be more than two signatures required (i.e., Mathematics, Women's Studies). In the majority of cases either the Undergraduate Director or Chair of a unit approves the agreement to cross-list. All relevant signatures must be obtained prior to submission to the Faculty curriculum committee.

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Changes to Existing Course

Faculty: Science

Department: Physics and Astronomy

Course Title: Electricity, Magnetism & Optics for Engineers

Course Number: PHYS 1801 3.0

Date of Submission: January 21, 2019

Effective Session: FW 2019

Type of Change:

- [x] in pre-requisite(s)/co-requisite(s)
- [x] in degree credit exclusion(s)
- [x] in title (max. 40 characters for short title)
- in course format/mode of delivery *

Change From:

Prerequisite: SC/PHYS 1800 3.00.
Corequisites: SC/MATH 1014 3.00 or SC/MATH 1310 3.00 or SC/MATH 1505 6.00. Course Credit Exclusions: SC/PHYS 1010 6.00, SC/PHYS 1410 6.00, SC/PHYS 1420 6.00; SC/SCI 1310 6.00.

Rationale: SC/Math 1013 3.00 is a required prerequisite for SC/PHYS 1801 3.00. Course credit exclusion's updated to reflect current course offering in Integrated Science.

To:

Prerequisite: SC/PHYS 1800 3.00 and SC/MATH 1013 3.00 or equivalent.
Corequisites: SC/MATH 1014 3.00 or SC/MATH 1310 3.00 or SC/MATH 1505 6.00. Course Credit Exclusions: SC/PHYS 1010 6.00, SC/PHYS 1410 6.00, SC/PHYS 1420 6.00; SC/SCI 1310 6.00; SC/SCI 1302 3.00.

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an on-line delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised "Course Design" and "Method of Instruction" information.
Changes to Existing Course

Faculty: Science
Department: Physics and Astronomy
Course Number: PHYS 1410 6.00
Course Title: Physical Science

Type of Change:
- [ ] in pre-requisite(s)/co-requisite(s)
- [x] in course number/level
- [ ] in credit value
- [ ] in title (max. 40 characters for short title)
- [ ] in Calendar description (max. 40 words or 200 characters)
- [ ] in cross-listing
- [ ] in degree credit exclusion(s)
- [ ] regularize course (from Special Topics)
- [ ] in course format/mode of delivery *
- [x] retire/expire course
- [ ] other (please specify): This course is replaced by SC/PHYS 1411 3.00 and PHYS 1412 3.00.

Date of Submission: January 21, 2019
Effective Session: SU 2019
Change From: SC/PHYS 1410 6.00
To: SC/PHYS 1411 3.00 and PHYS 1412 3.00.

Rationale: SC/PHYS 1410 6.00 to be retired and replaced by SC/PHYS 1411 3.00 and SC/PHYS 1412 3.00.

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.
Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, Instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an on-line delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised "Course Design" and "Method of Instruction" information.
Changes to Existing Course

Faculty: Science

Department: Physics and Astronomy

Course Number: PHYS 1420 6.00

Course Title: Physics with Applications to Life Sciences

Date of Submission: January 21, 2019

Effective Session: SU 2019

Type of Change:

☐ in pre-requisite(s)/co-requisite(s)
☐ in course number/level
☐ in credit value
☐ in title (max. 40 characters for short title)
☐ in Calendar description (max. 40 words or 200 characters)
☒ other (please specify): This course is replaced by SC/PHYS 1420 3.00 and SC/PHYS 1422

Change From:

Rationale: SC/PHYS 1420 6.00 to be retired and replaced by SC/PHYS 1420 3.00 and SC/PHYS 1422 3.00.
Changes to Existing Course

Faculty: Science

Department: Physics and Astronomy

Course Number: PHYS 1010 6.00

Date of Submission: January 21, 2019

Effective Session: SU 2019

Course Title: Physics

Type of Change:

- [x] in pre-requisite(s)/co-requisite(s)
- [ ] in course number/level
- [ ] in credit value
- [ ] in title (max. 40 characters for short title)
- [ ] in Calendar description (max. 40 words or 200 characters)
- [x] retire/expire course
- [ ] other (please specify): This course is replaced by SC/PHYS 1011 3.00 and SC/PHYS 1012 3.00 (split in two)

Change From: 

To:

Rationale: SC/PHYS 1010 6.00 to be retired and replaced by SC/PHYS 1011 3.00 and SC/PHYS 1012 3.00.

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/Departments is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an on-line delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised "Course Design" and "Method of Instruction" information.
### Changes to Existing Course

**Faculty:**

**Department:** BIOLOGY  
**Course Number:** SC/ISCI 1110 6.00  
**Course Title:** Integrated Science (Biology)

**Date of Submission:** Jan 29, 2019  
**Effective Session:** FW19

**Type of Change:**

- [X] in pre-requisite(s)/co-requisite(s)  
- [] in course number/level  
- [] in credit value  
- [] in title (max. 40 characters for short title)  
- [X] in Calendar description (max. 40 words or 200 characters)  
- [] other (please specify):

**Change From:**

This course primarily examines foundational topics in biology through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. Registration in this course requires simultaneous registration in SC/ISCI 1210 6.00, SC/ISCI 1310 6.00, and SC/ISCI 1410 6.00. This course is Drop by Permission only.

**To:**

This course primarily examines foundational topics in biology through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. **Registration in this course requires simultaneous registration in SC/ISCI 1210 6.00, SC/ISCI 1310 6.00, and SC/ISCI 1410 6.00.** Registration in this course requires simultaneous registration in SC/ISCI 1210 6.00, or SC/ISCI 1201 3.00 and SC/ISCI 1202 3.00; SC/ISCI 1310 6.00, or SC/ISCI 1301 3.00 and SC/ISCI 1302 3.00; SC/ISCI 1410 6.00, or SC/ISCI 1401 3.00 and SC/ISCI 1402 3.00. This course is Drop by Permission only.

Corequisites: SC/ISCI 1210 6.00, or SC/ISCI 1201 3.00 and SC/ISCI 1202 3.00; SC/ISCI 1310 6.00, or SC/ISCI 1301 3.00 and SC/ISCI 1302 3.00; SC/ISCI 1410 6.00, or SC/ISCI 1401 3.00 and SC/ISCI 1402 3.00.

Course Credit Exclusion: SC/Biol 1000 3.00, SC/Biol 1001 3.00, SC/ISCI 1101 3.00, SC/ISCI 1102 3.00
Rationale: To reflect the current changes to the Integrated Science course offering.

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an on-line delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised 'Course Design' and 'Method of Instruction' Information.
Changes to Existing Course

Faculty:

Department: BIOLOGY

Date of Submission: JAN 29, 2019

Course Number: SC/ISCI 1101 3.00

Effective Session: FW19

Course Title: INTEGRATED SCIENCE I (BIOLOGY)

Type of Change:

- [x] in pre-requisite(s)/co-requisite(s)
- [ ] in course number/level
- [ ] in credit value
- [ ] in title (max. 40 characters for short title)
- [x] in Calendar description (max. 40 words or 200 characters)
- [ ] other (please specify):

Change From:

This course primarily examines foundational topics in biology through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. Registration in this course requires simultaneous registration in SC/ISCI 1201 3.00, SC/ISCI 1301 3.00, and SC/ISCI 1401 3.00. This course is Drop by Permission only.

Course Credit Exclusion: SC/BIOL 1000 3.00, SC/ISCI 1110 6.0.

To:

This course primarily examines foundational topics in biology through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. Registration in this course requires simultaneous registration in SC/ISCI 1201 3.00, SC/ISCI 1301 3.00, and SC/ISCI 1401 3.00.

Registration in this course requires simultaneous registration in SC/ISCI 1201 3.00, SC/ISCI 1301 3.00, and SC/ISCI 1401 3.00.

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Registration in this course requires simultaneous registration in SC/ISCI 1201 3.00, SC/ISCI 1301 3.00, and SC/ISCI 1401 3.00.

Course Credit Exclusion: SC/BIOL 1000 3.00, SC/ISCI 1110 6.0.
Rationale: Course description update to reflect the current course offering of ISCI courses.

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an on-line delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised "Course Design" and "Method of Instruction" information.
Changes to Existing Course

Faculty:
Department: BIOLOGY

Course Number: SC/ISCI 1102 3.0
Course Title: Integrated Science II (Biology)

Date of Submission: JAN 29, 2019
Effective Session: FW19

Type of Change:
- [x] in pre-requisite(s)/co-requisite(s)
- in course number/level
- in credit value
- in title (max. 40 characters for short title)
- [x] in Calendar description (max. 40 words or 200 characters)
- in cross-listing
- in degree credit exclusion(s)
- regularize course (from Special Topics)
- in course format/mode of delivery *
- retire/expire course
- other (please specify):

Change From:
This course primarily examines foundational topics in biology through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. Registration in this course requires simultaneous registration in SC/ISCI 1202 3.00, SC/ISCI 1302 3.00, and SC/ISCI 1402 3.00. This course is Drop by Permission only.
Course Credit Exclusion: SC/Biol 1001 3.00, SC/ISCI 1110 6.0.

To:
This course primarily examines foundational topics in biology through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. Registration in this course requires simultaneous registration in SC/ISCI 1202 3.00, SC/ISCI 1302 3.00, and SC/ISCI 1402 3.00. Registration in this course requires simultaneous registration in SC/ISCI 1101 3.0; SC/ISCI 1210 6.0, or SC/ISCI 1201 3.00 and SC/ISCI 1202 3.00; SC/ISCI 1310 6.0, or SC/ISCI 1301 3.00 and SC/ISCI 1302 3.00; SC/ISCI 1410 6.0, or SC/ISCI 1401 3.00 and SC/ISCI 1402 3.00. This course is Drop by Permission only.

Corequisites: SC/ISCI 1210 6.0, or SC/ISCI 1202 3.00; SC/ISCI 1310 6.0, or SC/ISCI 1302 3.00; SC/ISCI 1410 6.0, or SC/ISCI 1402 3.00.

Course Credit Exclusion: SC/Biol 1001 3.00, SC/ISCI 1110 6.0.
Rationale: To reflect the current changes in the course offering for Integrated Science

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an on-line delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised 'Course Design' and 'Method of Instruction' information.
Changes to Existing Course

Faculty: CHEMISTRY
Department: CHEMISTRY
Course Number: SC/ISCI 1210 6.00
Course Title: Integrated Science (Chemistry)

Date of Submission: JAN 29, 2019
Effective Session:

Type of Change:
- [ ] in pre-requisite(s)/co-requisite(s)
- [ ] in course number/level
- [ ] in credit value
- [ ] in title (max. 40 characters for short title)
- [X] in Calendar description (max. 40 words or 200 characters)
- [ ] in cross-listing
- [ ] in degree credit exclusion(s)
- [ ] regularize course (from Special Topics)
- [ ] in course format/mode of delivery *
- [ ] retire/expire course
- [ ] other (please specify):

Change From:
This course primarily examines foundational topics in chemistry through the lens of contemporary issues in science, integrating, disciplinary knowledge, skills and values from biology, chemistry, physics and mathematics and statistics. Registration in this course requires simultaneous registration in SC/ISCI 1110 6.0, SC/ISCI 1310 6.0, and SC/ISCI 1410 6.0. This course is Drop by Permission only.

Course Credit Exclusion: SC/CHEM 1000 3.00, SC/CHEM 1001 3.00 Chemical Dynamics, SC/ISCI 1201 3.0, SC/ISCI 1202 3.0

To:
This course primarily examines foundational topics in chemistry through the lens of contemporary issues in science, integrating, disciplinary knowledge, skills and values from biology, chemistry, physics and mathematics and statistics. Registration in this course requires simultaneous registration in SC/ISCI 1110 6.0, SC/ISCI 1310 6.0, and SC/ISCI 1440 6.0. Registration in this course requires simultaneous registration in SC/ISCI 1110 6.0, or SC/ISCI 1101 3.0 and SC/ISCI 1102 3.0; SC/ISCI 1310 6.0, or SC/ISCI 1301 3.00 and SC/ISCI 1302 3.0; SC/ISCI 1410 6.0, or SC/ISCI 1401 3.0 and SC/ISCI 1402 3.0. This course is Drop by Permission only.

Corequisites: SC/ISCI 1110 6.0, or SC/ISCI 1101 3.00 and SC/ISCI 1102 3.00; SC/ISCI 1310 6.0, or SC/ISCI 1301 3.00 and SC/ISCI 1302 3.00; SC/ISCI 1410 6.0, or SC/ISCI 1401 3.00 and SC/ISCI 1402 3.00.

Course Credit Exclusion: SC/CHEM 1000 3.00, SC/CHEM 1001 3.00 Chemical Dynamics, SC/ISCI 1201 3.0, SC/ISCI 1202 3.0
Rationale: To reflect the recent changes in the course offering for Integrated Science.

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an on-line delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised ‘Course Design’ and ‘Method of Instruction’ information.
Changes to Existing Course

Faculty: Chemistry

Department: Chemistry

Course Number: SC/ISC1 1201 3.0

Course Title: Integrated Science I (Chemistry)

Date of Submission: Jan 29, 2019

Effective Session: FW19

Type of Change:

- [x] in pre-requisite(s)/co-requisite(s)
- [] in course number/level
- [] in credit value
- [] in title (max. 40 characters for short title)
- [x] in Calendar description (max. 40 words or 200 characters)
- [] other (please specify):

Change From:

This course primarily examines foundational topics in chemistry through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. Registration in this course requires simultaneous registration in SC/ISC1 1101 3.00, SC/ISC1 1301 3.00, and SC/ISC1 1401 3.00. This course is Drop by Permission only. Course Credit Exclusion: SC/CHEM 1000 3.00, SC/ISC1 1210 6.00.

To:

This course primarily examines foundational topics in chemistry through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. Registration in this course requires simultaneous registration in SC/ISC1 1401 3.00, SC/ISC1 1301 3.00, and SC/ISC1 1404 3.00. Registration in this course requires simultaneous registration in SC/ISC1 1110 6.00, or SC/ISC1 1101 3.0 and SC/ISC1 1102 3.00; SC/ISC1 1202 3.00; SC/ISC1 1310 6.00, or SC/ISC1 1301 3.00 and SC/ISC1 1302 3.00; SC/ISC1 1410 6.00, or SC/ISC1 1401 3.00 and SC/ISC1 1402 3.00. This course is Drop by Permission only.

Corequisites: SC/ISC1 1110 6.00, or SC/ISC1 1101 3.00; SC/ISC1 1310 6.0, or SC/ISC1 1301 3.00; SC/ISC1 1410 6.0, or SC/ISC1 1401 3.0.

Course Credit Exclusion: SC/CHEM 1000 3.00, SC/ISC1 1210 6.00.
Rationale: To reflect the current changes to the Integrated Science course offering

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an on-line delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised "Course Design" and "Method of Instruction" information.
Changes to Existing Course

Faculty: 

Department: Chemistry

Date of Submission: Jan 29, 2019

Course Number: SC/ISCI 1202 3.00

Effective Session: FW19

Course Title: Integrated Science II (Chemistry)

Type of Change:

X in pre-requisite(s)/co-requisite(s)

□ in course number/level

□ in credit value

□ in title (max. 40 characters for short title)

X in Calendar description (max. 40 words or 200 characters)

□ other (please specify):

Change From:

This course primarily examines foundational topics in chemistry through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. Registration in this course requires simultaneous registration in SC/ISCI 1102 3.00, SC/ISCI 1302 3.00, and SC/ISCI 1402 3.00. This course is Drop by Permission only. Course Credit Exclusion: SC/CHEM 1001 3.00, SC/ISCI 1210 6.00.

To:

This course primarily examines foundational topics in chemistry through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. Registration in this course requires simultaneous registration in SC/ISCI 1102 3.00, SC/ISCI 1302 3.00, and SC/ISCI 1402 3.00. This course is Drop by Permission only. Registration in this course requires simultaneous registration in SC/ISCI 1110 6.00, or SC/ISCI 1101 3.0 and SC/ISCI 1101 3.0; SC/ISCI 1201 3.0; SC/ISCI 1310 6.0, or SC/ISCI 1301 3.0 and SC/ISCI 1302 3.0; SC/ISCI 1401 6.0, or SC/ISCI 1401 3.0 and SC/ISCI 1402 3.0. This course is Drop by Permission only.

Corequisites: SC/ISCI 1110 6.00, or SC/ISCI 1102 3.0; SC/ISCI 1310 6.0, or SC/ISCI 1302 3.0; SC/ISCI 1410 6.0, or SC/ISCI 1402 3.0.

Course Credit Exclusion: SC/CHEM 1001 3.00, SC/ISCI 1210 6.00.
Rationale: To reflect the current changes to the Integrated Science course offering.

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an on-line delivery mode should follow the Instructions provided on page 4 of the New Course Proposal Form to provide revised 'Course Design' and 'Method of Instruction' information.
Changes to Existing Course

Faculty:  
Department: PHAS  
Course Number: SC/ISCi 1310 6.00  
Course Title: Integrated Science (Physics)  
Date of Submission: January 29, 2019  
Effective Session: FW2019

Type of Change:  
☐ in pre-requisite(s)/co-requisite(s)  
☐ in course number/level  
☐ in credit value  
☐ in title (max. 40 characters for short title)  
☒ in Calendar description (max. 40 words or 200 characters)  
☐ other (please specify):  

Change From:  
This course primarily examines foundational topics in physics through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. Registration in this course requires simultaneous registration in ISCI 1101 3.00, ISCI 1201 3.00, and ISCI 1401 3.00. This course is Drop by Permission only.  
Course Credit Exclusion: SC/ISCi 1310 6.00, SC/PHYS 1010 6.00, SC/PHYS 1410 6.00, SC/PHYS 1420 6.00, SC/PHYS 1800 3.00, SC/PHYS 1801 3.00.

To:  
This course primarily examines foundational topics in physics through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. Registration in this course requires simultaneous registration in SC/ISCi 1101 3.00, SC/ISCi 1102 3.00, SC/ISCi 1210 3.00, and SC/ISCi 1404 3.00. Registration in this course requires simultaneous registration in SC/ISCi 1110 6.00, or SC/ISCi 1110 3.00 and SC/ISCi 1112 3.00; SC/ISCi 1210 6.00, or SC/ISCi 1210 3.00 and SC/ISCi 1202 3.00; SC/ISCi 1410 6.00, or SC/ISCi 1401 3.00 and SC/ISCi 1402 3.00. This course is Drop by Permission only.  
Course Credit Exclusion: SC/ISCi 1301 3.00, SC/ISCi 1302 3.00, SC/PHYS 1010 6.00, SC/PHYS 1011 3.00, SC/PHYS 1012 3.00, SC/PHYS 1410 6.00, SC/PHYS 1411 3.00, SC/PHYS 1412 3.00, SC/PHYS 1420 6.00, SC/PHYS 1421 3.00, SC/PHYS 1422 3.00, SC/PHYS 1800 3.00, SC/PHYS 1801 3.00.
Rationale: Change in course credit exclusions to reflect the creation of the new 3 credit Physics courses.

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an on-line delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised 'Course Design' and 'Method of Instruction' information.
Changes to Existing Course

Faculty:
Department: PHAS
Course Number: SC/ISCI 1301 3.0
Course Title: Integrated Science I (Physics)
Date of Submission: JAN 29, 2019
Effective Session: FW19

Type of Change:
- [ ] in pre-requisite(s)/co-requisite(s)
- [ ] in course number/level
- [ ] in credit value
- [ ] in title (max. 40 characters for short title)
- [x] in Calendar description (max. 40 words or 200 characters)
- [ ] other (please specify):

Change From:

This course primarily examines foundational topics in physics through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. Registration in this course requires simultaneous registration in ISCI 1101 3.00, ISCI 1201 3.00, and ISCI 1401 3.00. This course is Drop by Permission only.

Course Credit Exclusion: SC/ISCI 1310 6.00, SC/PHYS 1010 6.00, SC/PHYS 1410 6.00, SC/PHYS 1420 6.00, SC/PHYS 1800 3.00, SC/PHYS 1801 3.00.

Corequisites: SC/ISCI 1110 6.00, or SC/ISCI 1211 6.00, or SC/ISCI 1210 3.00; SC/ISCI 1401 3.00.

Course Credit Exclusion: SC/ISCI 1310 6.00, SC/PHYS 1010 6.00, SC/PHYS 1410 6.00, SC/PHYS 1420 6.00, SC/PHYS 1800 3.00, SC/PHYS 1801 3.00.

To:

This course primarily examines foundational topics in physics through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics.

Registration in this course requires simultaneous registration in ISCI 1101 3.00, ISCI 1201 3.00, and ISCI 1401 3.00. Registration in this course requires simultaneous registration in SC/ISCI 1110 6.00, or SC/ISCI 1101 3.00 and SC/ISCI 1102 3.00; SC/ISCI 1210 6.00, or SC/ISCI 1201 3.00 and SC/ISCI 1202 3.00; SC/ISCI 1302 3.00; SC/ISCI 1410 6.00, or SC/ISCI 1401 3.00 and SC/ISCI 1402 3.00. This course is Drop by Permission only.

Course Credit Exclusion: SC/ISCI 1310 6.00, SC/PHYS 1010 6.00, SC/PHYS 1410 6.00, SC/PHYS 1420 6.00, SC/PHYS 1800 3.00, SC/PHYS 1801 3.00.

Corequisites: SC/ISCI 1110 6.00, or SC/ISCI 1101 3.00; SC/ISCI 1210 6.00, or SC/ISCI 1201 3.00; SC/ISCI 1410 6.00, or SC/ISCI 1401 3.00.
Rationale: To reflect the current changes in the course offering for Integrated Science and Physics.

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an on-line delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised "Course Design" and "Method of Instruction" information.
Changes to Existing Course

Faculty: 
Department: PHAS 
Course Number: SC/ISCI 1302 3.00 
Course Title: Integrated Science II (Physics) 
Date of Submission: Jan 29, 2019 
Effective Session: FW19 

Type of Change: 

x in pre-requisite(s)/co-requisite(s) 
□ in course number/level 
□ in credit value 
□ in title (max. 40 characters for short title) 
□ in Calendar description (max. 40 words or 200 characters) 
□ in cross-listing 
□ in degree credit exclusion(s) 
□ regularize course (from Special Topics) 
□ in course format/mode of delivery * 
□ retire/expire course 
□ other (please specify): 

Change From: 
This course primarily examines foundational topics in physics through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. Registration in this course requires simultaneous registration in SC/ISCI 1102 3.00, SC/ISCI 1202 3.00, and SC/ISCI 1402 3.00. This course is Drop by Permission only. Course Credit Exclusion: SC/ISCI 1310 3.00, SC/PHYS 1010 6.00, SC/PHYS 1410 6.00, SC/PHYS 1420 6.00, SC/PHYS 1800 3.00, SC/PHYS 1801 3.00. 

To: 
This course primarily examines foundational topics in physics through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. Registration in this course requires simultaneous registration in SC/ISCI 1402 3.00, SC/ISCI 1202 3.00, and SC/ISCI 1402 3.00. Registration in this course requires simultaneous registration in SC/ISCI 1110 6.00, or SC/ISCI 1101 3.00 and SC/ISCI 1102 3.00, or SC/ISCI 1210 6.00, or SC/ISCI 1201 3.00 and SC/ISCI 1202 3.00; SC/ISCI 1301 3.00, SC/ISCI 1410 6.00, or SC/ISCI 1401 3.00 and SC/ISCI 1402 3.00. This course is Drop by Permission only. 

Corequisites: SC/ISCI 1110 6.00, or SC/ISCI 1102 3.00; SC/ISCI 1210 6.0, or SC/ISCI 1202 3.00; SC/ISCI 1410 6.00, or SC/ISCI 1402 3.00. 

Course Credit Exclusion: SC/ISCI 1310 6.00, SC/PHYS 1010 6.00, SC/PHYS 1410 6.00, SC/PHYS 1420 6.00, SC/PHYS 1800 3.00, SC/PHYS 1801 3.00. 

Corequisites: SC/ISCI 1310 6.00, SC/PHYS 1010 6.00, SC/PHYS 1410 6.00, SC/PHYS 1420 6.00, SC/PHYS 1800 3.00, SC/PHYS 1801 3.00. 

Corequisites: SC/ISCI 1310 6.00, SC/PHYS 1010 6.00, SC/PHYS 1410 6.00, SC/PHYS 1420 6.00, SC/PHYS 1800 3.00, SC/PHYS 1801 3.00.
Rationale: To reflect the changes to the course offering for Integrated Science and the changes to the first year Physics course offering.

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an on-line delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised 'Course Design' and 'Method of Instruction' information.
## Changes to Existing Course

**Faculty:**

**Department:** MATH & STATS

**Course Number:** SC/ISC1 1410 6.0

**Course Title:** Integrated Science (Mathematics)

**Effective Session:** FW19

**Date of Submission:** Jan 29, 2019

**Type of Change:**

- [X] in pre-requisite(s)/co-requisite(s)
- [ ] in course number/level
- [ ] in credit value
- [ ] in title (max. 40 characters for short title)
- [X] in Calendar description (max. 40 words or 200 characters)
- [ ] other (please specify):

### Change From:

This course primarily examines foundational topics in mathematics, through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. Registration in this course requires simultaneous registration in SC/ISC1 1110 6.00, SC/ISC1 1210 6.00, and SC/ISC1 1310 6.00. This course is Drop by Permission only.

Course Credit Exclusion: SC/SCI 1401 3.00, SC/SCI 1402 3.00, SC/MATH 1013 3.00, SC/MATH 1014 3.00, SC/MATH 1505 6.00.

### Change To:

This course primarily examines foundational topics in mathematics, through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. -Registration in this course requires simultaneous registration in SC/ISC1 1110 6.00, SC/ISC1 1210 6.00, and SC/ISC1 1310 6.00. -Registration in this course requires simultaneous registration in SC/ISC1 1110 6.00, or SC/ISC1 1101 3.00 and SC/ISC1 1102 3.00; SC/ISC1 1210 6.00, or SC/ISC1 1201 3.00 and SC/ISC1 1202 3.00; SC/ISC1 1310 6.00, or SC/ISC1 1301 3.00 and SC/ISC1 1302 3.00. This course is Drop by Permission only.

Corequisites: SC/ISC1 1110 6.00, or SC/ISC1 1101 3.00 and SC/ISC1 1102 3.00; SC/ISC1 1210 6.00, or SC/ISC1 1201 3.00 and SC/ISC1 1202 3.00; SC/ISC1 1310 6.00, or SC/ISC1 1301 3.00 and SC/ISC1 1302 3.00.

Course Credit Exclusion: SC/SCI 1401 3.00, SC/SCI 1402 3.00, SC/MATH 1013 3.00, SC/MATH 1014 3.00, SC/MATH 1300 3.00, SC/MATH 1310 3.00, SC/MATH 1505 6.00, SC/MATH 1550 6.00.
Rationale: To reflect the current course offering for Integrated Science

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an on-line delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised 'Course Design' and 'Method of Instruction' information.
Changes to Existing Course

Faculty:

Department: Math & Stats
Course Number: SC/ISCI 1401 3.00
Course Title: Integrated Science I (Mathematics)

Date of Submission: Jan 29, 2019
Effective Session: FW19

Type of Change:

- [x] in pre-requisite(s)/co-requisite(s)
- [ ] in course number/level
- [ ] in credit value
- [ ] in title (max. 40 characters for short title)
- [x] in Calendar description (max. 40 words or 200 characters)
- [ ] other (please specify):

Change From:

This course primarily examines foundational topics in calculus through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. Registration in this course requires simultaneous registration in SC/ISCI 1101 3.00, SC/ISCI 1201 3.00, and SC/ISCI 1301 3.00. This course is Drop by Permission only. Course Credit Exclusion: SC/ISCI 1410 6.00, SC/MATH 1013 3.00, SC/MATH 1300 3.00, SC/MATH 1505 6.00, SC/MATH 1550 6.0.

To:

This course primarily examines foundational topics in calculus through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. Registration in this course requires simultaneous registration in SC/ISCI 1101 3.00, SC/ISCI 1201 3.00, and SC/ISCI 1301 3.00. This course is Drop by Permission only.

Corequisites: SC/ISCI 1110 6.00, or SC/ISCI 1120 6.00, or SC/ISCI 1210 6.00, or SC/ISCI 1310 6.00, or SC/ISCI 1320 6.00, or SC/ISCI 1402 3.00. This course is Drop by Permission only.

Course Credit Exclusion: SC/ISCI 1410 6.00, SC/MATH 1013 3.00, SC/MATH 1300 3.00, SC/MATH 1505 6.00, SC/MATH 1550 6.0.
Rationale: To reflect the current changes to the Integrated Science course offering.

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course.
Courses converted from face-to-face to an on-line delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised “Course Design” and “Method of Instruction” information.
Changes to Existing Course

Faculty: Math & Stats

Department: Math & Stats

Course Number: SC/ISCI 1402 3.00

Course Title: Integrated Science II (Mathematics)

Type of Change:

x in prerequisite(s)/co-requisite(s)

in course number/level

in credit value

in title (max. 40 characters for short title)

x in Calendar description (max. 40 words or 200 characters)

in cross-listing

in degree credit exclusion(s)

regularize course (from Special Topics)

in course format/mode of delivery *

retire/expire course

other (please specify):

Change From:

This course primarily examines foundational topics in calculus through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. Registration in this course requires simultaneous registration in SC/ISCI 1102 3.00, SC/ISCI 1202 3.00, and SC/ISCI 1302 3.00. This course is Drop by Permission only. Course Credit Exclusion: SC/ISCI 1410 6.00, SC/MATH 1014 3.00, SC/MATH 1310 3.00, SC/MATH 1505 6.00, MATH 1550 6.0.

To:

This course primarily examines foundational topics in calculus through the lens of contemporary issues in science, integrating disciplinary knowledge, skills and values from biology, chemistry, physics, and mathematics and statistics. Registration in this course requires simultaneous registration in SC/ISCI 1102 3.00, SC/ISCI 1202 3.00, and SC/ISCI 1302 3.00. This course is Drop by Permission only. Course Credit Exclusion: SC/ISCI 1410 6.00, SC/MATH 1014 3.00, SC/MATH 1310 3.00, SC/MATH 1505 6.00, MATH 1550 6.0.

Corequisites: SC/ISCI 1110 6.00, or SC/ISCI 1102 3.00; SC/ISCI 1210 6.0, or SC/ISCI 1201 3.00 and SC/ISCI 1202 3.00; SC/ISCI 1301 3.00. This course is Drop by Permission only.

Course Credit Exclusion: SC/ISCI 1410 6.00, SC/MATH 1014 3.00, SC/MATH 1310 3.00, SC/MATH 1505 6.00, MATH 1550 6.0.
Rationale: To reflect the current changes to the Integrated Science course offering.

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an online delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised "Course Design" and "Method of Instruction" information.