S.23-101

SFU GRADUATE AND POSTDOCTORAL STUDIES

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MEMORANDUM

ATTENTION Senate

DATE June 23, 2023

FROM Jeff Derksen,
Chair of Senate Graduate Studies Committee (SGSC)

RE: New Courses

For information:
Acting under delegated authority at its meeting of June 13, 2023, SGSC approved the following new course, effective **SPRING 2024**:

Faculty of Science
Department of Biology
New Course: BISC 805 Teaching and learning in Undergraduate Sciences

Department of Chemistry
New Course: CHEM 803 Lectures in Modern Chemistry Research

Department of Earth Sciences
New Course: EASC 669 Research in Geoscience

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

SFU

MEMO

Faculty of Science

ATTENTION: Senate Graduate Studies Committee

FROM: Vance Williams, Associate Dean Graduate Studies, Faculty of Science

RE: Proposed Course Additions ~~and Program Changes~~ for Spring 2024, Faculty of Science

DATE: May 10, 2023

Dear SGSC,

The following curriculum changes have been approved by the Faculty of Science and are being submitted to the Senate Graduate Studies committee for approval.

The following *new courses* are being proposed:
CHEM 803 Lectures in Modern Chemistry Research
BISC 805 Teaching and Learning in Undergraduate Sciences

~~The following program changes are being proposed~~:
~~**CHEM M.Sc. program**~~
~~**PHYS Ph.D. program**~~

Enclosed are the documents in support of these changes.

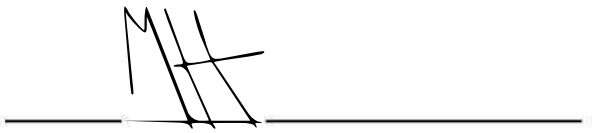
Sincerely,

Vance Williams
Associate Dean Graduate Studies, Faculty of Science

To: Faculty of Science Graduate Studies Committee
From: Michael Hart, BISC Graduate Program Chair
Re: New course BISC 805 Teaching & Learning in Undergraduate Sciences
Date: 11 May 2023

This new course has been approved by the Department of Biological Sciences and is being forwarded to the Faculty of Science Graduate Studies Committee for review and approval. The change should be effective Spring 2024.

The new course is an addition to the curriculum to meet the needs & interests of our graduate students in development of skills for post-secondary teaching.



Michael Hart, BISC Graduate Program Chair

SFU GRADUATE AND POSTDOCTORAL STUDIES

New Graduate Course Proposal

Course Subject (eg. PSYC) BISC	Number (eg. 810) 805	Units (eg. 4) 3

Course title (max. 100 characters)
Teaching and Learning in Undergraduate Sciences

Short title (for enrollment/transcript - max. 30 characters) Science Teaching in Higher Ed

Course description for SFU Calendar (course descriptions should be brief and should never begin with phrases such as "This course will..." or "The purpose of this course is..." If the grading basis is satisfactory/unsatisfactory include this in the description - max. 50 words)

Foundational knowledge and practical skills for effective undergraduate science teaching. Collaboratively explore modern best practices and pedagogical theory, tailored to teaching within your research discipline. Components include curricular development, literature discussion, classroom consultation, self-reflection; culminates in tangible outcomes that support your career goals. Ideal for those interested in teaching in STEM higher education.

Rationale for introduction of this course Effective undergraduate science teaching requires not only expertise in the content area, but also the ability to engage students and create meaningful learning experiences. Further, to enter an academic career, our graduate students increasingly need expertise in teaching. This course offers a unique approach to developing this expertise by tailoring best practices and pedagogical theory to the specific needs of each participant's research discipline. This course is distinctive in its emphasis on both practical skills development and aligning instruction to discipline-specific needs, making it a valuable addition to any STEM program. Developed in consultation with academic units and the CEE, this course complements but does not duplicate existing resources; it is most appropriately offered as an optional course in a STEM department's formal graduate course offerings.

Term of initial offering (eg. Fall 2019) Spring 2024	Course delivery (eg. 3 hrs/week for 13 weeks) 3hrs/week for 13 weeks
Frequency of offerings/year 1	Estimated enrollment per offering 15

Equivalent courses (courses that replicates the content of this course to such an extent that students should not receive credit for both courses)
N/A

Prerequisite and/or Corequisite N/A

Criminal record check required? ☐ Yes if yes is selected, add this as prerequisite

Additional course fees? ☐ Yes ☐ No

Campus where course will be taught ☐ Burnaby ☐ Surrey ☑ Vancouver ☐ Great Northern Way ☐ Off campus

Course Components * ☐ Lecture ☑ Seminar ☐ Lab ☐ Independent ☐ Capstone ☐ _____

Grading Basis ☑ Letter grades ☐ Satisfactory/ Unsatisfactory ☐ In Progress / Complete

Repeat for credit? ☐ Yes ☑ No	Total repeats allowed? _____	Repeat within a term? ☐ Yes ☑ No
Required course? ☐ Yes ☑ No	Final exam required? ☐ Yes ☑ No	Capstone course? ☐ Yes ☑ No

Combined with a undergrad course? ☐ Yes ☑ No If yes, identify which undergraduate course and the additional course requirements for graduate students:

* See important definitions on the curriculum website.

RESOURCES

If additional resources are required to offer this course, provide information on the source(s) of those additional resources.

Faculty member(s) who will normally teach this course
Megan Barker
Additional faculty members, space, and/or specialized equipment required in order to offer this course
Other instructors: Leanne Ramer (BPK); Miranda Meents (BISC).

CONTACT PERSON

Academic Unit / Program	Name (typically, Graduate Program Chair)	Email
Dept of Biological Sciences	Mike Hart (DGSC Chair)	mwhart@sfu.ca

ACADEMIC UNIT APPROVAL

A course outline must be included.

Non-departmentalized faculties need not sign

Graduate Program Committee Michael Hart	Signature	Date
Department Chair ~~Fred Taylor~~ T D Williams	Signature	Date ~~29 May 2023~~ May 10, 2023

FACULTY APPROVAL

The course form and outline must be sent by FGSC to the chairs of each FGSC (fgsc-list@sfu.ca) to check for an overlap in content

Overlap check done? ☑ YES

This approval indicates that all the necessary course content and overlap concerns have been resolved. The Faculty/Academic Unit commits to providing the necessary resources.

Faculty Graduate Studies Committee	Signature	Date
Vance Williams		May 10, 2023

A library review will be conducted. If additional funds are necessary, DGS will contact the academic unit prior to SGSC.

SENATE GRADUATE STUDIES COMMITTEE APPROVAL

Senate Graduate Studies Committee	Signature	Date
Jeff Derksen		June 21, 2023

ADMINISTRATIVE SECTION (for DGS office only)
Library Check: _____
Course Attribute: _____
Course Attribute Value: _____
Instruction Mode: _____
Attendance Type: _____

If different from regular units:
Academic Progress Units: _____
Financial Aid Progress Units: _____

Course Outline: Teaching and Learning in Undergraduate Sciences – BISC 805

Semester-long graduate seminar course; 3 hours / week

Course Outline:

This graduate seminar focuses on exploring the current theories, research, and best practices in undergraduate science teaching and learning. This course aims to equip science graduate students with the knowledge, skills, and strategies necessary to become effective science educators in a variety of higher education settings.

Throughout the course, students will examine a range of topics related to science education, including student motivation, active learning strategies, assessment and evaluation techniques, curriculum design, and evidence-based instructional practices. We will also engage with challenges and strategies for creating an inclusive and supportive learning environment for all students.

Students will engage in a variety of activities throughout the course, including developing and implementing active teaching activities, reading and discussing research articles, observing teaching in their discipline as a stepstone to a community of practice, and reflecting on their teaching approaches. The course structure itself will model best practices in teaching, and topics will be integrated with the discipline of the student, to enrich both. Guest speakers will be invited to share their experiences & insights on teaching science at the undergraduate level.

Prerequisites:

No formal academic prerequisites; however, students should have a strong foundation in their scientific discipline and a passion for teaching and learning. To take this course, students need to have the support of their primary research supervisor, with an understanding that some of their time will be spent developing teaching skills relevant to their discipline. Students are welcome from all STEM disciplines; we also welcome auditors such as postdoctoral fellows.

Learning Objectives:

By the end of this course, students will be able to:

1. Apply principles of learning to design and evaluate effective teaching strategies, activities, and assessments for undergraduate science students.
2. Analyze and evaluate the current research and best practices in undergraduate science teaching and learning.
3. Create an inclusive and supportive learning environment that addresses the diverse needs and backgrounds of undergraduate science students.
4. Contribute to a teaching community of practice through classroom consultation and reflective feedback
5. Create components of a teaching dossier, suitable for including in a strong academic job application.
6. Engage in deliberate practice with feedback: reflect on their teaching experiences and identify areas for improvement.

Course Readings

- Ambrose, S. A., Bridges, M. W., DiPietro, M., Lovett, M. C., & Norman, M. K. (2010). How learning works: Seven research-based principles for smart teaching. Wiley.
- Selected articles from the Discipline-Based Education Research (DBER) and/or SoTL (Scholarship of Teaching & Learning) literature, aligned to the needs and interests of the course participants.

Assessment:

Course grades will be based on active participation in class discussions, completion of assigned readings and activities, and the development of a final project (independent or collaborative) that demonstrates mastery of the course objectives. Feedback and self-reflection will be incorporated throughout the course to support students' learning and development. We will use an ungrading assessment structure that prioritizes learning, growth, and self-reflection; a detailed structure for assigning letter grades will be developed with students at the beginning of the course.

MEMO

Department of Chemistry

ATTENTION: Faculty of Science Graduate Studies Committee

FROM: Tim Storr

RE: New Course Proposal – CHEM 803

DATE: April 11th, 2023

Dear FGSC,

Please find attached our revised new course proposal for CHEM 803, for approval by the Faculty of Science Graduate Studies Committee.

Rationale for proposing CHEM 803: To formalize a requirement that first year MSc students attend weekly department seminars to learn about the latest research and develop critical thinking skills.

All the resources required to offer this course will come from the Chemistry Department. The proposal was approved at our recent departmental meeting on Thursday, March 9th, 2023.

Please contact me if you have any questions, or if you require any changes.

Sincerely,

Tim Storr
Chemistry Graduate Program Chair

SFU GRADUATE AND POSTDOCTORAL STUDIES

New Graduate Course Proposal

Course Subject (eg. PSYC) CHEM	Number (eg. 810) 803	Units (eg. 4) 0

Course title (max. 100 characters)

Lectures in Chemistry Research

Short title (for enrollment/transcript - max. 30 characters) Lectures in Chemistry

Course description for SFU Calendar (course descriptions should be brief and should never begin with phrases such as "This course will..." or "The purpose of this course is..." If the grading basis is satisfactory/unsatisfactory include this in the description - max. 50 words)

Chemistry graduate student seminar course that includes weekly lectures by invited speakers. The grading is satisfactory/unsatisfactory and is required for all first year MSc students in chemistry.

Rationale for introduction of this course

The MSc program currently requires first year students to attentd

Term of initial offering (eg. Fall 2019) Spring 2024	Course delivery (eg. 3 hrs/week for 13 weeks) 2 hr/week for 13 weeks
Frequency of offerings/year Twice per year	Estimated enrollment per offering 60

Equivalent courses (courses that replicates the content of this course to such an extent that students should not receive credit for both courses)

n/a

Prerequisite and/or Corequisite

Criminal record check required? ☐ Yes if yes is selected, add this as prerequisite

Additional course fees? ☐ Yes ☑ No

Campus where course will be taught ☑ Burnaby ☐ Surrey ☐ Vancouver ☐ Great Northern Way ☐ Off campus

Course Components * ☐ Lecture ☑ Seminar ☐ Lab ☐ Independent ☐ Capstone ☐ _____

Grading Basis ☐ Letter grades ☑ Satisfactory/ Unsatisfactory ☐ In Progress / Complete

Repeat for credit? ☑ Yes ☐ No

Total repeats allowed? _____

Repeat within a term? ☐ Yes ☑ No

Required course? ☑ Yes ☐ No

Final exam required? ☐ Yes ☑ No

Capstone course? ☐ Yes ☑ No

Combined with a undergrad course? ☐ Yes ☑ No If yes, identify which undergraduate course and the additional course requirements for graduate students:

* See important definitions on the curriculum website.

RESOURCES

If additional resources are required to offer this course, provide information on the source(s) of those additional resources.

Faculty member(s) who will normally teach this course
Hua-Zhong Yu
Additional faculty members, space, and/or specialized equipment required in order to offer this course
n/a

CONTACT PERSON

Academic Unit / Program	Name (typically, Graduate Program Chair)	Email
Chemistry	Tim Storr	tsa34@sfu.ca

ACADEMIC UNIT APPROVAL

A course outline must be included.

Non-departmentalized faculties need not sign

Graduate Program Committee Tim Storr	Signature	Date 03/10/2023
Department Chair Charles Walsby	Signature	Date 17 April, 2023

FACULTY APPROVAL

The course form and outline must be sent by FGSC to the chairs of each FGSC (fgsc-list@sfu.ca) to check for an overlap in content

Overlap check done? ☑ YES

This approval indicates that all the necessary course content and overlap concerns have been resolved. The Faculty/Academic Unit commits to providing the necessary resources.

Faculty Graduate Studies Committee Vance Williams	Signature	Date May 10, 2023

A library review will be conducted. If additional funds are necessary, DGS will contact the academic unit prior to SGSC.

SENATE GRADUATE STUDIES COMMITTEE APPROVAL

Senate Graduate Studies Committee Jeff Derksen	Signature	Date June 21, 2023

ADMINISTRATIVE SECTION (for DGS office only)
Library Check: _____
Course Attribute: _____
Course Attribute Value: _____
Instruction Mode: _____
Attendance Type: _____

If different from regular units:
Academic Progress Units: _____
Financial Aid Progress Units: _____

Simon Fraser University
Department of Chemistry

CHEM 803 - 0

Lectures in Modern Chemistry Research

Fall and Spring Seminar Series

Instructor:	Hua-Zhong Yu
Description/topics:	Chemistry graduate student seminar course that includes weekly lectures by invited speakers. The grading is satisfactory/unsatisfactory and is required for all first year MSc students in chemistry. 2 hours/week for 13 weeks.
Grading:	Satisfactory/Unsatisfactory
Required texts:	None
Recommended texts:	None
Materials/supplies:	None
Prerequisite/corequisite:	None
Notes:	A required course for all first year MSc students in chemistry.

SFU

MEMO

Faculty of Science

ATTENTION: Senate Graduate Studies Committee

FROM: Vance Williams, Associate Dean Graduate Studies, Faculty of Science

RE: Proposed Course Addition ~~and Program Changes~~ for Spring 2024, Faculty of Science

DATE: April 10, 2023

Dear SGSC,

The following curriculum changes have been approved by the Faculty of Science and are being submitted to the Senate Graduate Studies committee for approval.

The following *new course* is being proposed:

EASC 699 Research in Geoscience

~~The following program changes are being proposed~~:
~~**EASC Ph.D. program**~~

Enclosed are the documents in support of these changes.

Sincerely,

Vance Williams
Associate Dean Graduate Studies, Faculty of Science

To: Faculty Graduate Studies Committee
From: Gwenn Flowers, EASC Graduate Program Chair
Re: New course proposals
Date: 3 April 2023

The following new course proposal has been approved by the Department of Earth Sciences and is forwarded to the Faculty Graduate Studies Committee for approval:

EASC 699: ***Research in Geoscience***

These curriculum items should be effective for Spring 2024.

The content of EASC 699 has already been offered in a Special Topics course (EASC 7XX). We are seeking to formalize this successful course as regularly offered EASC 600-level course to make it easier for EASC graduate students to fulfill their course requirements, which place a limit on the number of 700-level courses.

Gwenn Flowers, EASC Graduate Program Chair

SFU GRADUATE AND POSTDOCTORAL STUDIES

New Graduate Course Proposal

Course Subject (eg. PSYC) EASC	Number (eg. 810) 699	Units (eg. 4) 3

Course title (max. 100 characters)

Research in Geoscience

Short title (for enrollment/transcript - max. 30 characters) **Research in Geoscience**

Course description for SFU Calendar (course descriptions should be brief and should never begin with phrases such as "This course will..." or "The purpose of this course is..." If the grading basis is satisfactory/unsatisfactory include this in the description)

An introduction to the geoscience research landscape and some of the skills required in the transition from student to researcher. Appropriate for graduate students in the first half of their programs.

Rationale for introduction of this course

EASC 699 would fill a gap in the EASC graduate program course offerings. The only cross-cutting introductory graduate-level EASC course is a required one-day 0-credit orientation (EASC 600). EASC 699 covers material relevant to all EASC graduate students that is currently only taught on an informal tutorial basis by individual supervisors. This course was piloted in Spring 2021 as a Special Topics course (EASC 711) and was well received.

Term of initial offering (eg. Fall 2019) Spring 2024	Course delivery (eg. 3 hrs/week for 13 weeks) 3 hrs/week for 13 weeks
Frequency of offerings/year 1	Estimated enrollment per offering 5-20

Equivalent courses (courses that replicates the content of this course to such an extent that students should not receive credit for both courses)

N/A

Prerequisite and/or Corequisite: Enrollment in EASC MSc or PhD program or permission of instructor

Criminal record check required? ☐ Yes if yes is selected, add this as prerequisite

Additional course fees? ☐ Yes ☑ No

Campus where course will be taught ☑ Burnaby ☐ Surrey ☐ Vancouver ☐ Great Northern Way ☐ Off campus

Course Components * ☑ Lecture ☐ Seminar ☐ Lab ☐ Independent ☐ Capstone ☐ _____

Grading Basis ☑ Letter grades ☐ Satisfactory/ Unsatisfactory ☐ In Progress / Complete

Repeat for credit? ☐ Yes ☑ No	Total repeats allowed? N/A	Repeat within a term? ☐ Yes ☑ No
Required course? ☐ Yes ☑ No	Final exam required? ☐ Yes ☑ No	Capstone course? ☐ Yes ☑ No

Combined with a undergrad course? ☐ Yes ☑ No If yes, identify which undergraduate course and the additional course requirements for graduate students:

* See important definitions on the curriculum website.

RESOURCES

If additional resources are required to offer this course, provide information on the source(s) of those additional resources.

Faculty member(s) who will normally teach this course
EASC Graduate Program Chair (currently Gwenn Flowers, but could be any research faculty member in EASC)
Additional faculty members, space, and/or specialized equipment required in order to offer this course
N/A

CONTACT PERSON

Academic Unit / Program	Name (typically, Graduate Program Chair)	Email
Earth Sciences	Gwenn Flowers	gflowers@sfu.ca

ACADEMIC UNIT APPROVAL

A course outline must be included.

Non-departmentalized faculties need not sign

Graduate Program Committee	Signature	Date
Gwenn Flowers		19 Dec 2022
Department Chair	Signature	Date
Glyn Williams-Jones		3 April 2023

FACULTY APPROVAL

The course form and outline must be sent by FGSC to the chairs of each FGSC (fgsc-list@sfu.ca) to check for an overlap in content

Overlap check done? ☑ YES

This approval indicates that all the necessary course content and overlap concerns have been resolved. The Faculty/Academic Unit commits to providing the necessary resources.

Faculty Graduate Studies Committee	Signature	Date
Vance Williams		June 14 2023

A library review will be conducted. If additional funds are necessary, DGS will contact the academic unit prior to SGSC.

SENATE GRADUATE STUDIES COMMITTEE APPROVAL

Senate Graduate Studies Committee	Signature	Date
Jeff Derksen		June 21, 2023

ADMINISTRATIVE SECTION (for DGS office only)

Library Check: _____
Course Attribute: _____
Course Attribute Value: _____
Instruction Mode: _____
Attendance Type: _____

If different from regular units:
Academic Progress Units: _____
Financial Aid Progress Units: _____

Simon Fraser University
Science

EASC 699 – 3

RESEARCH IN GEOSCIENCE
D01.00
Semester 2024-1

Instructor:

Dr. Gwenn E. Flowers
(Email: gflowers@sfu.ca; Phone: 778-782-6638; Office: TASC 1 Room 7237)

Description/topics:

General:
An introduction to the geoscience research landscape and some of the skills required in the transition from student to researcher. Appropriate for graduate students in the first half of their programs.

Course topics:

1. Introduction to the research world
2. Time tracking and management
3. Health and wellness inside/outside the workplace
4. Research relationships and expectations: supervisor-student, roles in a research group
5. Scientific literature: classification, metrics, search strategies, staying current
6. Scientific literature: reference management, writing well
7. Scientific literature: collaboration, contributions, authorship, choosing a journal, pre-print servers, how to review a paper and respond to reviews
8. Data/code management, archival
9. The conference experience: abstracts, preparation, expectations
10. The conference experience: oral/poster presentation skills, data visualization
11. Research careers: projects, proposals, ethics & integrity
12. Research careers in academia, industry, government
13. Research with Indigenous partners
14. Science outreach & communication

Course Organization:
Seminar-style meetings totalling three hours per week, divided between lecture, discussion of readings, in-class exercises and guest-led presentations/workshops. Students interested in selected topics may

register in 1- or 2-unit Directed Readings, as appropriate. Students not requiring credit are welcome to audit the course.

Grading:

Discussion leading/participation: 10-25%
Weekly assignments: 55-85%
Final project: 0-20%

Required texts: None

Materials/supplies: None

Prerequisite/corequisite: Enrollment in EASC MSc/PhD program or permission of instructor

Notes: None