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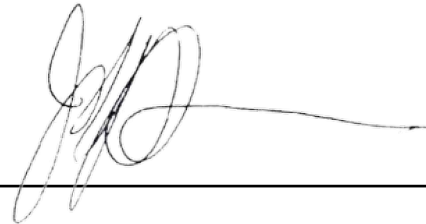
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MEMORANDUM

ATTENTION Senate
FROM Jeff Derksen,
Chair of Senate Graduate Studies
Committee (SGSC)
RE: New Courses

DATE February 16, 2023



For information:

Acting under delegated authority at its meeting of February 7, 2023, SGSC approved the following new courses, effective **Fall 2023**:

Beedie School of Business

New Courses:

- 1) BUS 800: Finance Foundations
- 2) BUS 806: Principles of Finance
- 3) BUS 881: Principles of Fund Management

Faculty of Science

Department of Biology

New Course:

- 1) BISC 633: Environmental Microbiology

Department of Earth Science

New Course:

- 1) EASC 629: Advanced Engineering Geology

Department of Molecular Biology and Biochemistry

New Course:

- 1) MBB 764: From Genome to System



Memo to SGSC

To: Senate Graduate Studies Committee
From: Andrew Gemino, Associate Dean, Graduate Programs
Re: MSc Calendar Changes for Fall 2023
Date: January 10, 2022

The following curriculum revisions have been approved by the Beedie School of Business and are forwarded to the Senate Graduate Studies Committee for approval. These curriculum items should be effective for **Fall 2023**.

Please include them on the next SGSC agenda.

- ~~Calendar description Change for MSc Finance. Course title/ language updates and changes to required credits. Elective language moved to within streams.~~
- New course proposals and minor course changes
- Course outlines to accompany proposals

Thank you for your attention herein. Should you have any questions or concerns, please do not hesitate to contact me.

Andrew Gemino
Associate Dean, Graduate Programs, Beedie School of Business

New Graduate Course Proposal

Course Subject (eg. PSYC) BUS	Number (eg. 810) 800	Units (eg. 4) 3
Course title (max. 100 characters) Finance Foundations		
Short title (for enrollment/transcript - max. 30 characters) Fin Foundations		
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) Essential mathematical, computational, and accounting topics for the MSc in Finance will be covered. Topics covered include an introduction to probability theory and statistics, basic accounting concepts and financial statements, good programming practices, the use of IDEs, and the Python programming language.		
Rationale for introduction of this course This course combines the previously split courses of BUS 877, 878 and 798 into one course. This will allow for greater flexibility in the introduction of topics/materials that align with the changing industry needs and special topics offerings in the program.		
Term of initial offering (eg. Fall 2019) Fall 2023	Course delivery (eg. 3 hrs/week for 13 weeks) 3hrs/ day, 4 days per week for 3 consecutive weeks	
Frequency of offerings/year 1/year	Estimated enrollment per offering 55	
Equivalent courses (courses that replicates the content of this course to such an extent that students should not receive credit for both courses)		
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 Frederick Wilderboorse
Additional faculty members, space, and/or specialized equipment required in order to offer this course

CONTACT PERSON

Academic Unit / Program Beedie Graduate Programs	Name (typically, Graduate Program Chair) Ariel Johnson	Email busgradprogram@sfu.ca
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ACADEMIC UNIT APPROVAL

A course outline must be included.

Non-departmentalized faculties need not sign

Graduate Program Committee	Signature	Date
Department Chair Frederick Wilderboorse	Signature <i>Willeboordse</i>	Date 23/09/2022

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 Andrew Gemino	Signature <i>AG</i>	Date 23/09/2022
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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 <i>JD</i>	Date 16/02/2023
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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: _____

BUS 800: Finance Foundations

Instructor: Frederick Willeboordse	Semester:
Email:	Note: (classroom #, blogs, etc.)
Phone:	Office:

Course Description

Essential mathematical, computational and accounting topics for the MSc in Finance will be covered. The mathematics part will focus on highlighting which mathematical skill are required to succeed in the program, and an introduction to probability and statistics. The computational part will cover good programming practices, the use of IDEs, and the basics of the Python programming language while the accounting part will cover basic accounting concepts and the basic financial statements.

Objectives

The objective of this course is to prepare students for the MSc program in Finance.

- Be familiar with introductory probability theory and basic econometrics
- Be able to write basic Python programs to download and analyze data
- Interpret basic financial statements

Course Expectations

Finance Foundations commences on **Date XX** and is completed on **Date XX**. During this time you can expect to spend a significant amount of time on this course unless you are already familiar with the materials. Please be aware that the MSc in Finance is a full-time program and that you need to be prepared to spend 40 hours or more on the program per week. There may be out of class activities. These out-of-class activities may include participating in online activities, preparing readings and cases, answering practice questions, doing library research and reviewing sources, conducting interviews, and project planning.

Courses may be scheduled in a compressed format where classes are held in intensive session, but expectations of consistent preparation and participation remain for the length of the semester.

Course Structure

This course may be offered through video lectures, in-person classes, online labs, in-person labs or a mixture of those.

Book and Materials

1. TBD

Learning and Assessments

Assessment summary

This is a required course and full participation is expected. Evaluation in the course will be based on individual activities and online participation.

Other Information

For most assignments, there will not be any makeups. If you miss an assignment due to illness, the usual procedure will be that you will be excused from that assignment after submitting a doctor's note, or other information as requested by the instructor.

Proper participation in the course is essential. With the exception of assignments for which you were excused *in writing* (usually this would be a documented illness), **you must complete all assigned work**. If you have unexcused missed assignments at the end of the semester, you will fail the course, even if your average is above the passing mark.

Academic integrity is essential, please see the information in the section below. However, I would like to stress that I consider enrolling in this course an implicit acknowledgement of your acceptance of SFU's academic integrity policies, and your acceptance of the validity of these policies throughout the entirety of the course whether or not these policies are explicitly repeated.

Course Policies

Online tools such as Turnitin, Kritik or others may be used. If so, this will be announced in class.

Use of Turnitin.com

At the discretion of the instructor, written work for this course will be submitted via Turnitin, a third-party service licensed for use by SFU. Turnitin is used for originality checking to help detect plagiarism. Students will be required to create an account with Turnitin, and to submit their work via that account, on the terms stipulated in the agreement between the student and Turnitin. This agreement includes the retention of your submitted work as part of the Turnitin database. Any student with a concern about using the Turnitin service may opt to use an anonymous identity in their interactions with Turnitin.

Students who do not intend to use Turnitin in the standard manner must notify the instructor at least two weeks in advance of any submission deadline. In particular, it is the responsibility of any student using the anonymous option (i.e., false name and temporary e-mail address created for the purpose) to inform the instructor such that the instructor can match up the anonymous identity with the student.

For more information see the Protection of Privacy section of the SFU calendar.

Use of Zoom

Lectures delivered on Zoom may be recorded by your instructor. As a result, Simon Fraser University may collect your image, voice, name, personal views and opinions, and course work under the legal authority of the University Act and the Freedom of Information and Protection of

Privacy. This information is related directly to and needed by the University to support student learning only (i.e., posting in the Learning Management System for students to review). If you have any questions about the collection and use of this information please contact your instructor.

Reading and Course Schedule

Readings can be found on Canvas, your textbook and through external links. They are labeled accordingly.

Please ensure that citations are in full APA (or other popular citation style), in order to ensure that the correct version of cases and articles are obtained for your course, and that copyright law is met.

Academic Integrity

SFU's Academic Integrity web site <http://www.sfu.ca/students/academicintegrity.html> is filled with information on what is meant by academic dishonesty, where you can find resources to help with your studies and the consequences of cheating. Check out the site for more information and videos that help explain the issues in plain English.

Each student is responsible for his or her conduct as it affects the University community. Academic dishonesty, in whatever form, is ultimately destructive of the values of the University. Furthermore, it is unfair and discouraging to the majority of students who pursue their studies honestly. Scholarly integrity is required of all members of the University. <http://www.sfu.ca/policies/gazette/student/s10-01.html>

ACADEMIC INTEGRITY: YOUR WORK, YOUR SUCCESS

About the Course Instructor

Instructors may write their own short biography, or use the existing one on the Beedie staff directory here: <https://beedie.sfu.ca/about/contact/>.

New Graduate Course Proposal

Course Subject (eg. PSYC) BUS	Number (eg. 810) 806	Units (eg. 4) 3
Course title (max. 100 characters) Principles of Finance		
Short title (for enrollment/transcript - max. 30 characters) Principles of Finance		
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) Topics covered include the time value of money, discounted cash flow techniques, types of financial securities, capital budgeting, risk and return trade-offs and capital market efficiency.		
Rationale for introduction of this course A general introductory finance course is needed to bring students from various backgrounds and undergraduate experience to a baseline of shared knowledge before they move on to more specialized courses.		
Term of initial offering (eg. Fall 2019) Fall 2023	Course delivery (eg. 3 hrs/week for 13 weeks) 15 hrs/ week for 4 weeks	
Frequency of offerings/year 1/year	Estimated enrollment per offering 55	
Equivalent courses (courses that replicates the content of this course to such an extent that students should not receive credit for both courses)		
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 Frederick Willeboorse, Christina Atanasova
Additional faculty members, space, and/or specialized equipment required in order to offer this course

CONTACT PERSON

Academic Unit / Program Beedie Graduate Programs	Name (typically, Graduate Program Chair) Ariel Johnson	Email busgradprogram@sfu.ca
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ACADEMIC UNIT APPROVAL

A course outline must be included.

Non-departmentalized faculties need not sign

Graduate Program Committee	Signature	Date
Department Chair Frederick Willeboordse	Signature <i>Willeboordse</i>	Date 23/09/2022

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 Andrew Gemino	Signature <i>AG</i>	Date 23/09/2022
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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 <i>JD</i>	Date 16/02/2023
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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: _____

BUS 806: Principles of Finance

Instructor: Frederick Willeboordse, Christina Atanasova	Semester: Fall
Email:	Note: (classroom #, blogs, etc.)
Phone:	Office: HC 7000

Course Description

A general introduction to finance is provided. Topics covered include the time value of money, discounted cash flow techniques, types of financial securities, capital budgeting, risk and return trade-offs and capital market efficiency.

Objectives

The objective of the course is to assist students to acquire an understanding of the fundamental principles and issues in financial management. Upon completion of the course, participants should be able to define basic terminology, understand the theoretical relations and apply the analytical techniques covered in the course to various decision-making situations.

Problem solving, analytical and decision-making skills will be practiced through exercises and problem assignments (generally with the help of a spreadsheet).

Course Expectations

Preparation commences on **Date XX** and is completed on **Date XX**. During this time you can expect to spend a significant amount of time on this course unless you are already familiar with the materials. Please be aware that the MSc in Finance is a full-time program and that you need to be prepared to spend 40 hours or more on the program per week. There may be out of class activities. These out-of-class activities may include participating in online activities, preparing readings and cases, answering practice questions, doing library research and reviewing sources, conducting interviews, and project planning.

Courses may be scheduled in a compressed format where classes are held in intensive session, but expectations of consistent preparation and participation remain for the length of the semester.

Course Structure

This course may be offered through video lectures, in-person classes, online labs, in-person labs or a mixture of those.

Book and Materials

1. TBA

Learning and Assessments

Assessment summary

This course is graded. Evaluation in the course will be based on a combination of group and individual work. As in all large courses in the Beedie School of Business, grading norms will be observed. In other words, students with the top marks relative to the class average will receive the top grades.

Individual	Mini-Tests	70%
	Assignments	10%
Group	Group Project	20%
	Total	100%

Other Information

For most assignments, there will not be any makeups. If you miss an assignment due to illness, the usual procedure will be that you will be excused from that assignment after submitting a doctor's note, or other information as requested by the instructor.

Proper participation in the course is essential. With the exception of assignments for which you were excused *in writing* (usually this would be a documented illness), **you must complete all assigned work**. If you have unexcused missed assignments at the end of the semester, you will fail the course, even if your average is above the passing mark.

Academic integrity is essential, please see the information in the section below. However, I would like to stress that I consider enrolling in this course an implicit acknowledgement of your acceptance of SFU's academic integrity policies, and your acceptance of the validity of these policies throughout the entirety of the course whether or not these policies are explicitly repeated.

Course Policies

Online tools such as Turnitin, Kritik or others may be used. If so, this will be announced in class.

Use of Turnitin.com

At the discretion of the instructor, written work for this course will be submitted via Turnitin, a third-party service licensed for use by SFU. Turnitin is used for originality checking to help detect plagiarism. Students will be required to create an account with Turnitin, and to submit their work via that account, on the terms stipulated in the agreement between the student and Turnitin. This agreement includes the retention of your submitted work as part of the Turnitin database. Any student with a concern about using the Turnitin service may opt to use an anonymous identity in their interactions with Turnitin.

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Reading and Course Schedule

Readings can be found on Canvas, your textbook and through external links. They are labeled accordingly.

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Academic Integrity

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Each student is responsible for his or her conduct as it affects the University community. Academic dishonesty, in whatever form, is ultimately destructive of the values of the University. Furthermore, it is unfair and discouraging to the majority of students who pursue their studies honestly. Scholarly integrity is required of all members of the University. <http://www.sfu.ca/policies/gazette/student/s10-01.html>

ACADEMIC INTEGRITY: YOUR WORK, YOUR SUCCESS

About the Course Instructor

Instructors may write their own short biography, or use the existing one on the Beedie staff directory here: <https://beedie.sfu.ca/about/contact/>.

New Graduate Course Proposal

Course Subject (eg. PSYC) BUS	Number (eg. 810) 881	Units (eg. 4) 3
Course title (max. 100 characters) Principles of Fund Management		
Short title (for enrollment/transcript - max. 30 characters) Principles Fund Mgt		
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 managing stock and bond portfolios, and is a pre-requisite to working on the Student Investment Advisory Service Endowment Fund. The course will cover investment policy, allocation of assets to different asset classes, selecting specific securities, managing portfolio risk, an introduction to fixed income investing, and reporting to clients.		
Rationale for introduction of this course Based on student and instructor feedback, we have identified a need for a course that specifically prepares students for fund management prior to participation in real world experiential courses. This course will provide the foundational knowledge for students who wish to pursue the optional Student Investment Advisory Service practicum in term 2.		
Term of initial offering (eg. Fall 2019) Fall 2023	Course delivery (eg. 3 hrs/week for 13 weeks) 3hrs/week for 13 weeks	
Frequency of offerings/year 1/year	Estimated enrollment per offering 55	
Equivalent courses (courses that replicates the content of this course to such an extent that students should not receive credit for both courses)		
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? 0	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 Glenn Powers
Additional faculty members, space, and/or specialized equipment required in order to offer this course

CONTACT PERSON

Academic Unit / Program Beedie Graduate Programs	Name (typically, Graduate Program Chair) Ariel Johnson	Email busgradprogram@sfu.ca
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ACADEMIC UNIT APPROVAL

A course outline must be included.

Non-departmentalized faculties need not sign

Graduate Program Committee	Signature	Date
Department Chair Frederick Wilderboorse	Signature <i>Willeboordse</i>	Date 23/09/2022

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 Andrew Gemino	Signature <i>AG</i>	Date 23/09/2022
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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 <i>JD</i>	Date 16/02/2023
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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: _____

BUS 881: Principles of Fund Management

Instructor: Glenn Powers

Semester: Fall 2023

Email: gpowers@sfu.ca

Phone: 1.604.862.9291

Office: Segal 4600

Course Description

This course provides an introduction to managing stock and bond portfolios, and is a pre-requisite to working on the SIAS Endowment Fund. The course will cover investment policy, allocation of assets to different asset classes, selecting specific securities, managing portfolio risk, an introduction to fixed income investing, and reporting to clients.

Objectives

Completion of the course will enable students to participate in making responsible investment decisions for part of SFU's endowment. Students should be able to:

- Understand the SIAS Investment Policy Statement (IPS) and use it as a guide to portfolios that comply with the client's expectations
- Articulate recommendations for an optimal mix of fixed income and equity securities
- Use tools like Bloomberg and CapitalIQ to analyze potential investments
- Select securities for inclusion in different types of stock and bond portfolios, with a focus on global portfolios
- Measure risk in different portfolios, and understand how to use risk tools to inform decisions on portfolio weights
- Apply Environmental, Social and Governance (ESG) standards in stock and bond selection
- Make decisions on credit risk for corporate and provincial bonds
- Build fixed income portfolios that conform to different economic outlooks and risk objectives
- Present investment strategies and performance to a client

Course Expectations

The class starts on **September 15, 2023** and is completed on **November 17, 2023**. During this time you can expect at least 10 hours of out-of-class work weekly for each course. These out-of-class activities will include, participating in online activities, preparing readings and cases, answering practice questions, doing library research and reviewing sources, conducting interviews, and project planning.

Courses may be scheduled in a compressed format where classes are held in intensive session, but expectations of consistent preparation and participation remain for the length of the semester.

Course Structure

This course is built around a case: a real portfolio of over \$20 million in fixed income, Canadian stocks, and global stocks. During the course, students will be working as advisors to the investment

managers in the previous cohort. By the end of the course, students will have an organized themselves into teams, interviewed for leadership roles, and will take over the management of the fund. This will include choosing stocks and bonds, placing trades, monitoring performance, ensuring compliance with investment policy, and implementing a risk budget.

Book and Materials

1. There is no textbook for the class. Students should create a logon on the Bloomberg terminal and request that SIAS portfolios be shared with them. Students may want to buy any edition of Reilly Brown *Investment Analysis & Portfolio Management*, which covers many of the concepts in the course.
2. Students must complete Bloomberg's certification course, which is available at <https://portal.bloomberforeducation.com/>. To get credit for the material, use the code PX67CDBJYS. Five points will be deducted from the attendance score if this is not completed by the deadline.

Learning and Assessments

Assessment summary

Evaluation in the course will be based on a combination of group and individual work. As in all large courses in the Beedie School of Business, grading norms will be observed. In other words, students with the top marks relative to the class average will receive the top grades.

**** Please remember that as per graduate grading policies, group assignments should not add up to more than 50% of the total grade.**

Individual	Weekly Quizzes / Attendance / completion of Bloomberg certification	10%
	Assignment 1: Optimize mix of three asset classes	10%
	Assignment 2: Build global equity portfolio	20%
	Midterm 1	20%
	Midterm 2	20%
Group	Assignment 3: Client Presentation	20%
	Total	100%

Assignment 1: Asset Allocation

Due: September 29, 2023 at 6:00 PM

Using a supplied spreadsheet of historical investment returns from the three asset classes in which SIAS invests, use a modern portfolio theory framework to find an optimal mix of the three assets. Contrast that result with an allocation based on the Black Litterman model.

Note for instructors:

Format	Excel workbook
File Format	Name.xlsx
Length	Use workbook supplied with assignment
Submission	Canvas
Printed copy	No
In-class discussion or presentation	From randomly selected students
Other notes The objective of this exercise is to analyze the results of using historical returns in an optimization problems, and to explore alternatives that fit students' outlook for future returns.	

Assignment 2: Build Global Equity Portfolio

Due: October 23, 2023 at 6:00 PM

Using the MSCI All-Country World Index as an investment universe, select several stocks from a subsector of the market that 1) have a liquid market in USD 2) have a favourable mix of attributes in growth, value, quality, sentiment, and ESG.

Format	Presentation on the proposed portfolio
File Format	Name.pptx
Length	10 pages
Submission	Canvas
Printed copy	No
In-class discussion or presentation	From randomly selected students
Other notes The current global portfolio is comprised of US stocks and passive ETFs for the rest of the world. This cohort is going to transition the fund into a true global portfolio. This assignment will provide a framework for trading into a better global equities portfolio for SIAS.	

Assignment 3: Client Presentation

Due: November 6, 2023 at 6:00 PM

Working in groups of 4-6 students, build a presentation on the investment strategy and performance of the SIAS fund during the most recent quarter.

Format	Quarterly Update on the SIAS portfolio
File Format	Name.pptx
Length	16 pages
Submission	Canvas
Printed copy	No
In-class discussion or presentation	Each group will have 15 minutes to make their presentations.
Other notes This is a dry run for the first SIAS presentation that the 2022 cohort will make to an actual advisory panel in May 2023.	

Mid-term 1

On: October 20, 2023 at 2:15 PM

Exam will be in-class and will be one hour in length. 1-5 of the course material.

Format	Written document on paper. Students can bring only a writing implement and a calculator.
File Format	Paper
Length	10 questions (some multi-part) - Approximately 10 pages.
Submission	In person
Printed copy	Yes
In-class discussion or presentation	In class
Other notes - Must have a real calculator, not an app on a phone. - No formula sheets will be allowed, just a pencil and a calculator.	

Mid-term 2

On: October 20, 2023 at 2:15 PM

Exam will be in-class and will be one hour in length. 1-5 of the course material.

Format	Written document on paper. Students can bring only a writing implement and a calculator.
File Format	Paper
Length	• 10 questions (some multi-part) • Approximately 10 pages.
Submission	In person
Printed copy	Yes
In-class discussion or presentation	In class
Other notes • Must have a real calculator, not an app on a phone. • No formula sheets will be allowed, just a pencil and a calculator.	

Participation

Ten percent of the grade will be based on participation. Participation will be assessed based on weekly attendance, which may include quiz questions to assess learning. Five points will be deducted from students that fail complete the Bloomberg certification by the deadline.

Reading and Course Schedule

The Bloomberg certification will require 20-30 hours of study depending on students' familiarity with stocks and bonds. Because this course is based on using existing portfolios as a case study, there is no textbook for the course.

Session 1 (9/15/2023)

Investments, Returns and risk

- Measuring returns from price and dividends
- Compound returns
- Measures of volatility
- Asset classes

Session 2 (9/22/2023)

Portfolios and Portfolio Management

- Introduction to Assignment 1, Asset Allocation
- Modern Portfolio Theory

- Active vs. Passive Investment Strategies
- Long-only vs. Long-short portfolios

Session 3 (9/29/2023)

Portfolios and Portfolio Management

- Introduction to Assignment 2: Building a Global Equity Portfolio
- Brinson decomposition
- Factor-based portfolios
- Z-score ranking and weighting

Session 4 (10/6/2023)

Asset Valuation

- Value, Growth, Quality, Sentiment and ESG
- Valuing zero coupon and bullet bonds
 - DCF calculations
 - Perpetuities
 - DCF vs. Comparable Analysis

Session 5 (10/13/2023)

Portfolios and Portfolio Management

- CAPM, Risk-free Rates and Beta
- Cost of Equity and Cost of Capital
- Regression Beta and Blume Adjustment
- Fundamental Beta
- Quality Factor for Assignment 2: ROE vs K_e
- DDM and cash flow models

Session 6 (10/20/2023)

First midterm exam

- Portfolio performance reporting
 - Brinson-Fachler model
 - Factor-based attribution

Session 7 (10/27/2023)

Investment Risk

- Position weights in portfolios
- Total vs. active risk
- Measuring tracking error and forecasting active risk

Session 8 (11/3/2023)

Fixed Income Valuation and Security Selection

- Credit Analysis
- Duration and Convexity

Session 9 (11/10/2023)

Fixed Income Portfolio Management
Student Presentations

Session 10 (11/17/2023)

Second midterm exam
Student Presentations

Academic Integrity

SFU's Academic Integrity web site <http://www.sfu.ca/students/academicintegrity.html> is filled with information on what is meant by academic dishonesty, where you can find resources to help with your studies and the consequences of cheating. Check out the site for more information and videos that help explain the issues in plain English.

Each student is responsible for his or her conduct as it affects the University community. Academic dishonesty, in whatever form, is ultimately destructive of the values of the University. Furthermore, it is unfair and discouraging to the majority of students who pursue their studies honestly. Scholarly integrity is required of all members of the University. <http://www.sfu.ca/policies/gazette/student/s10-01.html>

ACADEMIC INTEGRITY: YOUR WORK, YOUR SUCCESS

About the Course Instructor

Glenn Powers is an Associate Professor of Practice at SFU, where he has been teaching graduate and undergraduate finance courses since 2015. He currently serves as the industry advisor to the BEAM fund (managed by undergraduate students) and SIAS fund (managed by students in the MSc Finance program).

Prior to joining SFU, Glenn worked at BCI, where he led a team managing the Global Thematic equity portfolios. Prior to that, he was a portfolio manager in Canadian Equities in BCI. During his career, Glenn has worked in management consulting, sell-side research, investment banking, and investment management.

Glenn has a masters in financial risk management (MFRM) from SFU and is a CFA charter-holder.



MEMO

Faculty of
Science

ATTENTION: Senate Graduate Studies Committee

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

RE: Proposed Course ~~Changes and~~ Additions for Fall 2023,
Faculty of Science

DATE: January 11, 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 course deletions have been proposed:~~

~~MBB 726 Immune System I~~

~~MBB 728 Microbial Pathogenesis~~

~~The following course changes have been proposed:~~

~~EASC 810 MSc Proposal~~

~~MBB 669 Special Topics in Genomics~~

~~MBB 727 Immune System II~~

~~ONC 510 Seminar in Oncology~~

The following *new courses* are being proposed:

EASC 629 Advanced Engineering Geology

MBB 764 From Genome to Systems

BISC 633 Environmental Microbiology

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 633 Environmental Microbiology
Date: 12 January 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 Fall 2023.

The new course is an addition to the curriculum for the Master's in Environmental Toxicology program and will be taught by our newest MET faculty member (Dr. Jane Fowler).

A handwritten signature in black ink, consisting of a stylized 'M' followed by several vertical and diagonal strokes.

Michael Hart, BISC Graduate Program Chair

New Graduate Course Proposal

Course Subject (eg. PSYC)	BISC	Number (eg. 810)	633	Units (eg. 4)	3
Course title (max. 100 characters)					
Environmental Microbiology					
Short title (for enrollment/transcript - max. 30 characters)					
Environmental Microbiology					
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 overview of environmental and applied microbiology. Topics include microbial growth and kinetics, microbial metabolism and thermodynamics, biogeochemical cycling, microbial ecology, applied microbiology as well as analysis of microbial community data in the lab. Students will write a review paper and disseminate their results to the class and lead discussions with undergraduate students.					
Rationale for introduction of this course					
This course will provide a graduate offering in environmental microbiology, which is needed within BISC and Faculty of Environment. It will also serve as an elective course for the Masters of Environmental Toxicology program.					
Term of initial offering (eg. Fall 2019)			Course delivery (eg. 3 hrs/week for 13 weeks)		
Fall 2023			2h lecture/ week, 3h lab		
Frequency of offerings/year			Estimated enrollment per offering		
1			8		
Equivalent courses (courses that replicates the content of this course to such an extent that students should not receive credit for both courses)					
BISC 433					
Prerequisite and/or Corequisite					
BISC 303, or an equivalent introductory microbiology course (or permission from the 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? <u>0</u>		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:					
BISC 433, grad students write a review paper and teach their topic to undergrads in a lecture. They will also lead small group discussions with undergraduate students and conduct lab assignments independently rather than in groups.					

* 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 Jane Fowler
Additional faculty members, space, and/or specialized equipment required in order to offer this course Peter Hollmann

CONTACT PERSON

Academic Unit / Program BISC	Name (typically, Graduate Program Chair) Mike Hart	Email bisc_dgsc_chair@sfu.ca
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ACADEMIC UNIT APPROVAL

A course outline must be included.

Non-departmentalized faculties need not sign

Graduate Program Committee Michael Hart	Signature 	Date 12 January 2023
Department Chair Tony D. Williams	Signature 	Date 12 January 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 January 16, 2023
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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 16/02/2023
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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: _____

BISC 633 – Environmental Microbiology

Course Details:

This course is an overview of environmental and applied microbiology. It will consist of a combination of lectures, computer labs and completion and dissemination of a project on a relevant topic of student's choosing. Lecture topics will include microbial growth and kinetics, thermodynamics and microbial metabolism, biogeochemical cycling, microbial ecology, and applied microbiology.

The lab will familiarize students with methods for analysing microbial communities, and how to analyze and visualize results from these types of data.

Learning objectives

Have an in-depth understanding of growth, metabolism and energy conservation in microorganisms

Understand basic ecological and evolutionary processes that impact microbes

Discuss and describe the contribution of microorganisms to global biogeochemical cycling and provisioning of ecosystem services

Be familiar with biotechnological applications of microbial communities in natural and engineered environments

Have in-depth knowledge of the roles of microorganisms in the natural process or biotechnological application of your choosing

Effectively communicate scientific information in oral and written formats

Analyse and present microbial community datasets using appropriate methods

Grading

Midterm exam: 20%

Final exam: 30%

Lab assignments: 20%

Project: 20%

Prerequisites

BISC 303 or permission of the instructor. A basic knowledge of microbiology is required.

Required readings

There is no official course textbook. Readings will be assigned from a variety of sources including textbooks and primary literature. Recommended readings/ course resources include Brock Biology of Microorganisms 15th Ed. (available in reserves at the library), and Environmental Microbiology: From Genomes to Biochemistry, E. Madsen 2nd Ed (available online from the library).

To: Faculty Graduate Studies Committee
From: Gwenn Flowers, EASC Graduate Program Chair
Re: Course ~~change. EASC 810 &~~ EASC 629
Date: 19 Dec 2022

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

~~EASC 810: course change from 0 units to 3 units~~

EASC 629: New Course

This change should be effective for Fall 2023.

A handwritten signature in black ink, appearing to read "Gwenn Flowers", written in a cursive style.

Gwenn Flowers, EASC Graduate Program Chair



New Graduate Course Proposal

Please save the form before filling it out to ensure that the information will be saved properly.

Course Subject (eg. PSYC)	EASC	Number (eg. 810)	629	Units (eg. 4)	3
Course title (max 100 characters including spaces and punctuation) Advanced Engineering Geology					
Short title (for enrollment/transcript - max 30 characters) Advanced Engineering Geology					
Course description for SFU Calendar * Application of engineering geology and geotechnics to geohazards and engineering projects. Topics include: Engineering geological characterization; slope failure mechanisms; stability analysis methods; seismically induced landslides; remote sensing tools; slope and tunnel reinforcement; geotechnical site assessment for engineering construction. Case studies illustrate the influence of geotechnics in resource industries.					
Rationale for introduction of this course This course enables graduate students whose research will include a component of engineering geology or geotechnics to access this area of specialization of the instructor. The course is designed to provide a graduate level understanding of engineering geology and its application to natural hazards or geotechnical problems that is not met by any graduate courses currently offered by Earth Sciences or other departments at SFU.					
Effective term and year Fall 2023		Course delivery (eg 3 hrs/week for 13 weeks) 5 hrs/week for 13 weeks (2hrs lecture and 2hrs lab 1hr seminar)			
Frequency of offerings/year Every 2nd year		Estimated enrollment/offering 2-10			
Equivalent courses (These are previously approved courses that replicate the content of this course to such an extent that students should not receive credit for both courses.) Offered in conjunction with EASC413. No equivalent graduate courses.					
Prerequisite and/or Corequisite ** EASC313 or permission of instructor					
Criminal record check required? ☐ Yes ☒ No If yes, then add this requirement as a prerequisite.					
Campus where course will be taught ☒ Burnaby ☐ Surrey ☐ Vancouver ☐ Great Northern Way ☐ Off campus					
Course Components ☒ Lecture ☒ Seminar ☒ Lab ☐ Research ☐ Practicum ☐ Online ☐					
Grading Basis ☒ Letter grades ☐ Satisfactory/Unsatisfactory ☐ In Progress/Complete				Capstone course? ☐ Yes ☒ No	
Repeat for credit? *** ☐ Yes ☒ No		Total completions allowed? 1		Repeat within a term? ☐ Yes ☒ No	
Required course? ☐ Yes ☒ No		Final exam required? ☐ Yes ☒ No		Additional course fees? ☒ Yes ☐ No	
Combined with an undergrad course? ☒ Yes ☐ No If yes, identify which undergraduate course and what the additional course requirements are for graduate students:					

EASC413. Graduate students will carry out individual research on selected topics to be presented in a seminar, and run a term-long project including field and computational modelling components, with use of advanced remote sensing equipment and specialized software.

* 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.

** If a course is only available to students in a particular program, that should be stated in the prerequisite.

*** This mainly applies to a Special Topics or Directed Readings course.

RESOURCES

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

Faculty member(s) who will normally teach this course
Sergio Sepulveda. Adjunct faculty Davide Elmo, Sonia D'Ambra, Marc-Andre Brideau would also be qualified to teach this course.
Additional faculty members, space, and/or specialized equipment required in order to offer this course
Remote sensing equipment from the EASC Engineering Geology laboratory will be used in fieldwork.

CONTACT PERSON

Department / School / Program	Contact name	Contact email
Earth Sciences	Sergio Sepulveda	ssepulve@sfu.ca

DEPARTMENTAL APPROVAL

REMINDER: New courses must be identified on a cover memo and confirmed as approved when submitted to FGSC/SGSC. Remember to also include the course outline.

Non-departmentalized faculties need not sign

Department Graduate Program Committee Gwenn Flowers	Signature 	Date 29 Nov 2022
Department Chair Glyn Williams-Jones	Signature 	Date 29 Nov 2022

LIBRARY REVIEW

Library review done? ☐ YES

Course form, outline, and reading list must be sent by FGSC to lib-courseassessment@sfu.ca for a review of library resources.

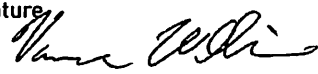
OVERLAP CHECK

Overlap check done? ☒ YES ☐ N/A

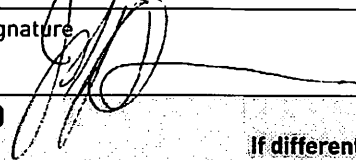
The course form and outline must be sent by FGSC to the chairs of each FGSC (fgsc-list@sfu.ca) to check for an overlap in content. An overlap check is not required for some courses (ie. Special Topics, Capstone, etc.)

FACULTY APPROVAL

This approval indicates that all the necessary course content and overlap concerns have been resolved, and that the Faculty/Department commits to providing the required Library funds and any other necessary resources.

Faculty Graduate Studies Committee (FGSC) Vance Williams	Signature 	Date December 3, 2022
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SENATE GRADUATE STUDIES COMMITTEE APPROVAL

Senate Graduate Studies Committee (SGSC) Jeff Derksen	Signature 	Date 16/02/2023
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ADMINISTRATIVE SECTION (for DGS office only)

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 629 - 3

**Advanced Engineering Geology
D01.00
Semester 2024-3**

Instructor: Sergio Sepulveda
(Email: ssepulve@sfu.ca)

Description/topics: **Course Outline:**
Application of engineering geology and geotechnics to geohazards and engineering projects. Topics include: Engineering geological characterization; slope failure mechanisms; stability analysis methods; seismically induced landslides; remote sensing tools; slope and tunnel reinforcement; geotechnical site assessment for engineering construction. Case studies illustrate the influence of geotechnics in resource industries.

Grading:

1. Midterm	25%
2. Laboratory Reports, Seminar	35%
3. Final Project	40%

Required texts: None

Recommended texts: Geological Engineering, Gonzalez de Vallejo, L.I. & Ferrer, M. 2011. CRC Press, ISBN 978-0-415-41352-7 (hbk). This book was the EASC 313 required text.

Rock Slope Engineering Civil Applications., Wyllie, D.C. September 14, 2017 by CRC Press, 568 Pages - 16 Color & 326 B/W Illustrations ISBN 9781498786270 - CAT# K30229.

Turner A.K. & Schuster, R.L. 1996. Landslides. Investigation and Mitigation. Transportation Research Board Special Report 247.

Materials/supplies: None.

Prerequisite/corequisite: Prerequisite: EASC 313 or permission of instructor.

Notes: *"Be aware that during the field trip there may be periods of strenuous hiking, hiking close to cliffs and crossing roads with busy traffic. Appropriate clothing and footwear are required. Further details regarding safety, food, housing and field supplies will be discussed prior to the field trip. Accommodation for students with mobility issues may be arranged in advance"*

There may be a supplementary fee.

MOLECULAR BIOLOGY AND BIOCHEMISTRY

Memorandum

To: Chair, Faculty Graduate Studies Committee,
Faculty of Science

From: Christopher Beh, MBB Graduate
Program Chair

Re: ~~Graduate Course Changes: MBB 669,~~
~~MBB 727 & ONG 510;~~
~~Course deletions: MBB 726 & MBB 728;~~
New Graduate Course: MBB 764

Date: May 18, 2022

We are requesting approval of the following:

~~1. GRADUATE COURSE CHANGES~~

- ~~a. MBB 669: Special Topics in Genomics – course number, title, description & prerequisites (form attached)~~
- ~~b. MBB 727: Immune System II: Immune Responses in Health and Disease – title & prerequisites (form attached)~~
- ~~c. ONG 510: Seminars in Oncology – description (form attached)~~

~~2. GRADUATE COURSE DELETIONS~~

- ~~a. MBB 726: The Immune System I: Basis of Innate and Adaptive Immunity (form attached)~~
- ~~b. MBB 728: Microbial Pathogenesis (form attached)~~

3. NEW GRADUATE COURSE PROPOSALS

- a. **MBB 764: From Genome to System** (form and outline attached)

We were hoping these changes can be submitted to Grad Studies for their next deadline of June 8, 2022 at noon.

Sincerely,



Dr. C.T. Beh

New Graduate Course Proposal

Course Subject (eg. PSYC) MBB	Number (eg. 810) 764	Units (eg. 4) 3
Course title (max. 100 characters) From Genome to System		
Short title (for enrollment/transcript - max. 30 characters) From Genome to System		
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) Methods that enable the integration of Biochemical, Genetic and Genomic knowledge (BiGG) to reconstruct a genomic scale network that defines the metabolic physiology of an organism will be explored. Applications of these approaches in the fields of microbial evolution, interaction networks, genetic engineering and drug discovery will be discussed.		
Rationale for introduction of this course Genomics / Bioinformatics is an exploding field and the MBB department is fortunate enough to have a strong core group of Research Faculty in these cutting edge disciplines. MBB 464/764 has been created to introduce important material not covered in our other Genomics / Bioinformatics courses.		
Term of initial offering (eg. Fall 2019) Fall 2023	Course delivery (eg. 3 hrs/week for 13 weeks) 4 hrs/week for 13 weeks	
Frequency of offerings/year Once / year	Estimated enrollment per offering 10	
Equivalent courses (courses that replicates the content of this course to such an extent that students should not receive credit for both courses)		
Prerequisite and/or Corequisite An undergraduate bioinformatics course or equivalent		
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: MBB 464; undergrad grading is mostly based on midterm exams, while grad grading focuses mostly on a project paper and presentation.		

* 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 Frederic Pio
Additional faculty members, space, and/or specialized equipment required in order to offer this course Fiona Brinkman, Ryan Morin, Robert Holt

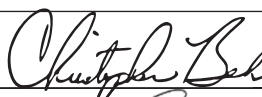
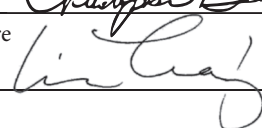
CONTACT PERSON

Academic Unit / Program MBB	Name (typically, Graduate Program Chair) Mimi Fourie	Email mbb@sfu.ca
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ACADEMIC UNIT APPROVAL

A course outline must be included.

Non-departmentalized faculties need not sign

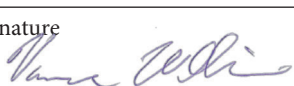
Graduate Program Committee Christopher Beh	Signature 	Date April 8, 2022
Department Chair Lisa Craig	Signature 	Date May 10, 2022

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 January 15, 2023
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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 16/02/2023
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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: _____

MBB 764: FROM GENOME TO SYSTEM (3)

Course outline

CALENDAR DESCRIPTION:

Methods that enable the integration of Biochemical, Genetic and Genomic knowledge (BiGG) to reconstruct a genomic scale network that defines the metabolic physiology of an organism will be explored. Applications of these approaches in the fields of microbial evolution, interaction networks, genetic engineering and drug discovery will be discussed.

COURSE DETAILS:

The process of extracting biochemical content from genome annotations and literature sources to computationally catalog and interconnect the metabolic pathways available to the cell (i.e., metabolic reconstruction) is well established and has been carried out for a growing number of organisms on the genome scale. Such network reconstruction has led to the development of modeling approaches that gain a better understanding of the observable phenotypes and coordinated functions of the cell. As a result, these approaches are being used to apply and develop *in silico* models for biological discovery and engineering applications.

In this course we will cover conceptually some methods that enable the integration of Biochemical, Genetic and Genomic knowledge (BiGG) to reconstruct a genomic scale network that defines the metabolic physiology of an organism. We will also describe through examples computational models that integrate high-throughput data sets for prospective experimentation and validation. Finally, we will show how valuable and relevant these approaches are at making important biological predictions that can be validated experimentally. Applications in the fields of microbial evolution, interaction networks, genetic engineering and drug discovery will be discussed through student presentations.

LECTURE TOPICS:

- What is System Biology?
- Network reconstruction from biological data
- Genomic scale reconstruction of prokaryotes
- Genomic scale reconstruction of eukaryotes
- Biochemical networks
- Genome metastructures
- Biochemically, Genomically and Genetically structured database (BiGG)
- Properties of reconstituted networks
- Phenotype potential of reconstituted networks
- Applications in microbial evolution, genetic engineering, drug discovery, environmental science, synthetic biology and biomedicine

Grading

- 2 Midterm Exams (2x30%) – 60%
 - Paper presentation and participation – a written proposal aimed at answering a biological question using the concepts and tools developed in class will be evaluated – 40%
-