

Faculty of Science

Office of the Dean
St. John's, NL Canada A1B 3X7
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MEETING OF THE FACULTY COUNCIL OF THE FACULTY OF SCIENCE

A regular meeting of the Faculty Council of the Faculty of Science will be held on Wednesday, October 19, 2022, at 1:00 p.m. by WebEx and in-person (Room: C- 2045).

AGENDA

- 1. Regrets**
- 2. Adoption of the Minutes of September 21, 2022**
- 3. Business Arising from the Minutes**
- 4. Correspondence:** None
- 5. Reports of Standing Committees:**
 - A. Undergraduate Studies Committee:** None.
 - B. Graduate Studies Committee:**
 - a. Department of Earth Science, Special Topics Course, EASC 6906, Gem Deposits, approved by the committee and presented to Faculty Council for information only, Paper 5.B.a. (pages 6-11)
 - b. Department of Earth Science, Request for Approval of a Graduate Course, EASC 6060, Gen Deposits, Paper 5.B.b. (pages 12-17)
 - c. Department of Earth Science, Request for Approval of a Graduate Course, EASC 6620, Groundwater Modeling, Paper 5.B.c. (pages 18-22)
 - d. Department of Biochemistry, Calendar change - supervisory committee meetings, Paper 5.B.d. (pages 23-25)
 - C. Library Committee:** No business
- 6. Committee Matrix:** The Committee Matrix is posted on-line ([Committees | Faculty of Science | Memorial University of Newfoundland \(mun.ca\)](#)) for your review and approval.
- 7. Reports of Delegates from Other Councils**
- 8. Report of the Dean**
- 9. Question Period**
- 10. Adjournment**



Travis Fridgen, Ph.D.
Acting Dean of Science



Faculty of Science

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**FACULTY OF SCIENCE
FACULTY COUNCIL OF SCIENCE
Minutes of Meeting of September 21, 2022**

A meeting of the Faculty Council of the Faculty of Science was held on Wednesday, September 21, 2022, at 1:00 p.m. using a Hybrid model (WebEx and In-Person).

FSC 2960

Present

Biochemistry

M. Berry, R. Bertolo, V. Booth, J. Burton, S. Christian, D. Hunt

Biology

A. Chaulk, L. Robinson, Y. Tzenov

Chemistry

C. Bottaro, L. Cahill, H. Grover, F. Kerton, C. Kozak, E. Merschrod, S. Pansare, B. Power, H. Reader, S. Smith, D. Stirling, T. Stockmann

Computer Science

S. Anthony, D. Churchill, A. Fiech, M. Hatcher, C. Hyde, K. Popuri, A. Soares, T. Tricco, F. Tu

Earth Sciences

A. Langille, A. Malcolm, K. Welford

Economics

K. Chu

Mathematics & Statistics

I. Booth, D. Dyer, C. Evans, A. Hatefi, D. Harvey, R. Haynes, J.C. Loredano-Osti, S. MacLachlan, D. Pike, C. Ou, T. Steel, M. Strong, T. Stuckless, Y. Yilmaz-Cigsar

Ocean Sciences

I. Fleming, M. Rise

Physics & Physical Oceanography

E. Hayden, H. Neilson, I. Saika-Voivod, A. Yethiraj, L. Zedel

Psychology

A. Brown, K. Hourihan, C. Quinn-Nilas, C. Walsh, C. Thorpe

Dean of Science Office

J. Blundell, J. Bowering, S. Dufour, M. Fitzpatrick, K. Foss, T. Fridgen, C. Hussey, L. Frizzell, G. Jackson, J. Kavanagh, P. MacCallum, V. MacNab, J. Major, T Mackenzie, R. Newhook, R. Temple

Registrar's Office:

T. Edmunds

Student Representatives:

J. Carter, Deng, E. Dormody, L. Fowler, K. Templeman,

FSC 2961 Regrets:

C. Couturier, G. Dunning, L. Fowler, M. Katz, K. Poduska, S. Mantyka, S. Sullivan

FSC 2962 Adoption of Minutes

Moved: Adoption of the Minutes of the meeting of May 18, 2022. (Dufour/Berry) **Carried.**

FSC 2963 Business Arising: None**FSC 2964 Correspondence: None****FSC 2965 Reports of Standing Committees:**

A. Undergraduate Studies Committee: Presented by Suzanne Dufour, Acting Associate Dean of Science, Undergraduate and Administration:

- a. Department of Computer Science - Calendar Change, Amend Mathematics pre-requisite for Computer Science 2001 and 2022, (Dufour/Fiech) **Carried.**
- b. Department of Computer Science – Calendar Changes, Amend course description for Computer Science 1001, (Dufour/Fiech) **Carried.**
- c. Department of Computer Science – Calendar Changes, New Course – Computer Science 499A/B, (Dufour/Fiech) **Carried.**
An additional minor amendment was requested to specify that there is no cost associated with the change.
- d. Department of Biology – Calendar Changes, Amend program Regulations, 11.2.3.1 Major in Biology, (Dufour/Chaulk) **Carried.**
Minor amendment; correction of typographical errors (Honours in Biology is 11.2.4.1).
- e. Department of Biology – Calendar Changes, Crosslist Biology 4605 with Ocean Sciences 4605, amend course title and update course description, (Dufour/Chaulk) **Carried.**

B. Graduate Studies Committee: Presented by Jacqueline Blundell, Associate Dean of Science, Research and Graduate

Jacqueline Blundell thanked Graham Layne for his hard work and dedication as Chair of the Faculty of Science Graduate Studies committee over the years.

- a. Department of Earth Science, Special Topics Graduate Course, EASC 6956, Applications of Petrochronology, approved by the committee and presented to Faculty Council for information only.
- b. Department of Earth Science, Request for Approval of a Graduate Course, EASC 6560, Applications of Petrochronology, (Blundell/Berry) **Carried.**

C. Library Committee: No business.

FSC 2966 Committee Matrix: Suzanne Dufour thanked the Department Heads and Program Chairs that sent along the names of their departmental representatives. She requested that those who have yet submitted the names of the departmental or student representatives to do so by the next Faculty Council, October 19. She also encouraged all members to review the *Constitution and By-laws of the Faculty of Science Faculty Council* found [here](#).

FSC 2967 Dr. C. Robert Lucas Graduate Fund
Jacqueline Blundell explained that this fund was established through a generous gift from Dr. Lucas who was a former faculty member and head of Chemistry, a former Dean of Science and now a Professor Emeritus. During a difficult financial time in Dr. Lucas' life he was able to avail of a special fund that the university he was attending at the time had for students in this situation. Dr. Lucas' Fund is now providing the same support for students within the Faculty of Science. This fund will help students that find themselves in a difficult financial situation, and help them finish their studies without interruption. We are very pleased to announce that two students have received support from this fund.

FSC 2968 Motion for an Open Phase for the Provost Search:
Travis Fridgen will present the document to the President's office. (Merschrod/ Berry)
Carried.

FSC 2969 Report of the Dean:

Budget update.

The Faculty of Science has received a \$1.5M budget reduction for the 22-23 fiscal year and going forward. The Dean's office has been meeting and working with Department Heads to deal with the reductions and will continue to do so.

Collective bargaining update.

At the April Faculty Council meeting, the Dean provided updates on ongoing negotiations between MUNFA and the University. They met two more times for two-day blocks in May and June and continued to make considerable progress. MUNFA filed for conciliation on June 9th, which is a normal part of the process and both MUNFA and the University met for two days on September 8 and 9, and the Dean characterized the meetings as collegial and productive. Meetings are expected to be held in October and November to continue the process.

FSC 2970 Question Period

There was a discussion on budget reductions in hopes that the Faculty could say no to cuts. However, the budget given to the Faculty of Science is what has to be managed by the Dean. The budget cuts were not strategically distributed to Faculties and were across the board.

A question was raised on the criteria that the Provost uses to decide on the budget. The Dean explained that the Faculty of Science presents a budget request to the Provost and other Faculties and Schools to justify the request and any needed increases. This year a multiple million dollar shortfall was announced, six or eight months after the budget presentations.

Decisions should be made by late October or early November regarding any faculty recruitments that are currently on hold.

Concerns were raised on the University's business model, and faculty would like to have the Provost present at Faculty Council to explain it. The Dean offered to extend an invitation to the Provost to attend Faculty Council.

The Faculty of Science enrollment is down slightly this year, but last year it was up by about 10%. A new budget model was discussed at the end of last spring that would be an activity based model where money follows the students; tuition money would go to the units based on enrollments. In this model, services such as space would then need to be paid. Unfortunately, when the Provost left the University, the review of the budget model was placed on hold. This lost momentum impacts student experience, especially when we are losing supports that are needed to make programs attractive to students and help the students succeed.

Computer Sciences has three positions ready to advertise for the MAI program. The budget didn't affect the plans for artificial intelligence computer lab. This space should be ready for the Winter term since it is funded externally.

The Dean thanked everyone for attending, and reminded everyone about the Dean's Awards Ceremony taking place at 5pm tonight.

FSC 2971

Adjournment

The meeting adjourned at 1:50 p.m.



SCHOOL OF
GRADUATE STUDIES

Request for Approval of a Graduate Course

Adobe Reader, minimum version 8, is required to complete this form. Download the latest version: <http://get.adobe.com/reader>. (1) Save the form by clicking on the diskette icon on the upper left side of the screen; (2) Ensure that you are saving the file in PDF format; (3) Specify where you would like to save the file, e.g. Desktop; (4) Review the [How to create and insert a digital signature](#) webpage for step by step instructions; (5) Fill in the required data and save the file; (6) Send the completed form by email to: sgs@mun.ca.

To: Dean, School of Graduate Studies
From: Faculty/School/Department/Program
Subject: Regular Course Special/Selected Topics Course

Course No.: EASC 6906

Course Title: Gem Deposits

I. To be completed for all requests:

A. Course Type: Lecture course Lecture course with laboratory
 Laboratory course Undergraduate course¹
 Directed readings Other (please specify)

B. Can this course be offered by existing faculty? Yes No

C. Will this course require new funding (including payment of instructor, labs, equipment, etc.)? Yes No
 If yes, please specify:

D. Will additional library resources be required (if yes, please contact munul@mun.ca for a resource consultation)? Yes No

E. Credit hours for this course: 3

F. Course description (please attach course outline and reading list):
 See attached course outline

G. Method of evaluation:	Percentage	
	Written	Oral
Class tests	30	15
Assignments	35	20
Other (specify):		
Final examination:		

Total 100

¹ Must specify the additional work at the graduate level

II. To be completed for special/selected topics course requests only

For special/selected topics courses, there is no evidence of:

	Instructor's initials
1. duplication of thesis work	<u>PB</u>
2. double credit	<u>PB</u>
3. work that is a faculty research product	<u>PB</u>
4. overlap with existing courses	<u>PB</u>

Recommended for offering in the Fall Winter Spring 20 23

Length of session if less than a semester:

III. This course proposal has been prepared in accordance with General Regulations governing the School of Graduate Studies**Philippe Belley** Digitally signed by Philippe Belley
Date: 2022.10.07 10:06:03 -02'30'

Course instructor

7 Oct 2022


Date

Alison Leitch Digitally signed by Alison Leitch
Date: 2022.10.07 10:09:53 -02'30'

Approval of the head of the academic unit

7 October 2022

Date

IV. This course proposal was approved by the Faculty/School/Council

Secretary, Faculty/School/Council

14 October 2022

Date

EASC 6906: Gem Deposits

Learning Outcomes

To gain a broad understanding of gemstones, their mineralogy, chemistry, inclusions, treatments, deposit genesis, and economic geology.

To critically assess scientific literature, and to develop and employ systems thinking by relating scientific data in many sub-fields to broader geological concepts and to economic geology.

Topics covered

- Gemstones as a commodity
 - Why gemstones are valued; how their value is determined.
 - Market demand; supply chains; geopolitics; sustainability.
 - Gem minerals of principal economic importance.
 - Perspectives on gemstone mining.
- Gemstone mineralogy, physical properties, chemical composition, and inclusions.
 - Optical properties; causes of color.
 - Major & trace element chemistry.
 - Inclusions and their significance.
 - “Origin”/Provenance determination and the challenge of accuracy.
- Gemstone treatments & synthetics.
- Gem deposit geology
 - Diamonds
 - Corundum (ruby/sapphire)
 - Beryl (variety emerald)
 - Jade
 - Pegmatite-hosted deposits
 - Other selected gemstone deposits
 - Placer deposits
- Gem Deposits and Exploration

Instruction Method

Reverse classroom approach where readings and research topics are assigned. Participants come to class prepared to present and discuss the assigned readings or topics. The instructor will relate information learned in literature to the economic aspects of the gem mining industry. Students will have the opportunity to observe various gem materials, both rough and faceted, using binocular microscopes, and relate observations to the learned material.

Resources

The “Geology of Gem Deposits, 2nd edition” volume (2014; ed.: L.A. Groat) published by the Mineralogical Association of Canada will be used in addition to numerous papers from the published peer-reviewed literature.

Prerequisites

Permission of the instructor following determination of suitable background or experience. A foundational understanding of mineralogy and geochemistry are required, and knowledge of metamorphic and igneous petrology is highly beneficial.

Exercises

Students are expected to complete readings from the “Geology of Gem Deposits” volume and published literature, demonstrating their understanding by providing written summaries, and discussing them in class. Students will produce a maximum of one deliverable per week.

Research Project

Each student will produce a written research project outlining the mineralogy, physical properties and chemistry of a gem mineral, in addition to describing its’ geology in detail (including geodynamic settings, regional and local geological settings, genetic model(s), host rocks, associated minerals, and important sources/deposits). Graduate students will be expected to produce a longer (2×), more in-depth report compared to reports expected of undergraduate students.

Assessment

30 %	Reading summaries
15 %	Discussion (Class involvement)
35 %	Final Project
20 %	Final Presentation

Textbook

Groat, L.A., *ed.* (2014) *Geology of Gem Deposits*, 2nd edition. Mineralogical Association of Canada, Short Course 44, 405 p.

Relevant papers from the literature, such as:

Gemstone colour

Fritsch, E. & Rossman, G.R. (1987) An update on color in gems. Part 1: Introduction and colors caused by dispersed metal ions. *Gems & Gemology* 23, 126-139.

Fritsch, E. & Rossman, G.R. (1988) An update on color in gems. Part 2: Colors involving multiple atoms and color centers. *Gems & Gemology* 24, 3-15.

Fritsch, E. & Rossman, G.R. (1988) An update on color in gems. Part 3: Colors caused by band gaps and physical phenomena. *Gems & Gemology* 24, 81-102.

Provenance & Origin Determination

McClure, S.F., Moses, T.M., & Shigley, J.E. (2019) The geographic origin dilemma. *Gems & Gemology* 55, 457-462.

Palke, A.C., Saeseaw, S., Renfro, N.D., Sun, Z., & McClure, S.F. (2019a) Geographic origin determination of blue sapphire. *Gems & Gemology* 55, 536-579.

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Sun, Z., Palke, A.C., Moyal, J., DeGhionno, D., & McClure, S.F. (2019) Geographic origin determination of alexandrite. *Gems & Gemology* 55, 660-681.

Vertriest, W., Palke, A.C., & Renfro, N.D. (2019) Field gemology: Building a research collection and understanding the development of gem deposits. *Gems & Gemology* 55, 490-511.

Deposit Geology

Belley, P.M. & Groat, L.A. (2020) Metamorphosed carbonate platforms and controls on the genesis of sapphire, gem spinel, and lapis lazuli: Insight from the Lake Harbour Group, Nunavut, Canada and implications for gem exploration. *Ore Geology Reviews* 116, article 103259.

Belley, P.M., Dzikowski, T.J., Fagan, A., Cempirek, J., Groat, L.A., Mortensen, J.K., Fayek, M., Giuliani, G., Fallick, A.E., & Gertzbein, P. (2017) Origin of scapolite-hosted sapphire (corundum) near Kimmirut, Baffin Island, Nunavut, Canada. *Canadian Mineralogist* 55, 669-699.

Giuliani, G., Groat, L.A., Fallick, A.E., Pignatelli, I., & Pardieu, V. (2020) Ruby deposits: A review and geological classification. *Minerals* 10, article 597.

Giuliani, G., Groat, L.A., Marshall, D., Fallick, A.E., & Branquet, Y. (2019) Emerald deposits: A review and enhanced classification. *Minerals* 9, article 105.

Kjarsgaard, B.A., de Wit, M., Heaman, L.M., Pearson, D.G., Stiefenhofer, J., Januszczak, N., & Shirey, S.B. (2022) A review of the geology of global diamond mines and deposits. *Reviews in Mineralogy and Geochemistry* 88, 1-117.

Palke, A.C., Renfro, N.D., & Berg, R.B. (2016) Origin of sapphires from a lamprophyre dike at Yogo Gulch, Montana, USA: Clues from their melt inclusions. *Lithos* 260, 339-344.

Simmons, W.B., Pezzotta, F., Shigley, J.E., & Beurlen, H. (2012) Granitic pegmatites as sources of colored gemstones.

Exploration

Belley, P.M., Shang, P., & Lake, D.J. (2020) Gem exploration using a camera drone and geospatial analysis: A case study of peridot exploration in British Columbia, Canada. *Journal of Gemmology* 37, 80-90.

Beus, A.A. (1979) Sodium – a geochemical indicator of emerald mineralization in the Cordillera Oriental, Colombia. *Journal of Geochemical Exploration* 11, 195-208.

Groat, L.A. (2019) Adding logic to luck: recent advances in coloured gem exploration in Canada. *Journal of Gemmology* 36, 524-532.

Kjarsgaard, B.A., Januszczak, N., & Stiefenhofer, J. (2019) Diamond exploration and resource evaluation of kimberlites. *Elements* 15, 411-416.

Turner, D., Groat, L.A., Rivard, B., & Belley, P.M. (2017) Reflectance spectroscopy and hyperspectral imaging of sapphire-bearing marble from the Beluga Occurrence, Baffin Island, Nunavut. *Canadian Mineralogist* 55, 787-797.



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To: Dean, School of Graduate Studies
 From: Faculty/School/Department/Program
 Subject: Regular Course Special/Selected Topics Course

Course No.: EASC 6060

Course Title: Gem Deposits

I. To be completed for all requests:

A. Course Type: Lecture course Lecture course with laboratory
 Laboratory course Undergraduate course¹
 Directed readings Other (please specify)

B. Can this course be offered by existing faculty? Yes No

C. Will this course require new funding (including payment of instructor, labs, equipment, etc.)? Yes No
 If yes, please specify:

D. Will additional library resources be required (if yes, please contact munul@mun.ca for a resource consultation)? Yes No

E. Credit hours for this course: 3

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See attached course outline

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Final examination:		

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Recommended for offering in the Fall Winter Spring 20 23

Length of session if less than a semester:

III. This course proposal has been prepared in accordance with General Regulations governing the School of Graduate Studies

Philippe Belley Digitally signed by Philippe Belley
Date: 2022.09.18 12:09:04 -02'30'

Course instructor

18 September 2022

Date

Alison Leitch Digitally signed by Alison Leitch
Date: 2022.10.06 15:35:37 -02'30'

Approval of the head of the academic unit

6 October 2022

Date

IV. This course proposal was approved by the Faculty/School/Council

Secretary, Faculty/School/Council

Date

EASC 6060: Gem Deposits

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GRADUATE STUDIES

Request for Approval of a Graduate Course

Adobe Reader, minimum version 8, is required to complete this form. Download the latest version: <http://get.adobe.com/reader>. (1) Save the form by clicking on the diskette icon on the upper left side of the screen; (2) Ensure that you are saving the file in PDF format; (3) Specify where you would like to save the file, e.g. Desktop; (4) Review the [How to create and insert a digital signature](#) webpage for step by step instructions; (5) Fill in the required data and save the file; (6) Send the completed form by email to: sgs@mun.ca.

To: Dean, School of Graduate Studies
 From: Faculty/School/Department/Program
 Subject: Regular Course Special/Selected Topics Course

Course No.: EASC 6620

Course Title: Groundwater Modelling

I. To be completed for all requests:

A. Course Type: Lecture course Lecture course with laboratory
 Laboratory course Undergraduate course¹
 Directed readings Other (please specify)

B. Can this course be offered by existing faculty? Yes No

C. Will this course require new funding (including payment of instructor, labs, equipment, etc.)?
 If yes, please specify: Yes No

D. Will additional library resources be required (if yes, please contact munul@mun.ca for a resource consultation)? Yes No

E. Credit hours for this course: 3

F. Course description (please attach course outline and reading list):

EASC 6620 Groundwater Modelling examines the basic theory and methods for numerical modelling of groundwater. Governing equation, boundary conditions, model dimensionality, calibration, space & time discretization, and steady-state and transient simulations are discussed.

G. Method of evaluation:	Percentage	
	Written	Oral
Class tests	50	
Assignments	20	
Other (specify):		
Final examination:	30	

Total 100

¹ Must specify the additional work at the graduate level

II. To be completed for special/selected topics course requests only

For special/selected topics courses, there is no evidence of:

Instructor's initials

- 1. duplication of thesis work _____
- 2. double credit _____
- 3. work that is a faculty research product _____
- 4. overlap with existing courses _____

Recommended for offering in the **Fall** **Winter** **Spring** 20 ____

Length of session if less than a semester:

III. This course proposal has been prepared in accordance with General Regulations governing the School of Graduate Studies



Digitally signed by Tao Cheng
DN: cn=Tao Cheng, o=Memorial University, ou,
email=tcheng@mun.ca, c=CA
Date: 2022.10.06 16:34:24 -02'30'

Course instructor

6 October 2022

Date

Alison Leitch

Digitally signed by Alison Leitch
Date: 2022.10.06 16:40:19 -02'30'

Approval of the head of the academic unit

6 October 2022

Date

IV. This course proposal was approved by the Faculty/School/Council

Secretary, Faculty/School/Council

Date

EASC 6620: Groundwater Modelling

Course description

EASC 6620 Groundwater Modelling examines the basic theory and methods for numerical modelling of groundwater flow. Governing equation, boundary conditions, model dimensionality, calibration, space & time discretization, and steady-state and transient simulations are covered, using MODFLOW, a widely used finite-difference model, as an example. Students gain hands-on experience in dealing with field-scale modelling problems using computer software.

Learning Outcomes

To gain knowledge in theory and methods for numerical modelling of groundwater flow.

To gain hands-on experience in using computer software to solve groundwater problems.

Justification for the course

Enhance Earth Science graduate students' ability to solve problems quantitatively using advanced mathematical methods and computer software, which will better prepare graduate students for their future careers.

Strengthen environmental geoscience curriculum at graduate level in the Department of Earth Sciences. Currently, only a few graduate level environmental geoscience courses are being offered. If the proposed course is offered, environmental geoscience graduate students will have more course options to better suit their needs.

Provide opportunities for graduate students in other academic units to take a groundwater modelling course. Over the past a few years, as the instructor of an undergraduate course EASC 4620 Groundwater Modelling, I have received many inquiries from graduate students from other academic units (e.g., Environmental Engineering and Environmental Science). They are interested in taking a groundwater Modelling course at graduate level.

Course Topics

Part 1: Introduction to groundwater modelling

1.1 Conceptual model, analytical model, numerical model

1.2 Model dimensionality, setting boundaries

1.3 Groundwater flow equation, boundary conditions

1.4 Steady-state model, transient model

1.5 Model calibration

Part 2: MODFLOW: a finite-difference flow model

2.1: Derivation of the finite-difference equation

2.2: Design of the ground-water flow process

2.3: Basic package

2.4: Internal flow packages

2.5: Stress packages

2.6: Solver packages

Textbooks

(1) Anderson, M.P., W.W. Woessner, and R.J. Hunt, 2015. **Applied Groundwater Modeling, Simulation of Flow and Advective Transport** (2nd Edition). Academic Press (**Required**. Full text is available online via MUN library website.)

(2) Harbaugh, A.W., 2005. **MODFLOW-2005, The U.S. Geological Survey Modular Ground-Water Model—the Ground-Water Flow Process**. (**Required**. A PDF version of this manual is free for download from the Internet.)

Instruction method

Both lecture and lab will be used for instruction. Lectures (~3 hours per week) are given by the course instructor. Students are required to read assigned materials and engage in discussion with the instructor during the lectures. Labs (~3 hours per week) are exclusively numerical exercises involving derivation and manipulating of equations, calculations, and modelling of groundwater flow using computer software.

Resources

The course will be offered using existing teaching resources available in the Department of Earth Sciences and taught by existing faculty (Dr. Tao Cheng). No additional resources are required. Students will use the Groundwater Vistas computer software, which has already been purchased and installed on computers in computer labs for EASC 4620 students.

Current library holdings are sufficient. No new library resources are needed.

Prerequisites

EASC 3610 (the former EASC 4610) or ENVS 4479 or equivalence. You are expected to have the knowledge of the basic theories in groundwater flow, surface-groundwater interactions, field and laboratory techniques, and have good understanding of calculus. You are expected to have successfully completed MATH 1000 Calculus I, MATH 1001 Calculus II, and EASC 3610 Hydrogeology (or equivalence of these courses) when you take this course. Although knowledge of linear algebra and numerical analysis will help you understand the course materials, courses in these areas are not required.

Credit restrictions: EASC 4620

Most materials in the EASC 6620 will be very similar to the materials in EASC 4620, and EASC 6620 and EASC 4620 will be taught concurrently. However, additional work will be required for EASC 6620 students to gain more in-depth knowledge. The three exams for EASC 6620 and EASC 4620 will be the same, however, the exams will account for 70% of the final grade for EASC 6620 but 90% of the final grade for EASC 4620. Additionally, EASC 6620 students will be given two term projects, each of which is

worth 15% of the final grade and more involved than the EASC 4620 term project, which is worth 10% of the final grade. EASC 6620 is therefore intended for graduate students who have not earned credit for EASC 4620 (i.e., graduate students from other departments and institutions). Students who have earned credit for EASC 4620 are not allowed to register or get credit for EASC 6620.

Evaluation

Mid-term # 1 (20%)

Mid-term # 2 (20%)

Final exam (30%)

Term project #1 (15%)

Term project #2 (15%)

October 13, 2022

Biochemistry- Frequency of supervisory committee meetings

Proposal

Currently, Biochemistry has a requirement for graduate students to have twice yearly committee meetings. We propose to change this to a yearly requirement to be more consistent with SGS regulations. In addition, we propose to remove the requirement for students to be solely responsible for scheduling committee meetings.

Background

The requirement that graduate students have twice yearly committee meetings made this very difficult to track, and therefore, difficult to enforce. In addition, either the supervisor, the supervisory committee, or the student should be able to call a committee meeting when it is deemed to be needed by any party. Changing our regulations to match the SGS requirements (section 4.9.3.1) will allow the department to more easily track the frequency of meetings and follow-up with the student and supervisory committee as appropriate. However, as a committee meeting early in the student's program is beneficial for students to appropriately plan their thesis research work, we are also requiring that students have their first committee meeting within 6 months after admission.

October 13, 2022

PROPOSED CALENDAR CHANGES-

31.5.2 Program of Study

1. The program of a student for the M.Sc. Degree shall be the responsibility of the supervisory committee, composed of the Supervisor and at least two other faculty members recommended with the concurrence of the Supervisor by the Head of the Department or delegate.
2. All students must enrol in Biochemistry 6999 (Seminars in Biochemistry and Food Science), and must complete Biochemistry 7000 (Graduate Skills) plus a minimum of 6 credit hours of graduate courses with a minimum 'B' grade. Depending on the background and/or area of specialization, a student's program may include additional courses taken for credit in Biochemistry, Food Science, or related subjects.
3. ~~*It is the responsibility of the student to arrange regular meetings with the student's supervisory committee. A semi-annual report, A supervisory committee report, prepared within the first 6 months after admission followed by at least annually, by the Supervisor and signed by all members of the supervisory committee, is required to be given to the Head of the Department or delegate.*~~
4. Master of Science students are required to complete a M.Sc. oral defence of their thesis research. The defence will be examined by the Supervisory Committee (at least three voting members) and chaired by the non-voting Deputy Head (Graduate), or delegate. The defence and first round of questions will be open to the public; the second round of questions will be in camera. Outcomes of the defence will be:
 - a. "Proceed" - proceed to submission of thesis to the School of Graduate Studies for examination; or
 - b. "Do not proceed" - the supervisory committee will convene to make a final recommendation on the student's overall program as per the **General Regulations** of the School of Graduate Studies **Supervisory Reports** and **Termination of a Graduate Program**.
5. The M.Sc. Degree program will conclude with a thesis examination as prescribed in the **Regulations Governing the Degree of Master of Science**.

43.3.2 Program of Study

1. The program of a student for the Ph.D. Degree shall be the responsibility of the supervisory committee, composed of the Supervisor and at least two other faculty members recommended with the concurrence of the Supervisor by the Head.
2. All students must enrol in Biochemistry 6999 (Seminars in Biochemistry and Food Science), and must complete Biochemistry 7000 (Graduate Skills) if they have not already done so. Depending on the background and/or area of specialization, a student's program may include additional courses taken for credit in Biochemistry, Food Science or related subjects.
3. ~~*It is the responsibility of the student to arrange regular meetings with the student's supervisory committee. A semi-annual report, A supervisory committee report, prepared within the first 6 months after admission followed by at least annually, by the Supervisor and signed by all members of the supervisory committee, is required to be given to the Head of the Department or delegate.*~~
4. A student for the Ph.D. degree shall normally take the Comprehensive Examination within the first seven semesters of the student's program. The examination will have two components: the preparation of a grant proposal on a topic related to the student's research specialization followed by an oral examination of the proposal. Failure of this examination will result in the termination of the student's program.

October 13, 2022

CLEAN VERSION

31.5.2 Program of Study

6. The program of a student for the M.Sc. Degree shall be the responsibility of the supervisory committee, composed of the Supervisor and at least two other faculty members recommended with the concurrence of the Supervisor by the Head of the Department or delegate.
7. All students must enrol in Biochemistry 6999 (Seminars in Biochemistry and Food Science), and must complete Biochemistry 7000 (Graduate Skills) plus a minimum of 6 credit hours of graduate courses with a minimum 'B' grade. Depending on the background and/or area of specialization, a student's program may include additional courses taken for credit in Biochemistry, Food Science, or related subjects.
8. A supervisory committee report, prepared within the first 6 months after admission followed by at least annually, by the Supervisor and signed by all members of the supervisory committee, is required to be given to the Head of the Department or delegate.
9. Master of Science students are required to complete a M.Sc. oral defence of their thesis research. The defence will be examined by the Supervisory Committee (at least three voting members) and chaired by the non-voting Deputy Head (Graduate), or delegate. The defence and first round of questions will be open to the public; the second round of questions will be in camera. Outcomes of the defence will be:
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