

## **Cyclical Program Review of Geological Sciences and Geological Engineering**

### **2021-2022 CPR Bridging Report**

In light of the COVID-19 pandemic and the subsequent delays to the cyclical program review (CPR) process, programs are being asked to provide an update on the final assessment report and implementation plan of their previous CPR cycle.

The plan and one year progress report below was agreed to by the Vice Provost (Teaching and Learning), Dean (Faculty of Arts and Science), Dean (Faculty of Engineering and Applied Science) and the Vice-Provost and Dean (School of Graduate Studies) in October 2014. The Deans are responsible for monitoring the implementation plan.

Please complete the table below to report on any progress made. Add further explanation if necessary in the *additional notes* section.

Please complete this report and return it to [gugap@queensu.ca](mailto:gugap@queensu.ca) by April 12, 2021. The Vice Provost (Teaching and Learning) will review this progress report. It will then be appended to the program's delayed CPR and filed in the Office of the Provost and Vice-Principal (Academic). Please note that monitoring reports will be posted on the university website.

| Final Assessment Report and Implementation Plan  |  |   |   | Follow-up and Bridge to the Next CPR   |
|--|--|---|---|--|
| Recommendation   | Proposed Follow-up   | Responsibility for Leading Follow-up  | Timeline for Addressing Recommendation  | Please indicate whether the implementation was completed, and provide a brief description and any recent updates on initiatives  |
| Improve lines of communication between the Faculty of Arts and Science and the Faculty of Engineering and Applied Science to ensure effective and integrated program decisions and continues student satisfaction. | Initiate retreat with relevant deans, associate deans, department head and senior faculty to ensure discussions involving strategic planning, budgeting and revenue generation are inclusive | Deans of Engineering and Applied Science and Arts and Science   | Dean of Engineering and Applied Science's <i>Annual Report</i> to the Provost 2015<br><br>Dean of Arts and Science's <i>Annual Report</i> to the Provost 2015 | <ul style="list-style-type: none"> <li>The Deans of Arts &amp; Science (FAS) and Engineering &amp; Applied Science (FEAS) meet at regular intervals throughout the year.</li> <li>As part of the commitment of both faculties to improve communications and ensure effective and integrated decision-making, both the Deans initiated an External Review of the Engineering Science programs, including Geological Engineering, Math and Engineering, and Engineering Physics. The review began in June 2021, and at the time of this revision, the results of the review are not yet available.</li> <li>Many GEO faculty, and especially those who are professional engineers or soon to be, are involved in teaching, curriculum development, other service roles including undergraduate chair (advising and curriculum), FEAS curriculum committee, and the Continuous Improvement Committee for Graduate Attributes/ CEAB accreditation.</li> <li>The Geological Sciences department is also actively involved in planning for the first-year engineering curriculum, including introducing important elements on ethics, EDII (equity, diversity, inclusion, and Indigeneity), and the effect of engineering in the environment.</li> <li>There was especially close collaboration during the planning for remote delivery during the 2020-2021 academic year.</li> <li>The Geological Engineering program has received three six year accreditations since 2005 and the next accreditation visit is expected in the Fall of 2023.</li> </ul> |
| Seek ways to reduce time-to-completion for thesis-based graduate students  | Consult with other departments and the School of Graduate Studies to identify best practices   | Head, Department of Geological Sciences and Geological (GSGE) Engineering and the Vice-Provost and Dean, School of Graduate Studies | Vice-Provost and Dean of the School of Graduate Studies' <i>Annual Report</i> to the Provost 2015   | <ul style="list-style-type: none"> <li>My review of the times to completion for graduate students from 2014 to 2021, indicates that the time to completion is decreasing for the Ph.D. In reviewing these data, I note that students withdraw or are withdrawn by SGS from all degrees except the Pattern 2 Masters of Applied Geology (Table below).</li> <li>The factors influencing time-to-completion were investigated to determine if barriers could be reduced or removed. Most of the factors that lengthen studies (illness, field work delay, job opportunities) are unavoidable.</li> <li>We encouraged all supervisors and graduate students to ensure that students who may need accommodations are registered with QSAS.</li> <li>We encourage co-supervision of research masters students by external professionals or faculty members within the department in order to provide mentorship and guidance</li> </ul>   |

|  |  |   |  |   |
|--|--|---|--|---|
|  |  |   |  | <p>more similar to the PhD committee structure as required by SGS (not required at the masters level).</p> <ul style="list-style-type: none"> <li>We are considering adopting the process used by Environmental Studies to alert those faculty supervising students when the student is within 2 to 3 terms from expected completion. It will be discussed at future departmental meetings.</li> </ul>  |
| Continue to develop the proposed two new professional master's program in <i>Natural Resource Intelligence</i> and in <i>Earth and Energy Resources Leadership</i> with an eye to diversifying the unit's program offerings by launching new credentials | Department and School of Graduate Studies collaborate in steering proposal for new program(as) through QUQAP process | Head, Department of Geological Sciences and Geological (GSGE) and Vice-Provost and Dean, School of Graduate Studies | Dean of the School of Graduate Studies' <i>Annual Report</i> to the Provost 2015   | <ul style="list-style-type: none"> <li>The Masters of Earth Energy Leadership (MEERL) program is now fully operational, has graduated 26 MEERL students, with 20 in program.</li> <li>MEERL is delivering on the promise of a mostly on-line high quality part-time professional program geared at early to mid-career working professionals.</li> <li>Students from four continents are in or have completed the MEERL program. Faculty are from GSGE, Smith, the MacDonald Institute, Economics, and retired professionals such as a 35 year veteran of the United Nations and a former director of strategic initiatives for a major gas company</li> <li>Owing to the heavy commitment of time, human resources and alumni + eCampus funding required to create MEERL with all purpose-developed courses, the decision was taken by the previous head in consultation with the proponent to delay the proponent of the Natural Resrouces Intelligence program indefinitely.</li> </ul>  |
| Build on its pedagogical innovation by developing blended, online and modular courses as appropriate to its programs   | Initiate meeting with Associate Vice-Provost (Teaching and Learning)   | Head, Department of Geological Sciences and Geological (GSGE) and Associate Vice-Provost (Teaching and Learning)    | <p>Dean of Engineering and Applied Science's <i>Annual Report</i> to the Provost 2015</p> <p>Dean of Arts and Science's <i>Annual Report</i> to the Provost 2015</p> | <ul style="list-style-type: none"> <li>The MEERL program is on-line, and we have additional graduate courses that are taught on-line from time-to-time (e.g. GEOL 849)</li> <li>I have requested the opportunity to develop fully on-line courses but at the present time, the proposed courses do not meet the criteria of ASO.</li> <li>During Covid restrictions, all programs were moved to remote delivery during the 2020-2021 academic term. GSGE faculty have been exceptionally innovative in creating virtual lab and field components. The Engineering Teaching and Learning Team (ETLT), the Centre for Teaching and Learning (CTL), and Arts and Science On-line (ASO) supported members of the department in developing online resources and in the development of remotely delivered courses.</li> <li>Similarly we have scanned and made available 3D models for teaching laboratories that will remain in a digital archive for future use. These will augment the physical collections.</li> <li>Recently, a course called Applied Hydrogeology (GEOL/GEOE 343) was developed with the support of the ETLT using the blended mode. This course will continue to be offered this way in the 2021-2022 academic year.</li> <li>Most faculty are planning to use innovative materials and modules developed under Covid to augment their course development</li> </ul> |

## Additional Comments:

Please identify any new initiatives that would be part of the upcoming CPR.

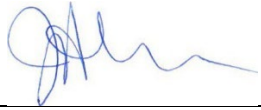
- Supports for students
  - 2017, we created the Garnet Program to match young alumni with undergrads and grads to assist with the job search. The program has become highly valued by students.
  - We work closely with the undergrad Miller Club and graduate Joliffe Club on events and programs to engage students. Reports from the student clubs are a standing agenda item on all departmental meetings.
  
- Outreach
  - We have funds dedicated to create a rock garden on the main lawns of Miller Hall, complete with an outdoor “conversation circle”, as part of bringing the Miller Museum to the outdoors. The plans for the Rock Garden involve discussions with the Office of Indigenous Initiatives, using plantings native to eastern Ontario and curated rock specimens. We have an informal (email) agreement with the Agnes Etherington Art Centre, that the stone sculpture facing University Avenue will be relocated to the Rock Garden. These plans have been interrupted by Covid.
  - In the summer of 2020, we developed the curriculum for a summer camp “Terraforming Mars”. Owing to the pandemic, we decided to launch the camp in 2022. We have the commitment of prominent Geo Alumni involved in research / NASA to present a Q&A panel with campers (including Dr. Drew Feustel) and hope to 3D print a scale model of a Marsha (Mars habitat)
  
- Space and Renovations:
  - The 2014 Review (CPR) by the external reviewers noted that Miller Hall is “in an advanced state of decrepitude”. To that end, we are fund-raising for renovations to some 90 year old laboratory spaces which are at present, un-useable. We would also like to refresh the lobbies of Miller and Bruce to help support what we hope will be a new vision and identity for the department. (We are revisiting changing the name of the department in the coming year.)
  
- EDII
  - Like many units, we were moved to launch an EDII committee in June 2020. The committee works at arms-length and the recommendations are supported by the head. In addition we have joined URGE (<https://urgescience.org>) . Both URGE and the EDII committee are now standing items on the agenda for Departmental meetings.
  - In April 2019, in conjunction with local elders, we developed a workshop for faculty and staff on Indigenous Ways of Knowing. Owing to the pandemic we were unable to undertake a second workshop.
  
- Research:
  - The new Geoselenics Project, focused on fundamental research into the Earth and Moon Interaction is underway. , with seed money from a thoughtful alumni donor and the hiring of the first Geoselenics post-doctoral fellow.
  - The past academic year has seen the awarding of numerous accolades to members of the department. Notably, Assistant Professor Chris Spencer received the Geological Society of America’s Donath Medal for an outstanding early career researcher (under 35).
  
- Governance

- The Governance committee, formed in late 2019, and chaired by the Head, is working through internal procedures to ensure that regulations and processes align with those of Faculty Boards and Senate. As mentioned above, we are revisiting the name of the department again in the coming year.

| Table: GSGE Completion times for graduate degrees (MAG, MSC, MASc, Ph.D)                     |   |                    |                    |                         |                    |                    |                         |                    |                    |                         |                    |                    |
|--|---|--------------------|--------------------|-------------------------|--------------------|--------------------|-------------------------|--------------------|--------------------|-------------------------|--------------------|--------------------|
|  | MAG*  |                    |                    | MSC§                    |                    |                    | MASC&                   |                    |                    | Ph.D                    |                    |                    |
|  | Average number of terms   | Standard Deviation | Number of Students | Average number of terms | Standard Deviation | Number of Students | Average number of terms | Standard Deviation | Number of Students | Average number of terms | Standard Deviation | Number of Students |
| 2014-2015  | 3.4   | 0.5                | 7                  | 9.2                     | 2.9                |                    | 8.3                     | 1.2                |                    | 13.7                    | 5.4                | 6                  |
| 2015-2016  | 3.1   | 1.2                | 12                 | 8.9                     | 2.0                | 7                  |                         |                    |                    | 13.4                    | 5.3                | 8                  |
| 2016-2017  | 2.8   | 0.4                | 5                  | 8.8                     | 2.3                | 8                  | 7.3                     | 1.4                | 7                  | 13.8                    | 2.9                | 5                  |
| 2017-2018  | 3.9   | 2.4                | 8                  | 9.3                     | 2.7                | 6                  | 7.3                     | 0.5                | 6                  | 12.5                    | 3.8                | 4                  |
| 2018-2019  | 3.0   | 0.7                | 5                  | 9.5                     | 3.5                | 8                  | 7.0                     | 0.0                | 3                  | 11.5                    | 1.3                | 4                  |
| 2019-2020  | 5.0   | 0.0                | 1                  | 7.6                     | 4.5                | 8                  | 7.4                     | 0.9                | 5                  | 10.8                    | 4.4                | 5                  |
| 2020-2021  |   |                    |                    | 8.0                     | 2.2                | 7                  | 7.5                     | 0.6                | 6                  | 9.5                     | 2.1                | 2                  |
| 2014-2021  | 3.5   |                    | 38                 | 8.8                     |                    | 44                 | 7.5                     |                    | 27                 | 12.2                    |                    | 34                 |
| * nominally 1 year course work Master's informally called MAG                                |   |                    |                    |                         |                    |                    |                         |                    |                    |                         |                    |                    |
| § research Masters   |   |                    |                    |                         |                    |                    |                         |                    |                    |                         |                    |                    |
| & research Masters done by students who wish to obtain the P.Eng, supervisor must hold P.Eng |   |                    |                    |                         |                    |                    |                         |                    |                    |                         |                    |                    |
| 2020-2021  | yellow highlighting indicates data as of March 2021   |                    |                    |                         |                    |                    |                         |                    |                    |                         |                    |                    |
| 2014-2021  | green highlighting indicates number of terms, per program, averaged over the period from 2014 to 2021 |                    |                    |                         |                    |                    |                         |                    |                    |                         |                    |                    |



**Signatures:**



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Dean, Faculty of Arts and Science

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**May 19, 2021**

Date




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Dean, Faculty of Engineering and Applied Sciences

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September 7 2021

Date



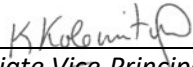
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Dean, School of Graduate Studies (if applicable)

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September 7, 2021

Date



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Associate Vice-Principal (Teaching and Learning)

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September 15, 2021

Date

Approved by the Senate Cyclical Program Review Committee:

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November 26, 2021

Date