

**CARLETON UNIVERSITY COMMITTEE ON
QUALITY ASSURANCE**

**Cyclical Review of the undergraduate and graduate programs in Cognitive Science
Executive Summary and Final Assessment Report**

This Executive Summary and Final Assessment Report of the cyclical review of Carleton's undergraduate and graduate programs in Cognitive Science is provided pursuant to the provincial Quality Assurance Framework and Carleton's Institutional Quality Assurance Process (IQAP).

EXECUTIVE SUMMARY

The undergraduate and graduate programs in Cognitive Science resides in Institute of Cognitive Science, a unit administered by the Faculty of Arts and Social Sciences.

As a consequence of the review, the programs were categorised by the Carleton University Committee on Quality Assurance (CUCQA) as being of **GOOD QUALITY** (Carleton's IQAP 7.2.12).

The External Reviewers' report, submitted to Institute of Cognitive Science on July 6th, 2018, offered a very positive assessment of the programs. Within the context of this positive assessment, the report nonetheless made a number of recommendations for the continuing enhancement of the programs. These recommendations were productively addressed by the Director of Institute of Cognitive Science, the Dean of the Faculty of Arts, and the Dean of the Faculty of Graduate and Postdoctoral Affairs in a response to the External Reviewers' report that was submitted to CUCQA on May 8th, 2019.

An Action Plan detailing how, when and by whom the recommendations will be implemented was received and approved by the Senate Quality Assurance and Planning Committee (SQAPC) on October 17th, 2019.

Quality Assurance Action Plan

Cognitive Science

Program Cycle: 2016-17

Completed by: Mark MacLeod Date: July 2, 2019

Dean or delegate: Pauline Rankin Approval date: July 15, 2019

External Reviewer Recommendation	Unit Action Item *	Timeline & Owner
<p>A1. Space</p> <p>a. That with IIS leaving the 22nd floor plans are already in place to renovate the entire floor with all of it then available to the Institute of Cognitive Science. Given our suggestions about faculty expansion and the undergraduate space to follow, this will barely be enough. If there are desires to expand the Institute further, which is imminently possible with additional marketing, more space will be required. If there was an opportunity to expand in such a way as to bring together the entire Institute including the labs, this would certainly be beneficial for the cohesion and collegiality of cognitive science at Carleton.</p>	<p>When the 22nd floor is available, we will have sufficient office space for all current faculty members and staff.</p>	<p>Sept. 2019 Space Committee Approval Dean's Approval</p>
<p>b. The undergraduates emphasized the value of a small seminar-style meeting space, and the faculty also mentioned that a space for collaborations and small working groups could be valuable to them as well. If such a space could be included in the renovations, and if a means could be found to share the space between students and faculty, both groups would be served. Very possibly there would be benefits for collegiality and collaborations achieved by bringing together faculty, students, and staff in a multipurpose collaborative space.</p>	<p>See above – a small seminar room will be created from the space currently occupied by the main office. Students will be able to book the seminar room for working together.</p>	<p>Sept 2019 (as above) Space Committee Approval Dean's Approval</p>
<p>c. There is a desire to set up an EEG / fNIRS suite in the lab area, and the Director of the Institute has identified a suitable space. This suite could be critical to the research success of cognitive neuroscience faculty while also being a valuable resource for students at all levels. We recommend allocating the necessary resources to realize that suite including any renovations necessary to allow for clean data collection.</p>	<p>Jouravlev, Muldner, & Herdman were successful in obtaining a CFI grant to set up this suite. Space is available in VSIM 2nd floor. Plans are underway to renovate and acquire the equipment.</p>	<p>Space ready and equipment obtained by Sept 2019. Jouravlev, Muldner to find equipment. Herdman coordinating space renovations.</p>

<p>A2. Faculty Growth - The Institute is strong in Philosophy, Linguistics and Psychology, but not as strong in the areas of Computer Science and Cognitive Neuroscience. Recent hires in Cognitive Neuroscience may fill some of the gap in that area, but we felt an additional hire in this area would also be extremely valuable to both students and the program itself, especially given how active a research area it is. However, even more important at this point is a hire in Computer Science. Students very much want to acquire more skills in this area, and these skills are at a premium both in academic and in industry pathways. Thus, we believe a Computer Scientist with 100% association with the Institute should be a hiring priority, with another Cognitive Neuroscientist (perhaps shared, perhaps not) as a second priority.</p>	<ol style="list-style-type: none"> 1. Tier 2 CRC Chair split with Psychology “Cognition and Wellness”; this position will support the department in general, but will contribute little to teaching resources. 2. Replacement position for Ash Asudeh with expertise in Computational Modeling (and ability to teach AI courses). 3. New position in Cognitive Neuroscience, 100% in ICS. 	<ol style="list-style-type: none"> 1. Advertising in Summer/Fall 2019; Appointment would be for July of 2021. 2. Advertising in Fall 2019; Appointment for July 2020. Dean’s approval 3. Not approved for 2019-20
<p>A3. <i>Undergraduate Administrator Position.</i> Although listed third in this list, we feel very strongly that the Undergraduate Administrator position that is not yet permanent should be made permanent as soon as possible. Smaller units have such permanent positions and it was clear to us that the work that is already being performed, along with many of the suggestions we make here, would more than justify making this administrative position permanent. Unfortunately, this position was not approved for base funding in the 2018-19 budget submission</p>	<p>This position was approved and funded by the Dean’s office. The hiring committee interviewed in June. Position was filled for July 1st.</p>	<p>No further action needed.</p>
<p>A4. <i>Ethics.</i> This recommendation is a little more tentative. As alluded to previously we heard complaints from several sources about the slowness and number of hoops associated with the process of applying for ethical approval via the university Research Ethics Board. The feeling was that measures that are important for high risk human research were being applied even to very low risk research, unnecessarily slowing down research projects, even to the point where it was making the completion of honour’s theses challenging and frustrating. REBs work a little differently at different institutions (and sometimes depend on the particular constitutions of the committee) and it is not clear how much influence an administration might have over their processes. But if some form of expedited or exempt review could be created for low risk research studies, one that still ensures proper ethical standards for conducting research but is able to do so in much less time, that could eliminate a lot of frustration and allow research to proceed more efficiently.</p>	<p>Not under the unit’s control.</p>	<p>No action needed.</p>

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<p><i>U1. Students desire more exposure to computer science courses (R, Python) and more opportunities in Cognitive Neuroscience. It is possible that recent hires may help with the Cognitive Neuroscience offerings but we recommend an additional hire in Computer Science with 100% appointment to the Institute of Cognitive Science</i></p>	<p>See item A2 above.</p>	
<p><i>U2. Only list courses in the Calendar that are actually available. Apparently many of the listed courses are not available and may not be available for some time. Students find these ambiguities in communication frustrating.</i></p>	<p>Not clear what courses were meant here. All cognitive science courses up to 4th year are available every year. Graduate courses are available every 2nd year. CGSC 5001 has not been offered for a few years but alternatives have been available.</p>	<p>Unclear what the problem is. It is unclear which students raised this issue.</p>
<p><i>U3. The opportunity for engaging in research via Independent Studies courses is not communicated sufficiently at present. Students claimed they only learned about these opportunities through peers and although they are presented in the calendar, the information presented is vague and understated given the value of these courses to them. One possibility would be to reserve an occasion early in the academic year for faculty to “pitch” their research, to give students a better sense of research opportunities. They also felt that a more systematic matching process or technology that connects students to faculty would be valuable. This would also possibly remedy an apparent inequity in the number of honours theses mentored by different faculty members. Currently, the onus of chairing honours theses is falling to heavily on a few faculty members.</i></p>	<p>Students appear to be talking about two different things here: Independent Studies courses, which are rare; and the Honours Thesis course. While both involve independent supervision by a faculty member, we typically do not advertise Independent Study courses because of the burden it would place on faculty resources. We do already have a course in place, CGSC 3908, which helps prepare students for the Honours Thesis, and faculty members already visit this course to “pitch” their research.</p>	<p>No action needed.</p>
<p><i>Students indicated difficulties “connecting the dots” over the first two years of the program. That is, they had difficulties understanding the relevance of the courses they were taking until about the third year when finally the convergences of the different course topics were made clear. Perhaps a “so you feel lost at sea” pamphlet could help, though another idea was to choose some theme central to Cognitive Science (e.g., emotion, intelligence, etc) and have faculty associated with the different pillars give short presentations about how that theme is considered from the perspective of their pillar, thereby providing explicit examples of how these perspectives interrelate and crossfertilize.</i></p>	<p>The CGSC 2001 course has been restructured such that it will function less as an introduction and more as a course that will help students pull together the different areas. In addition, a prerequisite has been added (CGSC 1001). *</p>	<p>Undergraduate supervisor. Rename CGSC 2001 (Summer 2019).</p>

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<p><i>U5. Students would very much appreciate the opportunity to interact with more senior and already graduated students, especially alumni who have left academia. They feel such sessions would give them a clearer sense of what one can do with a Cognitive Science degree, and which pathways are best preparations for specific opportunities</i></p>	<p>We plan to organize periodic Career talks. We will be reaching out to the CSSA for planning support.</p>	<p>Co-op supervisor will organize these sessions.</p>
<p><i>U6. In general students found the co-op office not as useful as it could be. They feel that the co-op group does not understand what the Cognitive Science program is all about, and the kinds of skills and knowledge gained in the program and how that prepares them well for certain opportunities. We recommend some form of liaison to the co-op program to bridge that knowledge gap in a way that will make co-op work better for all.</i></p>	<p>Our Co-op supervisor is aware of these issues and is in regular contact with the Co-op office.</p>	<p>No further action needed.</p>
<p><i>U7. The students greatly appreciated the small first year seminar courses. They felt they provided them with direct practice in critical thought, oral communication and written communication at a critical juncture early in their university experience. One comment that produced a lot of resonance came from a student who said “I don’t know if I really appreciated that course at the time, but in retrospect it was one of the most valuable courses I have taken at university”. Here our recommendation is straightforward: keep these courses in place if at all possible.</i></p>	<p>We will continue to offer our three sections of FYSM 1607.</p>	<p>No action needed.</p>
<p><i>U8. The students noted that in the Computer Science department there is a small collaborative drop-in space wherein students can work together on collaborative projects or share information related to courses. They see this space as serving many functions including connecting peers and facilitating information sharing. They indicated that such a space with the Institute of Cognitive Science could serve a similar function and in so doing could enhance the undergraduate experience significantly.</i></p>	<p>see item A1(b), above.</p>	

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<p><i>U9. Generally speaking, we heard about a tension around opportunities for doing research with faculty. The issues around the previously discussed independent studies courses aside, the growing number of students interested in honours thesis projects has grown to a point wherein it is a significant challenging finding enough faculty to supervise projects. New hires will help this, as would the additions we recommend. Perhaps other options should be considered as well, such as greater employment of team projects, or more use of a hierarchical structure that allows senior graduate students to perform some of the supervision duties. Greater involvement of graduate students in project-based training of undergraduate students not only enables more frequent and more personalized training of undergraduates, but also provides valuable mentoring and supervising training for graduate students.</i></p>	<p>We have not had students expressing this to us directly. All honours students who are qualified and who want to do honours theses are accommodated. Many students volunteer in labs prior to their thesis year.</p>	<p>Undergraduate supervisor/administrator will continue to provide information to students. Participation in the 3rd year honours class (CGSC 3908) will continue to be a pathway to research activities.</p>
<p><i>G1. Some incoming graduate students did their undergraduate work in the Institute of Cognitive Science and Carleton, and some did not. Currently all of these students are required to take courses that introduce them to Cognitive Science, courses that the returning students feel are unnecessary for them. They would appreciate some option of being exempted from these courses (e.g., testing out?) so they could take other courses they feel would be more interesting or relevant for them. If this option is already available, then they are not aware of it, and these options should be made more apparent.</i></p>	<p>All incoming graduate students are encouraged to meet with the graduate supervisor to choose courses. Exceptions and/or alternative courses are chosen on a case-by-case basis.</p>	<p>Graduate supervisor.</p>
<p><i>G2. Echoing the undergraduates, the graduate students also indicated a desire for more advanced coursework in the areas of Computer Science (especially AI and Machine Learning) and Cognitive Neuroscience. This convergence across students is represented in our hiring recommendations above.</i></p>	<p>See item A2, above. Our 4th year course will be moved to 3rd year (i.e., CGSC 4001 will be renamed and renumbered as CGSC 3xxx).* A new 4th year/graduate course will be created that will be project based.*</p>	<p>Undergraduate supervisor/administrator (Summer 2019).</p>

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<p><i>G3. Also similar to their undergraduate peers, the graduate students indicated a desire to hear from and interact with those who went before them. They would appreciate events in which alumni and others who are applying cognitive science in industry and government visited the program to describe what they are doing now, and what they wished they had known as graduate students now that they see things from a workforce position. Perhaps some form of homecoming event (at the Institute level) could accommodate the desires of both the undergraduate and graduate communities while bringing together the “Institute Community” as a whole. We understand there is already a Spring Conference wherein current students present their work; perhaps a “Cognitive Science Careers” workshop could be part of that event, allowing different groups to have a turn “taking the floor” and presenting their perspectives. NOTE: This would necessitate some means of tracking alumni and keeping the communication channels open with them. There are other potential benefits (success statistics, fundraising, etc) for improving alumni tracking.</i></p> <p><i>Three other mechanisms worth considering for strengthening the connection between the Institute and alumni are: 1) institute an award for outstanding alumni achievement, 2) create a periodic cognitive science newsletter that is sent to current students and faculty as well as alumni, and 3) constitute an advisory board for the Institute including alumni as well as local representatives from industries related to cognitive science.</i></p>	<p>We plan to organize periodic Career talks. We will be reaching out to the graduate student organization for planning support.</p> <p>We are in the planning stages for publishing an annual Institute newsletter. The newsletter will provide faculty and student updates, and will be targeted at current students, alumni, and prospective students.</p>	<p>Graduate supervisor/graduate committee (Career talks).</p> <p>Graduate and Undergrad admin staff (Newsletter).</p>

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<p><i>G4. We understand that there currently is a weekly Cognitive Science colloquium series, but that attendance is spotty, and perhaps the meetings are not as regular as they should be. We previously highlighted the power of the first year seminar courses for undergraduates. These colloquia should perhaps be seen as the “other bookend” of this same experience for graduates. We recommend that all graduate students be required to attend, perhaps even listing it as a course with pass/fail grading based on attendance. Students should be encouraged to present their work at this venue, as should faculty from the Institute. These contexts are important for continuing the development of critical thought in students, fostering a collegial and interactive intellectual atmosphere, and providing practice with clear and effective communication.</i></p>	<p>During the 2018-2019 academic year more effort was put into making new graduate students aware of the colloquium series (it was discussed during graduate orientation, and thesis supervisors encouraged their students to participate). As a result, we saw improved student attendance, and will continue these practices going forward.</p>	<p>Graduate supervisor/Thesis supervisors (ongoing).</p>
<p><i>G5. Carleton’s graduate degree programs are some of the few programs to offer stand-alone degrees in cognitive science not dependent or housed within another department. Furthermore, several of the faculty members have attained international prominence for their cutting-edge research in cognitive science. Given Carleton’s competitive advantage in cognitive science, we were surprised by the relatively low number of graduate applications for both the Master’s and PhD degrees. The number of applications is lower than would be expected for a program of Carleton’s stature and the relative popularity of cognitive science as a field compared to the small number of universities offering degrees in cognitive science. Even if growth is not desired at this point, the uniqueness and value of this program should be promoted more widely with the goal of increasing the quality of students in the Institute. Again, the training students receive is extremely valuable and relevant given current trends in AI, Machine Learning, Big Data, and online interactions, and there is every reason to believe that good marketing could result in significantly more applications at the graduate level, and even at the undergraduate level. As the quality of the cohort increases so too does research output, external funding, and collaborations.</i></p>	<p>Note: This year we have 16 new students. Part of the increase is because of admitting more international students (1 funded; others self-funding).</p> <p>We are going to constitute a Public Relations Committee this fall, whose mandate will be to determine effective methods for promoting the unique strengths that our Institute has to offer.</p>	<p>New Public Relations committee (Fall 2019).</p>

***Will any of the Action Items described above require calendar changes? If yes, please indicate which ones.**