

# Review of the Department of Computer Science

## University of Regina

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### *External reviewers:*

- Dr. Mourad Debbabi, Professor of Computer Science, Concordia University
- Dr. Peter van Beek, Professor of Computer Science, University of Waterloo

### *Internal reviewer:*

- Dr. Maria Vélez Caicedo, Professor of Geology

Site visit dates: April 17–18, 2017

Report date: June 11, 2017

## **Executive summary**

The Department of Computer Science of the University of Regina was established in 1968. Since then, it evolved to a nationally and internationally recognized academic unit that has provided teaching and research in computer science, information technology, and software systems development. In terms of undergraduate programs, the Department offers five BSc undergraduate programs: BSc Major in Computer Science, BSc Honours in Computer Science, BSc Combined Major in Computer Science and Mathematics, BSc Honours Combined Major in Computer Science and Mathematics, and a BSc in Software System Development. In terms of graduate programs, the Department offers an MSc degree (including thesis-based, project-based, co-op based, and course based options) as well as a PhD degree in Computer Science. As for research, the Department has an established capacity in three main areas, namely: Artificial Intelligence, Digital/Multi-Media and Software Systems Development.

On April 17th and 18th 2017, the Review Committee conducted a site visit to the Department of Computer Science, University of Regina. During this visit, the committee met with the Department faculty members, technical and administrative staff, student representatives as well as the leaders of the Department and the Faculty of Science in addition to members from the senior administration of the University. The analysis of the received documentation and the collected information from the Review Committee meetings confirms that Department is fulfilling, with dedication and professionalism, its teaching and research missions despite the modest number of faculty members and limited allocated resources. Moreover, the Department maintains a set of comprehensive and active undergraduate and graduate programs. In terms of research, the Department has active and diverse research programs supported by Tri-Agency funding, and other government and private-sector sources.

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*The unit review of the Department of Computer Science is divided into the following sections. As specified in the University of Regina policy on academic unit reviews, within each section the review committee gave careful consideration to the priorities and aspirations of the unit and the extent to which they are being realized, and the challenges and opportunities faced by the unit.*

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## 1. Introduction

The review committee for the University of Regina's Department of Computer Science consisted of two external reviewers (Dr. Mourad Debbabi, Concordia University, and Dr. Peter van Beek, University of Waterloo) and one internal reviewer (Dr. Maria Vélez Caicedo). Prior to the site visit, the review committee received extensive information about the department and the university including helpful links to the University's Strategic Plan 2015–2020; the Strategic Plan for Teaching and Learning; the Academic Unit Review Policy; the Department of Computer Science Self-Study, and a data analysis of Computer Science spending, enrollment, tuition, research revenue and teaching for the seven most recent years. During the site visit, the review committee met with academic and research administrators of the University and of the Faculty of Science. Within the Department of Computer Science, the review committee met with the Head of the Department, faculty members, advising and administrative staff, systems and technical staff, laboratory instructors, graduate students, and undergraduate students. The review committee also had the opportunity to tour some of the instructional laboratories. The full agenda for the site visit can be found in Appendix A.

The review committee wishes to express their thanks to all who met with us for taking time out of their busy schedules to helpfully answer our many, sometimes probing, questions. The committee in particular wishes to express their thanks to Dr. Malek Mouhoub, Head of the Department of Computer Science, for all his efforts in answering our questions and providing background data during and after our visit. The committee also acknowledges the authors of the Department of Physics Unit Review Report, which we used as a model for this report.

## 2. Teaching: Undergraduate

*In this section, we address the structure and quality of the undergraduate programs and instruction; the contribution of each program to related disciplines and fields of study; and the degree to which academic programs meet students' learning needs and goals.*

**Structure of undergraduate programs.** The Department offers five BSc undergraduate programs: BSc Major in Computer Science, BSc Honours in Computer Science, BSc Combined Major in Computer Science and Mathematics, BSc Honours Combined Major in Computer Science and Mathematics, and a BSc in Software System Development. As shown in Table 1, the number of undergraduate students in Computer Science BSc programs has grown significantly in the past few years reaching 402 students in Fall 2016. The Computing Research Association (CRA), an association of more than 200 computer science departments and research laboratories, notes that this surge in enrollments is widespread in Canada and the United States and provides evidence that this growth is likely to continue (see <http://cra.org/data/generation-cs/>). Of the programs offered by the Department, the BSc Major is overwhelmingly the most popular, with the remaining programs having smaller enrollments: the BSc in Software System Development has enrollment in the low teens, the BSc Combined Major in Computer Science and Mathematics has single digit enrollments, and there have been no BSc Honours graduates over the last few years. A co-op option, which allows students to obtain career-related work experience while working towards their degrees, is available with all BSc programs. Over the last ten years, a total of 537 students have graduated with a BSc in

Computer Science, with 37 graduating in the most recent year. As well, the Department offers a Post-Diploma BSc, a Minor in Computer Science, a Minor in Creative Technologies, and a Certificate in Computer Science for training or continuing education. As well, we note that the Department has several new initiatives, such as a 2+2 program with Chizhou University and a BSc in Computer Science with a Business Area of Concentration, which may further increase enrollments.

*Table 1: Number of undergraduate students in Computer Science BSc programs  
(Source: Registrar and Malek Mouhoub)*

Date	Professors	CS Students
Fall 2010	16	187
Fall 2011	17	199
Fall 2012	16	226
Fall 2013	17	239
Fall 2014	15	275
Fall 2015	15	312
Fall 2016	14	402

All applicants who meet the eligibility requirements for the Faculty of Science are eligible to major in Computer Science. For example, students entering from high school are required to have a 70% average on a specified set of high school courses. The Review Committee notes that the Faculty of Engineering and Applied Science has put in place higher eligibility requirements in order to ensure that the number of students admitted are commensurate with the faculty, staff, and laboratory resources available. For example, Engineering specifies that students who are admitted with a high school admission average of 80% or greater will be granted their first preference of a major at the time of admission. Such higher eligibility requirements may be necessary for Computer Science as well to ensure that the Department continues to offer high-quality programs to its undergraduates.

**Recommendation 1:** That the Faculty of Science considers increasing the allocated resources to the Department of Computer Science to be commensurate with the significant increase in enrollment, or in the absence of increased resources, the Faculty considers a mechanism for controlling the number of majors in Computer Science by, for example, requiring a higher minimum incoming admission average before guaranteeing that a student gets their first preference of a major at the time of admission.

As noted above, the Department offers a BSc in Software System *Development* (SSD). The SSD program had a total of twelve students enrolled as of Fall 2016 and only one student

graduated in the 2016 convocation year. The Faculty of Engineering and Applied Science offers a BSc in Software Systems *Engineering (SSE)*. The SSE program currently has approximately 25 students in first year and 35–40 are expected in Fall 2017. The programs have the same intent: to educate students in the discipline of software engineering. Currently, the Department contributes to the SSE program through its service teaching. At many Canadian universities, the Bachelor's in software engineering is a joint program between two faculties: Engineering and the faculty home of computer science. Given the size of the relevant departments and the constrained resources, collaborating on offering the software engineering seems prudent.

**Recommendation 2:** That the Department of Computer Science collaborates with the Faculty of Engineering and Applied Science to jointly offer the BSc in Software Systems Engineering.

The Department also performs a significant amount of service teaching, primarily within the Faculty of Science and the Faculty of Engineering and Applied Science (see Table 2). Most BSc degrees in the Faculty of Science and BSc degrees in the Faculty of Engineering and Applied Science require three credit hours of computer science, with the BSc in Physics requiring six hours and the BSc in Electronic Systems Engineering and the BSc in Software Systems Engineering requiring twelve hours. The Review Committee considers the current structuring of computer science education at the University to be most commendable; i.e., where the Department is considered a teaching resource for the University and is responsible for introducing computer science to non-majors. Of course, service related teaching needs to be balanced against teaching computer science for majors.

*Table 2: Service teaching by Computer Science in support of other programs for academic year 2015–2016  
(Source: Department of Computer Science Unit Review Self-Study Report)*

Service to Faculties	100 level	200 level	300 level	Total
Engineering	437	105	16	<b>558</b>
Science	200	19	5	<b>224</b>
Arts	36	3	1	<b>40</b>
All others	13	8	0	<b>21</b>
<b>Total</b>	<b>686</b>	<b>135</b>	<b>22</b>	<b>843</b>

**Quality of undergraduate programs and instruction.** The Department of Computer Science has an active undergraduate curriculum committee and the BSc programs are accredited by the Computer Science Accreditation Council (CSAC), an autonomous accreditation body established by the Canadian Information Processing Society (CIPS). CSAC accreditation was first started in 1980 and is sought by most computer science departments in Canada—including Carleton University and the University of Waterloo, the home institutions of the external members of the Review Committee. Thus, the undergraduate programs offered by the Department are of

comparable content and quality to similar offerings at other Canadian computer science departments. The Department offers a rich set of third and fourth year elective courses to introduce the students to the breadth of the field, including some that, while important and interesting, would be hard to find in much larger departments such as Computer Audio, Interactive Entertainment Software, and Animation Software. Although many of the fourth-year courses are taught only every other year, it should also be noted that the Department provides a detailed chart to the students to help them plan ahead to ensure they are able to take the courses in which they are most interested.

From the tours of the labs, the review of the curriculum, discussions with the curriculum committee, discussions with the faculty, and discussions with the undergraduates, all indications are that the department offers strong, high-quality undergraduate programs. As another indicator of quality, faculty members have won several teaching awards. And as a further indicator of quality, Computer Science has attracted some of the strongest undergraduate students to its programs, including a student that has gone on to do PhD studies at the MIT Media Lab, a student who won the Governor General's Academic Silver Medal, and a student who won the University Medal (see the Self-Study Report for further examples). A risk is that the high quality of the program could be jeopardized by the climbing enrollments if there is no commensurate increase in resources. The faculty members expressed to the Review Committee concerns that class sizes have increased dramatically and teaching assistantship resources had not kept pace with the increases in enrollments.

**Meeting student's learning needs and goals.** The undergraduate students that the Review Committee met with, appeared to be very satisfied with their educational experience. The students mentioned as positive factors: the relatively small class sizes in upper years, the fairly intensive supplemental instruction available in lower courses, the nice way that the courses in the program build upon one another, and that the program and supplemental help is structured in such a way that one can succeed even if she/he has little or no background in computer science upon entering (this is a perennial issue in computer science everywhere, due to the lack of availability and the uneven quality of computer science at the high school level). The undergraduate students also remarked on the overall good relations with their computer science professors. The students mentioned as negative factors: many upper year courses are offered on an alternate year basis and only once in that two-year window, the choice of C++ in the first two years rather than including more popular languages such as Python, and that the example applications in the introductory programming courses are not geared more towards their interests. A strong co-op program provides students with practical experience and helps prepare them for jobs in industry, government, and service industries. An active NSERC USRA program and individual reading courses provide academically-oriented students the opportunity to gain research experience.

### 3. Teaching: Graduate

*In this section, we address the structure and quality of the graduate programs and instruction; the contribution of each program to related disciplines and fields of study; and the degree to which academic programs meet students' learning needs and goals.*

**Structure of graduate programs.** The Department offers the MSc degree (including thesis based, project based, co-op based, and course based options) and the PhD degree in its graduate program. As shown in Table 3, the number of graduate students in Computer Science programs has grown significantly in the past few years. Much of the increase is attributable to the introduction in 2013 of a co-op option for the MSc degree. The current enrollment of 86 graduate students represents about one-third of the graduate students in the Faculty of Science. Of the 86 graduate students, 57 require a considerable amount of time from a supervisor: 29 are PhD, 22 are thesis-based Master's, and 6 are project-based Master's (the course-based and co-op-based Master's require minimal supervisory capacity). This represents an average of a little over two PhD students and two thesis/project-based Master's graduate students per faculty member, a commendable ratio. The major areas of research pursued in the Department include artificial intelligence and data mining; databases, information retrieval, and web intelligence; human-computer interaction; media: animation, audio, games, graphics, image analysis, and visualization; software engineering; and theoretical computer science. Over the last ten years, a total of 174 students have graduated with an MSc or PhD in Computer Science.

*Table 3: Number of graduate students in Computer Science Master's and PhD programs  
(Source: Registrar and Malek Mouhoub)*

Date	Professors	Master's	PhD	Total
Fall 2010	16	40	22	<b>62</b>
Fall 2011	17	39	22	<b>61</b>
Fall 2012	16	36	23	<b>59</b>
Fall 2013	17	59	21	<b>80</b>
Fall 2014	15	62	21	<b>83</b>
Fall 2015	15	53	18	<b>71</b>
Fall 2016	14	57	29	<b>86</b>

The Department was also scheduled to offer a Master's of Health Information Management program, effective Fall 2017. This was to be an online Master's program aimed at information technology professionals in the medical and health sectors both in Canada and elsewhere in the world. A plan was put in place to hire a lecturer to create the courses and to support the online program. However, the lecturer position was put on hold (for at least two years as per the received feedback) as the Provincial Government asked the University to not increase its overall commitments. The Review Committee deems the program design and the calendar descriptions of the courses in the program (Source: <https://www.uregina.ca/gradstudies/programs/comp-sci.html>) to be excellent and the program to be a unique opportunity to attract and train highly qualified personnel in this important area.

**Recommendation 3:** That the Department of Computer Science starts offering the online Master's of Health Information Management program.

**Quality of graduate programs and instruction.** The Department offers a fairly extensive set of graduate courses to introduce the students to the main research foci in the department. As well, graduate students can take a limited number 400-level advanced undergraduate courses towards their degrees. Some graduate students that the Review Committee met with commented on a lack of suitable graduate courses, although it is hard to see how the graduate course offerings could be made more extensive, given the number of faculty members. Graduate students that require significant supervisory capacity (such as thesis-based students) are admitted by the Department's Graduate Committee and graduate students who do not require significant supervisory capacity (such as course-based students) are admitted centrally by the University. This model appears to be working well for the Department, although faculty members that the Review Committee met, expressed concerns related to some incoming students lacking sufficient background to succeed. However, it was also noted that, in the future, the Department will use a qualifying semester for students who may lack sufficient background. The Review Committee's examination of the CVs in the Department's Self-Study Report indicates that faculty members are successful at publishing with their graduate students, a strong indication of the quality of the graduate program. The Department's success at obtaining NSERC Discovery grants, which are judged partly on the applicant's past success at training high-quality personnel, is a further indication of the quality of the graduate program.

**Meeting student's learning needs and goals.** The graduate students that the Review Committee met, appeared to be overall satisfied with their educational experience and the quality of the graduate supervision, although areas of concern were also noted. The Review Committee identified two areas where there may be room for improvement in meeting the learning needs and goals of the graduate students: office space and funding.

*Graduate student office space.* The Review Committee heard that, for many graduate students, their office space is far away from faculty offices and that there is uncertainty about maintaining access to the existing office space. It is clear that the best office space groups graduate students in clusters close to their supervisors; this allows intermingling students across areas, cross-fertilization of ideas, and easy access to one's supervisor. While this may not be possible for all graduate students, the Review Committee notes that in the current space allocation, prime space is given to the CS and Math undergraduate clubs. Clubs do not belong in prime space, especially not at the expense of graduate students. (Note that this is not a statement diminishing the importance of undergraduate students; rather, clubs are accessed by relatively few students and are not central to the academic mission.)

**Recommendation 4:** That the prime space currently allocated to the CS and Math undergraduate clubs be reallocated to graduate student space of the Department of Computer Science.

There is also the perennial problem in departments that space allocated to individual research groups in the past may no longer be commensurate with current graduate student numbers within the research group in the present. The Review Committee certainly understands that space allocation is often a contentious issue within academic units, but nevertheless believes that a reallocation study would be fruitful.

**Recommendation 5:** That the Faculty of Science and the Department of Computer Science perform a space reallocation exercise to ensure that the allocation of research space is commensurate with current needs and graduate student enrollment in each research area.

*Funding for graduate students.* The Review Committee heard that for many graduate students the uncertainty from term to term around their continued funding is particularly stressful. Graduate students are only promised one year of funding upon admittance and they must apply each term for teaching assistantships, marking, and sessional teaching. We heard from both faculty and graduate students that Regina is an expensive place to live and the graduate students were clear in that the financial uncertainty takes a heavy toll. It is the Review Committee's opinion that a minimum of three years of financial support should be guaranteed for PhD students. While increased pools of money are of course desirable, such a financial guarantee is not contingent on new money. Rather, it requires the construction of multi-year funding packages that consist of (perhaps unspecified) combinations of TAs, RAs, marking, and sessional teaching, all subject of course to a student continuing to demonstrate satisfactory performance. In other words, while the duties may vary from term to term, the student is assured that the financial support will be there as long as the student is making satisfactory progress towards their degree.

**Recommendation 6:** That the Faculty of Science and the Department of Computer Science reconsider their decision to only offer a guarantee of one year of financial support for PhD students and devise longer term funding packages of a minimum of three years of support.

Travel funds are available for graduate students to attend conferences and disseminate their research. The amounts are modest, and barely cover conference registration fees.

#### 4. Research

*In this section, we address the scope and significance of the research being pursued in the unit.*

The Review Committee considered the Department's research productivity and the underlying impact as measured by number of publications, quality of journal and conference venues, best paper awards, national and international awards, success in peer-reviewed funding exercises, leadership positions in national and international scientific bodies, and journal editorial

positions and conference program committee participation. In terms of the external funding investigation, it is important to mention that:

- Nine out of fourteen faculty members hold NSERC Discovery grants.
- In the latest NSERC Discovery competition, five faculty members out of five have been successful in renewing their grants. As well, two faculty members currently hold NSERC Collaborative Research and Development (CRD) grants.
- Faculty members have held or are holding several other external grants such as from the following programs/agencies such as NSERC Strategic Projects, NSERC CRD, NSERC Engage, CFI, MITACS, etc.
- One faculty members, namely Dr. Sandra Zilles, holds a Canada Research Chair in Computational Learning Theory.

While this is a very positive indicator on the quality of the research activity being conducted at the Department, there is still a great opportunity to increase the level of external research funding by leveraging programs such as: MITACS, NSERC RTI, NSERC Strategic Grants, NSERC CRD Grants, NSERC Engage, etc. In this regard, the Office of the Vice President Research could encourage and support the faculty members of the Department in preparing applications for the aforementioned programs. In addition, the Faculty of Sciences could take a leading role in assisting the faculty members of the Departments to secure research partnerships with industrial and governmental organizations.

**Recommendation 7:** That the Office of the Vice-President encourage and support the faculty members of the Department to prepare and submit applications to funding agencies such as NSERC and MITACS. In addition, it is recommended that the Faculty of Science takes a leading role in assisting the faculty members of the Department to establish research partnerships with private and public sector organizations.

Furthermore, it is important to mention that the faculty members in the Department of Computer Science regularly publish in very respectable venues. As such, they published, between 2007 and 2016 more than 730 research articles in respectable venues (refereed journals and conferences, books and book chapters). As well, they have been awarded numerous best paper awards and four patents.

The success of a department's research program rests heavily on the quality of its graduate students, and many graduate students in turn are reputation-based when choosing their department. To this end, many computer science departments have established awards committees to ensure that their faculty members are nominated for appropriate scientific (and teaching) awards to bring (well-deserved) recognition and to enhance their reputations.

**Recommendation 8:** That the Department of Computer Science establish an Awards committee (or individual) whose responsibility is to nominate or arrange for nominations of faculty members for University, national, and international awards.

The committee is aware that the current policy of teaching load elaboration neither takes into account the level of supervision of graduate students nor the administration of major research grants. Consequently, faculty members who are very active in research and graduate student supervision end up having a significantly higher load than their colleagues. As such, we recommend enhancing the current policy of teaching load assignment so as to enforce a better fairness.

**Recommendation 9:** That the Faculty of Science and the Department of Computer Science explore establishing a policy for teaching load differentiation that takes into account the levels of graduate student supervision and administration of major research grants.

## 5. Service

*In this section, we address the degree to which the unit is meeting its service responsibilities including service to the institution, service to the scientific discipline or profession, and community engagement and outreach.*

**Service to the institution.** Department members participate and have participated in an appropriate level of service to the University, including significant leadership roles within the Faculty of Science such as Associate Dean (Research & Graduate Studies) and Dean of Science (Acting), as well as numerous faculty and university level committees.

**Service to the scientific discipline or profession.** Department members participate and have participated in an appropriate level of service to their scientific disciplines, including Editor-in-Chief of a journal, Editorial Board members of various journals, program committee members of various conferences, program chairs of various conferences, leadership roles in scientific bodies, and various roles in NSERC grant committees.

**Service to the community and outreach.** The Department participates and has participated in many community service initiatives, including Science Rendezvous, the largest science festival in Canada; the Canada-Wide High-Altitude Balloon Experiment Program (HABEX), an initiative co-lead by Computer Science professor Dr. David Gerhard to give high school students experience and education in science; First Lego League (FLL), an initiative hosted by the Department to introduce children ages 9–14 to computer programming and engineering challenges; Summer Camps, an initiative for children ages 6–12 to provide computer science activities as part of the Summer Sports Camps; and public events such as Science Pub talks, evening public lectures, and TEDx Regina talks. The level of community service and outreach is outstanding, particularly given the size of the department.

## 6. Staffing

*In this section, we address the appropriateness of the levels of academic staff and administrative & support staff, given the opportunities and commitments of the unit.*

Currently, the Department has nine Full Professors, five Associate Professors, and no Assistant Professors. Of serious concern is that over the last seven years the faculty complement has declined from sixteen faculty members down to fourteen faculty members, in spite of the considerable increase in under graduate majors (see Table 1) and the increase in graduate students (see Table 3). A further concern is that, to successfully offer the required undergraduate teaching, the Department makes high use of sessional instructors. The Review Committee examined the demographics of the other departments in Science and counted four Assistant Professors in Biology, one Assistant Professors in Chemistry and Biochemistry, one Assistant Professors in Geology, on Assistant Professors in Physics, no Assistant Professors in Mathematics and Statistics, and no Assistant Professors in Computer Science. Thus, it appears that all but Math and CS have been allocated new faculty positions in the last five or so years. That most other units in Science have been permitted to hire new tenure-track faculty and the Department of Computer Science has not been so permitted is hard to understand, given both the teaching demands of the Department at the undergraduate and graduate levels and the research strength of the Department.

**Recommendation 10:** That the Department of Computer Science be granted the permission to hire a tenure-track faculty member in the upcoming 2017 – 2018 hiring season.

In addition to the faculty complement, the Department has four lab instructors, three IT support staff shared with other units, an administrative assistant, and a program coordinator/student advisor. The Review Committee notes the important role played by these staff members in the undergraduate and graduate programs. It is also important to note that the committee received very strong and positive impact from the students on the contribution of the lab instructors and the administrative staff.

## 7. Financial resources

*In this section, we address the appropriateness of the financial resources of the unit, given the opportunities and commitments of the unit.*

As shown in Table 4, the Department's current operating budget is \$156,085. The operating budget is used mainly for salaries for instruction services: sessional instructors, teaching assistants, laboratory instructors, and tutors. In 2014, the budget was cut by approximately \$40,000 and costs for instructional services have increased mainly due to increased benefit costs for teaching assistants. In contrast, enrollments have gone up significantly, leading to an inadequate number of marking hours for courses and the need for more sessional instructors. The Department recently received an additional \$125,000 for the upgrading of laboratories that was outside of the operating budget.

*Table 4: Computer Science faculty complement and operating budget for last seven academic years  
(Source: Malek Mouhoub)*

Academic year	Professors	Operating budget
2009 – 2010	16	\$181,531
2010 – 2011	17	\$182, 279
2011 – 2012	16	\$188,013
2012 – 2013	17	\$189,919
2013 – 2014	15	\$189,919
2014 – 2015	15	\$150,893
2015 – 2016	14	\$156,085

The Review Committee notes that targeted funding designated for Computer Science appears in the Budget Letter from the Minister of Advanced Education, Government of Saskatchewan, to the Chair, Board of Governors, University of Regina (see Table 5). As specified in the Budget Letters, the budget amounts include “targeted funding to increase capacity in upper year classes in Computer Science programs.” (The Review Committee also notes that the most recent budget letter also indicates a cut of approximately \$5,000,000 from the Provincial contribution to the University’s budget.)

*Table 5: Target funding for Computer Science in recent Budget Letters from Minister of Advanced Education  
(Source: Government of Saskatchewan web site)*

Fiscal year	Targeted funding
2014 – 2015	\$852,000
2015 – 2016	\$861,000
2016 – 2017	\$861,000
2017 – 2018	\$817,900

Although comparisons between departments are difficult as we do not have full information on, for example, the funding and need for the lab instructors across the disciplines, the Review Committee is aware that the Physics Department’s annual budget is approximately one-half that of the Computer Science Department’s annual budget even though the number of undergraduate BSc students and the number of graduate students in Computer Science are both approximately nine times larger, and the level of service teaching is roughly comparable.

**Recommendation 11:** That the Department’s operating budget be increased to reflect the level of activity and student enrollment in the Department.

## 8. Role in meeting the University's strategic plan

*In this section, we address the role the unit plays in meeting the University's vision, mission, goals, and priorities.*

The University of Regina's Strategic Plan 2015 – 2020 identifies three strategic priorities: Student success, research impact, and commitment to our communities. Throughout these priorities, indigenization and sustainability are emphasized. The Department's Self-Study Report specifically refers to and commits to the three strategic priorities identified in the University Strategic Plan.

**Student success.** The Department's efforts align well with this aspect of the Strategic Plan. In this regard, the increased effective and flexible learning opportunities offered by the academic programs of the Department together with the Co-op nature of the programs provide the students with concrete opportunities for experiential learning and position them for success. The Self-Study report lists several examples of successful students. For instance, Natasha Jaques (Honours BSc'12 s, BA'12) has been identified by the President and Vice-Chancellor of the University of Regina, as a student who has demonstrated extraordinary academic achievement. She received the S.E. Stewart Award in Arts and started her PhD at the MIT Media Lab in Fall 2014. Another successful student is Kevin Williams who is recipient of the Governor-General's Academic Silver Medal, which recognizes academic excellence demonstrated by a graduating student receiving a first degree. The Self-Study report lists other examples of student success.

**Research impact.** The Department's efforts also align well with this aspect of the University Strategic Plan. In the latter, "The Digital Future" has been identified as one of the strategic research clusters, given its critical mass in highly-qualified personnel. Thus, Computer Science and its focus on high-impact research are important to the success of the plan. A focus of the Strategic Report is increased Tri-Council funding, and the Department has been very successful in this regard, with five applications funded out of five submissions in the latest round of the NSERC Discovery Grant competition.

**Commitment to our communities.** The Department's efforts also align well with this aspect of the Strategic Report. Examples include the following. The Department's Self-Study Report makes particular mention of a special effort being made to strengthen ties with local industry through collaborative projects, which aligns well with a focus of the Strategic Report. As well, the Department's 2+2 program and other efforts on similar programs aligns well with a focus in the Strategic Report to increase the number of joint programs and collaborations internationally. As a final example, the Department's service to the local community and outreach (see above), contributes significantly to this strategic priority.

**Indigenization and sustainability.** The Department's efforts align reasonably well with the objective of sustainability identified in the Strategic Report as at least three department faculty members (L. Fan, D. Hepting, and B. Yang) are involved in research that supports sustainability. The Review Committee could not identify any Department efforts towards the objective of indigenization.

## 9. Summary of recommendations

The formulated recommendations are summarized hereafter by the order of their appearance in the text of the report:

1. That the Faculty of Science considers increasing the allocated resources to the Department of Computer Science to be commensurate with the significant increase in enrollment, or in the absence of increased resources, the Faculty considers a mechanism for controlling the number of majors in Computer Science by, for example, requiring a higher minimum incoming admission average before guaranteeing that a student gets their first preference of a major at the time of admission.
2. That the Department of Computer Science collaborates with the Faculty of Engineering and Applied Science to jointly offer the BSc in Software Systems Engineering.
3. That the Department of Computer Science starts offering the online Master's of Health Information Management program.
4. That the prime space currently allocated to the CS and Math undergraduate clubs be reallocated to graduate student space of the Department of Computer Science.
5. That the Faculty of Science and the Department of Computer Science perform a space reallocation exercise to ensure that the allocation of research space is commensurate with current needs and graduate student enrollment in each research area.
6. That the Faculty of Science and the Department of Computer Science reconsider their decision to only offer a guarantee of one year of financial support for PhD students and devise longer term funding packages of a minimum of three years of support.
7. That the Office of the Vice-President encourage and support the faculty members of the Department to prepare and submit applications to funding agencies such as NSERC and MITACS. In addition, it is recommended that the Faculty of Science takes a leading role in assisting the faculty members of the Department to establish research partnerships with private and public sector organizations.
8. That the Department of Computer Science establish an Awards committee (or individual) whose responsibility is to nominate or arrange for nominations of faculty members for University, national, and international awards..
9. That the Faculty of Science and the Department of Computer Science explore establishing a policy for teaching load differentiation that takes into account the levels of graduate student supervision and administration of major research grants.
10. That the Department of Computer Science be granted the permission to hire a tenure-track faculty member in the upcoming 2017 – 2018 hiring season.
11. That the Department's operating budget be increased to reflect the level of activity and student enrollment in the Department.

**Appendix A: Agenda of the Review Committee's site visit**

Note: The schedule below does not reflect the addition of Dr. Esam Hussein, Dean of Engineering and Applied Science on Tuesday, April 18, 2:30–3:00 pm.

**UNIT REVIEW 2016-17****Schedule for Department of Computer Science**

External Unit Review Site Visit: **Monday 17 April 2017**

<b>Time</b>	<b>Who/ What</b>	<b>Participants</b>	<b>Where</b>
<b>7:30-8:30</b>	<b>Opening Breakfast</b> <i>Reservation under: University of Regina</i>	<b>Provost, VP (Research), Review Team</b>	<b>Delta Hotel</b> <i>1919 Sask Drive</i>
9:00	Dean of Science, Dr Doug Farenick	<b>Review Team, Dean Farenick</b>	RI 209
9:20	Department Head, Dr Malek Mouhoub	<b>Review Team, Dr Malek Mouhoub</b>	RI 209
9:45	Systems Admin	<b>Review Team, Max Ivanov, Florin Palanciuc, Pat Wagner</b>	RI 209
<b>10:15</b>	<b>Break</b>		
10:30	Computer Science Curriculum Committee	<b>Unit Review Team, Xue- Dong Yang, Yiyu Yao, Guili Liu, Samira Sadoui</b>	RI 209
11:30	Liaison Librarian	<b>Review Team, Charles Phelps</b>	RI 209
<b>12:00-1:30</b>	<b>Lunch</b> <i>Reservation under: Maria</i>	<b>Review Team Only</b>	<b>Lakeshore</b> <i>1350 23<sup>rd</sup> Avenue</i>
1:30	Dean of Faculty of Graduate Studies and Research, Dr Thomas Bredohl	<b>Unit Review Team, Dean Bredohl</b>	RI 209
2:00	Associate Dean of Faculty of Graduate Studies and Research, Dr Karen Meagher	<b>Unit Review Team, Associate Dean Meagher</b>	RI 209
2:30	Lab Instructors	<b>Review Team</b>	RI 209
3:30	Tour of Teaching Labs	<b>Review Team, Alex Clarke, Catherine Song, Guili Liu, Nova Scheidt</b>	Tour
4:00	Undergraduate Students	<b>Review Team</b>	RI 209
4:30	Graduate Students	<b>Review Team</b>	RI 209



## UNIT REVIEW 2016-17

### Schedule for Department of Computer Science

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External Unit Review Site Visit: **Tuesday 18 April 2017**

<b>Time</b>	<b>Who/ What</b>	<b>Participants</b>	<b>Where</b>
8:30	Computer Science Staff	<b>Review Team</b>	RI 209
9:00	Associate Director UR International, Haroon Chaudhry	<b>Review Team</b>	RI 209
<b>10:00</b>	<b>Break</b>		
10:30	Computer Science Faculty	<b>Review Team</b>	RI 209
<b>12:00-1:30</b>	<b>Lunch</b>	<b>Review Team Only</b>	<b>University Club</b>
1:30	Software Systems Engineering	<b>Review Team, Dr Luigi Benedicenti</b>	RI 209
2:00	Associate Dean (Academic), Dr Nader Mobed Associate Dean (Research), Dr Cory Butz	<b>Review Team</b>	RI 209
3:00	Review Team Wrap Up	<b>Review Team</b>	RI 209
<b>3:30-4:00</b>	<b>Post-Review Meeting</b>	<b>Provost, VP (Research), Review Team</b>	RI 209