Final Assessment Report

Academic Review

Mathematics and Computer Science

The Final Assessment was approved by Senate at the May 13, 2016 meeting. The following is the review:

**A.      Summary**

i.   The Self Study was presented to the PPC on February 15, 2013.
ii.  The Review Committee consisted of two external reviewers:  Dr. Walter Tholen, York University and Dr. Sheridan Houghten, Brock University and two internal reviewers, Dr. Doug Franks and Dr. Roman Brozowski.
iii. The site visit occurred on March 21 and 22, 2013.
iv.  The Reviewers' Report was received on April 29, 2013.
v.   The Department's response was provided on October 18, 2013.
vi.  The Faculty Dean's response was received on October 21, 2013.

The academic programs offered by the Department which were examined as part of the review included:

BSc Honours Specialization in Mathematics and in Computer Science
BSc Concurrent Education with an Honours Specialization in Mathematics and in Computer Science
BSc Specialization in Mathematics and in Computer Science
BSc Major in Mathematics and in Computer Science
BA Honours Specialization in Mathematics and in Computer Science
BA Concurrent Education with an Honours Specialization in Mathematics and in Computer Science
BA Specialization in Mathematics and in Computer Science
BA Major in Mathematics and in Computer Science
BA Minor in Mathematics and in Computer Science
Certificate in Game Design and Development

This review was conducted under the terms and conditions of the IQAP approved by Senate.

**B.  Strengths**

According to the Review Committee, "*The Mathematics and Computer Science programs at Nipissing offer tightly organized BA and BSc degree programs of respectable Ontario standards in which students benefit from a most favourable professor-to-student ratio and an early exposure to project- and research-driven learning, guided by a small group of well-prepared and qualified professors whose commitment to excellence in teaching and research is impressive. While students in these programs enjoy the higher-than-normal individual attention by their teachers, the small faculty complement inevitably causes some limitations in students' choices*

*of upper-level courses and specializations. We encourage the Department and the University to take steps to strengthen the Programs further and play a greater role in the design and delivery of "service" courses across the University. Increased connectivity with central University offices and sustained efforts in community outreach to foster stronger student recruitment are also of great importance to the Programs' success, as is an increase in special attention to the retention of students in introductory mathematics and computer programming courses.*"

## C.    Opportunities for Improvement and Enhancement

The Review Team offered the following specific recommendations:

> 1. Strengthen tutoring assistance to students of first-year mathematics courses, especially to those showing weaknesses during the first weeks of the fall term in math preparedness, or difficulty in making the high-school-to-university mathematics transition.

In its response, the Department advised that "*they already took some steps towards enhancing tutoring help for first-year students in the form of online Math Help Center, in addition to the existing face-to-face Math Drop-In Center. We agree, however, that additional help may be required during the first weeks of classes. While individual instructors address the issue of preparedness in various ways, a more centralized approach should be required. Perhaps the University could fund additional TA positions during the month of September which will be used for this purpose. While NU Work positions might be a first suggestion, our recent experience shows that it is almost impossible to find students who are qualified for this program.*"

The Faculty Dean stated "*that the Math Department provides a great deal of student support. They have an online Math Help Centre, as well as a Drop-In Centre—this is beyond what is provided by OSDS. While it may be true that students find the transition in the first few weeks of September especially difficult, it is difficult to address a problem with such a short duration. NUWorks students sought to provide extra support do not have sufficient qualifications. It might be possible to deploy Math graduate students in this role, directing our attention to graduate enrollment might solve this problem as well as ensure the viability of the graduate program.*"

PPC response is as follows: **PPC considers that the Department provides considerable assistance to students showing weaknesses in the first term of Year 1. However, the Department is encouraged to review its existing tutoring activities and to assess their effectiveness in order to ascertain whether additional activities might be warranted, and if so, possible.**

> 2. The Department should explore the possibility of using a different programming language such as Python for first-year courses, with the understanding that other language(s) such as C/C++ (and variants) or Java should still be used in upper-level courses.

The Department responded that they "*are prepared to give this suggestion a serious consideration. The challenging part here is that such a change would require introduction of an additional course and hence additional faculty resources.*"

The Faculty Dean advised that "*the Department of Computer Science has been encouraged by the Dean (former and current) to consider a complementary first-year course in Python that would potentially interest students who are intimidated by programming in C++. This is part of a long list of possible initiatives to encourage students who don't see themselves as programmers to consider Computer Science as a possible major. Human-Computer Interaction, User Experience Design, Developing Web-based Apps are three examples of the kinds of courses that are not heavily dependent on programming with appeal to a wide variety of students.*"

PPC response is as follows: **The Department should explore the possibility of using a different programming language in first year Computer Science courses, and present the findings of that analysis to Dean for further action if warranted.**

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3. The Department should work towards assuming greater responsibility for the teaching of statistics courses across campus that should be tailored to the needs of the various programs but taught by professional statisticians. The core Mathematics requirements should be augmented by an introductory application-oriented statistics course (separate from the current MATH 2076 which may have to undergo some minor modifications in order to avoid duplication of materials), suitable not only for Mathematics majors but also for students of other programs in the social sciences (including Sociology, Psychology, Geography), business, or economics. Differentiated foci of applications may be provided through separate sections of the course or tutorials. [See also Recommendation 7 below.]

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The Department "*completely agrees with this recommendation. Moreover, in the case of statistics, our department already offers the course that is suggested by the reviewers, MATH 1257 Technical Statistics. If necessary, multiple sections of tutorials of the same course can be created to address the needs of specific programs. On the other hand, we expect that administration will follow up with Recommendation 3 to stop and in fact reverse the "statistics spread" (and sometimes even "mathematics spread"!) in the University. We believe that all statistics, mathematics, and IT courses should be returned to its rightful place – the Department of Computer Science and Mathematics*

The Faculty Dean advised that *the Department of Computer Science curriculum currently follows the ACM/IEEE-CS guidelines and the members have agreed to revamp their curriculum according to the newly revised guidelines. For the last two years, the Department has considered the value/benefit of CIPS accreditation. A CIPS accreditation is not necessary; most students are not aware of the designation. Having said this, we offer a rigorous and diverse program of study, so we could obtain the designation.*"

PPC Response is as follows: **This recommendation falls somewhat outside the scope of a "program review" of the Mathematics program, and deals with how other programs incorporate statistics in their programs.**

> 4 (MATH). The Department should explore the possibility of offering Math 3156 Algebra I on an annual basis, if necessary at the expense of courses less central to a solid Mathematics curriculum (such as MATH 3216, MATH 4086) which, depending on student demand and within the constraints of the current faculty complement, may have to be offered less frequently. [See also Recommendation 9 below.]

The Department advised that "*they feel that our current course cycling is quite adequate. In fact, MATH 3216 is a cycled course, and MATH 4086 is a new course, "cross-coded" with the corresponding graduate course, offering of which is subject to enrollment so perhaps there was some misunderstanding on the reviewers' part. Of course, offering Algebra I on an annual basis would be desirable, but we do not see at the moment which courses could be removed from annual offering, since most of them are core courses.*"

The Faculty Dean advised that "*the Department and I agree with this recommendation. This is a Faculty (and potentially an institutional issue); the onus should not be on the department to devise a coherent scheme. In the Dean's office, we have set about coming up with a structure to formalize project and work experience efforts. We should be unveiling a discussion paper by December 2013.*"

PPC response is as follows: **Given existing staffing levels, PPC considers the existing practice of cycling courses, including MATH 3156 Algebra 1, to be appropriate. Should staffing levels change, the Department is encouraged to review that policy.**

> 5 (CS): The ACM/IEEE-CS guidelines are currently at the point of a new revision, named CS-2013. The Department should make every effort to update the Computer Science curriculum as necessary to ensure that it reflects these newest guidelines.

The Department "*agrees with the recommendation and advised that they will adjust course descriptions to reflect the new curriculum CC 2013.*"

The Faculty Dean advised "*that the Department of Computer Science curriculum currently follows the ACM/IEEE-CS guidelines and the members have agreed to revamp their curriculum according to the newly revised guidelines. For the last two years, the Department has considered the value/benefit of CIPS accreditation. A CIPS accreditation is not necessary; most students are not aware of the designation. Having said this, we offer a rigorous and diverse program of study, so we could obtain the designation.*"

PPC response is as follows: **The Department should ensure that the Computer Science curriculum be reviewed to ensure that it meets ACM/IEEE-CS guidelines.**

> 5A (CS): Simultaneously, the Department should investigate accreditation of the Computer Science program by the Canadian Information Processing Society. This will help to inform decisions regarding curriculum and may also help to raise the profile of the Department.

The Department "*agrees with the recommendation and advised that accreditation from the Canadian Information Processing Society may improve the reputation of CS program. We will request some resources to accommodate such an accreditation.*"

The Faculty Dean responded "*that the Department of Computer Science curriculum currently follows the ACM/IEEE-CS guidelines and the members have agreed to revamp their curriculum according to the newly revised guidelines. For the last two years, the Department has considered the value/benefit of CIPS accreditation. A CIPS accreditation is not necessary; most students are not aware of the designation. Having said this, we offer a rigorous and diverse program of study, so we could obtain the designation.*"

PPC response is as follows: **Given existing staffing and enrolment levels, as well as the financial situation of the University, PPC does not consider that obtaining accreditation is warranted at this time.**

> 5B (CS): The Department should explore the possibility of requiring Discrete Mathematics II, Data Structures II and Theory of Computation for Honours Specialization and Specialization students. These would help to fill in some of the required knowledge as specified by ACM/IEEE. Also, without such courses students applying to graduate school may find themselves at a disadvantage.

The Department "*agrees with the recommendation and stated that we may add a new category of "recommended optional courses" to include these courses that are useful for graduate studies.*"

The Faculty Dean responded "*that the Department of Computer Science curriculum currently follows the ACM/IEEE-CS guidelines and the members have agreed to revamp their curriculum according to the newly revised guidelines. For the last two years, the Department has considered the value/benefit of CIPS accreditation. A CIPS accreditation is not necessary; most students are not aware of the designation. Having said this, we offer a rigorous and diverse program of study, so we could obtain the designation.*"

PPC response is as follows: **PPC considers that the Department's response to this recommendation, that of considering a category of "recommended optional courses", to be a reasonable and practical way to achieve this objective.**

> 6. The Department should investigate the feasibility of formalizing student project and work experience by developing a co-op or internship program for Computer Science; likewise for applied areas of Mathematics, such as financial mathematics.

The Department agrees with the recommendation and stated that "*some steps are already taken towards this goal, such as partnership with local businesses and soliciting practical problems from industry that can be used as a basis for research projects. Additionally, the Computer Science Program Advisory Board, consisting of faculty members and representatives from business and industry, has been recently re- established to address, in particular, this challenge.*"

The Faculty Dean stated that "*the Department and I agree with this recommendation. This is a Faculty (and potentially an institutional issue); the onus should not be on the department to devise a coherent scheme. In the Dean's office, we have set about coming up with a structure to*

*formalize project and work experience efforts. We should be unveiling a discussion paper by December 2013."*

PPC response is as follows: **The issue of "project and work experience" is an issue much broader that Mathematics and Computer Science. The Faculty of Arts and Science has developed a mechanism to incorporate this in many of its programs. PPC recommends that the Department investigate how to integrate project and work experience into the curriculum of both Mathematics and Computer Science.**

> 7. The University should make it a priority to hire a true statistician with both a strong mathematical background and proven expertise in statistical applications, who can strengthen and unify the statistics courses across campus. The Computer Science and Mathematics Department should be the "natural home" for such a hire.

The Department "*advised that they agree with the recommendation (see also our response to Recommendation 3 above)."*

The Faculty Dean stated that "*the recommendation to bring Statistics together in one department, esp. for foundations, makes unqualified sense. In the Faculty of Arts & Science, we offer 42+ credits of statistics courses annually, many of them obvious duplication. Additionally, there are Statistics courses offered in the BPhEd, APS, and Education.*
*While I think everyone agrees that upper-year courses should be specialized; first- or second-year fundamentals courses taught by a trained academic statistician (with breakouts/labs) would be preferable to the current model. This is especially true as the new modular curriculum unfolds and we have more students doing double majors (each subject area has its own statistics requirement).*
*Many departments are invested in maintaining their own stats courses. It is possible that only a prioritization exercise will allow us to reorder resources appropriately. The benefits will be the elimination/reduction of redundancy (this is a benefit for both students and faculty); the better training of students; the redistribution of faculty to upper year courses.*
*I support the recommendation for a Statistician to be located in Math/CS, esp. if that person had the support of Sociology, Geography, Economics, Psychology, and Math and, with that support, was asked to lead a discussion around the place of Statistics in our Faculty."*

PPC response is as follows: **This recommendation falls somewhat outside the scope of a "program review" of the Mathematics program, and deals with how other programs incorporate statistics in their programs.**

> 8. The University should consider creating a full-time position in Physics, in an area that offers optimal collaboration with existing faculty expertise in Mathematics, Computer Science and/or the natural sciences.

The Department "*noted that such position has recently been given to the Department and will be advertised shortly."*

The Faculty Dean advised that "*we will be advertising the position shortly. The hiring of a computational physicist is a priority.*"

PPC response is as follows: **The University has hired a full-time position in Physics.**

> 9 (MATH). In order to broaden and strengthen its course offerings in the general area of algebra (inclusive of its "Advanced Research Courses") the Department should consider hiring an algebraist (in a broad sense) as a mid-term priority, a direction that would also help to achieve greater breadth in the fields of research interests by its faculty members as part of the Department's mid- to long-term evolution

The Department advised that "*they believe that our current mathematics faculty is completely qualified to teach any undergraduate algebra course. However, to create more options for undergraduate research projects, as well as for graduate courses and research, such appointment may be discussed in the future.*"

The Faculty Dean stated that "*while it may be of merit in the future, the Department does not see an immediate need for an algebraist. The reviewers' recommendation seems more like a suggestion as a way of prodding the department to think about its future direction and needs. In that light, it is very helpful.*"

PPC response is as follows: **PPC suggest that this issue be revisited by the Department and the Dean once additional faculty positions have been approved.**

> 10. The University should consider creating at least one more full-time, tenure/tenure-track position in Computer Science.

The Department "*strongly agree to make sure the program stays attractive for potential students and to offer existing courses on a regular basis, an additional appointment in Computer Science is necessary.*"

The Faculty Dean state "*that given the enrollment numbers in Computer Science, and particularly the flow through, another position in Computer Science is not justified at this point. Having said this, the ACM/IEEE-CS curriculum requires (and CIPS accreditation will also reaffirm) that a certain number of courses be offered. We are routinely in the perilous position of offering many low subscribed courses. CS needs an infusion of students. Should that infusion arrive only then would a fourth position make sense.*"

PPC response is as follows: **PPC notes according to Quality Assurance Framework Reviewers are asked to comment on the "Appropriateness and effectiveness of the academic unit's use of existing human, physical and financial resources in delivering its program(s)". In making this assessment, reviewers must recognize the institution's autonomy to determine priorities for funding, space, and faculty allocation." Accordingly, PPC refers this matter to the Dean for consideration as part of the normal budgetary process.**

> 11. The University should ensure that computing resources are kept up-to- date by a regular cycle of renewals. [See also Recommendation 21 concerning technical support]

The Department advised that "*renewals of equipment by a regular cycle in our CS labs are required for us to keep at a high level of performance.*"

The Faculty Dean stated that "*there is a regular cycle of renewal and maintenance.*"

PPC response is as follows: **PPC recommends that the Dean ensure that the regular cycle of renewal and maintenance be continued.**

> 12. The University should provide compensation in the form of course relief for supervision of project and seminar courses should the number of students in such courses significantly increase.

The Department noted that "*such policy is already implemented.*"

The Faculty Dean stated that "*the new Collective Agreement has provision for course relief for supervision.*"

PPC response is as follows: **PPC is satisfied that the existing provisions in the Collective Agreement are sufficient.**

> 13. Given the large proportion of its Majors pursuing a teaching career, it is important that the Department develop a closer working relationship with the Schulich School of Education especially on curricular needs from both the School's and the University's perspectives.

The Department advised that "*we are open to such discussion. In particular, to address the transition to the inquiry-based school curriculum, MATH 1070 Fundamentals of Arithmetic for Teachers has been substantially redesigned. See also our response to Recommendation 14.*"

The Faculty Dean noted that "*given the reforms to the Education curriculum precipitated by the Ministry changes to the B.Ed. program, it will be vital for the Department and faculty from Education to speak about MATH1070, in particular. This course was designed with Education students in mind.*"

PPC response is as follows: **PPC recommends that the Dean and the Department Chair meet with the Dean of Education to ensure that the curriculum continues to meet the needs of the Education Faculty.**

14. The Department needs the assistance of the Faculty and the University to intensify the recruitment efforts for the programs it offers, through the facilitation of presentations in high schools of the region, through positive and open-minded collaboration with the colleges (which may in particular benefit the new Science and Technology Program) and net-working with local boards of commerce, through high-quality and up-to-date presence on the Internet and in social media, and through the attention to international recruitment that would highlight the individual attention that students receive at Nipissing. Department efforts may also include, for example, continued or increased involvement in high school events, such as Mathematics, Robotics or Programming contests.

The Department advised that *"our outreach program has a long history and dates back to 2005. We offer various activities including Math Circles, Math Talks, and Math Contests. Together with our colleagues from the School of Education, we established Nipissing University Mathematics Education, Research, and Information Centre. We are planning to continue these initiatives and intensify similar efforts in the area of Computer Science. In particular, our Department supports the local Robotics team (FIRST Team 1305). We also developed 2+2 proposal in Computer Science, as well as a transfer agreement with Humber College. On the other hand, we feel that more efforts should be made by administration to publicize and promote our programs in Computer Science, Mathematics, and Science and Technology."*

The Faculty Dean noted that "*the Department of Computer Science and Math deserves great credit for the number and amount of service they provide to the Institution which should be accounted as recruitment efforts. As well, the Department has been active in negotiating transfer pathways and 2+2 proposals to ensure that students from colleges and other international institutions can easily access admission to Nipissing's programs.*"

PPC response is as follows: **PPC considers that the Department already does a significant amount of collaboration and outreach activities.**

15. The Department should work with the appropriate units at Nipissing (e.g. Recruitment, Marketing & Communications) to develop a marketing strategy that highlights, among other things, student research and work experience.

The Department advised that "*we are open for such discussion.*"

The Faculty Dean noted that "*I have invited the Director of Marketing to meet with faculty members in order to open another channel for promotion and discussion.*"

PPC response is as follows: **PPC considers this recommendation to be somewhat outside the scope of the program review. However, PPC recommends that the relevant University units (Recruitment, Marketing and Communications) continue to consult with all academic units and the Deans in the development of their marketing/recruitment/communications strategies.**

16. (Related to Technology Management) The University should closely examine the necessity of such overlapping courses given the University's limited resources. In this particular case, these courses overlap existing courses in Computer Science; furthermore, students in these courses would benefit from the depth of knowledge available only from experts in Computer Science.

The Department recommended to "*please see our response to Recommendation 3. Here we would like to also note the existence of: ADMN 1606 Business Math and Statistics; ADMN 1607 Business Mathematics; ADMN 2606 Business Statistics. These courses are not offered by the Department of Computer Science and Mathematics, which, in our opinion, is strange, at best.*"

The Faculty Dean advised that "*the recommendation to move Technology Management from the School of Business to Math/CS is an interesting one, for a number of reasons. The reviewers have pointed to an odd artefact of programming at Nipissing University. In the past, there seems to have been little oversight in the germination of redundancy across Faculties. While there has always been expertise (research and teaching) in Math/CS in Industrial Mathematics and Service Technology (two streams within the Science and Technology program), the School of Business devised its own Technology Management courses (36 credits; 30 credits of which seem to duplicate what is offered in A&S, if we follow the calendar descriptions).*
*The recommendation to move Technology Management from the School of Business to Math/CS would "restore" them to their home (that is certainly how the department views it). The Technology Management stream in STEM (A&S) is more academically robust than the stream in Business. Given the comments of the reviewers, I undertook a brief conversation by e-mail with the Director of Business to see if there is a simply way of redressing the reviewers' concerns. At present, the Director of Business is not interested in "hiving" off part of the Business program; I assume that his reticence corresponds to the Math/CS departments horror at having had their courses "hived" off.*
*More significantly, the Director of Business seemed to not know that there were two streams in STEM (Industrial Mathematics and Service Technology) that might complement what was being offered in Business. A strategy of working together would probably address the same problem that both programs are dealing with: enrollment. Please note, according to the Assistant Vice President, Institutional Planning and Quality Assurance:*

*At the November count date last year, considering that this was a review for the 2012---13 year, there were 7 students in the BBA TMGT stream. 2 were first year, 2 were second year and 3 were third year (none in their fourth year).*

*If we could combine our resources to target for recruitment students interested in Technology Management (from either a Business or an applied research point of view), there would be obvious benefit. Establishing a working collaborative partnership might also ensure that redundancy is reduced and future programming makes more sense to the collective.*"

PPC response is as follows: **PPC does not at this point make any recommendations regarding this issue.**

> 17. The Department is encouraged to actively participate as the University works towards a new Academic Plan.

The Department noted that "*they agree. We are not aware of a new Academic Plan at the moment. However, the draft of a document called "Strategic Plan" has been recently circulated to the departments. We are working on our comments to this document.*"

The Faculty Dean advised "*that the Institution is undertaking a Strategic Planning exercise. The Faculty is also working towards an "academic snapshot" that will then allow it to move on to a 4- or 5-year planning document.*"

PPC response is as follows: **PPC considers that all academic units should participate in the development of an Academic Plan for the University and/or the Faculty.**

> 18. The Department should consider establishing an Associate Chair position to assume the Chair's responsibilities in times of absence. The Associate Chair should be a Computer Science faculty member in the case that the Chair is a Mathematics faculty member, and vice-versa, thereby enhancing the profile of each discipline.

The Department advised that "*this recommendation seems to be redundant due to the following:*
• *we already have a position of Computer Science Program Coordinator (which may be supplemented by Math Program Coordinator in the future)*
• *the chair appoints an acting chair for the period of absence.*"

The Faculty Dean advised that "*CS/Math has a system of chair and coordinator in place. It seems to work to the satisfaction of the Department members.*"

PPC Response is as follows: **PPC considers that the exiting academic governance structures at the Departmental level are adequate and conform to the Collective Agreement.**

> 19. The Department is encouraged to ensure that the Chair or Associate Chair attends networking events such as annual meetings of Canadian Chairs (e.g. CACS/AIC for Chairs of Computer Science).

The Department "*agrees with this recommendation.*"

The Faculty Dean "*encourages all chairs to attend annual meetings. We should dedicate cost centres and budgets to ensure participation.*"

PPC response is as follows: **PPC recommends that the Dean encourage the Chair to attend those annual meetings.**

> 20. The University should attempt to provide a physical "home" for the Department, both for faculty and students. All faculty offices should be in close vicinity to each other. The University should also ensure exclusive use of a room for Mathematics students (such as A223), as well as the continued exclusive use of the Sun lab.

The Department "*strongly agrees with this recommendation. In particular, it would be highly desirable to reserve A223 for the exclusive use of the Department and equip it (in addition to the blackboard) with a SMART Board (or similar technology) and a computer.*"

The Faculty Dean "*believes plans are underway to ensure that departments are housed in close proximity. Dedicating A223 to Math makes sense, given the technical requirements and the ways in which students associate drop-in and tutorial hours to that space.*"

PPC response is as follows: **PPC recommends that the University continue to develop and implement plans to house faculty in close proximity to each other, in other words, to create "departmental space".**

> 21. The University should explore the possibility of providing additional staff support to the Department. There is a need for both dedicated secretarial support and technical support (e.g. computer hardware and software maintenance).

The Department *agrees with this recommendation. Moreover, a part-time position of lab technician who would take care of Sun lab and Physics lab would greatly benefit our faculty. We made multiple attempts to hire such technician using NU Work program, but were unable to find a candidate that would qualify for this program.*

The Faculty Dean noted *it is believed that plans are underway to give departments shared secretarial support.*

PPC response is as follows: **PPC notes according to Quality Assurance Framework Reviewers are asked to comment on the "Appropriateness and effectiveness of the academic unit's use of existing human, physical and financial resources in delivering its program(s)". In making this assessment, reviewers must recognize the institution's autonomy to determine priorities for funding, space, and faculty allocation." Accordingly, PPC refers this matter to the Dean for consideration as part of the normal budgetary process.**


## D. PPC RECOMMENDATIONS

Below are the recommendations that require specific action as a result of the Review, along with the identification of the position or unit responsible for the action in question. Notwithstanding the position or unit identified as the being responsible for specific recommendations, the Dean of the Faculty of Arts and Science has the overall responsibility for ensuring that the recommended actions are undertaken.

| Recommendation | Responsible | Projected Date |
|---|---|---|
| **The Department should explore the possibility of using a different programming language in first year Computer Science courses, and present the findings of that analysis to Dean for further action if warranted.** | **Department** | **December 2016** |
| **The Department should ensure that the Computer Science curriculum be reviewed to ensure that it meets ACM/IEEE-CS guidelines.** | **Department** | **May 2017** |
| **The issue of "project and work experience" is an issue much broader that Mathematics and Computer Science. The Faculty of Arts and Science has developed a mechanism to incorporate this in many of its programs. PPC recommends that the Department investigate how to integrate project and work experience into the curriculum of both Mathematics and Computer Science.** | **Department** | **May 2017** |
| **PPC recommends that the Dean and the Department Chair meet with the Dean of Education to ensure that the curriculum continues to meet the needs of the Education Faculty.** | **Dean** | **December 2016** |