MEMORIAL UNIVERSITY OF NEWFOUNDLAND
Department of Computer Science
Academic Program Review
Response and Action Plan

Prepared by: J. M. Foltz, Interim Head

Recommendation 1-1: *Every effort should be made to ensure that future Academic Review Committees receive at least a current CV from all faculty members in the unit being reviewed, and that these CVs be prepared according to some consistent guideline.*

Agree.

ACTION: Responsibility for carrying out this recommendation lies with the Head of Department. Every effort will be made in future academic reviews in Computer Science to obtain a current CV from all faculty members and to ensure that this CV is in a standardized format.

Recommendation 2-1: *Improvement in communication could usefully start with more open and regular dialogue between the Department and the Dean of Science regarding progress in the search for a Head.*

Agree.

Throughout the search for a future Head of the Department and the negotiating process with the prospective Head, the Dean of Science provided information to the Interim Head of Department with respect to progress being made. This information was then immediately made available to all members of the Department. However, this search was initiated in 1999, and because of the length of time involved in making an appointment, people at all levels became quite frustrated.

Recommendation 2-2: *We recommend that the Department hold a retreat with a professional mediator to recognize and resolve interpersonal conflicts prior to the arrival of a new Head. Such conflict must not be allowed to compromise the effectiveness of a new Head or to limit the possibility of attracting a good person to this position.*

Disagree.

It is not felt that a retreat with a professional mediator to resolve past conflicts is necessary. Members of the Department have worked together throughout the past year to bring about many changes which will have a positive impact on the future of the Department. However, there is agreement within the Department that a one-day Departmental retreat with the new Head, shortly after he takes up the position, would be in order. This retreat would provide an opportunity for faculty and staff to discuss the future development of the Department, as well as an opportunity for the Head and the members to become better acquainted in an informal setting.

ACTION: Head of Department. There is a need to set aside one day in Fall Semester for a Departmental retreat.

COST: Approximately $600 for 40 members of faculty and staff.

Recommendation 2-3: *We urge all members of the Department to begin collegial discussions aimed at addressing at least some of the resource-related problems that they themselves have identified. They must stop dwelling on past difficulties and start taking individual and collective responsibility for their future.*

Agree.

A more collegial atmosphere is evident within the Department. During the current academic year, a number of Departmental meetings was held to discuss various items which will impact on the future of the Department and to make recommendations accordingly. Faculty have worked together to bring about changes to our undergraduate and graduate programs with the development of several new courses for offering in the next academic year. These courses are intended to increase enrollments, be more attractive to students and provide them with better job-related opportunities and increase student satisfaction.

At the time of the Academic Program Review Panel visit in October, there were only five students registered in our graduate programs. This number increased to nine by January 2003. If all offers that have been extended to prospective graduate students for entrance in Fall Semester 2003 are accepted, our graduate student population will increase to 25. It is unrealistic to believe that all of these students will accept our offer. However, a goal of 25 graduate students for the beginning of 2004-2005 academic year appears to be realistic.

The Department also carried out a review of all of its research activities over the past five years in order to determine its research strengths. These findings will form a basis for future development of the Department, and will be used for recruitment of faculty and graduate students, and to promote visibility within the University community and outside.

These findings were based on journal publications, conference publications, and graduate supervision, from 1998 to the present. In decreasing order, the five areas with the most activities are as follows: analysis of algorithms and complexity, simulation and modeling, computer graphics, performance of systems, and database management.

ACTION: Department. All members of the Department must continue to work together, in a collegial and respectful manner, for the betterment of the Department and its future.

Recommendation 2-4: *The Computer Science Department should move expeditiously to complete the review it has started of its Undergraduate Program. This review should involve consultation with members of cognate areas around the University so as to maximize the very real opportunities for fruitful collaboration.*

Agree.

A review of our undergraduate program is in process and moving forward positively, at the Departmental level in the first instance. When curriculum changes are completed internally, then consultation with all academic units with whom we currently offer joint programs (Departments of Mathematics and Statistics, Physics and Physical Oceanography, Geography, and Economics, and the Faculty of Business Administration) will take place.

It is fully realized by all members of the Department that changes to the undergraduate curriculum for our majors are needed. This view is supported by the recommendations contained in the APR report and student surveys. In preparation for making changes to the curriculum, a Departmental Curriculum Review Committee was established in Fall semester 2002, prior to the arrival of the Academic Program Review Panel. This Committee presented its proposal in January 2003. Following discussions at numerous Departmental meetings, the proposal as well as a modified version, did not receive sufficient faculty support to proceed. However, some aspects of the proposal may be salvaged and reconsidered in the next academic year.

Although the initial proposal for curriculum changes did not meet with success, nevertheless, the Department is working toward changing the current curriculum. The Departmental Undergraduate Studies Committee has now been given the task to continue work toward curriculum revisions and to come forward with a proposal that will make changes to our current core. It is anticipated that the number of required courses in the core will be decreased and that the new core will include more programming, maintaining consistency with the curriculum as proposed by the Association of Computing Machinery 2001. These curriculum changes should be completed before the end of Fall Semester 2003.

Implementation of a revised curriculum for computer science majors, at the 1000-level, can begin as early as Winter Semester 2004. In the meantime, our Department will continue to collaborate and cooperate with other academic units to ensure that our course offerings are available to students in other programs. To this end, in Fall Semester 2003, the Department will offer a new course COMP-1600, an overview of computers and information technology. Students will be introduced to spreadsheets, word processing, and database packages as well as the internet and social issues. All academic units have been advised of this new offering which will be available to their students. One further course at the 3000-level has been put forward for offering in Winter 2004. This course, in programming languages and primarily for computer science majors, will enhance our offerings in that area.

ACTION: Department. Curriculum revisions to the undergraduate programs will continue in Fall Semester 2003, with a view to their being introduced no later than Fall 2004.

Recommendation 2-5: *The Computer Science Department should move expeditiously to initiate a review of all aspects of its Graduate Program. In particular, the Department needs to assess all sources of funding for graduate students, improve its recruitment strategies (including recruitment of its own BSc and BA graduates), and develop ways to offer graduate courses that are more than addenda to senior undergraduate courses. Involvement with other academic units of the University would be very useful in addressing all these issues. Time is short within which to save the Graduate Program, and by extension, the Research Program in Computer Science.*

Agree.

A review of our graduate program took place in the 2002-2003 academic year with several notable changes being made. In the first instance, the Departmental Committee on Graduate Studies implemented a means of processing applications for our graduate program in a much more timely fashion. This is working very well. It is recommended that this process be reviewed at the beginning of Fall Semester 2003 to see whether additional changes are needed to again improve processing time.

A Deputy Head for Graduate Studies for the next academic year has been named for the 2003-2004 academic year.

In January 2003, four new students entered our Master's program, plus one Master's student in the interdisciplinary program in Computational Science (who uses our Department as her home base, since her supervisor is in Computer Science). Likewise, a much greater effort has been made to encourage our graduating honours students to pursue graduate studies in our Department–one entered our program in Winter 2003, and an additional six have been approved for admission, and accepted for Fall 2003.

Eight of our faculty currently hold sufficient NSERC grant funding so that each of them can partially support at least one graduate student for the next academic year. This will occur. Two, possibly three faculty members, will provide support for two graduate students, and one faculty member in the Faculty of Business Administration provides support for three of our graduate students. As noted previously, the Department is working toward having 25 full- or part-time students enrolled in our graduate programs by Fall 2005. However, in order for our graduate programs to continue to grow and be viable, additional financial support from the Deans of Graduate Studies and Science is required. We have been advised by the Dean of Graduate Studies that our Department has already exceeded its baseline funding for the next academic year and that no additional funds are available. For future funding from the University, the Department will be looking at requiring our students to work as TAs.

For the 2003-2004 academic year, 15 graduate courses are proposed for offering as separate course offerings. These courses are open to students in other academic units as well. In Spring 2003, one of our graduate course offerings had considerable interest from students in the Faculty of Engineering. Three new graduate courses have been forwarded for approval for offering in the next academic year. In addition, it has been proposed that the number of courses required for both the M.Sc. and the PhD be decreased by one in order that our students can complete requirements in a more timely fashion without jeopardizing the academic integrity of these programs. This will go before Senate for approval in Fall 2003.

ACTION: Department. The Departmental Graduate Studies Committee will review all aspects of our graduate program in the 2003-2004 academic year to determine what additional changes are needed to strengthen the program. A graduate poster will be completed and distributed widely, promoting the programs and the research strengths of our faculty. A graduate/research brochure will be initiated.

Deans of Graduate Studies and Science will be asked to provide additional funding in order to increase our graduate student population in the next academic year. These students will be employed as TAs.

COST: Immediate costs for the 2003-2004 academic year include an additional $30,000 in order to support five of our honours students, who have indicated that they wish to do graduate studies with us, as TAs.

Recommendation 2-6: *The University needs to address the issue of job classification and equitable remuneration so that staff can have a reasonable career path within the Department.*

Agree

It is felt by members of the Department that a reclassification of the Computer Science Systems Support Staff is long overdue and that these individuals are being paid unfairly. Responsibility for reclassification and equitable remuneration rests with Senior Administration and the Department of Human Resources. On numerous occasions over the years, the Department has made its case to have these positions upgraded so that there is consistency across the University. This has not been done, and as a result, our systems support staff are being paid lower salaries than others on campus who are doing the same type of work.

ACTION: Senior Administration and the Department of Human Resources need to carry out a review of our Systems Support Staff salary component.

COST: Not able to determine.

Recommendation 2-7: *The Department should realistically evaluate their use of existing space before requesting additional space from other units of the University.*

Agree.

The Department will reevaluate its existing space to determine what changes can be made. At the present time, the Department is in need of one additional office to accommodate a current member of faculty. Discussions need to be held with the prospective new Head with respect to utilization of non-office space and the need for additional space to accommodate new hires, their research space needs, and additional graduate student space. Since these are unknowns at the present time, a realistic evaluation of future needs cannot be determined. But future growth of all aspects of the Department will be impeded without the allocation of additional space.

At the present time, we are utilizing all existing space to accommodate the 25 graduate students expected for September 1, 2003.

ACTION: Head of Department. When the future direction of the Department is determined, in consultation with members of the Department, the Head of Department will need to review the existing space and additional space

requirements as determined by the number of new faculty appointments and their research needs, as well as an increased graduate student population.

COST: Not able to determine at this time.

Recommendation 2-8: *Additional faculty resources and additional space should be allocated to the Computer Science Department in step with the effective implementation of a clearly presented plan for expansion of their Undergraduate Program, for renewal of their Graduate Program, for increased levels of externally funded research, and for faculty renewal.*

Strongly agree.

In the 2003-2004 academic year in the Department of Computer Science, a number of changes to our undergraduate and graduate program offerings was made which are being received quite positively by our students and other academic units. Approval was given to introduce several new undergraduate and graduate courses. Further undergraduate curriculum changes are in process. The number of courses required for the M.Sc. and PhD degrees was decreased. Departmental research strengths were identified. A graduate poster is nearing completion. Enrollments at the graduate level are increasing significantly, undergraduates are also expected to show an increase. Additional interdisciplinary programs are being explored. Two faculty members were added to the list of those receiving NSERC funding–one is a new recipient, and the other has gone back into the system. With this increased activity at all levels, we are reaching our limits with the existing resources.

The three-year budget request submitted in 2002 included provisions for six additional faculty members over that same time period to account for retirements, a replacement for a faculty member who left in 1999, and other needed faculty to move forward into new areas. (Reference Recommendation 2-7 regarding space needs.)

ACTION: The Head of Department and Dean of Science will have to determine what additional resources and space are needed in order for the Department to continue to move forward.

COST: The increase to the Departmental salary component would be in the order of $250K at the end of the three-year time period, taking retirements into account.

Recommendation 3-1: *More application areas should be moved to earlier in the curriculum, and made part of the core program. This is particularly true for the Department's Software Engineering Program. At present, this program has a very small number of students and it would be beneficial to see the numbers increase.*

Strongly Agree.

As part of the ongoing undergraduate curriculum review, the Department is considering a more applied approach for our majors. This would enhance our Software Engineering program, making it a more attractive option, as the status quo is not acceptable.

All of our program offerings, especially the Software Engineering Option and the Computer Industry Internship Option, are now being more widely advertised and marketed to incoming students and prospective majors.

A new programming course at the 3000-level has been added to the curriculum for offering in Winter 2004. This is not a required course but can be used as a science elective. It is intended as an interim arrangement to meet a void in the area of programming until curriculum revisions are completed. All changes that are being made are in keeping with student feedback.

ACTION: This recommendation has been partially addressed by the Department. As part of the curriculum review process to be completed in Fall 2003, attention will be given to including more application areas into our core courses, while at the same time, efforts will be made to enhance, as well as to market, the Software Engineering program more vigorously.

Recommendation 3-2: *The Department should consider having their programs accredited by the Computer Science Accreditation Council (CSAC) in order that students can be reassured that these programs meet national standards. In particular, it would be helpful to have the Software Engineering Program accredited in order to attract more students to this pioneering, but controversial and under-subscribed program.*

Agree.

In the past, the Department did not actively explore having its programs accredited by the Computer Science Accreditation Council (CSAC). However, following the recommendation of the APR Panel, information was gathered and discussion on this topic was initiated in Winter Semester 2003. All information available on their website with respect to accreditation was made available to faculty. In addition, the Director of the School of Computer Science at Acadia University, who has been directly involved in the accreditation process for a number of years, was invited to the Department in April 2003 to provide faculty with information with respect to the advantages and disadvantages of having programs accredited. As a result, our faculty are now more familiar with the accreditation process.

However, initiating the accreditation process by our Department is dependent, to a large extent, on the results of our curriculum review and whether or not substantial changes are made to our undergraduate programs. (New programs cannot be accredited until there are graduates of that program.) CSAC guidelines for accreditation of Computer Science and Software Engineering programs offered by Computer Science Departments are also currently being reviewed. The matter needs further discussion at the Departmental level.

ACTION: Department. The groundwork to have some of our program offerings accredited has begun at the Departmental level. Further discussion is required within the Department once the curriculum review is completed. The time frame for further action by the Department is Winter 2004, with attention also being paid to CSAC guidelines.

COST: Travel and local accommodation costs for two or three individuals who do the onsite visit, plus other costs as determined by CSAC.

Recommendation 3-3: *The Department should maintain its Internship Program but should not expect to expand it until the overall outlook for the IT industry improves.*

Agree.

The Computer Industry Internship Option (CIIO) offered by Computer Science will be maintained. Various means of expanding the program, especially in the local community, were actively explored by our Internship Coordinator, with some headway being made especially in Winter Semester 2003. However, this person resigned his position in May of this year. The position is still vacant as the Dean is currently reviewing the reporting structure and duties for this position.

The responses received from students who have completed this program have been very positive. However, students have also indicated that there needs to be more information readily available for them on this program, and that our current curriculum is not properly preparing them to enter the workforce at third year. These concerns are being addressed in the core requirements in the proposed new curriculum. As well, two new courses are being offered at the first and third year levels in the next academic year, and it is intended that these courses will also address the preparedness issue. During Winter Semester 2003, our Internship Coordinator held several information sessions for students, to make them more aware of this program, its benefits and academic merits. These sessions will be continued.

ACTION: Department and Dean. The maintenance of our CIIO program and marketing it internally to our undergraduates as well as to the local Information Technology businesses needs to be monitored by the Department quite carefully over the next academic year. Students need to be queried to determine if additional changes are needed and the Department then needs to act on those which may be identified. The position of the Internship Coordinator needs to be filled as soon as possible.

COST: The salary of the Internship Coordinator is already included as part of the Departmental salary allocation.

Recommendation 3-4: *The Department should not consider introducing a co-op program without a realistic evaluation of placement possibilities for the students in such a program.*

Agree

The Department has no plans to proceed with the introduction of a co-op program at this time, even though students have indicated that they would prefer to have this type of program rather than, or in addition to, our Internship program.

Recommendation 3-5: *The Department should either institute courses of its own that give students more opportunity to develop their written and verbal communication skills, or should*

encourage their students to take such courses in other academic units (e.g., Business 2000 - Business Communications).

Agree.

Our faculty and students are in agreement that students need more opportunity to develop their written and verbal communication skills. This matter is being addressed in our undergraduate curriculum revisions. In addition, some of our faculty have indicated that they now require students to do some course presentations and report writing. Furthermore, the 2003-2004 University calendar section for Computer Science includes a statement recommending that students take Business 2000 (Business Communications), as an elective.

ACTION: This recommendation has been partially addressed. However, the Department needs to ensure that our students are provided the opportunity to develop their verbal and written communication skills by including this as a requirement in curriculum revisions to core courses. Changes that have been made need to be monitored.

Recommendation 3-6: *The Department should add a course with more applied objectives, such as developing programming skills, at the first year level. This could be taken by Computer Science majors in addition to CS1700, or taken as a stand-alone course by students from other Departments.*

Agree.

The Department has added a new course at the 1000-level (COMP-1600), to be offered for the first time in Fall Semester 2003, which directly addresses this recommendation. This course, in computers and information technology, is available to all students on campus and will be offered each semester. It is not part of our core course requirements for Computer Science majors but can be used as a science elective. Academic units have been advised of this course offering and they have been most receptive. Likewise, it has been included in the information package made available to incoming first year students.

ACTION: The Department has responded positively to the recommendation with the introduction of COMP-1600 to be offered in Fall 2003.

COST: The estimate cost is approximately $8,500 per semester to cover the cost of a per-course appointee and a graduate student to work as a TA in the laboratory. These costs should be covered by students' tuition.

Recommendation 3-7: *A variety of techniques, ranging from use of computer technology to slowing down the classroom interaction, should be investigated to help overcome language-based communications difficulties. In some courses, it is possible that more effective use of the Web might alleviate some of the problems.*

Agree.

Better teaching methods, including the issue of language-based communication difficulties in the classroom is an issue that our students have identified as being problematic, especially at the lower level course offerings. This matter is being addressed on an individual basis with more effective use of the web as a definite option. The establishment of a Computer Science Help Centre during Fall Semester 2002 has helped to ease the problem somewhat, as the Centre is staffed by Instructional Assistants, honours, and graduate students who are knowledgeable in all aspects of our undergraduate program and can provide needed assistance. But this does not directly address the problem.

ACTION: The Head of Department and individual faculty members need to be more aware that their classroom presentations may not be readily understood because of language-based communication difficulties and that they themselves must make every effort to correct this problem. The Head of Department also needs to monitor this to see that the problem is being addressed and corrected.

Recommendation 3-8: *It is important for the Department to create an effective system for providing high quality academic advice to students, and to also ensure that all of the students know how to access this system.*

Agree.

It is fully realized that the current advising system is no longer functional and a new means of advising students must be introduced as soon as possible. For the past academic year, the Interim Head assumed responsibility for advising students. For the next academic year, a faculty member has agreed to assume this responsibility. In addition to email queries, the web can possibly be better utilized to provide information to students. This needs further exploration. The Department does produce an Undergraduate Handbook which gives detailed information on all course offerings, the many and varied programs that we offer, as well as degree requirements, and this is available on the web. In the meantime, every effort is made to ensure that no student is disadvantaged.

ACTION: This recommendation has been partially addressed by the Department with the appointment of an Undergraduate Advisor. However, the Department needs to explore various means of providing advice to students and to ensure that this is communicated to the students.

Recommendation 3-9: *The Department should, as part of the review of its Undergraduate Program, ensure that each course taught in the Department has a specific and detailed list of topics, which have been agreed to by the Department. Perhaps 15% of the content of any course could be variable to accommodate the interests of the individual teaching the course. Faculty members assigned to teach a course should be given a copy of these objectives at the time the course is assigned to them.*

Agree.

Students have expressed concern that course content varies considerably with the faculty member teaching the course. This becomes very problematic when the course is a prerequisite and the proper exposure to the required material has not been received. There

must be consistency in all course offerings. Faculty have been advised that they are to teach their assigned course(s) according to the course description as approved by the Department and the University Senate. Course outlines are available in our Undergraduate Handbook and, as well, course files are maintained in the General Office, with updates, requested at the end of each semester. Copies of the course outlines and course objectives for their assigned course(s) will be given to each faculty member.

ACTION: Steps have been taken to address this recommendation for Fall 2003. Individual faculty members must assume responsibility for offering their courses with the content as approved by the Department and the University Senate. The Head of the Department must monitor this to ensure that it is being done.

Recommendation 3-10: *Instructors of courses that are likely to be taken concurrently should endeavour to coordinate due dates for major assignments, term tests and other projects so as to spread the overall work load more evenly over the semester.*

Agree.

For all course offerings, students need to know what is expected of them throughout the semester so that they can allocate their time accordingly. Students have indicated that too much of the required Computer Science course work is due at the same time. A number of faculty indicated that they do consult amongst themselves and coordinate due dates for assignments. If there are conflicts, they permit flexibility. The problem can be alleviated if all faculty follow the Senate approved regulation, in particular General Academic Regulation 6.2, and in particular 6.2.3, which states that the approximate dates for all methods of evaluation are to be made known to students before the end of the first week of lectures. A template which includes all information as pertains to this regulation has been provided to faculty for their use.

ACTION: Steps have been taken to address this recommendation for implementation in Fall Semester 2003. Prior to the start of Fall Semester, and subsequent semesters, faculty will again be reminded of General Academic Regulation 6.2. The Head of Department needs to follow up on this to ensure that this regulation is being adhered to.

Recommendation 3-11: *Faculty need to be cross-appointed from other Departments and units, and to be treated as part of the Department. There should also be more cross-listing of courses from other Departments. This would automatically raise the profile of Computer Science across campus and offer a wider range of choice to students at essentially zero cost to the University. We caution that joint programs often suffer from requiring too many of each Department's core courses. There is a need for compromise between Departments in order to construct joint programs that are not unreasonably onerous to complete.*

Agree.

There is currently one faculty member from the Faculty of Business Administration who is cross-appointed to Computer Science. This individual is directly involved with supervision

of our graduate and honours students and also teaches for us at the senior level, and is included in other Departmental matters as well. It is hoped that he feels that he is being treated as a member of the Department. The increased research activity between Computer Science and Medicine could possibly lead to other cross-appointments.

Cross-listings of courses, especially with Computer/Electrical Engineering, will be looked into, once our undergraduate curriculum review is completed. Likewise, at this time, consultation with other academic units with whom we offer joint programs will proceed.

ACTION: As new appointments are made in other academic units, as well as increased research activities with other units, the Department Head should determine if additional cross-appointments with Computer Science need to be made. In addition, the consultative process with other academic units, once the curriculum review is completed, needs to begin to look at cross listings of courses for which there may be significant overlap, and to ensure that cross-appointments continue to be treated as members of this academic unit as well. The end result should bring closer collaboration for all concerned.

Recommendation 3-12: *The Department should open discussions with other academic units at Memorial with a view to developing new courses of mutual interest, which could be taken by a wider variety of students and could be taught by a wider variety of faculty members.*

Agree.

As indicated in the previous recommendation, consultation with other academic units with whom we offer joint programs and development of courses of mutual interest will begin once our Department has concluded its deliberations with respect to curriculum revision. However, negotiations with other academic units is currently in process and moving along quite nicely between some faculty members in Computer Science and the Faculty of Medicine, with a view to the establishment of joint research projects, course offerings and new interdisciplinary programs.

ACTION: The Head of Department must continue the consultation process with other academic units as indicated in the previous recommendation. Individual faculty members need to proceed with their joint collaborative efforts, especially those which are ongoing with the Faculty of Medicine.

Recommendation 3-13: *Consultation with personnel from QEII Library should be part of any planning exercise, in order to ensure appropriate Library support for diversification of the undergraduate teaching program into more applied areas.*

Agree.

The Chair of our Departmental Library Committee, also serves on the Faculty of Science Library Committee, all of whom are in consultation with personnel from the QEII Library. This individual exercised this responsibility in the past and will be asked to continue to do so, ensuring appropriate library support for diversification and expansion of our undergraduate programs into more applied areas.

ACTION: Department. The Head of Department and the Departmental representatives to the Library Committee must ensure appropriate library support for any enhancements to our teaching programs.

Recommendation 3-14: *In a review of the introductory courses in Computer Science for the Minor and Major programs, attention should be given to preparing the students to be able to complete a second year program successfully. Difficulties with the second year program may be discouraging students from completing a Major in Computer Science.*

Agree.

Over the past several months, in discussions with respect to curriculum review, the difficulties that many of our majors and minors encounter when doing second year courses, and the high failure rates at this level, have been duly noted. A Student Help Centre was established in Fall 2002 as an attempt to begin to address the problem of high failure rates at the first and second year levels. Restructuring and reorganizing of required course materials in the revised core curriculum will also address this issue. Furthermore, attention must be given to assigning our most effective teachers to the first and second year offerings.

ACTION: Department. When the first and second year core Computer Science courses are restructured in Fall 2003, the Department must ensure that our students are being properly prepared in order that they can successfully complete a Computer Science degree program. Very careful monitoring of the new curricula must be carried out annually.

Recommendation 3-15: *The Department should consider having regular quasi-social gatherings such as "town hall meetings" for students to express their concerns, social evenings, etc. The Computer Science student society would be an ideal partner in helping to create these events, and in helping to make them successful. Of course, without willing participation by the faculty and staff, such events will only exacerbate the students' sense of alienation from the Department.*

Agree.

Throughout the 2002-2003 academic year, the Department took important steps to improve internal relations and openness. A number of social functions was held, such as Friday morning coffees, which were well attended and well received by faculty, staff, undergraduate and graduate students. In addition, the Department organized a party for its May graduates–this is now an annual affair which the students look forward to and expect to be continued. The Computer Science Club also held a number of functions to which faculty and staff was invited. A "town hall" type meeting has yet to be scheduled.

ACTION: This recommendation has been acted upon. The Head of Department, working with the Computer Science Club, must continue to hold regularly scheduled social functions in which all members of the Department are invited to participate. During the next academic year, the Department will celebrate its 25th Anniversary as a Department. As part of this occasion, there will be ample opportunity for all members of the Department to participate and attend many social and academic events which are planned throughout the year,

including student programming and essay competitions, student achievement awards, research forms and lecture series.

Likewise, a "town hall" type meeting, where students can freely express their concerns, should be scheduled as early as possible in the next academic year. In addition, space must be found within the Department for our students to have a club room and to help create a sense of belonging for them.

Recommendation 4-1: *The Department must produce a viable plan to increase the number of graduate students completing MSc and PhD degrees.*

Agree.

Over a period of several years, the number of graduate students who left the program prior to completing degree requirements, in order to accept positions in industry, at huge salaries, was problematic. This has not happened over the past two years, a possible reflection of current economic conditions. The problem may have corrected itself. In addition, students who left the program, but were still eligible to continue in the program, were contacted and encouraged to continue. One student has replied positively.

As noted in Recommendation 2-3, the number of graduate students currently in our programs has increased significantly, and is expected to show another significant increase for the next academic year. The Department can readily accommodate this increase, as it has done so in the past.

In addition, the Department has put forward a change to degree regulations, whereby the number of courses required for the M.Sc. and PhD degrees was decreased by one, thus decreasing the time required to complete degree requirements by at least one semester.

ACTION: This recommendation has been acted upon, however, the Department must monitor the progress of its graduate students, and any who indicate that they may leave the program to take up lucrative positions in industry, must be encouraged to remain in the program until degree requirements are complete.

Recommendation 4-2: *An immediate goal of the Department should be to strongly encourage all faculty members with NSERC grants to have at least one graduate student.*

Agree.

It is strongly advocated that individual faculty members who hold an NSERC grant supervise, as well as financially support with at least partial financial support, a minimum of one graduate student as of the start of the 2003-2004 academic year. At the present time, there are only two faculty members in this category who are not scheduled to supervise a student, but this is expected to change prior to the start of the Fall semester, as several applications are still being processed.

However, NSERC grants in Computer Science are not large enough to provide full funding to students. In order for the Computer Science graduate program to grow, be sustained and

be viable, the Department, with the support of the School of Graduate Studies and the Dean of Science, must look at means of providing additional funding for graduate students, including better use of students for course delivery.

ACTION: This recommendation has been acted upon and will be in place for September 2003. The financial support of the Deans of Graduate Studies and Science will also be needed.

COST: Approximately $5,000 to $7,000 per student per annum for hiring graduate students to work as markers, laboratory assistants and possibly per-course appointees.

Recommendation 4-3: *Faculty members should not delay accepting a reasonable student in the hope that someone better will come along. The Department is a very long way from being overextended in graduate supervision.*

Agree.

This problem was identified within the Department and addressed prior to the visit of the Academic Program Review Panel. Faculty members processed graduate applications very early on and agreed to serve as the students' supervisors. This is reflected in the increase in the number of graduate students accepted into our program in Winter 2003 and, as well, for the significant increase expected for the 2003-2004 academic year.

ACTION: Department. The necessary steps were already taken at the Departmental level to process and accept graduate students into our program without unnecessary delays. Careful monitoring will ensure that it does not reoccur.

COST: As indicated in Recommendation 4-2 above.

Recommendation 4-4: *Judicious use of summer NSERC scholarships and Departmental summer employment could "turn students on" to research during their undergraduate years (and even produce publishable research). Giving undergraduate students a chance to work on research fosters interest in graduate studies at Memorial.*

Agree.

The Department took advantage of all possible sources of funds supporting employment opportunities for undergraduates for Summer 2003, including one NSERC summer scholarship recipient. These students are currently employed in the Department, carrying out research, some on a cost-shared basis. However, several funding sources announce their programs at times which are not convenient for our students to make application and, thus, the students and the Department are both disadvantaged.

ACTION: Department. The Department took the necessary steps to employ students in research-related projects for Summer 2003, taking advantage of various opportunities available. This must be continued and further expanded in future years.

COST: Approximately $1,175 per student for those funding agencies for which cost sharing is involved.

Recommendation 4-5: *The Department needs to revise its Web site to provide information about graduate programs and research that is up-to-date, explicit and easily located. Faculty members need to be encouraged to keep their personal Web sites up to date and informative to potential graduate students.*

Strongly agree.

The Department launched a new web site during the 2002-2003 academic year. However, updating the material was either not being done or being done very slowly. As a result, one of our faculty members was asked to assume responsibility for seeing that all Departmental information regarding academic and research programs on the web is current and updated as necessary. This has been agreed and is now in process. The Departmental web site is also being redesigned to make it visually more attractive. In the future, all Departmental information to be placed on the Departmental web site is to be channelled through this individual. Faculty members were encouraged to update and maintain their personal web sites with assistance from the Department, if necessary.

ACTION: Department. This recommendation is in process at the Departmental level. A faculty member has agreed to assume responsibility for updating and maintaining all Departmental information that is placed on our web site. As well, faculty were encouraged to update and maintain their individual web sites.

Recommendation 4-6: *Course entries in the University Calendar should be revised as appropriate.*

Agree.

The Departmental Committee on Graduate Studies was asked to undertake the task of reviewing all graduate course entries, revising those as appropriate and deleting those which are no longer being offered. This task is now completed and will be reflected in the 2004-2005 University Calendar.

ACTION: Department. This recommendation has now been carried out at the Departmental level. These changes will be forwarded for subsequent approval by Senate and, if approved, will be reflected in the 2004-2005 University Calendar.

Recommendation 4-7: *The Department needs to make every effort to offer a graduate curriculum that is different, and is seen to be different, from its senior undergraduate curriculum.*

Agree.

This recommendation was initiated in Winter Semester 2003. Graduate course offerings in the 2003-2004 academic year are scheduled to be offered as separate entities, distinct from

the undergraduate offerings in the same area. This recommendation is much easier to carry out with an increased graduate student population.

ACTION: Department. The Department must endeavour to continue the practice that was started in the 2003-2004 academic year of scheduling graduate course offerings separate from undergraduate offerings.

Recommendation 4-8: *Faculty members should look for opportunities to co-supervise students in other Departments and to have faculty members from other Departments co-supervise Computer Science graduate students.*

Agree.

This recommendation has been ongoing for quite some time, with supervision or co-supervision of graduate students, especially with Computer Science, and Computer/ Electrical Engineering and Computational Science, as well as with other universities. Likewise, a faculty member in the Faculty of Business Administration currently supervises two of our graduate students and for the next academic year, he has agreed to accept at least one additional student. Further avenues for co-supervision have recently been explored, especially with the Faculties of Medicine and Education, and these are showing promise for the next academic year.

ACTION: Department. Faculty members in Computer Science need to continue supervision or co-supervision of students from other academic areas at Memorial and elsewhere, and explore new venues for co-supervision. Furthermore, the Department must continue to support and recognize faculty members in other academic units at Memorial who are involved with supervision or co-supervision of Computer Science graduate students.

Recommendation 4-9: *The Department should consult with other cognate areas on campus to arrange a regular and well-advertised research seminar series.*

Agree.

The Computer Science Department Seminar Series underwent a renewal during the 2002-2003 academic year, following a short time period when very few seminars were being offered. All presentations are well advertised on campus, through the MUN Newsline. Our email distribution list for seminar announcements has been significantly expanded, reaching those on and off campus. Plans for a greatly enhanced 2003-2004 seminar series are well underway as part of our 25th Anniversary celebrations. In addition to continuing with our regular seminar series, a Distinguished Lecturer series is planned, as well as a research forum with participation from faculty, graduate and honours students. All presentations will be well advertised and open to the public.

ACTION: Department. This recommendation was acted upon prior to the visit of the Academic Program Review Panel, with very positive results. Plans for a greatly enhanced seminar series for the next academic year are well underway as part of the celebrations being planned to mark the 25th Anniversary of the establishment of the Department of Computer Science at Memorial.

COST: Approximately $12,000 for additional funding, in order to bring in several distinguished computer scientists in the next academic year, may be needed.

Recommendation 5-1: *The Department needs to consider which areas of Computer Science will be the focus of any future growth. These areas ought not to be random but rather designed to complement existing strengths inside the Department and in other units at Memorial. We suggest that these research linkages should be perhaps 50% internal and 50% external to the Department. This would foster interdisciplinary work without producing excessive duplications at the University level.*

Agree.

A small Departmental Committee recently carried out a review of all research activities of our faculty for the past five years in order to determine the research strengths of the Department. This review included all journal publications, conference presentations and graduate student supervision, and resulted in identification of the following areas: analysis of algorithms and complexity, simulation and modeling, computer graphics, performance of systems, and database management. The Department now has a basis upon which to build and some foci for future growth. However, it was agreed that prior to determining the areas for future growth, input from the new Head of Department is needed with respect to his vision for the Department, including future hires.

ACTION: Department. The Department began working on this recommendation during Winter and Spring Semesters 2003 in that current Departmental research strengths were identified based on faculty research activities for the past five years. Using this information as a basis, and input from the new Head of Department with respect to his vision for the Department, future growth areas can be determined, starting as early as Fall 2004. In doing so, the Department must also take into consideration those research areas which are now being cultivated and would not have been included in a five-year review.

Recommendation 5-2: *The Department needs to be proactive in seeking sources of research funding and pursuing these sources once they have been identified.*

Agree.

At the present time, the majority of external funding for support comes from NSERC, with less than 10% coming from other sources. In addition, there are in-kind contributions on an annual basis received from the Canadian Microelectronics Corporation to support VLSI research. There is no contract funding. The Department will investigate other sources of available funding, develop and circulate a listing of this funding, and encourage faculty members to make application.

ACTION: Department. The Department is to begin an investigation of sources of all available funding to support the research activities of the faculty, and to encourage faculty to make application for this funding.

Recommendation 5-3: *The Department should consider playing a greater role on the national and international scene through more active participation in professional organizations.*

Agree.

Faculty have been encouraged to become more active in Computer Science related activities on the national and international scene. One faculty member has just accepted an appointment to the NSERC Grant Selection Committee for a three-year period, beginning September 2003. In addition, the Department will host an international conference in the database area in Summer 2004, with one faculty member serving as the local organizer.

ACTION: In the next academic year, two of our faculty members will be quite involved serving on an NSERC committee and organizing an international conference. Our other faculty are also encouraged to offer themselves to serve in this capacity.

Recommendation 6-1: *The University should not institute fuller cost recovery for the work of the Computer Science Systems group without first investigating all aspects of this issue very carefully.*

Agree.

The work that is done by the Computer Science Systems Group may not be fully appreciated within the University community, as they may not be aware of the extent of the work that these members of staff do for the University community at large.

ACTION: This recommendation is being discussed with the Dean of Science.

Recommendation 6-2: *The Department should re-evaluate the use of contractual and permanent faculty members in the delivery of junior level instructional laboratories.*

Agree.

A re-evaluation of the teaching assignments for contractual and permanent faculty members was undertaken. For the next academic year, these individuals will not be assigned to be present in the laboratory component of the course. This work will now be assigned to our Laboratory Instructor, Instructional Assistants and graduate students, under the guidance of the instructor.

ACTION: This recommendation has been acted upon. Reevaluation and reassignment of contractual and permanent faculty has taken place and will be effective as of September 1, 2003.

Recommendation 6-3: *The new Head should have access to appropriate advice and assistance in what will be a very challenging position.*

Agree.

The Department of Computer Science has very dedicated and competent members, who, if asked, will provide the new Head of Department with appropriate advice and assistance. This is also true for the Office of the Dean of Science.

ACTION: Department Head. The responsibility for seeking advice and assistance rests with the new Head. Individuals whom he can contact will be made known to him.

Recommendation 10-1: *We encourage the Department to identify a series of goals, each of which is achievable and moves the Department forward in its desired direction. Such goals should be carefully developed to be achievable, and not be unreasonably ambitious. Ideally this should happen as soon as practicable, and should include the new Head, even if that individual has not yet formally taken up the appointment.*

Agree.

Although the Department has not as yet identified a series of goals (or new goals) as this recommendation states, nonetheless, during the 2002-2003 academic year, members of the Department did work together to introduce a number of changes, all of which were intended to move the Department forward. The most significant changes included the following:

- Undergraduate curriculum revision (still in process) and changes to undergraduate degree requirements;
- Introduction of new course offerings at the undergraduate level which are intended to increase enrollments, to provide more programming experience for our majors and minors, and to offer a computer literacy type course to the general student population at Memorial;
- Changes to degree requirements for our graduate programs;
- Introduction of new graduate courses;
- Significant growth in our graduate student population, with improved funding for these students;
- Increased research activity, with more faculty being funded from NSERC and collaborative research strengthened, especially with the Faculty of Medicine;
- Renewal of our seminar series;
- Publication of an Annual Report for 2001-2002; and
- Most importantly, improved relations and morale within the Department as a whole.

ACTION: Department. In Fall Semester 2003, the Department must undertake to review and clearly define its goals, ensuring that those which are set are achievable, while at the same time, continue to move the Department forward.