

Report of the Working Group for the Establishment of an Interdisciplinary Science Unit in the Faculty of Science

6 April 2015

In December 2014, the Dean established a Working Group (Appendix A) to develop a proposal to establish a new Interdisciplinary Science Unit in the Faculty of Science. The call for the Working Group stemmed directly from the Faculty's Academic Planning, a process that was launched in November 2013 and completed in October 2014, with the release of the Faculty of Science Academic Plan – 2014 to 2019 (Appendix B).

The Plan notes that: “McMaster is well known for its interdisciplinary approaches to teaching and research. Many of the complicated research questions of the day require that we move beyond traditional discipline-based inquiry and many colleagues have recognized the value of reaching out to colleagues in other disciplines to gain from their complementary expertise. Given the importance of interdisciplinary research, exposing our undergraduate and graduate students to this approach will be of benefit to all.”

The Faculty of Science currently offers a number of interdisciplinary instructional programs and it is certainly possible to continue to offer such programs without the creation of an administrative unit. However, the Academic Planning Committee and the IQAP review team for the Life Sciences Program felt the needs of students and some programs were not being met by the current governance and administration. There was a sense that some of the programs were viewed as an “afterthought” or “add-on” to more traditional programs and that discipline-based units did not consider students in such programs as being “our students.” This may lead to some students in such interdisciplinary programs feeling that they are “second class”, and it can also lead to an inappropriate allocation of resources as discipline-based units may view programs based outside their discipline as a “drain” on their resources. The APC was convinced that interdisciplinary programs that rely on the “good will” of Chairs and Directors of traditional programs face uncertainties in the availability of high quality instructors, access of their students to disciplinary courses and involvement with higher levels of administration. The APC thus called for a proposal to establish an Interdisciplinary Science unit that would serve to “stabilize and improve the interdisciplinary undergraduate programs in the Faculty of Science.” In addition, the APC envisioned that the new unit would be designed to function as a centre for interdisciplinary teaching and experimentation with pedagogical approaches, and serve as a resource to advise on interdisciplinary approaches across the Faculty of Science to improve the experience of all students in the Faculty.

The Working Group was specifically asked to:

- Develop an overarching academic vision for the unit and include a proposal for which interdisciplinary programs should be administered by the unit, along with plans for how the unit will serve to advise on interdisciplinary teaching across the Faculty;

- Describe the requirements for physical space that will provide a welcoming environment that students identify as their academic home and ensure opportunities for students, staff and faculty from the different programs to interact in formal and informal settings;
- Propose a system whereby teaching resources that flow to the interdisciplinary programs from other units are acknowledged in the Faculty's budget plans;
- Propose an initial faculty complement plan (in terms of areas to be covered) and system of governance, where colleagues holding appointments in the new unit will be drawn from across the Faculty and no one discipline should unduly dominate;
- Propose an initial staffing plan and budget;
- Prepare a transition plan designed to minimize disruption to students, staff and faculty.

The sections below provide details on each of these points.

Academic vision

To be a national and international centre for interdisciplinary science education with a diverse culture that fosters exploration and discovery, emphasizes experiential, collaborative, and student-centred learning, and that sustains a rich network of community partnerships. We are committed to an interdisciplinary approach to the learning and teaching of science, and to the exploration and application of effective methodologies to enhance student learning and help students reach their full potential.

Goals

- Prepare students for 21st century careers by integrating core academic subjects, the latest research discoveries, interdisciplinary themes, and essential skills development with effective instructional approaches.
- Help students learn how to access, understand, employ and synthesize knowledge across disciplines to solve real-world problems and to bridge knowledge gaps.
- Provide students with an interdisciplinary research environment that produces motivated graduates with highly developed scientific research and communication skills.

Core values

- Excellence
- Knowledge integration across disciplines and from lab to classroom
- Openness to explore and evaluate new pedagogies
- Inclusiveness
- Creativity

Programs to be administered by the new unit

All programs administered by the new unit – tentatively the ‘School of Interdisciplinary Science’ and herein referred to as the School – will be interdisciplinary in that they combine and integrate knowledge from different disciplines. The degree of interdisciplinarity will vary from program to program, but interdisciplinarity must be a core component of all programs administered by the unit.

The School will house a limited number of the interdisciplinary programs in the Faculty of Science. Several units and combinations of units in the Faculty of Science offer programs that are interdisciplinary in nature. Many such programs are effective in terms of governance and there is no intent to move them to the new School.

It is currently proposed that the School will administer the iSci program, the Life Sciences program and may, in collaboration with Mohawk College, the Medical Radiation Sciences (Med Rad Sci) program. The School may also house the Medical Physics program for the time being. The Medical Physics program is expected to undergo major modifications, and as yet, it is not clear whether the revised program will be best served by being housed in the School of Interdisciplinary Science or whether it should be administered by another unit.

The School will also serve as the administrative home for the Faculty-wide courses: SCI 1A03, SCI 3A03, SCI 3M03, SCI 3RP3, SCI 3EP3, SCI 3EP6. The School will focus on undergraduate programs and, at least initially, will not house any existing interdisciplinary graduate programs. Nevertheless, once well established, the School may want to consider the possibility of graduate, including Professional Masters, programs related to its undergraduate programs.

Service to other programs to enhance all students’ learning experience within the Faculty:

The School of Interdisciplinary Science will serve as a resource to other units in the Faculty of Science seeking to develop new interdisciplinary components for new and/or existing courses and/or programs. Instructors working within the School will be encouraged to develop and adopt pedagogical approaches and methodologies that emphasize experiential, collaborative and student-centred learning. The involvement of instructors and teaching assistants from all Science departments in the delivery of the interdisciplinary science programs will greatly facilitate communication, dissemination and adoption of successful teaching and learning strategies throughout the Faculty. The School will also collaborate closely with the Associate Dean (Academic)’s Office, the Science Career and Cooperative Education Office and MIETL to ensure students are provided with the best available opportunities and guidance.

Space for administration and instruction

Administrative and meeting space: The School of Interdisciplinary Science will be the administrative home for the largest group of undergraduate students in the Faculty of Science, and it is critical that the space and infrastructure associated with the School be readily identifiable and work to effectively meet the needs of these students. At the same time, the space should provide a sense of “home” and “belonging”, and ideally serve as a place where students, staff and faculty can interact outside of scheduled class times.

It is expected that General Sciences Building (GSB) 105, currently the central office for the Department of Medical Physics and Applied Radiation Sciences, will be the central office of the

School. It will house the Director, an Associate Director and the administrative staff described below. The space is somewhat constrained as there are no clear opportunities to include any adjacent space for further development but the existing space will be sufficient for current needs. It was noted that the current administrative space of the Life Sciences Program falls far short of its needs and will be repurposed.

A suite of small offices, both faculty and administrative, and a meeting place in the Thode Library is currently associated with the iSci program. It will be important that the core administrative functions of the School be dealt with in the main office and not diffused across two sites. As well no staff or faculty member should have more than one office. Given the administrative space in the Thode Library abuts teaching space that is currently used by iSci, it may be appropriate to use it to house some teaching staff and TAs associated with the School's various programs. The School will not have any graduate students of its own and graduate students with TA-ing responsibilities in the School will typically have their desk space in discipline-based units. Thus, it will be important to have an identifiable place for students in the various programs to meet TAs and for the TAs to interact with each other. The above reorganization will provide a better experience for students, allowing them to interact with both faculty and TAs in a dedicated space.

Teaching infrastructure: The iSci, Medical Physics and Med Rad Sci programs have existing teaching infrastructure (teaching labs and equipment) that appears suitable for the needs of those programs. There is no apparent need to modify this infrastructure because of the creation of the School. However, while some components of the infrastructure will continue to be used largely by only one program, none of the existing infrastructure will be viewed as being exclusive to any particular program. As with teaching infrastructure associated with discipline-based units, students in different programs are expected to share common infrastructure.

One obvious need identified is for teaching laboratories for students in the Life Sciences program. The Working Group on the redesign of the Life Sciences Program has identified the current lack of laboratory space and hands-on research opportunities for students in the existing program as a fundamental need that must be addressed in the revised program. The Dean's Office, in collaboration with the Faculty's Space Planning Program and the Office of the Registrar, is currently proposing the development of flexible (teaching laboratory/classroom) space to be associated with the new School. Again, while the new space may be used primarily by the Life Sciences students, it may well prove useful in the other programs associated with the School. The additional space will improve educational opportunities for our students.

Faculty complement and teaching resources

Faculty complement: Given the nature of the unit, it is essential that colleagues appointed to the unit broadly represent the disciplines within Science and that no particular discipline will unduly dominate. Also, while it is certainly appropriate for colleagues in the School to have much of their research and some of their teaching focused in particular areas, all must be involved with interdisciplinary approaches.

The School of Interdisciplinary Science's focus on undergraduate programs calls for faculty appointments in the School to differ in some ways from those in discipline-based units. It is expected that all tenure track colleagues will have joint appointments between the School and an existing unit, although the degree to which the appointment is shared across units will vary from

individual to individual. For example, approximately 50% of an individual's undergraduate teaching and administrative responsibilities could be assigned by the Director of the School while the remaining undergraduate and all graduate teaching and research-related responsibilities would be assigned by the Chair of the discipline-related unit. Other ratios (e.g., 75:25, 60:40) are possible, with the relevant duties being assigned on a pro rata basis. It will also be possible for some tenure track colleagues to have joint appointments between the School and an existing unit where 100% of their undergraduate responsibilities are in the School. In such cases, the Director of the School will be responsible for the assignment of all undergraduate teaching and general administrative duties, but all graduate- and research-related duties will be assigned by the Chair of the disciplinary unit.

The Dean's Office will allocate Faculty Career Progress/Merit (CP/M) units to each unit on the basis of each colleague's percentage appointment in the relevant units. The Chair of the disciplinary unit and the Director of the School will cooperate in the preparation of the CP/M material as is currently done for joint appointments.

In all cases, the Chair of the disciplinary unit will be responsible for allocating research space and resources, graduate teaching responsibilities, access to graduate student applications, etc., as with all other members of the unit. Also, all aspects of a colleague's research program will be administered by the disciplinary unit and all relevant overhead associated with research contracts, etc., will flow to that unit in the same manner as it does for all other colleagues. However, research programs directly related to teaching should be administered by the School and any associated OH will be directed to the School using the same allocation formula as used for regular research contracts.

Teaching Stream colleagues will be able to hold full or partial appointments in the School of Interdisciplinary Science. For partial appointments, each individual's undergraduate teaching and administrative responsibilities will be assigned on a pro rata basis by the Director and the Chair of the other unit.

Appointment of the Inaugural Director and faculty members: Wherever possible to appoint the Inaugural Director, the Faculty will follow McMaster's "Procedures for Selecting Department Chairs." That document calls for a set number of colleagues elected by the unit and from different ranks, to serve on the selection committee. The issue for the selection of the inaugural Director is that, as yet, there is no existing complement to draw a selection committee from. The Working Group proposes that the Dean, in consultation with colleagues associated with the programs to be included in the School, and with Chairs of existing units, will, with Senate Committee on Appointment's approval, appoint a Director whose term would begin approximately six months before the formal launch of the School and end two years after the launch of the unit. The Director would then consult with the Dean, Chairs and colleagues associated with the relevant programs, and prepare an initial complement plan for approval by the Dean, Provost and President. The Director may approach colleagues to determine their interest in joining the unit but no individuals will be transferred to the School against their wishes. Colleagues wishing to join the new unit should contact the Director and Dean; all such requests will be considered. The final decision as to whether the Dean will request a change in appointment from the Provost's Office will be made by the Dean in consultation with the Director and Chairs of relevant units.

Once the School is operational, the Director may request new appointments through the Faculty's process for this in the same manner as Chairs and Directors of existing units. Prior to the end of the inaugural Director's term, the Dean will strike a selection committee to identify the next Director; the inaugural Director will be eligible for reappointment. The Director of the School will be a full member of Faculty Council; this will likely require changes to the Faculty of Science bylaws.

Recognition of resources supplied by other units: The intent is for the majority of courses offered by the unit to be taught by colleagues appointed to the School. However, the nature of the programs, coupled with some individual colleagues wishes to remain affiliated with disciplinary units, make it likely that, as occurs currently, some colleagues with 100% appointments in a discipline-based unit will teach a course with a designator of one of the programs. This "contribution" of teaching resources will be recognized by assigning the net revenue associated with each course to the teaching unit responsible. This does not imply the budget of any unit will change because of who teaches each course, but the total revenue generated, and a sense of the workload shared by the different units, will be documented and studied in preparing each unit's budget allocations and considered in all requests for new faculty positions. Contributions associated with recent hires where the hire was predicated on a certain proportion of teaching in one of the interdisciplinary programs, and the previously defined contributions to the iSci program will not be considered as revenue for the discipline-based unit.

It is essential that the regular offering of such courses and continuity of instructors be as stable as courses offered in discipline-based units; such stability will benefit both the School and the existing units. The Director and Chairs of relevant units should work in collaboration with the Associate Dean (Academic) to develop long term plans for the teaching of such courses. Planning should include provision for colleagues on research or administrative leave. The costs of leave replacements for contributed courses will be provided by the contributing unit; the School will be responsible for covering the costs associated with leaves of colleagues appointed to the School.

Any subsequent changes to such plans must be approved by the Associate Dean (Academic). Colleagues requesting buyout for any course offered through the School (as described in the Provost's recent document) must discuss their proposal with the Director; funding for such buyouts will flow to SIS.

Governance: An Associate Director will be selected by the Director in consultation with colleagues and the Dean. Given the diversity of programs offered by the school, it is preferable that the Associate Director have a different disciplinary background from the Director. The Associate Director's portfolio is best designed by the Director in consultation with colleagues. It may be that the Associate Director is asked to lead the development of new interdisciplinary components for new and/or existing courses and/or programs both within and beyond the School; or the Director may want to assume the primary lead for this responsibility and ask the Associate Director to focus on other tasks. The Working Group recommends against the Director being primarily responsible for some programs and the Associate Director being responsible for the others; it may, however, be useful to appoint faculty program "coordinators" who would be responsible for each program or set of programs and who could serve to form an Executive Council.

The unit will need to develop a Tenure and Promotion Committee as described in Section III 38 of the McMaster University Revised Policy and Regulations With Respect to Academic Appointments, Tenure and Promotion [2012] (YD). That section includes information on the tenure and promotion processes for colleagues with joint appointments. The Director will also need to develop the School's factors for the CP/M process in accordance with the Faculty Career Progress/Merit Plan. For joint appointments not primarily appointed to the new unit, the Director will provide the required assessment information the home Department/School Chair/Director for CP/M purposes.

Staffing

Wherever possible, staff will be recruited from current positions associated with the relevant programs (iSci, Life Sci, Med Rad Sci, and Medical Physics). There are no plans to reduce the staff complement associated with these programs. Also, wherever possible, staff will be appointed to new positions that best match their existing positions. The Dean's Office will work with UNIFOR to, wherever warranted, simply transfer staff to new positions without the need for a search. A preliminary staffing plan is attached.

Operating Budget

The Dean's Office will transfer the relevant proportion of each faculty member's salary and benefit line from their existing unit to the new unit. Similarly, salary and benefit lines for all existing staff who are appointed to the new unit will be transferred. Many of the existing units in the Faculty are in deficit and their deficits will be reduced by an amount prorated to the salary and benefit lines transferred to the School. The sum of the reduced deficits will be handled centrally and not simply passed on to the School.

The current TA expenditures associated with the component programs will be maintained for the first year of operation. Given the expected changes to some of the programs, this aspect of the budget will require study and possible revision in the future. The Dean's Office will study the Collective Agreement with CUPE Local 3906 (Unit 1) and meet with the union to discuss any relevant issues.

The Academic Plan noted that the current practice of allocating TA resources to each unit on the basis of the number of graduate students associated with a particular unit creates a situation where some units have an excess of TAs and others have too few relative to the needs of their undergraduate programs. This concern is particularly relevant to the operation of the School as it will not be directly associated with any graduate program. The Associate Deans (Academic) and (Graduate Studies) will study this issue and will make recommendations on more appropriate ways to both support our graduate students with income and teaching opportunities while also fulfilling the requirements of all undergraduate programs in the Faculty. Until their study is complete and formal changes made, the Faculty will use the existing method of assigning TA allocations and selecting TAs. However, in anticipation of changes, the Dean's Office strongly encourages existing units to work with the new Director of SIS to ensure TAs are assigned in a manner that optimizes their use across the entire Faculty. Similarly, the process of allocating USRAs to the units will continue as before; this process may change in the future but not as a direct result of the establishment of SIS.

An allocation for non-salary costs (for instance, lab and office supplies) will be set by first studying the existing costs associated with the relevant programs. Again, given the expected changes to programs, this will be reviewed and adjusted in the future.

Transition

All students associated with the programs to be included within the School will be contacted as soon as possible after the formal approval for the establishment of the School. Students will be provided with a brief rationale for the change, an overview of how the change may affect them, and contacts in case they have further questions. It will be critical that students realize that the change in administrative structure will not result in any immediate changes to their programs and that they will all be able to complete the programs they enrolled in. The Dean will meet separately with the executives of each of the relevant program's student societies to discuss the development of the School and address any concerns.

All relevant University offices will be advised on the creation of the unit and the appropriate contact information. The Dean's Office will meet with the University's communications office in case they receive any questions from outside the University.

Consultation

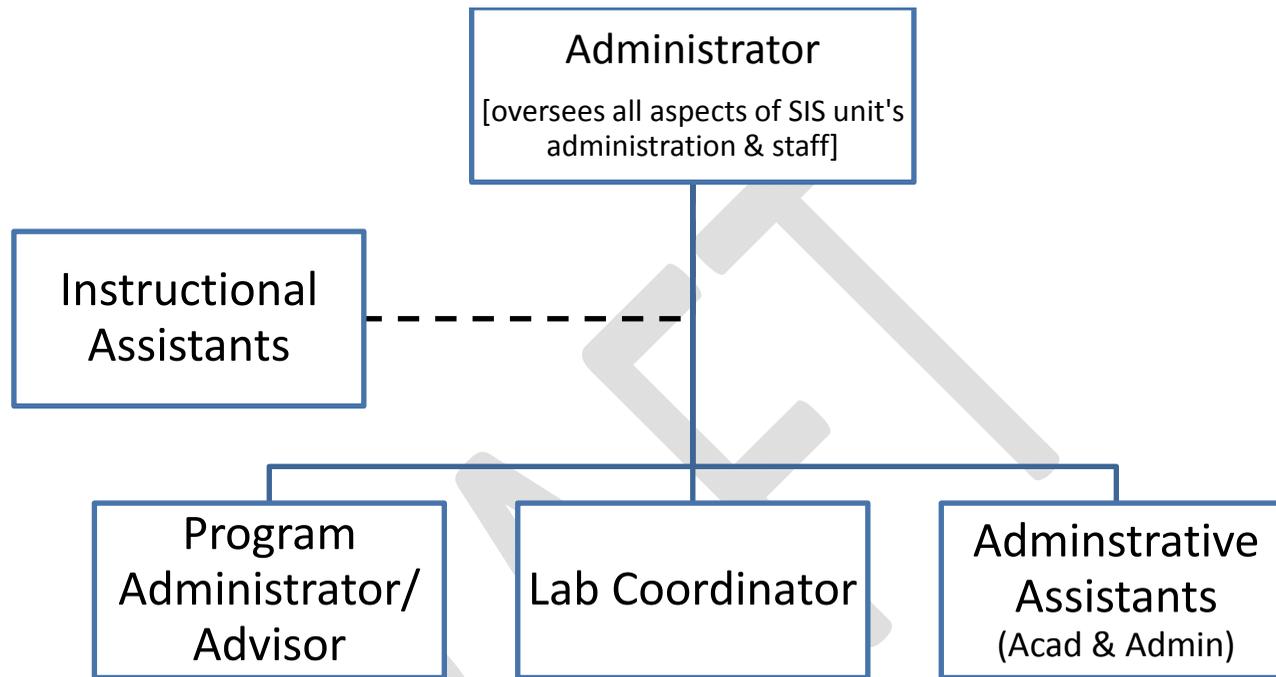
Much relevant discussion and consultation occurred during the year-long development of the Faculty of Science Academic Plan – 2014 to 2019. Since the release of the Plan the following have taken place:

- Discussion during Faculty Council Meetings on November 13, 2014, December 11, 2014, February 12, 2015, March 12, 2015, and April 9, 2015
- Discussion during General Faculty Meeting on October 30, 2014 and March 26, 2015
- Discussion within departmental meetings called to discuss the Academic Plan
- Release of Draft Proposal and request for written feedback
- Dean's offer to meet with any unit that wants to discuss the School in detail
- Discussion of selected issues with UNIFOR and CUPE in collaboration with HR and Labour Relations
- Dean's offer to meet with all staff associated with any of the programs (to come)
- Dean's offer to meet with student societies affiliated with the relevant programs
- Consultation with other relevant McMaster units outside the Faculty

Required Approvals

- Formal approval by Faculty Council
- Formal approval at General Faculty of the Faculty of Science
- Formal Approval at University Planning Committee (UPC)
- Formal Approval at Senate
- Formal Approval at Board of Directors (BOG)

DRAFT Functional Staffing Plan



Instructional Assistants: Design, adapt, and modify tutorial session and lesson plans in accordance to the curriculum priorities of the instructor. Provide formal supervision to teaching assistants and other part-time staff. Review current educational research literature to ensure curriculum follows best practices in teaching, education and learning. Organize and coordinate computer-based instruction and tutorial classes.. Tutor students in programs. Compose test questions and assignments, and prepare solution sheets for review by others. Organize and monitor the on-line learning environment for courses in an academic unit, department, or faculty by ensuring that the appropriate course content information is made available to students. Write a variety of documents such as procedure manuals, correspondence, and reports. Prepare a variety of lecture materials including presentation slides and handouts. Provide guidance, advice, and solutions to teaching assistants when resolving student inquiries. Provide teaching assistants with appropriate teaching material as specified by the instructor. Ensure accurate grading of assignments is completed by teaching assistants and report discrepancies to the instructor.

Program Administrator/Advisor: Write a variety of documents such as correspondence, reports, and procedure manuals. Contribute to the development of student surveys and disseminate surveys to applicable groups. Review applications for a variety of scholarship competitions and ensure they contain the required information and meet the defined eligibility requirements. Prepare and work in consultation with faculty and staff to coordinate the program timetable. Act as a liaison between students and the various individuals and offices within and external to the courses. Inform faculty of established procedures for grade submissions. Schedule student accommodations and resolve scheduling conflicts. Identify and analyze problems with the program and prepare recommendations for review and approval. Advise registered and prospective students of program options and requirements. Review, evaluate, and provide recommendations on applications to ensure students are eligible to transfer into, continue in, and graduate from the program. Act as a mediator between faculty and students when dealing with various issues such as special accommodations, scheduling conflicts, and grades. Gather and compile information required for a variety of documents and reports such as program accreditation, enrolment, and degree audits.

Lab Coordinator: Designs and sets up experiments for undergraduate laboratories. Participates with a team in the designing and editing of protocols. Analyzes experimental results. Coordinates space and equipment usage between departments and programs. Creates and maintains maintenance logs, instrument usage logs, waste disposal documents, staff training documents and works orders, standard operating procedures, lab manuals and teaching materials. Conducts database, literature and web searches to find documents and articles used for reference in laboratories. Prepares estimates of time and resources required for experiments. Attends meetings and retreats with faculty to organize and coordinate laboratories with course curriculum. Consults and provides recommendations to investigators and instructors on equipment purchases. Trains staff and students on the use of laboratory equipment and procedures. Uses hand tools to assemble new laboratory equipment and perform maintenance. Monitors the laboratory budget. Obtains quotes and negotiates pricing with suppliers for bulk purchases and discounts. Ensures that all laboratories are adhering to health and safety standards and procedures. Write a variety of documents such as correspondence, reports, and brochures. Create content for the program website databases and spreadsheets.

Administrative Assistants (Academic & Admin): Supports the Director of the School and the Administrator. Monitor budgets and reconcile accounts. Completes financial forms including travel expense reports, electronic cheque requisitions, purchase orders and journal entries. Develop marketing and advertising brochures. Creates content and maintains the program website. Plans and coordinate a variety of departmental events and activities. Forecast budgets and proposed expenditures for new program proposals and tutorial courses. Receive, send, sort, verify, process and prepare various documents such as purchase orders, invoices, cheque requisitions, receivables, and payables. Process, verify, and balance financial records and business transactions, such as accounts payable, accounts receivable, and payroll. Investigate discrepancies using established procedures. Prepare and generate a variety of scheduled and ad hoc reports. Update, maintain, and verify information in a variety of spreadsheets and databases. Write a variety of formal notes and records using form letters and templates. Answer routine inquiries via telephone, email, and in person that are specific in nature. May redirect complex inquiries to the appropriate area. Maintain filing systems, both electronic and hard copy.