Review Process

This was the first formal review of the undergraduate program of the School of Pharmacy. The School was founded in 2004. The School has now completed its first complete four-year academic cycle, with students in all four years of the program and is looking forward to the graduation of its first cohort of students.

Since the accreditation process of the Canadian Council for Accreditation of Pharmacy Programs (CCAPP) is taking place at the same time as the University of Waterloo’s (UW’s) undergraduate academic program review of the School, it was agreed that the CCAPP documents, which include a self-study, would suffice to meet UW’s requirements as long as there was an addendum that addressed any unanswered questions that were required by UW’s process. To develop the self-study five teams, composed of faculty and staff members as well as students, where appropriate, were identified. These groups developed content and reviewed drafts of the document.

The self-study and other documents were received July 14, 2011; the site visit occurred on 6 to 9, November, 2011; the accreditation report was received January 23, 2012; and the School’s and the Dean’s responses were received July 13, 2012.

Characteristics of the Program

Historical Review

In six years, UW’s School of Pharmacy has moved from concept to full reality. The circumstances of the School’s founding and its rapid growth have intrinsically shaped its culture.

Since 2004 both undergraduate and graduate curricula have been developed and implemented; two new buildings have been designed and constructed; a dynamic complement of faculty and staff members has come together; an active research program has been established; and $54 million in government investment and more than $6 million in private donations have been raised. This speaks to the accelerated rate of change.
The School’s culture encourages collaboration amongst its members. This belief extends to the professional, student and external communities. The very first meeting to discuss a UW Pharmacy curriculum involved individuals from a range of Pharmacy practice disciplines, none of whom was associated directly with UW.

The School of Pharmacy project involved not only a new professional program, but a new campus in Kitchener. Having been created through the generosity and involvement of the community, the School maintains a significant focus on community involvement and partnership.

The Pharmacy School became Canada’s first and only co-operative education (co-op) Pharmacy program. It graduated its first cohort of students in 2011.

**Program Objectives**

The School of Pharmacy is committed to pushing the frontiers of discovery in order to improve human health and well-being. It will pursue the ideals of learning and knowledge through academic excellence, creativity and exemplary scholarship. It will embrace such pursuits by emphasizing interdisciplinary collaboration, diversity of thought and mutual respect. In its quest for innovation, it will promote research that spans the spectrum from fundamental science to clinical care.

**Academic Programs Offered**

**Honours BSc in Pharmacy**

The curriculum is built on innovation, best practices in curriculum design and teaching and a commitment to moving the Pharmacy profession forward. The curriculum is outcome-based and outcomes are integrated across the curriculum and not the sole responsibility of individual courses or instructors. The curriculum content is informed by Pharmacy and community stakeholders. The curriculum has seven academic terms and four co-op terms. In addition to coop, there are two other experiential elements: community service learning and clinical rotation.

The courses cover the four main areas of a Pharmacy curriculum: Biomedical Science, Pharmaceutical Science, Clinical Science, and Social and Administrative Studies. However, the curriculum has an unusually high percentage of Clinical Science. This is because much of the Biomedical and Pharmaceutical Sciences’ content is included in the Integrated Patient-Focused Care (IPFC) nine-course series where concepts from clinical biochemistry, pathophysiology, pharmacology, medicinal chemistry, pharmacokinetics, alternative medicines and care, together with microbiology and therapeutics are integrated.
Distinctiveness/Benchmarking

The School delivers the only Pharmacy co-op program in Canada, and is one of two co-op programs in North America. The program is applauded by Pharmacists and Pharmacy academics as resonating with the needs of that community in offering a uniquely integrated program and a comprehensive experiential learning model. This innovative curriculum has won so far three awards that specifically highlight “innovation” in their title or description.

Students
To be admitted to the School of Pharmacy an applicant has to have completed two years of undergraduate science with at least 75% or equivalent. In addition, the individual has to undertake an interview and a reading comprehension/writing test. These entrance procedures have resulted in low attrition rates, positive co-op work term ratings, high academic success and motivated students.

The School has also initiated a Conditional Admission to Pharmacy (CAP) program for outstanding high school students who can enter the BSc Pharm program in their third year of University studies if they meet specific criteria. For the class of 2014 admission cycle, there were 212 CAP applicants.

During the four years in which the School has been admitting students, the average annual number of applicants was 474 with a high of 614 in the first year. The average annual entry grade was 80.6% with a range from 75% to 94%.

The average rating given by students to the overall quality of teaching in 127 courses delivered over the last seven terms in the School of Pharmacy was 3.9 on a five-point scale where five is “excellent” and one is “poor”. It would appear that students are satisfied with the teaching being offered by the School.

Of the 10 Pharmacy Schools in Canada with a total of 4,902 students, UW is the sixth largest with 430 (8.8%) of these students. The enrolment in first-year Pharmacy is limited to 120 students and in 2010-11, the first year had 117 students. The second year had 122 students, the third year had 103 and the fourth year had 88 students. The academic average each term for these students has consistently been above 76%

The School is working to develop a range of scholarships and awards. Currently there are 13 awards totaling $46,000.

There has been full employment of Pharmacy students in their co-op terms and employers are consistently positive in their opinion of the students. Over 91% of the co-op positions are in Ontario. The practice setting profile of co-op employers is consistent with the distribution of licensed pharmacists in Ontario: 53% in community, 24% in hospitals, 3% on long-term care, 3% in the pharmaceutical industry and 17% in other areas.
The attrition rate from the School is very low as would be expected with the thorough admission procedures.

Since the School involves all stakeholders it is no surprise to find that students are represented on all major committees.

Faculty

At full complement there will be 30 faculty members. At the time of the review there were 15 full-time faculty members; three Full Professors, two Associate Professors, nine Assistant Professors and one Clinical Lecturer. Of these 15, two are in Biomedical Science, six in Pharmaceutical Science, four are in Behavioural, Social and Administrative Sciences and three are in Clinical Sciences. Several of these faculty members are cross appointed in other Departments including Chemistry, Biology, Chemical Engineering and the School of Optometry. In addition, there were 27 part-time faculty members and 23 staff members.

Currently 28% of Pharmacy courses are taught by tenured or tenure-track faculty members. Full-time faculty members coordinate two courses and spend an average of 44.2 hours in classroom and 7.2 hours in lab teaching per year.

In the 10 Pharmacy Schools in Canada, the student/faculty ratio ranges from 38:1 at Dalhousie to 12:1 at Memorial. AT UW it is 36:1. When adjunct faculty members are factored in, the ratio decreases to 25:1. The ratio is high at UW primarily due to delays in hiring faculty members. Over the past six years, faculty members have published 91 journal articles and one refereed conference proceeding, attended 134 professional meeting, delivered 63 invited lectures and attracted $4.5 million from 48 grants. It must be remembered that from 2006 to 2009 there were fewer than nine faculty members in the School, that number increased to 11 in 2011 and 13 in 2011.

Faculty members have also been heavily involved in professional associations.

Strengths and Concerns

Strengths

- Support of the University administration and the Faculty of Science for the program;
- The faculty members are to be congratulated on all the accomplishments since the last CCAPP visit. A core group of faculty members have developed a unique program well respected by the professional community;
- State of the art physical facilities, though it is noted that there is an urgent need for access to a second large classroom to accommodate an entire class;
- A dedicated, enthusiastic group of faculty members;
Centre for Teaching Excellence whose staff has provided a wealth of guidance and support to the faculty members and the program;
Passionate, energetic, well qualified students who are proud to be part of this program;
The co-op program which allows for integration of knowledge and skills to meet the outcomes and competencies of the program;
Strong community engagement and support;
Well qualified Director who is eager to move the program to the next level.

For accreditation, the CCAPP has 23 standards for which compliance is required. Thirteen were met; eight were partially met; and two were not met. The two not met relate to the need for a strategic plan and academic program evaluation. The eight that were partially met were:

- Evaluating the outcomes of the School;
- School/University relationships;
- University/ Affiliated health Care Organizations’ relationships;
- Organization and administration of the School;
- Faculty and staff resources to meet the needs of the School;
- Evaluation of individual faculty members;
- Adequacy and accessibility of library and learning resources

Most of these are stated in the concerns below

**Concerns**
While support for Pharmacy is evident, Governance under the Faculty of Science is unconventional for a Pharmacy program and results in:

- The inability to respond efficiently to rapid changes in the profession due to delay in processes in such areas as curriculum change, policy and procedure approval etc.
- Limited understanding of the requirements for delivery of clinical curricula
  - CCAPP recommends that there be exploration of the best way to meet the needs of Pharmacy and perhaps other Health Professional faculties on campus
  - Recognizing that discussions are underway, a permanent budget with independent authority and responsibility is recommended as soon as possible
  - Need for the development of a strategic plan with succinct mission and vision, goals, objectives, timelines and performance measurements
  - Lack of a program evaluation structure
  - Lack of tenured stream faculty teaching core components of the curriculum

Heavy reliance on adjunct faculty members who provide the expertise in core curriculum.

- These positions are not formally recognized in the current University environment.
- Perhaps consideration should be given to converting some of these positions to clinical professorships
- One of the requirements of CCAPP standards is that faculty members develop relationships with other health profession Faculties. The new standards, which will be released next year specify that there must be a close relationship with a Faculty of Medicine and Nursing. We recognise that the Medicine satellite is relatively new at the
University of Waterloo but we are disappointed that the relationship seems underdeveloped.

Given the close proximity to the McMaster Faculty of Medicine Satellite program, a number of opportunities exist that would benefit both programs such as inter-professional education, (IPE) library facilities and resources and curriculum delivery.

Faculty members and students should be commended for their leadership in IPE, however, a formal strategy by the University is recommended to ensure compliance with the increasing emphasis of IPE by all health professional accreditation bodies - Committee structures were reviewed and due to the importance of the curriculum committee to the mandate of the school, CCAPP recommends the chair should always be a pharmacy faculty member.

Action Items related to the External Review of the Pharmacy Program

Item 1: The School must move forward with strategic planning including developing a succinct mission, vision, goals and objectives with performance measurements and timelines; it has been difficult to measure success without a strategic plan.

Response: Although the School currently has a mission and vision statement, this needs to be revised. In addition, the School does not currently have a strategic plan. There was little opportunity to engage in formalized strategic planning prior to 2011 given that there were relatively few faculty and staff members until recently. In addition, at the same time, the School underwent a period of transition related to the retirement of the founding Director.

Plan: A strategic planning process is scheduled to begin in summer 2012. The anticipated process and timeline is outlined in the following diagram with the goal of having a new mission and vision statement adopted in 2012 and completion of a strategic plan by June 2013.

August 2012

- Vision
- Mission
- Values

October 2012

Strategic Priorities
March 2013
◆ Strategic Goals
◆ Metrics

June 2013
Approval of Final Document

**Item 2:** The draft constitution needs to be approved according to UW procedures and implemented.

**Response:** The School of Pharmacy adopted a constitution in 2010 that was modeled in part on the Faculty of Science constitution and provided a governance structure for the School. However, the external reviewers pointed out that this document was not approved by any University committee or body outside the School of Pharmacy. In addition, concern was expressed with the inclusive nature of the voting privileges defined in the constitution. Full voting rights were granted to a wide spectrum of part-time faculty and staff members which could in theory permit these individuals to play an important role in decisions which should more properly be decided upon by full-time faculty members.

**Plan:** The constitution has been significantly revised with input from the Executive Committee of the School of Pharmacy. This will be presented at the next scheduled faculty meeting in fall 2012 for discussion and approval. In the absence of specific University guidelines regarding approval beyond the School, we believe that Science Faculty Council be asked to review the constitution and provide its input and support.

**Item 3:** Curricular mapping must be completed.

**Response:** Although the Pharmacy curriculum was designed several years ago, it was not until the end of the spring term 2011 that all courses had been offered. The School of Pharmacy held a curriculum retreat in fall 2011 to begin the process of mapping the curriculum with respect to content and desired outcomes.

**Plan:** The Curriculum Committee, a standing committee of the School of Pharmacy, is charged with completing the curricular mapping process. The curriculum has been divided into several components for mapping with sub-groups assigned to review each component. Significant progress has been made in mapping the Professional Practice sequence (four laboratory and three didactic courses) together with the nine courses that comprise the Integrated Patient Focused Care sequence. Completion of the curricular map for this section is expected by the end of 2012. A similar time frame is anticipated for completion of the practical training components of the curriculum (co-op, clinical capstone, objective structured practical exams).
We anticipate that the full curricular map should be finished by mid-2013.

**Item 4:** Co-op experiences need to be evaluated to ensure adequate exposure to patient care in both community and hospital settings.

**Response:** Co-operative education is an innovative model for providing students with practical experience that enhances and reinforces classroom learning. UW’s School of Pharmacy is the only pharmacy program in North America that provides essentially all of its practical experiences using a co-op model. Co-op offers our students exposure to a much broader range of potential career opportunities than traditional experiential education. Students may work in community pharmacy, hospital pharmacy, long-term care, family health teams, pharmaceutical industry, government, and professional organizations.

A concern that has been raised by external evaluators is that co-op is an employer-driven model with the priorities for the work term primarily established by the employer. Since the employer is paying the student, it is difficult for the University to impose rigid expectations for student learning during the co-op experience. Training of health care professionals has traditionally used a highly structured model in which preceptors (typically clinicians working in a variety of health care settings) provide close supervision of students under their direction to ensure that students are meeting a rigid set of outcomes established by the university. The majority of these clinical rotations typically take place in hospitals and other acute care settings.

**Plan:** Responsibility for ensuring that our Pharmacy students are learning the skills that they need to provide patient care rests primarily with our Curriculum Committee as well as the individuals who direct experiential education within the School. As part of the strategic planning process, we will need to determine whether or not our current structure for experiential education is meeting the needs of our students as well as the requirements for accreditation. Depending on the outcome of this evaluation, a re-structuring of our experiential program may be required, particularly given the new accreditation standards that are quite explicit regarding the timing, length and nature of practice experiences:

**Criterion 28.1:** The curriculum must include practice experiences where students can develop the appropriate clinical skills to assist a variety of patients, including the management of patients with acute illnesses and/or chronic conditions in primary care, long-term care, critical or emergency care, and those in the transitions between levels of care.

**Criterion 28.4c:** For the Bachelor’s degree, a sustained period of required concluding practice experiences near the end of the program must involve at least 12 weeks (480 hours) of fulltime, student placement in practice sites.
**Item 5:** The program needs to implement a systematic approach for program evaluation including assessment of teaching effectiveness.

**Response:** The external review noted that the School did not have a coordinated plan in place to assess and monitor progress towards achieving the objectives of the program. As a result, Standard 13: Academic Program Evaluation was judged as “not met”. The ability to collect and analyze data related to the achievement of curricular and other programmatic goals was limited prior to the graduation of the first class to complete the entire curriculum in fall 2011.

**Plan:** The School has created an Assessment Committee which will be charged with developing and implementing a comprehensive plan for assessing the intended outcomes of the program. This committee is expected to collect or co-ordinate the collection of data from students, alumni, faculty, staff and external stakeholders needed to fulfill its mandate. In addition, the Assessment Committee will work closely with other standing committees such as the Curriculum Committee and Admissions Committee to identify areas where improvement is needed.

**Item 6:** The full complement of faculty vacancies needs to be approved for hiring and filled; the large number of sessional appointments, rather than full-time faculty members in the professorial stream, who are teaching major components of the curriculum creates some vulnerability to the program.

**Response:** A number of factors have contributed to the current situation in which many courses in the Pharmacy curriculum are not being taught by full-time faculty members in the professorial stream. Chief among these is the relatively small number of full-time faculty members. Although there have been four new hires in the past 12 months, there are still only 16 full-time faculty members in the School. It was originally anticipated that the full faculty complement would be 30. In addition to full-time faculty members, several faculty lines are currently occupied by part-time faculty members who are typically pharmacists whose expertise is needed to deliver the clinical portion of the pharmacy curriculum. Recruiting the projected number of required faculty members has occurred more slowly than expected. Delays in completing the new Pharmacy building made it difficult to recruit faculty members with laboratory-based research programs and the lack of affiliated teaching hospitals in the Kitchener-Waterloo region has posed a challenge in attracting clinical faculty members who require access to patients for their teaching, research and service activities.

**Plan:** The administration of the School of Pharmacy is eager to move forward aggressively with hiring new faculty members. There is currently only one open position and a preferred candidate has been identified. We are optimistic that this search will result in the addition of a senior faculty member joining the School in fall 2012. Further additions to the faculty complement will require approval of additional positions within the budget for the program (see Item 7). The hiring plan will also include provisions for consolidation of some of the faculty
lines currently occupied by part-time or sessional instructors. However, it should be noted that there will continue to be a need to hire some practicing pharmacists as part-time and sessional faculty members to teach pharmacy students.

**Item 7:** A finalized budget for the School needs to be established that provides the School with the necessary resources to achieve its mission.

**Response:** It has been difficult to plan and prioritize spending within the School to achieve our objectives without a defined budget. In addition, new faculty positions need to be approved within the budget in order to reach the anticipated full complement of faculty and staff (see Item 6).

**Plan:** A budget proposal has been developed by the administration of the School of Pharmacy in conjunction with the Dean of the Faculty of Science. Further progress in this area is dependent on approval by the Provost’s Office and central administration of the University.

**Item 8:** Strengthen and expand inter-professional education (IPE) with a particular focus on relationships with medicine and nursing.

**Response:** Inter-professional education has been a significant challenge for the School of Pharmacy. Every other Pharmacy program in Canada is located in a University that has Medicine and Nursing programs as well as an affiliated network of teaching hospitals. Faculty, staff and students at the School have worked hard to create an inter-professional group involving Optometry (Waterloo), Medicine (McMaster University satellite campus), Nursing and Health Sciences (Conestoga College) and Social Work (Wilfred Laurier University). Despite these efforts, the external reviewers noted that the current level of activity is at the level of inter-professional discussion and needs to move to a higher level of interaction. The site team also expressed disappointment that a more significant working relationship has yet to be developed with McMaster University School of Medicine given that a satellite campus for this program is located on the Health Sciences Campus of University of Waterloo.

**Plan:** The School of Pharmacy is committed to moving forward in this area to address the concerns of the external reviewers as well as to meet increasing expectations in this area by CCAPP. The new accreditations standards for Pharmacy programs, effective January 2013, include two new standards related to inter-professional education and specifically require a strong commitment to IPE on the part of the University:

**Standard 3:** The University has integrated and endorsed the concept of interprofessional education and collaboration in practice. Our efforts will be primarily devoted to enhancing IPE with Medicine and Nursing. These are
the primary health care professionals that pharmacists must work with in order to effectively manage the medication requirements of patients and are explicitly mentioned in the new accreditation standards:

**Standard 1, Criterion 1.1:** At a minimum, the other health professions must include Medicine and Nursing. If the University does not have these programs, the Faculty must establish a formal alliance at another University within close proximity.

A retreat has been scheduled with McMaster University School of Medicine, Kitchener satellite for Monday, July 23 to discuss a variety of topics of common interest. Professor Edwards, the Director of the School of Pharmacy, is scheduled to meet with officials from Conestoga College in early August to discuss enhancing the relationship between Pharmacy and the Nursing program at Conestoga (also affiliated with McMaster University). In addition to these initiatives, we have had preliminary discussions with both the Schulich School of Medicine and Dentistry at the University of Western Ontario and the Northern Ontario School of Medicine (NOSUM) regarding how we might further relationships with both of these programs.

**Item 9:** Library resources need to be assessed and possibly upgraded. Preceptors and employers involved in the supervision of students on clinical placements should have access to appropriate electronic and other resources as needed.

**Response:** Efforts to move forward with improving the resources in the Pharmacy library as well as the service offered to students, faculty and staff were hindered until recently by the lack of a permanent pharmacy liaison librarian. A recent agreement by the Provost’s Office to support the permanent position within the library budget was a significant positive development.

**Plan:** A search for a Pharmacy liaison librarian was initiated in late April with the search committee including representatives from both the School of Pharmacy and the library. Finalists were identified and interviews conducted in late June. An offer has been made to the preferred candidate. The successful candidate will be expected to assess current library resources, hard copy and electronic, and upgrade the collection as needed. The Pharmacy liaison librarian will also develop a plan for meeting the library needs of students, staff and faculty. This includes the need to provide access to appropriate resources for individuals who are supervising the education of Pharmacy students at clinical sites that are remote from the University of Waterloo campus.