

Meeting the *Blueprint for Pharmacy* through curricular design: School of Pharmacy, University of Waterloo

About the School

- Anchor institution for Waterloo's new Downtown Kitchener Health Sciences Campus (also home to a regional program of McMaster University's Michael G. DeGroot School of Medicine, and a satellite of the UW School of Optometry's teaching clinic)

- First class of Pharmacy undergraduates began studies in January 2008.

- Currently there are approximately 315 students, spanning three academic years. At full capacity, the School is expected to have 480 undergrads, 70 graduate students, 30 faculty members, and 20 staff

- City of Kitchener made a \$30 million contribution to the development of the School of Pharmacy in its downtown core

Value Statement

The UW School of Pharmacy values community. We mean community in the largest possible sense because we belong to a large number of communities. Some of them are intimate; like the on-campus faculty, students and staff. Some of them are distributed; like the pharmacy profession in Canada and the international science community. But we see the big picture and understand how we may work with, serve and impact all of our communities. We intend to cultivate relationships with a broad, inclusive set of collaborators and strive for mutual success. We will demonstrate this through communication, supportive environments, pursuing innovation in science, education, health and wellness and encouraging individualism. This encompasses our shared respect for each other, our openness, caring, gregariousness and our desire to make a difference.

Large elective component:

- Incorporated 5 elective courses into the curriculum with a broad range of offerings
- opportunities within co-op for students to work in a wide range of pharmacy practice areas, other health related settings and geographic locations

Enhanced experiential programming:

- to have more experiential earlier in the curriculum
- integrated throughout the curriculum
- with opportunity for broader student exposure to healthcare, global health and the pharmacy profession
- interprofessional opportunities
- "real world" experiences
- substantial elective offerings
- connecting and working with our local community to understand social determinants of health
- to use real practice as the final assessment of medication management skills

NOTABLE CURRICULAR DESIGN FACTORS

Creating a curriculum from a blank slate has offered many opportunities for innovation, incorporation of curricular/teaching best practices and teaching knowledge/skills that will move the pharmacy profession forward

1.1 Ensure that core pharmacy curricula address the knowledge, skills and values required for future pharmacy practice to ensure new graduates are prepared to develop and practice in emerging role

Course Integration

- integration of some of the core content that traditionally is taught in separate courses.
- Integrated Patient Focused Care (IPFC) series integrates clinical biochemistry, pharmacology, medicinal chemistry, pharmacokinetics, therapeutics, self care and natural health products using a mixed delivery method of didactic lectures and cases.
- Led to creative thinking about how to deliver content within IPFC (i.e. infectious disease topics taught by body system versus in a separate section, geriatrics and pediatrics integrated throughout the IPFC course sequences) and how to coordinate between courses (i.e. medical microbiology parallels its content with the IPFC modules, so that it is reinforcing content and students need to pull information from one course to another in order to adequately assess a patient's medication therapy needs)

Additional curricular focus areas:

- Business/entrepreneurship / change management
- Informatics
- Personal, business and health applications
- Compounding/formulation

An inclusionary approach to curricular design

- Curricular planning in a specific area occurs with input from internal and external experts.
- a group of external experts was brought in to assist with visioning and designing a forward-thinking curriculum for some aspects of our curriculum (ex business, informatics and patient safety)
- For other areas, groups of individuals from within the program spend time designing and interlinking courses to ensure content and skill coverage
- This inclusionary approach to curricular design has led to innovative approaches to course design and delivery.

This vibrant colored garden mosaic depicting the natural roots of pharmaceuticals, drapes the School of Pharmacy building in downtown Kitchener

Symphytum officinale(Comfrey)
Vinca (periwinkle)

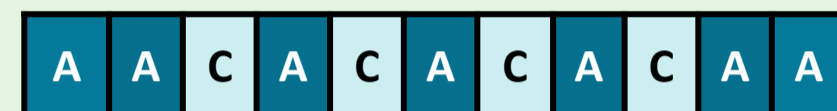
Experiential Education

1.5 Increase the accessibility, quality, quantity and variety of experiential learning opportunities to prepare pharmacy professionals, including students, to practice in expanded and innovative roles

Our innovative experiential learning model integrates a didactic curriculum with: Co-operative Education, Community Service Learning, and a Clinical Rotation.

Co-operative education

Our School of Pharmacy is only the second of its kind in North America to offer a co-op program, and the very first one available in Canada. As part of an Honours Co-operative Bachelor of Science in Pharmacy (BScPhm) degree, students must complete a total of four, four month work terms as per the following schedule (with each block representing 4 months):



A = Academic Semester; C = Co-op work term

		Fall 2009 (1st co-op term)	Winter 2010 (3rd co-op term)	Spring 2010 (2nd co-op term)
General	Number of students	113	89	109
	Number of employers	57	76	57
	Number of job postings	131	127	126
Types of job postings	Community	75 (67.0%)	69 (61.6%)	80 (63.5%)
	Hospital	17 (15.2%)	19 (17.0%)	31 (24.6%)
	Family Health Team	2 (1.8%)	6 (5.4%)	2 (1.6%)
	Corporate – Head Office	2 (1.8%)	2 (1.8%)	2 (1.6%)
	Government/Military	3 (2.7%)	2 (1.8%)	1 (0.8%)
	Industry	6 (5.4%)	8 (7.1%)	3 (2.4%)
	Research/Academia	3 (2.7%)	3 (2.7%)	4 (3.2%)
	Professional Associations	1 (0.9%)	2 (1.8%)	2 (1.6%)
	Other	3 (2.7%)	1 (0.9%)	1 (0.8%)

Community Service-Learning(CSL)

CSL is an educational approach that integrates service in the community with intentional learning activities. CSL was incorporated into the pharmacy curriculum to address professional competencies and educational outcomes such as professionalism, ethics, citizenship, advocacy, diversity, competency, and communication skills.

Pharmacy innovation Garden (PHiG): – "planting ideas, growing change"

- Combines the goals of meeting the capacity-building needs expressed by the community while encouraging students' professional development through practical volunteer experiences.
- PHiG projects are part of the first year curriculum and are completed over a 6-month period.
- Transformative learning is facilitated by lectures, discussions and reflective assignments that link community experiences with classroom material in the Introduction to the Profession of Pharmacy course, as well as informally in Professional Practice and Communications courses.
- Successful outcomes have been confirmed through student and agency evaluations and by students' greater social awareness, as well as development of work skills and engagement in community work expressed through students' reflection assignments.

Clinical Rotation

- Developing a Regional Medication Management Clinic
- Faculty members provide medication management services in interprofessional environment
- Opportunity for students to demonstrate their competence in a controlled environment, and apply their skills and knowledge to patients in a primary care setting.
- Students will be evaluated on assessment, intervention, documentation, and follow-up for moderately complex patients with common diseases.
- 2-3 days/week would be dedicated each semester to clinic time
- A student seminar will be incorporated into this clinical capstone program.

Co-op process

School of Pharmacy Co-op Requirements

All co-op students are expected to work a minimum of 35 hours per week for 16 – 18 weeks. These are paid positions. Students at the School of Pharmacy have a number of additional and unique requirements for their co-op work terms. These requirements include:

- No more than two work terms with one employer
- No more than two work terms in one type of practice setting
- By the end of the second work term, must complete a minimum of one work term with a drug distribution component
- In the third or fourth work term, must complete a minimum of one work term with a direct patient care designation
- Must have a minimum of one work term that is in an underserved geographic area in Ontario
- Must incorporate into a minimum of one work term service to an underserved population where the student interacts with patients and makes a meaningful contribution to their well-being

Evaluation

There are three written evaluation pieces during a co-op work term.

- CECS evaluation forms at the mid-point and the end of the work term,
- Professional Learning Outcome Tracker (PLOT)
- Reflective assignment.

Examples of 2009 Community Service-Learning Projects

Organization	Project Description
Spiritual Heritage Education Network	Deliver breathing workshops for blood pressure management: hospital, prison, schools
Women's Crisis Services	Complete survey report and recommendations on women's shelter programs
Parkwood Mennonite Home	Plan grand opening event
Grand Valley Trails Association	Develop awareness campaign and partnerships, assist with fundraiser
Kids & Dad	Plan father's day/fundraising events
Working Centre, Psych Outreach	Research compassionate care pharmacies, assist with fundraiser walk
ACCKWA (AIDS Committee)	Conduct vitamin drive, assist with fundraiser dance
Learning Disabilities Association	Learning disabilities public awareness campaign
Juvenile Diabetes Research Fdn	Link pharmacists as diabetes resource, help w/ research symposium and walk
Project Read	Research health literacy awareness, curriculum, tools in medical education and practice
Christian Horizons	Develop public health education materials for international aid initiative
Kidsability	Develop community education forum on treatment for autism or sleep disorders
DeafBlind Ontario Services	Research adaptive technologies for clients and/or implement sensory activity plan
Planned Lifetime Networks	Implement Reaching Out to Senior Parents awareness project and network
K-W Habilitation Services	Develop health fair/wellness workshops

Integration of Learning

1.4 Ensure all pharmacy professionals, including students, value and develop lifelong learning and personal performance assessment skills to assist them to be competent to practice in these emerging roles.

Co-op Debrief

After the work term, students and faculty discuss the students' development of their professional competencies and what steps they plan to take to further develop the competencies either from academic course work or future co-op work terms.

PDPHARM Courses

- *Co-op Fundamentals
- *Communication for Pharmacists
- *Drug Distribution for Pharmacists
- *Patient Safety for Pharmacists
- *Patient Care for Pharmacists
- *Drug Information, Education and Health Promotion for Pharmacists
- *Interprofessional Relations;
- * Pharmacy Practice, Management and Leadership

E-portfolio

Students use the e-portfolio as an integrating tool.

In their e-portfolio they are required to add the following:

- Completed PLOT
- Completed evaluation forms
- Reflective assignments
- Résumé and mission statement

Professional Learning Outcome Tracker (PLOT)

*An assessment tool for students to track their learning outcomes of a pharmacy undergraduate program throughout their 4 co-op work terms.

*A comprehensive and well-defined framework for the learning outcomes and competency elements (with practical examples provided) that students need to address and achieve upon graduation and at entry-to-practice of the pharmacy profession

*The four main constructs measured are:

*Patient care *Drug Distribution* Drug Information, Education, and Health Promotion Pharmacy Practice * Management and Leadership

*Allows student's self-assessment (with practical examples or evidence extracted from student's Experience Log), employer's assessment (with employer's comments and practical examples or situations observed by the employer), and also student's revised self-rating with rationale after discussion with the employer.

*Student and employer can choose from a rating of 1 to 5 which represent 1-Not addressed ,2-Observed, 3-Challenging, 4-Developing, 5-Mastering

Interprofessional/Intraprofessional Initiatives

1.2 Promote and increase interprofessional and intraprofessional approaches to education and training to ensure optimal patient-centred care in an integrated health care environment.

In each year of study, we provide students with interprofessional experiences that build competence over the four years of study.

*Year 1: We establish a foundation

*Year 2 and 3: We create opportunities for shared learning and practice

*Year 4 : We place students in a mandatory rotation in an interprofessional family health team

There are six UW Pharmacy course areas where interprofessional learning is anchored

- Pharmacy 120 (Introduction to the Professional of Pharmacy) where interprofessional concepts are introduced featuring a videotaped simulation of an interprofessional team case conference.

- Second-year seminar course where Pharmacy, Medical and Social Work students learn together about subjects of shared interest.

- Third-year Business courses where the interprofessional team concept and in particular, the different roles pharmacists can play, is explored.

- IPFC, where cases that include interprofessional elements are featured.

- Professional Practice where simulations demand interprofessional skill in interacting with either standardized patients acting as non-pharmacist healthcare providers or learners from other programs

- Clinical rotation where students counsel actual patients in a family health team environment

Educational Research

1.11 Conduct and utilize research to develop, evaluate and improve education and CPD programs.

Examples of ongoing educational research:

- Co-operative education: experiential capacity building at the University of Waterloo

- Development of a state-of-the-art patient safety curriculum : from classroom to co-op and vice versa

- Investigating the effectiveness of drama as a learning methodology and means of engaging students in the school of pharmacy.

- A model for measuring co-op learning outcomes: a tracker, work term reports and e-portfolio.

- Exploring the Barriers and Enablers of Community Pharmacist Delivered Smoking Cessation Interventions

- An Outcomes-Based Model for Microbiology Curricular Assessment and Design in Pharmacy at the University of Waterloo

- Continuing Professional Development Needs Assessment Project

- The Memory Clinic: Translating Inter-Professional Care into Inter-Professional Education

- Learning to Serve, Serving to Learn: The Beginning of a Cross-Campus Community Service Learning Initiative.

- Making Patient Safety Real: An Outcome-Driven "Classroom to Co-op and Back Again" Research Initiative

- A Blended Learning Approach to Teaching Basic Pharmacokinetics and the Significance of Face-To-Face Interaction