**Course Number:** PHM144H1

**Course Title:** Pharmacokinetics

**Outline Version Code:**

**Course Description:**

This course will examine how physiologic and biochemical processes influence the fate of drugs in the body. The interrelationship between the physicochemical properties of the drug and the rate/extent of absorption, distribution, and elimination (ADME) will be explored. Mathematical modeling of the plasma concentration time curves following drug administration will constitute a major part of the course. Fundamental pharmacokinetic principles and quantitative relationships will be used to determine approaches in designing dosage regimens, evaluating pharmacologic response and explaining mechanisms of drug-drug interactions. The resulting theory will form the basis for selecting a particular route of drug administration, determining the frequency of administration, and identifying patient factors which require a modification of normal drug dosing regimen.

**Semester:** ☒ Fall ☐ Winter ☐ Summer

**Course Type:** ☐ Elective ☐ Selective ☒ Mandatory

1. **Course Learning Objectives:**
   Upon completion of this course, students will have achieved the following level of learning objectives:
   Introductory = knowledge and comprehension of concepts, definitions
   Intermediate = application of concepts to simple situations
   Advanced = application of concepts to more complex situations with ability to synthesize and evaluate
**Knowledge**

**Introductory Level:**

Describe how changes in normal physiology or disease affect the absorption, distribution, metabolism or elimination of the drug. Relate, using equations, drug concentrations with pharmacologic activity (or toxicity). Explain the pharmacokinetic basis for specific drug interactions.

**Intermediate Level:**

Calculate the plasma drug levels with any dosage regimen (infusions, multiple doses, single doses). Deduce the extent of accumulation of drugs after multiple dosing.

Interpret the pharmacokinetic/dosing information found in readily available drug information sources like the Compendium of Pharmaceuticals and Specialties (CPS).

**Advanced Level:**

Determine the dosage adjustments for individual patients taking into account patient-specific characteristics.

**Skills**

**Introductory Level:**

**Intermediate Level:**

**Advanced Level:**

**Attitudes/Values:**

**Introductory Level:**

Realize the importance of pharmacokinetics in decision-making related to drug therapy.
2. Rationale for Inclusion in the Curriculum:

Pharmacokinetics is integral to the deep understanding of the fundamentals of drug absorption distribution, metabolism and elimination. Together with information regarding response and toxicity, pharmacokinetics assists in product design and the identification of a dosing regimen to be recommended for the average patient. When physiologic differences between patients lead to noteworthy changes in a drug's normal pharmacokinetics, it is possible to furnish a rational quantitative adjustment in order to achieve the desired response.

3. Pre-requisites:

4. Co-requisites:

Physiology

5. Course Contact Hours and Teaching Methodologies:

<table>
<thead>
<tr>
<th>Didactic (lecture)</th>
<th>Hours: 33</th>
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<tbody>
<tr>
<td>Large group problem-based/ case-based learning (group size: )</td>
<td>Hours:</td>
</tr>
<tr>
<td>Laboratory or Simulation</td>
<td>Hours:</td>
</tr>
<tr>
<td>Tutorial/Seminar/Workshop/Small Group (group size: )</td>
<td>Hours: 6</td>
</tr>
<tr>
<td>Experiential</td>
<td>Hours:</td>
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<tr>
<td>On-line</td>
<td>Hours:</td>
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<tr>
<td>Other (please specify): Workshop with group size of ~30 students</td>
<td>Hours:</td>
</tr>
<tr>
<td><strong>Total Course Contact Hours</strong></td>
<td><strong>Hours: 39</strong></td>
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</table>

6. Estimate and description of student's weekly out-of-class preparation time excluding exam preparation:

Two to four hours to prepare for each workshop.

7. Topics Covered and Lecture Specific Learning Objectives

**Week 1**

**Lecture Topic:** Introduction to PK (CC)/ Concentration vs. time data/ One Compartment IV dosing (CC)

**Lecture Learning Objectives:**
Explain why plasma or serum drug concentrations are more frequently used to assess drug in the body than blood concentrations. Define the following terms: bioavailability, compartment, disposition, distribution, excretion, extravascular administration, first-pass loss, intravascular administration, local administration, metabolism, parenteral administration, pharmacokinetics, systemic absorption, systemic exposure. List 4 reasons why understanding pharmacokinetics is critical for drug development or therapeutic practice. Plot concentration-time data obtained after i.v. bolus dose on rectilinear (Cartesian) and semi-log paper. Calculate t1/2, V and k for a drug that exhibits one-compartment model characteristics. Explain the compartmental model concept in PK. Define, in both words and equations, elimination rate constant, apparent volume of distribution, and half-life.

**Week 2**

**Lecture Topic:** Volume of distribution/ Clearance concepts (CC)

**Lecture Learning Objectives:**

List the physiologic factors that determine the apparent volume of distribution. Estimate the apparent volume of distribution of a drug in a patient with an altered fraction unbound. Calculate the plasma concentration of a drug at time t after an IV bolus dose. Calculate the IV bolus dose of a drug required to achieve a desired plasma concentration at time t. State the equation to describe the plasma drug concentration as a function of time for drugs exhibiting characteristics of a 1 compartment model. Define drug clearance and contrast this with the rate of elimination and the elimination rate constant. Given the CL of a drug, calculate the dosing rate required to maintain a desired steady-state concentration (Css). Define the extraction ratio (ER) and describe how it relates to CL of a drug. Calculate the ER of a drug across an organ given organ blood flow and clearance. Determine from the value of its extraction ratio whether the clearance of a drug by an organ is sensitive to perfusion or to cellular activity (intrinsic clearance) and plasma protein binding. Explain the statement “Half-life and elimination rate constant depend on clearance and volume of distribution, and not vice versa”.

**Week 3**

**Lecture Topic:** Two compartment models (CC) / Workshop 1

**Lecture Learning Objectives:**

Explain why a simple one-compartment model, as a description of drug distribution in the body, often does not suffice. When the distribution kinetics of a drug after a single IV dose is described by the sum of two exponential terms, ascertain which term is associated predominantly with elimination and which with distribution following a single bolus dose. Calculate rate constants (k12, k21, k10), half-life, V1, V2 and Vss given plasma concentration data for a drug exhibiting two-compartment model. When given macro-constants for a 2-compartment model determine the micro-constants and vice versa.

**Week 4**

**Lecture Topic:** Oral dosing / Bioavailability (CC)

**Lecture Learning Objectives:**

Describe the characteristics of, and the differences between, first-order and zero-order absorption processes. Estimate the bioavailability of a drug, given plasma concentration-time profiles following both extravascular and intravascular administration. Given plasma concentration data, determine ka, k, t1/2, Cmax, tmax following extravascular administration of a drug. Knowing absolute bioavailability, estimate pharmacokinetic parameters from plasma concentration data following extravascular administration. Anticipate the effects of altering rate or extent of absorption, clearance, or volume of distribution on the plasma concentration and amount of drug in the
body following extravascular administration. Determine whether absorption or disposition rate limits drug elimination, given plasma concentration-time data following different dosage forms by the same route of administration or the same dosage form by different routes of administration. Anticipate the effect of altering the kinetics of absorption, extent of absorption, clearance, or volume of distribution on the systemic exposure-time following extravascular administration. Define bioequivalence and briefly describe how it is assessed.

**Week 5**

**Lecture Topic:** Membranes and principles of drug absorption (KSP) Physiologic factors affecting drug distribution and elimination (KSP) / Workshop 2

**Lecture Learning Objectives:**

Define the terms: transcellular, paracellular, passive diffusion, facilitated diffusion, active transport and permeability. Discuss how a change in the intestinal transit time influences the rate and extent of drug absorption. Describe the process of membrane transport and its influence on drug absorption and availability. List the primary factors that limit bioavailability. Understand that the rate-limiting step in absorption will depend on the properties of the drug molecule. With the help of the Michaelis-Menten equation, relate the Km and Vmax of a drug to different proteins, to the importance of this interaction in absorption or elimination.

**Week 6**

**Lecture Topic:** Physiologic factors affecting drug distribution and elimination (KSP)

**Lecture Learning Objectives:**

Relate the rate of membrane transport to the membrane permeability coefficient, the surface area of the membrane and the concentration gradient across the membrane. Explain the concept of the pH partition theory by relating the ionization state of a drug molecule (with a known pKa) to the pH of a biological fluid. Describe the major plasma proteins that bind drugs and the influence that protein binding has on the extent of distribution. List the key transporters present at the brush border of the intestinal lumen, the blood- brain barrier, the sinusoidal and canalicular membranes of the hepatocyte, and the basolateral and apical membrane of the kidney. Describe where filtration, secretion and reabsorption of drugs occur within the nephron.

**Week 7**

**Lecture Topic:** Principles of drug metabolism (JU)

**Lecture Learning Objectives:**

List the important P450 isoforms (i.e., CYP3A4, CYP2D6) involved in drug metabolism and provide two important characteristics for each. Predict which metabolite is most likely to be formed given the chemical structure of the parent compound and the drug metabolizing enzyme involved. Understand some of the reasons for individual differences in drug response. Be able to predict the effects of metabolism on pharmacological/toxic properties. Draw the path through which electrons have to move to generate a given drug metabolite. Identify key functional groups in drug molecules and describe how this functional group will affect the properties of the drug (i.e., absorption, distribution, metabolic pathways, and excretion). Learn the metabolic pathways that a drug can undergo and how that changes the structural and kinetic properties of the drug. Describe the major enzymatic reactions involved in drug metabolism and where they occur in the body.
Week 8
Lecture Topic: Pharmacokinetics - Pharmacodynamics (DD) / Workshop 3

Lecture Learning Objectives:

Show graphically how one can readily detect when response does not track the plasma drug concentration after a single extravascular dose, and give at least two explanations for the delay. Explain why a graded response tends to decline linearly with time after a single dose when response lies between 80% and 20% of its maximum. Discuss briefly two situations in which response declines more slowly than plasma drug concentration. Explain why duration of response is often proportional to the logarithm of dose. Calculate the duration of the effect after a given dose for a drug that exhibits linear kinetics and follows the Emax model. Calculate the minimum effective drug concentration given the duration of effect (Tdur) and the dose.

Week 9
Lecture Topic: Dosage adjustments in renal disease (RB) / Workshop 3

Lecture Learning Objectives:

State the average value of glomerular filtration rate. Review the principles of renal drug handling and the factors that influence renal clearance of a drug. Describe where filtration, secretion and reabsorption of drugs occur within the nephron. State the average value of glomerular filtration rate for men and women. Calculate glomerular filtration rate for a patient. Given renal clearance and plasma protein binding data, determine whether a drug is predominantly reabsorbed from or secreted into the renal tubule. List and briefly discuss the pharmacokinetic parameters that are often altered in patients with chronic renal diseases. Review the principles of drug renal handling. Describe and understand the various clinical tests, mathematical approaches and nomograms that allow to quantify/estimate renal function. Explain dosing adjustments guidelines in renal insufficiency. Learn how to perform appropriate drug dosing adjustments in specific clinical cases.

Week 10
Lecture Topic: Multiple dosing IV and multiple dosing oral (CC)

Lecture Learning Objectives:

Predict the plasma concentration-time profile following a fixed-dose and fixed-dosing interval regimen when given the plasma concentration-time profile after a single dose of drug. Predict the rate and extent of drug accumulation for a given regimen of fixed dose and fixed interval. Explain why the time to reach steady-state on a multiple dosing regimen depends only on the half-life of the drug. Discuss the application of modified release products to the development of more convenient dosage regimens. Define plateau (steady-state) concentration and describe factors controlling it. Describe the relationship between half-life of a drug and time required to approach steady state following a constant-rate input with or without a bolus dose. Estimate the values of half-life, volume of distribution, and clearance of a drug from plasma concentration data obtained during and following constant-rate intravenous input. Determine the bolus dose needed to achieve the same amount in the body, or same plasma concentration as that achieved at steady state on infusing the drug at a given rate. Determine the input rate needed to maintain the bolus amount in the body, or the initial plasma concentration, with time after giving an IV bolus dose. Briefly discuss why short-term infusions are generally used when a single IV dose is called for.

Week 11
Lecture Topic: IV infusions (CC)
**Lecture Learning Objectives:**

Describe the relationship between half-life of a drug and time required to approach steady state following a constant-rate input with or without a bolus dose. Estimate the values of half-life, volume of distribution, and clearance of a drug from plasma concentration data obtained during and following constant-rate intravenous input. Determine the bolus dose needed to achieve the same amount in the body, or same plasma concentration as that achieved at steady state on infusing the drug at a given rate. Determine the input rate needed to maintain the bolus amount in the body, or the initial plasma concentration, with time after giving an IV bolus dose. Briefly discuss why short-term infusions are generally used when a single IV dose is called for. Use pharmacokinetic parameters to predict the plasma concentration and the amount in the body with time during and following constant-rate input with or without a bolus dose.

**Week 12**
**Lecture Topic:** Non-linear pharmacokinetics (DD)

**Lecture Learning Objectives:**

Describe sources of non-linearity in the kinetics of drugs. Understand Michealis-Menten (MM) kinetics and distinguish between linear and non-linear PK on plasma concentration-time data and dose. Show graphically the relationship between the dosing rate and the steady-state concentration for drugs exhibiting non-linear kinetics. Estimate Vmax and Km constants from dose or plasma concentration data. Design an appropriate dosage regimen to achieve a desired steady-state concentration for drugs which display non-linear kinetics. Know how to use the Rambeck et al., Vozeh et al., Pospisil et al. nomograms for phenytoin dosage adjustments.

**Week 13**
**Lecture Topic:** Workshop 4 / Exam Review (CC)

**Lecture Learning Objectives:**

N/A

**8. Assessment Methodologies Used:**

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Course Learning Objectives Addressed</th>
<th>Assessment Method Used</th>
<th>Percent of Course Grade</th>
<th>For Group Work: Individualized or same mark for all group members</th>
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<tbody>
<tr>
<td>☑ Assignment - Quiz</td>
<td>• Describe how changes in normal physiology or disease affect the absorption, distribution, metabolism or elimination of the drug.</td>
<td>Calculations tested through multiple choice questions; True or false questions.</td>
<td>4 x 2.5% = 10% total</td>
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<tr>
<td>☐ Presentation</td>
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<td>☐ Participation</td>
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<td>☐ Final Exam</td>
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and drug-specific characteristics.

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- Describe how changes in normal physiology or disease affect the absorption, distribution, metabolism or elimination of the drug.
- Explain the pharmacokinetic basis for specific drug interactions.
- Calculate the pharmacokinetic parameters: half-life, CL, AUC, volume of distribution and plasma drug levels after an IV bolus.
- Interpret the pharmacokinetic/dosing information found in readily available drug information sources like the Compendium of Pharmaceuticals and Specialties (CPS).

Calculations and short answer questions.  

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- avert the absorption, distribution, metabolism or elimination of the drug.
- Relate, using equations, drug concentrations with pharmacologic activity (or toxicity).
- Calculate the pharmacokinetic parameters: bioavailability, ka, half-life, CL, AUC, volume of distribution and plasma drug levels with any dosage regimen (infusions, multiple doses, single doses: IV or oral).
- Deduce extent of accumulation of drugs (multiple dosing).
- Interpret the pharmacokinetic/dosing information found in readily available drug information sources like the Compendium of Pharmaceuticals and Specialties (CPS).
- Explain the pharmacokinetic basis for specific drug interactions. Determine the dosage adjustments for individual patients taking into account patient and drug-specific characteristics.

Calculations and short answer questions.  

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- Expectation for pass grades for all Pharmacy courses is 60%

9. Policy and procedure regarding late assignments/examinations/laboratories:

10. Policy and procedure regarding missed assignments/examinations/laboratories:

Students who miss a scheduled workshop session and who have a valid petition filed with the Registrar’s office will do a makeup quiz. A makeup workshop may also be required at the discretion of the instructor.

Students who miss an examination or a test and who have a valid petition filed with the Registrar’s office will be eligible to complete a make-up examination or test. The format of this examination or test will be at the discretion of the course coordinator, and may include, for example, an oral examination.
11. AFPC Education Outcomes addressed (check all those that apply):
- Refer to AFPC Educational Outcomes for Professional Programs for further information about the role and key competencies.

As Care Providers, pharmacy graduates:

**CP1 – Practice within the pharmacist scope of practice and expertise**

☒ CP1.1 Apply knowledge from the foundational sciences to make decisions relevant to the contemporary and evolving scope of pharmacist practice;

☐ CP1.2 Integrate AFPC Communicator, Collaborator, Leader-Manager, Health Advocate, Scholar, and Professional roles in their practice of pharmacy;

☐ CP1.3 Recognize and respond to the complexity, uncertainty and ambiguity inherent in pharmacy practice;

☐ CP1.4 Explain the benefits, risks and rationale associated with pharmacist-provided care as an important step in obtaining and documenting consent to pharmacist care;

☐ CP1.5 Recognize and take appropriate action when signs, symptoms and risk factors that relate to medical or health problems that fall into the scope of practice of other health professionals are encountered.

**CP2 – Provide patient-centred care**

☐ CP2.1 Collect, interpret, and assess relevant, necessary information about a patient’s health-related care needs;

☐ CP2.2 Formulate assessments of actual and potential issues and in collaboration with the patient and other health team members as appropriate, prioritize issues to be addressed in a given patient encounter;

☐ CP2.3 Create and document plans in collaboration with the patient and other health team members as appropriate, and make recommendations to prevent, improve or resolve issues;

☒ CP2.4 Implement plans in collaboration with the patient and other health team members as appropriate, including:

  - CP2.4.1 obtaining consent
  - CP2.4.2 making a referral or consulting others
  - CP2.4.3 adapting, initiating, renewing/continuing, discontinuing or administering medication as authorized
  - CP2.4.4a dispensing and/or
  - CP2.4.4b compounding and/or
  - CP2.4.4c delegating/authorizing such tasks to others appropriately
  - CP2.4.5 engaging the patient or care-giver through education, empowerment and self-management, and
CP2.4.6 negotiating the role of pharmacy and non-pharmacy team members in continuity and transitions of care.

☐ CP2.5 Follow-up by monitoring, evaluating progress toward achievement of the patient’s goals of therapy, adjusting plans in collaboration with the patient and health team members across the care continuum.

CP3 – Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety

☐ CP3.1 Recognize and respond to harm and potential harm from health care delivery, including patient safety incidents;

☐ CP3.2 Adopt strategies that promote patient safety and address human and system factors;

As Communicators, pharmacy graduates:

CM1 – Communicate in a responsible and responsive manner that encourages trust and confidence

☐ CM1.1 Select and use oral, non-verbal and written communication strategies (tools, techniques, technologies, etc.) effectively so that the patient's best interests are foremost;

☐ CM1.2 Provide timely, clear responses that are tailored to the context and audience;

☐ CM1.3 Express facts, evidence, opinions and positions accurately and effectively, with clarity and confidence;

☐ CM1.4 Listen, actively solicit and respond appropriately to ideas, opinions and feedback from others;

☐ CM1.5 Use language, pace, tone, and non-verbal communication that is suitable for:

  a) the intended outcomes of the communication, and
  b) the complexity, ambiguity, urgency and/or difficulty of a situation, conversation or conflict

☐ CM1.6 Seek and synthesize relevant information from others in a manner that ensures common understanding and where applicable, clarifies and secures agreement and/or consent;

☐ CM1.7 Compose and share oral, written, and electronic information in a manner that optimizes patient safety, dignity, confidentiality, and privacy.

CM2 – Communicate in a manner that supports a team approach to health promotion and health care

☐ CM2.1 Engage in respectful, empathetic, compassionate, non-judgmental, culturally safe, tactful conversations with patients, communities, populations, and health team members;

☐ CM2.2 Demonstrate awareness of the impact of one’s own experience level, professional culture, biases and power and hierarchy within the health team on effective working relationships,
communication and conflict resolution with health team members and adapt the approach to the situation appropriately;

☐ CM2.3 Demonstrate accuracy and appropriateness of communication as well as respect for the role of other health team members when disclosing information about harmful or potentially harmful situations;

☐ CM2.4 In word and in action, convey the importance of teamwork in patient-centred care, patient safety, health care quality improvement and health program delivery.

As Collaborators, pharmacy graduates:

CL1 – Work effectively with members of the health team including patients, pharmacy colleagues and individuals from other professions

☐ CL1.1 Establish and maintain positive relationships;

☐ CL1.2 Recognize, respect and negotiate the roles and shared/overlapping responsibilities of team members;

☐ CL1.3 Join with others in respectful, effective shared decision-making.

CL2 – Hand over the care of the patient to other pharmacy team members and non-pharmacy team members to facilitate continuity of safe patient care

☐ CL2.1 Determine when and how care should be handed over to another team member;

☐ CL2.2 Recognize, respect and honour the negotiate shared and overlapping responsibilities of patients, pharmacy team members and other health members when handovers occur;

☐ CL2.3 Demonstrate safe handover of care, using oral, written, and electronic communication, during a patient transition to a different care provider or setting.

As Leader-Managers, pharmacy graduates:

LM1 – Contribute to optimizing health care delivery and pharmacy services

☐ LM1.1 Work with others to apply quality improvement strategies and techniques to optimize pharmacy care;

☐ LM1.2 Contribute to a culture of patient safety;

☐ LM1.3 Confirm the quality, safety, and integrity of products;

☐ LM1.4 Use health informatics to improve the quality of care, manage resources and optimize patient safety.

LM2 – Contribute to the stewardship of resources in health care systems
☐ LM2.1 Apply evidence and management processes to achieve cost appropriate care;
☐ LM2.2 Allocate health care resources for optimal patient care;
☐ LM2.3 Contribute to the management of finances and health human resources in pharmacy practice settings;

LM3 – Demonstrate leadership skills

☐ LM3.1 Demonstrate leadership skills to enhance pharmacy practice and health care.

LM4 – Demonstrate management skills

☐ LM4.1 Work with others to apply the principles of effective management and supervision of health human resources and medication use systems;
☐ LM4.2 Use effective strategies to manage and improve their own practice of pharmacy.

As Health Advocates, pharmacy graduates:

HA1 – Respond to an individual patient’s health needs by advocating with the patient within and beyond the patient care environment

☐ HA1.1 Work with patients to address determinants of health that affect them and their access to needed health services or resources;
☐ HA1.2 Work with patients to increase opportunities to adopt healthy behaviours;
☐ HA1.3 Incorporate disease prevention, health promotion and health surveillance into interactions with individual patients.

HA2 – Respond to needs of communities or populations they serve by advocating with them for system-level change in a socially accountable manner

☐ HA2.1 Work with community or population to identify the determinants of health that affect them;
☐ HA2.2 Participate in health promotion and disease prevention programs.

As Scholars, pharmacy graduates:

SC1 – Apply medication therapy expertise to optimize pharmacy care, pharmacy services and health care delivery

☒ SC1.1 Use knowledge and problem-solving to arrive at recommendations and decisions that are appropriate, accurate, and practical;
SC1.2 Use professional experience to solve routine, previously encountered problems;
SC1.3 Use established decision-making frameworks and apply learning required to manage new situations and problems.

SC2 – Integrate best available evidence into pharmacy practice

SC2.1 Generate focused questions related to needs for information, recommendations and decisions in practice;
☐ SC2.2 Use systematic approaches in the search for best available evidence;
☒ SC2.3 Critically appraise health-related research and literature;
☒ SC2.4 Incorporate best available evidence in the decision-making process.

SC3 – Contribute to the creation of knowledge or practices in the field of pharmacy

☒ SC3.1 Apply scientific principles of research and scholarly inquiry;
☐ SC3.2 Apply ethical principles that underlie research and scholarly inquiry.

SC4 – Teach other pharmacy team members, the public and other health care professionals including students

☐ SC4.1 Provide effective education to others;
☐ SC4.2 Employ appropriate teaching roles when teaching others;
☐ SC4.3 Deliver effective feedback in teaching and learning situations;
☐ SC4.4 Use appropriate learning assessment and evaluation strategies when working with patients, team members, students and teachers.

As Professionals, pharmacy graduates:

PR1 – Committed to apply best practices and adhere to high ethical standards in the delivery of pharmacy care

☐ PR1.1 Exhibit professional behaviour whether face-to-face, in writing, or via technology-enabled communication. Professional; behaviour includes, but is not limited to:
  a) demonstrating honesty, integrity, humility, commitment, altruism, compassion, respect for diversity and patient autonomy;
  b) being accessible, diligent, timely and reliable in service to others;
  c) abiding by the principle of non-abandonment;
  d) maintaining appropriate interpersonal boundaries;
  e) maintaining professional composure, demeanor, and language even in difficult situations, and;
f) maintaining privacy and confidentiality;

☐ PR1.2 Use ethical frameworks as one component of professional judgment;

☐ PR1.3 Recognize and respond to situations presenting ethical dilemmas, including conflicts of interest;

☐ PR1.4 Engage in activities that:

   a) protect the public, and;
   b) advance the practice of pharmacy.

PR2 – Able to recognize and respond to societal expectations of regulated health care professionals

☐ PR2.1 Take responsibility and accountability for actions and inactions;

☐ PR2.2 Demonstrate a commitment to patient safety and quality improvement;

☐ PR2.3 Honour the laws, ethical codes, and regulatory requirements (by-laws, standards, policies) that govern the self-regulated profession of pharmacy;

☐ PR2.4 Demonstrate an understanding of federal, provincial/territorial, and municipal laws, policies and standards that apply to pharmacy workplaces;

☐ PR2.5 Demonstrate an ability to maintain competence to practice through evaluating areas for improvement and planning, undertaking learning activities to address limitations in competence and/or performance and incorporating learning into practice;

☐ PR2.6 Identify and respond to unprofessional, unethical, and illegal behaviours in pharmacists, other pharmacy team members, and other health professionals.

PR3 – Committed to self-awareness in the management of personal and professional well being

☐ PR3.1 Set professional and personal goals, priorities, and manage their time to balance patient care, workflow, and practice requirements;

☐ PR3.2 Examine, reflect upon, and manage personal attributes (knowledge, skills, beliefs, biases, motivations, emotions, etc.) that could influence self-development and professional performance;

☐ PR3.3 Adapt their practice of pharmacy to fulfill evolving professional roles;

☐ PR3.4 Recognize and respond to self and colleagues in need.