Course Specification

Published Date: 05-Apr-2019
Produced By: Oliver Jones
Status: Validated

Core Information

Awarding Body / Institution: University of Wolverhampton
School / Institute: School of Pharmacy
Course Code(s): PY003Q01UV  Full-time  4 Years
UCAS Code: B231
Course Title: Master of Pharmacy (MPharm Hons)
Hierarchy of Awards: Master of Pharmacy with Honours Master of Pharmacy (MPharm)
Bachelor of Science with Honours Pharmaceutical Studies
Bachelor of Science Pharmaceutical Studies
Diploma of Higher Education Pharmaceutical Studies
Certificate of Higher Education Pharmaceutical Studies
University Statement of Credit University Statement of Credit

Language of Study: English
Date of DAG approval: 12/Apr/2017
Last Review: 2013/4
Course Specification valid from: 2010/1
Course Specification valid to: 2019/0

Academic Staff

Course Leader: Mr Alan Hindle
Head of Department: Dr Colin Brown
Course Information

<table>
<thead>
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<th>Location of Delivery:</th>
<th>University of Wolverhampton</th>
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<td>Category of Partnership:</td>
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<td>Teaching Institution:</td>
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<tr>
<td>Open / Closed Course:</td>
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Entry Requirements:

Entry requirements are subject to regular review. The entry requirements applicable to a particular academic year will be published on the University website (and externally as appropriate e.g. UCAS)

All applicants are assessed by their highest level of study.

- Please note all candidates must have GCSE English Language and Mathematics both at grade C+/4.

Only the following equivalent qualifications are accepted for English:

- Functional Skills L2:English;
- National Test L2: Literacy;
- OCN Access to HE Core English

And for Mathematics:

- National Test L2: Numeracy;
- OCN Access to HE Core Mathematics

Typical offer: BBB

- Three A Levels with a minimum of BBB including A Level Chemistry at a minimum grade B, plus at least one further Maths or Science subject. General Studies and Critical Thinking are not accepted. Alternative qualifications include:
  - BTEC QCF Extended Diploma in Applied Science at grade DDD, which must include the following units -

Mandatory Units

1. Unit 4 (Scientific Practical Techniques) at grade distinction
2. Unit 6 (Using Mathematical Tools in Science) at grade distinction

Optional Units

One of the following units at Distinction -

1. Unit 7 (Mathematical Calculations for Science)
2. Unit 8 (Using Statistics in Science)

and

Two of the following units at Distinction -

1. Unit 16 (Chemistry for Biology Technicians)
2. Unit 19 (Practical Chemical Analysis)
3. Unit 22 (Chemical Laboratory Techniques)
4. Unit 26 (Industrial Chemical Reactions)
5. Unit 27 (Chemical Periodicity and It’s Applications)
6. Unit 28 (Industrial Applications of Organic Chemistry)

Other Qualifications:

- BTEC QCF Diploma in Applied Science at grade D*D*, plus A level Chemistry with a minimum grade B.
BTEC QCF Subsidiary Diploma in Applied Science at grade D* plus A level Chemistry and A level Biology or Maths (minimum grade B)

First Year (Level 4) of an appropriate degree with 65% minimum mark in all modules (note: not an overall average of 65%), or

Access to HE (Medicine and Health Professions) from Stafford College with 60 credits overall, of which at least 30 must be at distinction and the remainder at merit.

Students who have successfully completed the foundation year of the University of Wolverhampton BSc (Hons) Pharmaceutical Science with Foundation Year, AND who have met the advised requirements for transferring on to year 1 of the MPharm course

Other foundation years may be considered if in the opinion of the Pharmacy Admissions Tutor the content is appropriate in scope, level and depth, subject to a minimum grade of 75% overall and 70% in all Chemistry modules.

Candidates with qualifications other than those detailed may be considered for entry and should contact the School to discuss before applying.

English language requirements for International applicants for MPharm require a minimum overall IELTS score of 6.5 with a minimum of 6.0 in each element. International entry requirements and application guidance can be found here

Other Requirements

Personal statements will be reviewed to ensure that successful applicants demonstrate appropriate values including compassion, empathy, honesty, respect and responsible conduct.

Offers are subject to satisfactory occupational health and Disclosure and Barring Service (DBS) checks. Applicants must be immune to mumps, measles, German measles (rubella), chicken pox and tuberculosis or have been immunised as such to be accepted onto the course.

Note: Due to the integrated nature of the programme no RPL will be permitted for entry on to the MPharm degree. As such it must be commenced from year 1 and each year must be passed in entirety before progression in to the next stage is permitted.

Distinctive Features of the Course:

The Wolverhampton MPharm is a contemporary, patient-focused and clinical course which aims to develop the knowledge and skills that you will need to build a successful career in your chosen area of pharmacy. A team of expert academic pharmacists and scientists have developed the programme and, along the way, we have consulted with employers, practicing pharmacists, patients, carers and students in order to make sure that the product you are investing in is of the highest possible standard and relevance.

At Wolverhampton our smaller cohort sizes and extensive use of practitioners and educators from the different pharmacy sectors provide you with a more interactive learning experience that puts your learning fully in to context. Our placements and simulations are aligned carefully with the material you cover in class and they are staged in a way which helps you gradually build up confidence as the years progress. Our theme-based approaches to teaching cross over the traditional pharmacy disciplines such as pharmacology, pharmaceutical chemistry, pharmaceutics and pharmacy practice. This helps you to integrate your studies and make the links between the different aspects of theoretical content and its application to the world of work.

Of particular note is the introduction of Team-based Learning (TBL) and Case-based Learning (CBL) as the principal methods of delivery and assessment. TBL is employed in the early to intermediate stages of the course. It not only supports your transition to graduate level study but it has also been shown to enhance levels of attainment in subsequent tests, examinations and coursework. CBL will develop your knowledge and skills to the highest level by focusing on cases which draw together underpinning knowledge.

At Wolverhampton our assessments become increasingly applied and competency-focused as you progress through the course, allowing you to engage with “real world” assessments and provide you with the very best
preparation for the future. Our graduates are renowned for their high level clinical and communication skills. Through our teaching and learning approaches you will become a much sought, rounded professional: communicator, carer, lifelong learner, team-worker, problem solver, critical analyser and change-maker. We have no doubt that Wolverhampton graduates will go on to enjoy a successful and rewarding career in pharmacy.

Educational Aims of the Course:

The MPharm course at Wolverhampton aims to produce pharmacy graduates who are highly equipped to enter, and successfully complete, the pre-registration training year; and to meet the needs of the profession, future employers and, most importantly, patients. The friendly and supportive environment in which you will study focuses on developing the right knowledge, skills and attributes to equip you on your learning journey. As you progress, you will become an independent learner who is adaptable, self-aware and inherently capable of developing the profession and going on to enjoy successful and rewarding career in your chosen area of pharmacy. The programme itself is highly clinical and patient-focused, benefiting from our significant links with, and employment of, practitioners who have experience of working in the various sectors of the profession. The traditional disciplines of science and practice which underpin pharmacy are taught as an integrated whole using a thematic, rather than a subject-based, approach. This is achieved by organising your study around, patient, medicine or professionally orientated themes which transcend the traditional pharmacy subject areas. Content is then revisited each year at increasing levels of complexity as you become more equipped to apply and integrate the knowledge and skills which you develop along the way. We particularly emphasise:

- the clinical pharmacotherapeutic management of minor and major disease based on the underpinning actions, effects and properties of drugs
- the development and use of medicines from drug entities
- the development of interpersonal, writing and research skills needed to optimise medicines use and development
- the development of professionalism

A particular feature of the new Wolverhampton MPharm programme involves the introduction of innovative, contemporary teaching approaches, including Team-based Learning and Case-based Learning. These teaching methods are designed to maximise your engagement and satisfaction with the course. They will help you to apply acquired knowledge and skills to realistic pharmacy scenarios, enhance your critical thinking skills and enable you to work effectively in team environments. Class time will be “quality time” that is much more focused on interaction and feedback. What’s more, the important knowledge you will need at each stage will be much more likely to be committed to long-term memory making you better equipped to deal with exams and other assessments both here and when you leave us to enter the pre-registration stage of your training.

Intakes:

September

Major Source of Funding:

HE FUNDING COUNCIL FOR ENGLAND (HEFCE)

Tuition Fees:

Tuition fees are reviewed on an annual basis. The fees applicable to a particular academic year will be published on the University website.
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**PSRB:**

PY003Q01UV (Full-time)

Professional Accreditation Body:
General Pharmaceutical Council (GPhC)

Accrediting Body:
General Pharmaceutical Council (GPhC)

Accreditation Statement:
Accredited by the General Pharmaceutical Council (GPhC) in order to progress to pharmacist pre-registration training and then to register as a pharmacist.

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Course Structure:

**September (Full-Time)**

**Year 1**

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**September (Full-Time)**

**Year 2**

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September (Full-Time)

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Learning, Teaching and Assessment

Academic Regulations Exemption:

Section 1.2.3 - Exemption for all years (modules) to have ‘custom’ delivery in order to support the continual development and assessment of the theme areas across and throughout each academic year, thus supporting integration; and there will be no postgraduate block for this integrated masters degree programme. The custom block approach will also permit the diet of assessments within each year to be distributed appropriately across various University assessment and teaching weeks.

Section 1.3.1 - Exemption to permit the introduction of single, 120 credit, years (modules) with a corresponding increase in the numbers of learning outcomes and assessments which will be proportionate i.e. there will be no more than 12 summative assessments per year. This is required to meet the previously set GPhC condition on integrating the programme across all of the traditional cognate disciplines of pharmacy.

Section 2.3.1 - RPL is NOT permitted for previous study, or transfers from internal courses with credit, in order to ensure that all stages within the proposed new course remain horizontally and vertically integrated.

Section 3.4.2 - Part-time and sandwich routes will NOT be offered due to GPhC regulations (the Professional Board allows a maximum of 8 years between initial registration on the MPharm and final registration as Pharmacist).

Section 4.2.2 - Marking “pass” thresholds will not apply to certain patient safety-related assessments within the programme. These will be required to be passed at a higher level than the University norm and/or the normal University marking schemes will not apply. In some cases, when patient safety is compromised, marks will be removed to ensure that a pass cannot be achieved. These exceptions meet GPhC Standard 5.10 which stipulates that “marking criteria must be used for all assessments and all pass criteria must reflect safe and effective practice”. Higher pass mark thresholds will be clearly highlighted alongside the assessment descriptions in relevant Module Guides.

Section 4.3.4 - Exemption from the requirement to cap re-sits at 40% for the Reflective Portfolio (involving three linked summative assessment tasks) and increasing the average capped mark to 64% for the whole component as part of all 120 credit modules.

Section 4.3.5 - Due to the configuration of the programme in to four 120 credit module-free stages, the usual University retrieval and re-take arrangements that apply to modular courses will not be able to be applied in a way which meets the regulator’s requirements for an integrated professional course. Therefore students will, instead, be permitted to undertake an additional (i.e. third) sit opportunity for each summative assessment within a given 120 credit stage but there will be NO possibility of re-taking a stage if that third and final attempt is failed in respect of any assessment. This meets GPhC accreditation standard 5.9 which stipulates that "extended re-sit opportunities and other remedial measures should be extremely limited, if they are
permitted at all" and it also facilitates the configuration of the programme in to module-free stages to support integration. Students in a retrieval situation are therefore eligible to opt for 'External Student' status in order to gain restricted access to University facilities whilst not being liable for tuition fees during that period (note: students who have been granted extenuating circumstances would still be permitted to take a third re-sit opportunity at the next available opportunity but they must also not proceed to the next year until the entire stage has been passed).

Section 4.4.4 - Compensation or condonation is not permitted at any level. In order to ensure horizontal and vertical integration of all stages (years), all modules must be passed at the minimum required level in line with expectations outlined in GPhC Standard 5.9: "condonation and compensation should be extremely limited if permitted at all."

Sections 4.5.1 - Progression with less that 120 credits in each year will NOT apply to the MPharm (Hons) award. This meets GPhC accreditation standard 5.9 which stipulates that "trailing should be extremely limited, if permitted at all." In addition, to ensure that all of the GPhC’s Standard 10 learning outcomes are met, students must pass ALL assessments within a given stage in order to progress from one level to the next and to receive the final MPharm (Hons) award. Students who pass all weighted assessments at any given stage but fail to pass certain ‘professional’ assessments that are zero-weighted will be eligible to receive an alternative intermediate award as detailed above. However, such awards are not recognised by the GPhC for the purposes of registration as a pharmacist.

Section 4.6.1 - Students who have extenuating circumstances which have been accepted by the University and who submit, or attempt an assessment to which these circumstances apply, will be considered as 'fit to sit'. The grade achieved in the attempt will stand, regardless of the granted extenuation and the student will forgo the right to submit assessment again as if for the first time. The committee were informed that this exemption was sought in response to a recent move by the Professional Body to publish historical pass rates of graduates and also to comply with their regulation around limiting extended re-sit opportunities.

Section 5.10.1 - An aegrotat degree of MPharm will NOT be awarded.

Approved by AFRSC on Friday 18th July 2014 (with subsequent revisions in September 2015, January 2018 and August 2018).

Reference Points:

- QAA Benchmarks for Pharmacy
- GPhC Standards for the Initial Education and Training of Pharmacists 2011
- Equality Act 2010

Learning Outcomes:

CertHE Course Learning Outcome 1 (CHECLO1)
Demonstrate a knowledge of biological systems as they apply to the study of pharmacy.

CertHE Course Learning Outcome 2 (CHECLO2)
Apply an understanding of organic and physical chemistry and the principles of drug action and handling within the context of drug discovery and development.

CertHE Course Learning Outcome 3 (CHECLO3)
Explore how pharmacists use their expert knowledge and skills for the benefit of patients.
CertHE Course Learning Outcome 4 (CHECLO4)
Develop skills in good laboratory practice, medicines supply, communication, academic writing and numeracy applicable to the study of pharmacy.

CertHE Course Learning Outcome 5 (CHECLO5)
Develop an awareness of the skills needed to study effectively both as an individual and in a team.

DipHE Course Learning Outcome 1 (DHECLO1)
Evaluate the pathological processes involved in the development of common disease states.

DipHE Course Learning Outcome 2 (DHECLO2)
Utilise an understanding of the mechanisms of drug action to predict their beneficial and harmful effects in patients.

DipHE Course Learning Outcome 3 (DHECLO3)
Evaluate the development, formulation, packaging and handling of medicines in the context of disease states occurring within body systems.

DipHE Course Learning Outcome 4 (DHECLO4)
Relate a knowledge of safe systems of working and professional practices, and skills in consultation and case/prescription analysis, to the optimal use of medicines.

DipHE Course Learning Outcome 5 (DHECLO5)
Demonstrate reflective and research-orientated approaches to learning; and an ability to contribute effectively to a team.

Ordinary Degree Course Learning Outcome 1 (ORDCLO1)
Critically apply an in-depth knowledge of the pharmaceutical and clinical sciences to the diagnosis and therapeutic management of disease.

Ordinary Degree Course Learning Outcome 2 (ORDCLO2)
Rationalise the selection and use of medicines through critical analysis of confounding patient factors and clinical evidence in the literature.

Ordinary Degree Course Learning Outcome 3 (ORDCLO3)
Apply a knowledge of advanced and complex drug delivery technologies and the use of biological and genetic techniques in drug development to the management of patients.

Ordinary Degree Course Learning Outcome 4 (ORDCLO4)
Develop an awareness of the range of research approaches pertinent to pharmacy and apply enhanced consultation and communication techniques.

Ordinary Degree Course Learning Outcome 5 (ORDCLO5)
Undertake effective team-working in an inter-professional setting and demonstrate effective reflective practice.

Honours Degree Course Learning Outcome 1 (DEGCLO1)

Critically apply an in-depth knowledge of the pharmaceutical and clinical sciences to the diagnosis and therapeutic management of disease

Honours Degree Course Learning Outcome 2 (DEGCLO2)

Rationalise the selection and use of medicines through critical analysis of confounding patient factors and clinical evidence in the literature.

Honours Degree Course Learning Outcome 3 (DEGCLO3)

Apply a knowledge of advanced and complex drug delivery technologies and the use of biological and genetic techniques in drug development to the management of patients.

Honours Degree Course Learning Outcome 4 (DEGCLO4)

Develop an awareness of the range of research approaches pertinent to pharmacy and apply enhanced consultation and communication techniques.

Honours Degree Course Learning Outcome 5 (DEGCLO5)

Undertake effective team-working in an inter-professional setting and demonstrate effective reflective practice.

Integrated Masters Course Learning Outcome 1 (IMACLO1)

Understand, apply and critique the scientific principles of health, disease and the drug entity to the design, development and uses of medicines in patients.

Integrated Masters Course Learning Outcome 2 (IMACLO2)

Understand roles and functions of pharmacists and their place within the healthcare team.

Integrated Masters Course Learning Outcome 3 (IMACLO3)

Develop and apply appropriate skills and attributes required for the professional practice of pharmacy.

Integrated Masters Course Learning Outcome 4 (IMACLO4)

Utilise and critically evaluate scientific and healthcare information and data in order to inform change in practice and knowledge.

Overview of Assessment:
Teaching, Learning and Assessment:

The proposed curriculum has been planned with reference to:

- the GPhC's 2011 *Standards for the Initial Education and Training of Pharmacists*.
- the Faculty of Science and Engineering’s *Vision and Mission* outline plan.
- the views of stakeholders.

On this basis two strategies have been drafted to specifically underpin the development, delivery, assessment and monitoring of the proposed MPharm:

an *MPharm Learning, Teaching and Assessment* strategy; and an *MPharm Service (Practice) and Interprofessional Experience* strategy.

These strategies outline a vision to develop the School of Pharmacy's reputation for the quality of both its MPharm provision and its graduates and to support students in realising their potential through teaching excellence.

Increased levels of motivation and attainment will be achieved by employing contemporary instructional methods which develop desirable knowledge, skills and attributes; which ensure that content is assimilated in an integrated, meaningful way; and which place the patient at the forefront of learning. The strategies also describe the development of communities of learning and scholarship which will drive competitiveness, professionalism, independent learning and team-working.

In particular, the strategies stipulate that the curriculum and its delivery should:

- **approach syllabus content within the context of themes which draw together concepts, rather than within the context of the traditional cognate disciplines of pharmacy.**
- **incorporate learning outcomes which reflect professional practice and capability across the profession and, where possible and practicable, which transcend thematic strands, particularly in the latter stages of a programme where students possess greater levels of knowledge and skills.**
- **revisit content at increasing levels of complexity throughout the course in order to achieve upwardly spiralling, vertical integration.**
- **embed study skills in to the curriculum at all stages (years), including pharmaceutical numeracy and professional skills and attributes**
- **require all students to undertake organised, structured placement visits in the workplace setting and interactions with trained “Service Users” in the academic environment; and to experience organised, interprofessional learning with students and tutors of other health professions as part of the formal taught programme. These experiences must focus on the application of knowledge and skills and the demonstration of desirable behaviours, attitudes and values; must always be aligned directly with relevant course content; and must be staged according to the spiralled, integrated approach to the MPharm curriculum.**
- **avoid didactic approaches to the delivery of content. The instructional methods chosen should focus on active and independent learning with contact time focussing on diagnostic and/or formative assessment,**
problem solving, critical thinking, decision-making. They should also stimulate the adoption of deep learning approaches and scholarship, fostering independent study and lifelong learning skills; be inclusive and stimulating; and support motivation and engagement across the student body.

- be planned with reference to the learning outcomes applying to the stage and students should be aware of how the teaching supports the meeting of the stage and the GPhC's learning outcomes.

Derivation of Module Development Template learning outcomes

Standard 10 of the GPhC's 2011 Standards for the Initial Education and Training of Pharmacists lists a series of professionally-focused learning outcomes which must be met to varying degrees at the year 4 (graduate) stage. The level of performance for each outcome is based upon the Miller's triangle hierarchical approach to demonstrating competency at "knows", "knows how", "shows how" and "does" levels (Miller 1990). To enable learners to reach the higher levels of the triangle, assessment judgements usually become more complex and of a higher order. For example, assessments may require learners to integrate knowledge, skills and behaviours through simulations such as Objective Structured Clinical Examinations (shows how); or demonstrate "real life" competence through repeated assessments, 360 degree observations and testimonials (does).

The MPharm’s learning outcomes, at each of its four stages, correlate strongly with the GPhC's standards. They have been specifically formulated to ensure that subsequent learning and assessment opportunities will enable students to meet the GPhC’s Standard 10 outcomes at the desired performance levels. Each stage’s learning outcomes are broadly appropriate to Miller’s performance level hierarchies with, for example, "knows how" level outcomes featuring in the early stages and "shows how" featuring more latterly. "Does" level outcomes will be met via assessments and activities that have featured throughout the programme to reflect the requirement for repeated performance.

Integration and the Spiral Curriculum

The GPhC’s Standards stipulate that MPharm curricula should be integrated and progressive: “the component parts of education and training must be linked in a coherent way” and must deal “with issues in an increasingly complex way until the right level of understanding is reached”. To illustrate the latter point the Standards refer to the Spiral Curriculum defined by Harden and Stamper (1999) in which content is revisited and upwardly spiralled in its complexity as a course progresses (vertical integration). Whilst the Standards do not provide specific guidance on what is meant by an integrated curriculum, the GPhC has subsequently referred Schools of Pharmacy to the Integration Ladder, developed by Harden (2000). Harden outlines a taxonomical system which describes eleven levels (or steps) of integration which are situated on a continuum between two extremes from isolation at the foot of the ladder through to multi-disciplinary at its top:

- Trans-disciplinary
- Inter-disciplinary
- Multi-disciplinary
- Complementary
- Correlation
- Sharing
- Temporal coordination
- Nesting
- Harmonisation
- Awareness
- Isolation

Harden advises that his taxonomy may be used as a tool to aid the planning, implementation and evaluation of curricula: “a menu of choices, encouraging teachers to explore the integration options available and to discuss the extent or form of integration most appropriate in the curriculum”.

The GPhC has advised Schools of Pharmacy GPhC that visiting accreditation panels will use Harman's
taxonomy as an evaluative tool. Furthermore, the minimum required level of curriculum integration must be at the correlation or complementary levels of the ladder. At the correlation step separate, discipline-based teaching is brought together by additional integration “sessions” and, at the complementary step, these become extensive and widespread. However, the GPhC has also opined that it is less clear whether either of these two steps would represent a degree of integration that is “strong enough.”

The multidisciplinary level of the ladder describes teaching that is output based and in which (clinical) cases typically focus on applying knowledge and skills to solve a problem. The interdisciplinary level goes further in losing the autonomy and perspective of the individual subject discipline. The uppermost transdisciplinary step requires a curriculum that is “immersed in the real world”, something which the GPhC admit is not achievable within the current funding model for pharmacy education. It is becoming clear that the GPhC would like to see new pharmacy curricula achieving the higher multidisciplinary or interdisciplinary steps of Harman’s ladder, particularly where the extent of integration has been previously questioned.

Pearson and Hubball (2012) have reviewed the evidence base for curricular integration and also described its introduction into a pharmacy curriculum in British Columbia, Canada. The authors define an integrated curriculum as one being specifically designed to demonstrate patterns and applications of different knowledge domains. This differs from an integrative curriculum in which students define their own patterns and applications. They also describe different conceptions of the curriculum: the intentions of the curriculum planners (espoused curriculum), the learners and assessment activities implemented by instructors (enacted curriculum) and the educational activities taken up by the students (experienced curriculum). The paper highlights various desirable approaches that can support integration such as the use of the use of ability-based outcomes, case-based delivery approaches and “real-world” authentic assessments that are inherently capable of transcending the traditional disciplines. Despite a current paucity of evidence to support the benefits of curricular integration and integrative learning the authors view the introduction of integration strategies as being highly pertinent to those programmes (such as pharmacy) in which knowledge, skills and attributes are required to undertake competent practice within complex environments.

However, the approach used at the University of British Columbia describes various “integrative efforts” within a programme that is mainly structured along disciplinary lines. Horizontal (across discipline) integration is achieved using case-based tutorial courses; the temporal coordination and sequencing of content; and the formation of an interdisciplinary faculty structure. Vertical (temporal) integration is achieved through the sequencing of topics from term-to-term and year-to-year; the elimination of repetition; and the inclusion of sequential experiences of practice. Despite the authors’ assertion that they have achieved integration and integrative learning within a traditional, modular, discipline-based course integration appears to be at the correlation or complementary steps on Harden’s ladder. As such it is not certain whether the British Columbia programme would meet the GPhC’s expectations of an integrated course.

Achieving integration and spiralling in the proposed curriculum

The MPharm Learning, Teaching and Assessment Strategy describes how integration, integrative learning and a spiral curriculum should be achieved. It seeks to remove modular boundaries; to utilise enquiry-based instructional methods based on authentic “real life” scenarios; and to adopt cross-school approaches to delivery. The proposed curriculum will therefore incorporate a multi-faceted approach to integrated and integrative instruction and learning as follows:-

- The programme’s year (MDT) outcomes have been derived with reference to the GPhC’s standards. As such they take the form of “ability-based outcomes” that will support the integration of learning and of assessment. Integration would otherwise be more difficult to achieve with traditional discipline orientated learning outcomes.

- The entire programme will be ‘module free’ i.e. organised in to four single 120-credit bearing stages. Traditional modules, which invariably become discipline-focussed, do not feature. Instead, content delivery is organised in to thematically titled ‘strands’ to support horizontal integration. The strand titles, listed in section 9 above, have been developed within the context of one or more pharmacy relevant concepts: patients and populations, drugs and medicines and professional practice. Earlier in the programme more strands are included. This reflects the more disparate nature of the fundamental underpinning content. However related discipline/subject areas will nevertheless be integrated together. For example various biological sciences will
be delivered together in the *Molecules, Cells and Systems* strand. At subsequent stages, as students’ knowledge and skills develop, there will be fewer, ‘larger’ strands. These will be organised around disease management (through body systems) and the development of advanced practice. The risk of reverting to discipline-based perspectives will be further reduced by forming cross-disciplinary staff teams to develop, deliver and assess learning applying to the various strands. They will achieve this by using the instructional approaches described below.

- A ‘spiralled’, vertically integrated approach will be achieved by revisiting concepts and content covered in previous years but at an increasingly more applied, then clinically, and then developmentally focussed level. This will be supported by the incremental development of skills and attributes. More complex prescriptions and cases will be introduced as the instructional methods change, with an increasing scientific and practice knowledge and skills base underpinning the “solving” of those cases. Advances in pharmaceutical science and practice, and also highly complex patient and population scenarios, will feature latterly as the students are expected to deal will increasingly challenging concepts and more complex problems. The upward spiralling of content throughout the proposed MPharm is described in more detail as follows;

- At stage 1 fundamental scientific and practice knowledge and skills will be developed using four strands which integrate related disciplines or performances. The *Molecules, Cells and Systems* strand introduces the biochemical building blocks of life, the structure and function of eukaryotic and prokaryotic cells and human anatomy and physiology. Processes associated with these cells and systems will be compared and contrasted in health and disease. The *Introduction to Drugs and Medicines* strand introduces the basic principles of drug discovery and development and will provide students with an understanding of organic and physical chemistry, and the pharmacological principles, pertinent to medicinally important molecules. The *Pharmacists, Patients and Medicines* strand explores how pharmacists use their expert knowledge of medicines, health and the disease for the benefit of patients and the population through exploration of pharmacists’ roles and how medicines are distributed and handled in patient-facing settings. Concurrently the *Informed Pharmacy Learner* strand aims to introduce and develop fundamental graduate skills, techniques and attributes including, laboratory, communication learning and study skills. In stage 1 cross strand integration of content will be achieved using basic prescription and patient examples and through orientation-focused practice experiences in accordance with the MPharm Service (Practice) and Interprofessional Experience Strategy.

- In stage 2 three strands are incorporated. *Medicines in Development and Use* builds on the fundamental principles of drug action and handling, molecular biology, microbiology, physiology, pharmaceutical chemistry and physicochemical science covered at stage 1. The strand will explore how drugs are developed in to medicines and how they act and interact within specific body systems. It will provide a comprehensive overview of the current usage of drugs and where the next generation of therapies are likely to come from. The prediction of drug actions and effects in body systems and their uses will be exemplified using example multiple item/single condition prescriptions and uncomplicated case studies. Principles of drug mechanisms of action, drug design, delivery, packaging, handling and dosage forms as well as analytical techniques pertinent to the characterisation and development of drugs will be covered. *Clinical and Professional Skills for Pharmacists* will introduce the skills required to apply to knowledge of medicines and optimize their use in patients. The strand will focus on safe systems of working and governance, professional responsibility and accountability, ethical practice and the development of consultation skills, case history analysis, higher order prescription analysis and the strategies used to rationalise and optimize medicines use and patient care. Selected examples of disease topics will be used to exemplify these skills in preparation for Pharmacy Stage 3. The *Applied Pharmacy Learner* strand will continue to develop students as reflective learners and as student healthcare professionals who are aware of evidencing competencies in the meeting of standards. Study skills covered will incorporate more complicated calculations, further development of the retrieval and interpretation of academic papers, scientific writing, presenting skills, effective team working, and interprofessional working with students of other health professions. Students will be introduced to research methodologies and paradigms pertinent to pharmacy.

- Stage 3 incorporates two strands. The *Therapeutic Management of Patients* strand will revisit the range of conditions in the major body systems covered at level 5 with a focus on their diagnosis and therapeutic management. Students will consider rational drug choice based upon clinical evidence and patent factors and characteristics; and also health promotion. Concurrently students will apply knowledge of advanced drug development processes from discovery through to patient. These will include complex drug delivery technologies; development and uses of biological treatments; and pharmacogenetics, pharmacogenomics
and personalised medicine. In the Established Pharmacy Learner strand study skills will be further enhanced by considering more advanced communication and consultation techniques, research methodologies pertinent to pharmacy; and by undertaking effective team-working in an interprofessional setting. At the conclusion of this stage students will have developed a full appreciation of reflective practice through their portfolio building and the presentation of evidence of learning to meet standards.

- Stage 4 incorporates three strands. Frontiers in Pharmacy focuses on research and development. It considers public and population health, and health policy; and the roles of medicines and pharmacists in meeting these agendas. Building upon the paradigms then methodologies considered at stages 2 and 3 respectively, research and critical analysis skills will be applied to an extended project and there will also be an extended piece of work focusing on developing initiatives in pharmacy. Effective Patient Management will build on clinical therapeutics at level 6 by introducing students to increasingly complex scenarios, cases and prescriptions that require higher level pharmacist input. These will include patients with altered drug handling states, patients with multiple disease states, patients with additional counselling or drug administration requirements and prescribing-related queries. Students will be expected to utilise higher level interpersonal and written communication skills to deal with scenarios involving patients, health professionals and drug use. The Accomplished Pharmacy Learner considers more challenging consultation scenarios and calculations, and will develop coaching, teaching, management and leadership skills. Students will be required to demonstrate that they are accomplished reflective practitioners with the necessary skills, knowledge and attributes to meet the GPhC’s standards for pharmacy graduates and that they are fit to enter their pre-registration year.

- Since modular boundaries, are proposed to be removed through the requested regulatory exemptions, the programme's structure also permits assessments to transcend any possibility of notional boundaries that might exist between the strands. Various assessments are therefore constructively aligned across content (scope) which appears within the descriptions of the different strands. This is particularly the case across the skills-based strands such as the "learner" strands and recognises that the development of skills is embedded across the overall programme.

- The strategic organisation of the programme’s delivery in to enquiry-based instructional approaches such as Team-based Learning and Case-based Learning will support integration via exercises and cases which are derived and designed from cross-discipline perspectives.

Instructional approaches

Team-based Learning

During the first two years students will study almost exclusively using the Team-based learning (TBL) instructional approach. TBL is based upon the formation of teams of 5-6 students who stay together as a group for the entire academic year. It is delivered using several stages. Initially, the readiness assurance process requires students to assimilate content outside of the classroom using study packs and/or directed reading. Students are then assessed as individuals through a class test called an iRAT (individual readiness assurance test), typically using an electronic ‘zapper’ voting system. Students subsequently debate the same questions in their TBL groups and then retake the test as a gRAT (group readiness assurance test.) Final group answers are submitted on a “scratch card” and marks are awarded in indirect proportion to the number of attempts made to reveal the correct response. The readiness assurance process allows tutors to shift from the role of didactic lecturer to one of facilitator since the content is assimilated outside of the classroom. Contact time may then be used to focus on those concepts which learners find the most challenging.

The final stage of TBL involves students undertaking Team Application Exercises (tAPPs) which seek to place learning further in to context, encourage problem solving and further deepen the learning approach. With TBL students quickly become intrinsically and extrinsically motivated within a more competitive environment. This is driven by the readiness assurance process (continuously assessed), peer pressure and through the authenticity of the application exercises. TBL particularly supports those students who are not inherently deep learners whilst, at the same time, allowing those who are to flourish within the environment. The method, as it applies to pharmacy education, has been described in detail by Farland et al (2013).
Case-based Learning

By the third year of the programme students’ underpinning knowledge and skills will have increased in both depth and breadth and clinical application will become more prevalent. Therefore the amount of TBL learning will reduce significantly in favour of a predominantly Case-based Learning instructional approach.

Case-based Learning (CBL) is a derivative or relative of Problem-based Learning (PBL) but it principally differs from true PBL in that it requires students to hold, or develop, prior knowledge or experience of the subject. As such CBL is a guided enquiry method that involves more supported instruction than true PBL. CBL offers a number of advantages over traditional, didactic methods of instruction including increased extrinsic and intrinsic motivation; improved self-evaluation and critical evaluation; better integration of knowledge and practice; and an enhanced development of learning skills (including lifelong learning.)

Like TBL, supporting information is provided, usually in the form of directed reading, clinical papers, clinical guidance and case detail. Although numerous descriptions of CBL have been made, typically (in its guided enquiry format) students are given an authentic case and supplementary reading in advance of the classroom session. Small groups of students then undertake an analysis of the case, brainstorm from a variety of perspectives, and then formulate learning objectives. Further research and analysis is then undertaken in order to develop understanding before the findings are disseminated. The case study itself is used to guide the assimilation of knowledge and the application and development of skills and attitudes. Students recall previously covered and newly acquired material in order to 'solve' the cases. An understanding of the solutions will be derived from a combination of the content and performances acquired during previous stages, and from the directed reading that is given. As with TBL, but in contrast to true PBL, the CBL approach is advantageous to students who are not inherently deep learners of the very highest capability. This is because it does not start from a point of zero prior knowledge, yet it still retains an authentically relevant, collaborative, and competitive focus that fosters intrinsic motivation. The method, as it applies to pharmacy education, has been described by Jesus, Gomes and Cruz (2012).

Implementation

TBL and CBL will become the main instructional approaches used to integrate the acquisition and delivery of content throughout the course. Since application exercises, assurance tests and cases that students are exposed to will be generated by cross-disciplinary teams, both methods represent “enacted” and “experienced” approaches to integration. CBL, in particular, supports integrative learning since the authenticity and clinical nature of the cases encourages students to make connections using previously and currently acquired knowledge and experience.

As stated above TBL will be introduced early in the course since it fosters both extrinsic and intrinsic motivation and deep, independent learning. In this way students are ‘captured’ in to appropriate learning behaviours from the outset. Its continuous testing also supports students in assimilating the fundamental scientific and practice knowledge that underpins subsequent spiralled, vertical integration. By the end of stage 3 TBL will be phased out as a formally assessed method. CBL will begin to be introduced during stage 2 and will become the main method of instruction at stage 3, continuing on in to stage 4. This is advantageous since content must be considered in an increasingly clinical context as the course progresses. Unlike TBL, CBL does not formally incorporate continuous summative testing. Nevertheless, coursework assessments will run alongside CBL, with the method itself supporting success as autonomous learning and critical analysis skills develop. Competitive and authentic coursework such as drug formulary reports, case presentations, case discussions, pharmaceutical care plans and service developments are expected to develop self-confidence and a progressive approach to practice. These are described in section 15 below and, in more detail, in the individual Module Development Templates.

Notwithstanding the inherent feedback and assessment associated with TBL and CBL students are likely to require additional support when they are initially exposed to these enquiry-based learning methods. Therefore, more traditional contact approaches will initially be included to help clarify understanding of important or difficult principles. With TBL contextualisation keynote lectures and additional tutorial opportunities will supplement the readiness assurance and application exercise processes. Areas of difficulty
will also be identified through the readiness assurance process; through dialogue and feedback obtained during classes and online interactions; and also through standard University student feedback and personal tutor mechanisms. In addition, independent learning skills will be developed within the “learner” strands including effective reading, literature retrieval, note-making and group work (see below). These will be supplemented by directing students to University-wide skills support opportunities offered by the learning centres.

It is expected that the study skills required to successfully engage with TBL will serve to prepare students for the onset of CBL. Nevertheless similar opportunities for keynote lectures and additional tutorials will be made available as CBL is introduced. In addition CBL, as a method, will be introduced in a staged fashion in which learner engagement can initially be ‘structured’ through the provision of specific case questions and outcomes.

Later on, engagement can become more ‘guided’ with students generating their own hypotheses, outcomes and learning activities. The guided approach will develop as the course progresses through stage 2, becoming embedded in to stages 3 and 4 of the course. Workshops, practical classes, seminars, online collaborations and placement visits will also be incorporated, as appropriate, to support both instructional approaches.

During stages 3 and 4 there will be a requirement for students to engage, in depth, with individualised assessment tasks and activities at the forefront of pharmaceutical science and practice. These include case presentations, service developments and project work. In these instances alternative instructional approaches will also be employed which will involve a greater emphasis on self-directed and private study, one-to-one tutor support and formative assessment. The knowledge, skills and attributes that will have been developed through TBL and CBL will nevertheless underpin learners’ success in undertaking independent, self-directed study in more specialist areas.

Study and learning skills

Pharmacy students must develop the skills and attributes needed to utilise their developing pharmaceutical knowledge effectively for the benefit of patients. The various instructional methods described above will support students in their development of problem-solving and critical thinking skills through collaborative learning, formative assessment and feedback. They will also develop softer skills such as team-working, information retrieval and independent learning. However, additional support will be provided in order to enable students to succeed.

Each stage will incorporate a ‘learner’ strand in which students will develop skills relevant to the academic level concerned and in preparation for the next stage of the programme. The learner stands will sequentially developing build and graduate skills that are pertinent to future employability such as numeracy, computer literacy, information retrieval and research skills. These will be considered alongside those skills and attributes that are more specific to pharmacists and other healthcare professionals including lifelong learning and continuing professional development (CPD.) Stage 2 will incorporate an additional strand which focuses extensively on developing clinical skills, interpersonal skills and professional attributes. This anticipates the increasingly clinical and applied nature of the programme in the subsequent stages and further supports the development of the University’s key graduate attributes.

The development of an ongoing portfolio will be a major feature of the “learner” strands. The portfolio will initially focus around CPD. As the course progresses its emphasis will shift towards competency assurance and the gathering of evidence of meeting professional standards, specifically those learning outcomes outlined in Standard 10 of the GPhC’s 2011 Standards for the Initial Education and Training of Pharmacists.

Patient and practice experience

The proposed MPharm incorporates a staged approach to patient and practice experience which encourages students to apply knowledge and skills developed at the level appropriate to the stage of the programme. During the earlier stages of the course, placement visits, ‘Service User’ interactions and interprofessional learning cycles will be used to orientate students to the roles, functions and perceptions of pharmacists, other healthcare professionals and patients. These interactions will subsequently be used to exemplify professional,
clinical and communication skills.

During the latter stages placement visits, ‘Service User’ interactions and interprofessional learning cycles will provide students with first hand experience of clinical practice in the management of disease, and situations involving complex pharmaceutical needs. At stage 4, placement visits will be undertaken in more specialized areas of practice which require greater levels of multidisciplinary working.

As students progress through the stages, patient contact will become less observational and will increasingly encourage the practical application of knowledge, skills and attributes. There will also be less reliance on direct supervision/mentoring but activities will nevertheless take place within a controlled environment. There will be a proportionally greater number of placement visits and ‘Service User’ interactions in the latter stages of the programme to reflect its increasingly applied, and clinically orientated, nature.


Learning and Teaching Methods:

This data indicates the proportion of time in each year of study that students can expect to engage in the following activities (expressed as a percentage for each level).

<table>
<thead>
<tr>
<th>Level</th>
<th>Teaching</th>
<th>Independent</th>
<th>Placement</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>16</td>
<td>84</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>23</td>
<td>77</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>19</td>
<td>81</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>29</td>
<td>71</td>
<td>0</td>
</tr>
</tbody>
</table>

Assessment Methods:

This data indicates the proportion of summative assessment in each year of study that will derive from the following: (expressed as a percentage for each level).

<table>
<thead>
<tr>
<th>Level</th>
<th>Written Exams</th>
<th>Practical Exams</th>
<th>Coursework</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>55</td>
<td>0</td>
<td>45</td>
</tr>
<tr>
<td>5</td>
<td>50</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>6</td>
<td>55</td>
<td>5</td>
<td>40</td>
</tr>
<tr>
<td>7</td>
<td>20</td>
<td>5</td>
<td>75</td>
</tr>
</tbody>
</table>
Student Support:

A wide range of support for learning will be available to MPharm students. Generic support will include the use of central services such as FSE's Student Support Office, for general enquiries, and the City Campus Learning Centre. The Learning Centre will provide library facilities as well as electronic and literature search resources and will run specific academic study skills sessions for students.

The development of study skills and clinical skills is a major feature of the course and are these are embedded within the programme. The 'learner' strands in each year and the additional Clinical and Professional Skills for Pharmacists strand in stage two seek to develop study skills and are described in detail in section 10 above.

Outside of the formal strand-based teaching students will be signposted to 'drop-in' opportunities at the Learning Centres. For more specific support, students will be able to contact their personal tutors and subject-specialist strand tutors through the online Student Appointment Management System (SAMS) booking and recording system. Specialist software (e.g. PharmaCALogy, PebblePad, GraphPad Prism, Chart) is likely to be introduced within strand settings, thus further enriching the learning environment for students, and with additional staff support being offered where necessary.

Using the above mentioned frameworks to support the development of study skills, autonomous, independent student learning will be encouraged.

Employability in the Curriculum:

The majority of pharmacy graduates enter pre-registration training and become registered Pharmacists. Currently, the major area of employment for pharmacists (60-70%) is in the community sector, with most of the remainder entering the National Health Service (NHS) as hospital or 'primary care' pharmacists. A small proportion of pharmacy graduates and pharmacists enter careers in the pharmaceutical industry or in academic pharmacy.

Community pharmacists provide an expanding range of healthcare services ranging from the supply of medicines through to running minor ailments schemes, supporting the management of long-term conditions, undertaking medicines reviews and performing public health screening services. In hospital, pharmacists are involved across the whole spectrum of patient healthcare from diagnosis to medicines and disease management. Many pharmacists also hold management and consultant positions within the NHS. Industrial pharmacists are involved in the development of new drugs and their transformation into medicines, as well as the marketing and evaluation of new products. Academic pharmacists are occupied by healthcare-related research and development and in the education and training of future cohorts of pharmacy students.

Several areas of further study are open to pharmacy graduates. In particular, many pharmacists undertake further training in clinical pharmacy in order to underpin their provision of clinical services. This training is usually at the masters level (Level 7), but can also lead to doctoral studies (Level 8) in appropriate cases.

As healthcare professionals, pharmacists are expected to maintain their competence and ‘fitness to practise’ throughout their working lives. As such, they are actively involved in Continuing Professional Development (CPD), and are expected to design and implement their own learning strategies.