

Course Specification

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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:	MPharm (Hons) Master of Pharmacy		
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:	2019/0		
Course Specification valid from:	2013/4		
Course Specification valid to:	2024/5		

Academic Staff

Course Leader:	Miss Michelle Key
Head of Department:	Dr Colin Brown

Course Information

Location of Delivery:	University of Wolverhampton
Category of Partnership:	Not delivered in partnership
Teaching Institution:	University of Wolverhampton
Open / Closed Course:	This course is open to all suitably qualified candidates.

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)

Entry requirements for the course are reviewed on an annual basis.

Currently, for entry in 2019, the following applies:

All applicants are assessed by their highest level of study.

- GCSE English Language and Mathematics both at grade C+/4.

Only the following equivalent qualifications are accepted for English: Functional Skills Level 2 English and OCN Access to HE Core English (12 credits at Level 2 or 3 in English)

Only the following equivalent qualification is accepted for Mathematics: OCN Access to HE Core Mathematics (12 credits at Level 2 or 3 in Mathematics)

PLUS EITHER

- 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.
- BTEC QCF Extended Diploma in Applied Science at grade DDD, which must include the following mandatory units -
- Unit 1 (Principles and Application of Science 1) at grade distinction
- Unit 3 (Science Investigation Skills) at grade distinction
- Unit 5 (Principles and Applications of Science 2) at grade distinction
- Unit 14 (Applications of Organic Chemistry) at grade distinction

Plus two other units at grade Distinction from list below -

1. Unit 2 (Practical Scientific Procedures and Techniques)
2. Unit 4 (Laboratory Techniques and their Application)
3. Unit 6 (Investigative Project)
4. Unit 7 (Contemporary Issues in Science)

And two other units from list below at grade Merit or Distinction:

1. Unit 8 (Physiology of Human Body Systems)
2. Unit 9 (Human Regulation and Reproduction)
3. Unit 10 (Biological Molecules and Metabolic Pathways)
4. Unit 12 (Diseases and Infections)
5. Unit 13 (Applications of Inorganic Chemistry)
6. Unit 17 (Microbiology and Microbiological Techniques)
7. Unit 18 (Industrial Chemical Reactions)
8. Unit 19 (Practical Chemical Analysis)

9. Units 20 (Biomedical Science)

Applicants who are studying the outgoing (pre 2016/17) BTEC Extended Diploma in Applied Science should contact Admissions for the unit requirements.

- 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)
- Access to HE Diploma in Science or Medicine and Health Professions with 60 credits overall, to include 15 Level 3 credits in Chemistry at Distinction and 15 further credits in Science subjects at Merit
- First Year (Level 4) of an appropriate degree with a minimum of 65% in all modules (note: not an overall average)
- 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](#)

Those who do not meet the entry requirements may be offered an alternative course.

Other Requirements

Selection Proceedings:

Applicants are required to make a formal visit to the University to participate in selection proceedings. Applications made through clearing will also be subject to selection proceedings, which can include the option to participate by virtual means.

Offers are subject to satisfactory occupational health and Disclosure and Barring Service (DBS) clearance, which will incur charges.

Those who do not meet the entry requirements may be offered an alternative course.

Applicants must be immune to mumps, measles, German measles (rubella), chicken pox and tuberculosis and/or have been immunised as such to be accepted onto the course. Outstanding immunisations can be arranged and undertaken as part of the initial occupational health clearance check, the costs of which must be borne by the applicant.

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 provides 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, pharmaceuticals 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 improve performance 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, collaborator, problem solver, critical analyser, leader 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 patients, medicines, effective working or professionalism 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 for the benefit of patients and populations
- the development of professionalism and skills in collaborative working and leadership

A particular feature of the Wolverhampton MPharm programme involves the use of novel, student-centred teaching approaches, including *Team-based Learning* and *Case-based Learning*. These teaching methods 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. By using these approaches 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 university to enter the pre-registration stage of your training.

The General Pharmaceutical Council (GPhC) is the regulator for pharmacists, pharmacy technicians and pharmacy premises in Great Britain. It monitors and re-accredits all UK pharmacy programmes on a six-year cycle. The MPharm programme at Wolverhampton forms the first four years of pharmacist training which, on graduation, is followed by a one-year period of pre-registration training which is administered, and also examined, by GPhC.

As a course which leads to a career in a healthcare profession, entry to and completion of the MPharm imposes professional and ethical considerations on its students. Before final acceptance onto the course students are required to complete a Disclosure and Barring Service (DBS) check to establish whether, or not, they have a criminal record. Students are also required to complete and pass an Occupational Health Check and they must make annual declarations about their character and health at the beginning of each academic year.

The professional nature of the course also necessitates that students comply with codes of conduct and standards derived by the University and by the GPhC. Students are expected to develop professional attitudes to both learning and practice as a pharmacy student, with 'fitness to practise' being monitored and assessed throughout the course. Attending the various teaching sessions available and proactively engaging in all the learning-related activities provided is both necessary and expected. As trainee healthcare professionals, pharmacy students must understand and practice concepts of 'lifelong learning' and 'continuing professional development' (CPD), and provide evidence that they meet these requirements.

Intakes:

September

Major Source of Funding:

Office for Students (OFS)

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.

Year	Status	Mode	Amount
2020/1	H	Full Time / Sandwich	£9250.00
2020/1	Overseas	Full Time / Sandwich	£12250.00
2021/2	H	Full Time / Sandwich	£9250.00
2021/2	Overseas	Full Time / Sandwich	£12950.00

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.

Approved	Start	Expected End	Renewal
17/Oct/2014	17/Oct/2014		31/Aug/2021

Course Structure:

September (Full-time)

Year 1

Module	Title	Credits	Period	Type
4PY019	Pharmacy Stage 1	120	YEAR	Core

September (Full-time)

Year 2

Module	Title	Credits	Period	Type
5PY022	Pharmacy Stage 2	120	YEAR	Core

September (Full-time)

Year 3

Module	Title	Credits	Period	Type
6PY011	Pharmacy Stage 3	120	YEAR	Core

September (Full-time)

Year 4

Module	Title	Credits	Period	Type
7PY023	Pharmacy Stage 4	120	YEAR	Core

Please note: Optional modules might not run every year, the course team will decide on an annual basis which options will be running, based on student demand and academic factors, to create the best learning experience.

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 4.2.2/4.2.4 - 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 are clearly indicated alongside the assessment descriptions in relevant Module Guides.

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 into 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 have a third sit 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 than 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 unless conferred posthumously by exception.

APPROVED (by Chair's Action on 8/4/2020).

Section 5.4.1 – Exemption to allow the MPharm modules that are 120 credits, to amend the criterion for award of a higher class of degree based on weighted assessments and not the number of credits achieved at the higher classification.

Classification	Percentage Average	Criterion for award of a higher class
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First	70-100%	
First/Upper second border range	67.01-69.99%	Student must have 70% or above in at least 50% of weighted assessments at level 7
Upper second	60-67%	
Upper/lower second border range	57.01-59.99%	Student must have 60% or above in at least 50% of weighted assessments at level 7
Lower second	50-57%	
Lower second/third border range	47.01-49.99%	Student must have 50% or above in at least 50% of weighted assessments at level 7
Third	40-47%	

Effective date: May 2021.

APPROVED by AFRCS on 19/11/2020

Reference Points:

[UK Quality Code for Higher Education](#)

[Qualifications and Credit Frameworks](#)

[Subject Benchmark Statements](#)

[University Policies and Regulations](#)

Equality Act (2010)

GPhC Standards for the Initial Education and Training of Pharmacists 2011:

<http://www.pharmacyregulation.org/>

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:

Module	Title	Course Learning Outcomes
4PY019	Pharmacy Stage 1	CHECLO1, CHECLO2, CHECLO3, CHECLO4, CHECLO5
5PY022	Pharmacy Stage 2	DHECLO1, DHECLO2, DHECLO3, DHECLO4, DHECLO5
6PY011	Pharmacy Stage 3	DEGCLO1, DEGCLO2, DEGCLO3, DEGCLO4, DEGCLO5, ORDCLO1, ORDCLO2, ORDCLO3, ORDCLO4, ORDCLO5
7PY023	Pharmacy Stage 4	IMACLO1, IMACLO2, IMACLO3, IMACLO4

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 various University and Faculty level strategies, sub-strategies and enabling strategies.
- the views of stakeholders
- a formal *Curriculum Review*

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 Wolverhampton 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 has previously recognised 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 in to 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 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, if presented in the UK, 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 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 is ‘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; effective working* and *professional practice*. Earlier in the programme the fundamental underpinning content is inherently more disparate. However related discipline/subject areas are nevertheless 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, strands are organised around disease management (through body systems) and the development of advanced practice. The risk of reverting to discipline-based perspectives is further reduced by forming cross-disciplinary staff teams to develop, deliver and assess learning applying to the various strands. Staff achieve this by using the instructional approaches described below.

-A ‘spiralled’, vertically integrated approach is achieved by revisiting concepts and content covered in previous years but at an increasingly more applied, then clinically, and then developmentally focussed level. This is supported by the incremental development of skills and attributes. More complex prescription scenarios and cases are 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, features latterly as the students are expected to deal with 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 is 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 is 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 is achieved using basic prescription or patient case 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 explores how drugs are developed in to medicines and how they act and interact within specific body systems. It provided 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 is typically exemplified using example multiple prescription item/single condition 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 are covered. *Clinical and Professional Skills for Pharmacists* s the skills required to apply to knowledge of medicines and optimise their use in patients. The strand focuses 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 optimise medicines use and patient care. Selected examples of disease topics are used to exemplify these skills in preparation for Pharmacy Stage 3. The *Applied Pharmacy Learner* strand continues 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 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 are introduced to research methodologies and paradigms pertinent to pharmacy.
- Stage 3 incorporates two strands. The *Therapeutic Management of Patients* strand revisits the range of conditions in the major body systems covered at level 5 with a focus on their diagnosis and therapeutic management. Students consider rational drug choice based upon clinical evidence and patent factors and characteristics; and also health promotion. Concurrently students apply knowledge of advanced drug development processes from discovery through to patient. These 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 are 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 competency frameworks (e.g. the Professional Attributes Framework).
- 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 in earlier stages, research and critical analysis skills is applied to an extended project in an area chosen by the student and there is be an extended piece of work focusing on developing initiatives in pharmacy. *Effective Patient Management* builds on clinical therapeutics at level 6 by introducing students to increasingly complex scenarios, cases and prescriptions that require higher level pharmacist input. These 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 are expected to utilise higher level interpersonal and written communication skills to deal with scenarios involving patients, health professionals and drug use. The *Proficient Pharmacy Learner* strand considers more challenging consultation scenarios and calculations, and develops mentoring, management and leadership skills. Students 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 absent 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* supports integration via exercises and cases which are derived and designed from cross-discipline perspectives by the wider staff team.

Instructional approaches

Team-based Learning

During the first two years students learn 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). Students subsequently debate the same questions in their TBL groups and then retake the test as a tRAT (team 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 is then 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 have increased in both depth and breadth and clinical application becomes more prevalent. Therefore the volume of TBL learning reduces significantly in favour of *Case-based Learning* instructional approach.

Case-based Learning (CBL), as used on the Wolverhampton MPharm, 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 matter. 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 required, 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 concurrently, or newly, acquired material in order to 'solve' the cases. An understanding of the solutions is 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 represent major 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 previously TBL is 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 phases out as a formally assessed method. CBL is introduced 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 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 develop self-confidence and a progressive approach to practice. These assessments 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 are also included to help clarify understanding of important or difficult principles. With TBL contextualisation keynote lectures and additional tutorial opportunities supplement the readiness assurance and application exercise processes. Areas of difficulty are also identified through the readiness assurance process; through dialogue and feedback obtained during classes and online interactions; and also through standard University student feedback and tutor mechanisms. In addition, independent learning skills are developed within the “learner” strands including effective reading, literature retrieval, note-making and group work (see below). These are 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 are made available as CBL is introduced. In addition CBL, as a method, is introduced in a staged fashion with an initial introductory session and guided support. The self-directed approach develops further across stages 3 and 4 of the course. Workshops, practical classes, seminars, online collaborations and placement visits are also be incorporated, as appropriate, to support both instructional approaches.

During stages 3 and 4 there is 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 are also 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 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 support students in their development of problem-solving and critical thinking skills through collaborative learning, formative assessment and feedback. They also develop softer skills such as team-working, information retrieval and independent learning. However, additional support is provided in order to enable students to succeed.

Each stage incorporates a 'learner' strand in which students develop skills relevant to the academic level concerned and in preparation for the next stage of the programme. The learner stands sequentially developing graduate skills that are pertinent to future employability such as numeracy, computer literacy, information retrieval and research skills. These are 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 incorporates 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 is a major feature of the "learner" strands. The portfolio focuses around CPD. As the course progresses its emphasis shifts towards competency assurance and the gathering of evidence of meeting professional standards and attributes.

Patient and practice experience

The 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 are used to orientate students to the roles, functions and perceptions of pharmacists, other healthcare professionals and patients. These interactions are subsequently used to exemplify professional, clinical and communication skills.

During the latter stages placement visits, 'Service User/Carer' interactions and interprofessional learning cycles 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 are undertaken in more specialised areas of practice.

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

Schematic summary

The intended progression of student learning through the curriculum is illustrated by the following schematic:

Feature of programme Direction of travel as the course progresses

Learning outputs	Knowledge & application; demonstration; assurance
Thought processes	Context; prediction; critical analysis & reflection
Nature of content	Underpinning/skills-based; applied; multi-factorial; projected/novel
Assimilation of content	Continuous testing; case driven; task or project driven
Nature of cases/prescriptions	Single; multiple; complex
Reading	Provided; prescribed; self-directed; discovered
Patient, carer, healthcare team interaction	Observational; supervised; collaborative
Autonomy and independence	Procedural; experimental; creative
Progression through practice	Hesitant; contributory; confident; developmental

Assessment Strategies

Assessment methods employed within the proposed curriculum are designed to meet the goals outlined in the *MPharm Learning, Teaching and Assessment Strategy* which, in turn, has been informed by the GPhC's Standards, University and Faculty level strategies and sub-strategies and stakeholder views.

In order to move the provision further in the direction of high student attainment and professional capability the strategy describes a necessity to increasingly move away from methods of learning and assessment which are based on didactic delivery and factual recall.

Assessment methods therefore support the enquiry-based instructional methodologies outlined in 10 above in driving student learning and in developing the knowledge, skills and desirable attributes described.

The strategy acknowledges assessment's centrality to learning; and its value in allowing judgements to be made about student effort and about the effectiveness and depth of learning. However it also advises that the benefits of assessment must not exclusively be applied to terminal, credit bearing effort.

The following lists various assessment-related goals that are outlined within the strategy:-

- *Diagnostic, formative and summative assessment and feedback "for learning" should be embedded in to the curriculum and the instructional methods it employs. The focus should be on driving student attainment and developing competency. Summative assessment should NOT be restricted to the end of courses of study and it should be included throughout the programme in forms such as continuous testing, phase testing and coursework. There should be an appropriate balance of diagnostic, formative and summative assessment supported by the instructional methods chosen.*
- *Feedback should incorporate self, peer and tutor assessed approaches, should be extensive and should adopt a variety of formats. It should be focused on positive affirmation and future improvement and, wherever possible, it should be personalised and timely. It should always be targeted to meet student need, consider future performance, and be legible and coherent.*
- *Assessment should be planned with reference to the learning outcomes applying to the stage and students should develop an awareness of how assessments evidence the meeting of both the stage, and the GPhC, learning outcomes.*
- *Peer assessment, reflective portfolios and effective feedback systems should be used to develop students' understanding of the assessment process and to enhance self-assessment and lifelong learning skills. The diet of assessments across the curriculum must be planned to ensure that the learning outcomes in GPhC's Standard 10 can be satisfactorily met at the appropriate Miller's triangle level of competence. "Does" should be met by repeated assessment and "shows how" through competency-based approaches.*
- *At each stage of the curriculum there should be assessments that consider integration across disciplines. In the early stages, where fundamental underpinning knowledge is being developed, this may involve the use of synoptic examinations which consider groups of related disciplines. In the latter stages assessments may transcend a greater number of disciplines, typically by incorporating authentic, "real-life" scenarios, problems and tasks which must be considered from a cross-disciplinary perspective. Integration of assessment may be better achieved where learning outcomes apply to various strands of thematically arranged content.*

In addition, the *MPharm Service (Practice) and Interprofessional experience Strategy* includes the following:

- *Service (Practice) and Interprofessional experiences should be assessed using a range of methods that are appropriate to the experience including case study analyses and portfolio entries. Assessments and feedback that are applied to any experience should follow the principles outlined in the School's Learning, Teaching and Assessment Strategy.*

Approach to assessment in the curriculum

Since content acquisition occurs outside of the classroom environment TBL, through its readiness assurance and application exercise processes, concentrates contact time around continuous assessment; and also timely and targeted peer and tutor feedback. TBL delivery combines diagnostic and formative/summative assessment opportunities rendering it assessment both "for" and "of" learning. The Module Development Templates for stages 1 to 3 show significant weightings for TBL continuous assessment scores (both individual and group). Their position and higher relative assessment weighting earlier in the programme is a reflection of TBL's ability to drive both intrinsic and extrinsic motivation, and to raise attainment in final examinations.

As such, learning outcomes that are aligned to the TBL assessments will also be tested by final examination,

which will therefore measure the assessment “of” the learning at official semester or end-of-year assessment points.

The CBL method focuses heavily on peer and tutor feedback and formative assessment since content is similarly acquired outside of the classroom environment. This is supported through guided (peer and independent learning) approaches to further content acquisition; identification of learning gaps; and application of content to the critical analysis of cases. Compared to TBL, this “lighter” touch towards continuous assessment should suit students who have become more mature, independent learners and team-workers, and who have accumulated a body of underpinning knowledge and skills. CBL therefore sits in the intermediate and latter stages of the programme. As stated in 10 above, summative assessment is nevertheless embedded alongside CBL in the form of “authentic” coursework components. These will require students to apply the higher level, integrated knowledge and skills that CBL develops.

Examinations feature throughout the course and they hold a greater weighting at stages 1 and 2. This reflects an earlier focus on content acquisition, understanding and application. The presence of examinations also provides stakeholders with assurance that a body of fundamental knowledge has been assimilated. The MPharm’s examinations test application and problem solving using approaches such as extended matching questions and short answer questions. Content-based examinations in the final stage are supplemented by a competence-based Objective Structure Clinical Examination (OSCE) which tests clinical and interpersonal capability. This is supplemented by a synoptic clinical pharmacy MCQ examination. In this way the assessment “of” learning moves away from content application towards measurement of competence. Similarly, coursework also evolves in to more capability-focused assessment types such as service development and research projects. As such, the measurement “of” learning, both by coursework and by examination, ascends Miller’s triangle through its “knows how” and “shows how” levels. To complete Miller’s triangle various GPhC learning outcomes which relate to professional self-awareness, lifelong learning and pharmaceutical numeracy must be reached at “does” performance levels. By the end of the programme, these will have been repeatedly proven through reflective portfolio entries and the various zero weighted professional assessments described within the four Module Development Templates.

Portfolio

From the earliest stages and throughout the programme students use the ongoing portfolio to develop lifelong learning skills through reflective Continuing Professional Development (CPD) entries. However, in the latter stages, the portfolio evolves from a purely learning development tool to build in competency assurance. Ultimately artefacts which demonstrate learning and achievement are selected, presented and reflected upon. To support this, students are guided (through tutor, peer and formative assessment) to become increasingly aware of the professional competency frameworks, and how their learning and assessment experiences relate to them.

The portfolio is summatively assessed at each stage. In stage 1 the assessment focuses on the development of study skills, the exploration of professional attributes and the self-evaluation of learning needs. In stage 2, the portfolio assesses professionalism and self-awareness, study and learning skills and the implementation and evaluation of CPD. In stage 3 it assesses how students reflect on competence and performance and how CPD is used to drive self-development and how it is reviewed. Finally, in stage 4 the portfolio assesses evidence of professional characteristics and behaviours and of competence and performance in the context of revalidation.

Integrated assessment

Integration of assessment is achieved through a variety of means. During the earlier and intermediate stages examinations are synoptic in nature, testing across disciplines using problem-orientated approaches. Extended matching questions, and short answer questions facilitate this in the examinations which feature from stages 1 to 4. These questions are configured to draw together content from the various disciplines and will be developed using a cross-team approach. In stage 1 the questions are typically focused around uncomplicated patient or prescription examples. In stage 2, where the strands are orientated around body systems, questions tend to focus on cases and prescriptions which, in stages 3 and 4 will increase in clinical complexity. From stage 2 onwards the various authentic, “real world” coursework components test students’ ability to apply and integrate both underpinning and new knowledge and skills across the disciplines.

In addition, as the stages progress, learning outcomes increasingly apply to multiple assessments. This

frequently applies to outcomes which focus around study and professional skills which inherently transcend the disciplines. At stage 4 the coursework assessments are used to test the application of higher levels of knowledge, research and critical analysis skills that apply across the range of authentic tasks. Through the competency approach to portfolio building occurring in the latter stages of the programme, students draw together evidence that they can evidence competency, using their learning and assessment experiences.

Patient and practice experience

The staged progression of practice placements, expert (simulated) patients and interprofessional learning also supports the shift of assessment towards capability and competence. Early on students reflect upon their experiences and learning needs using portfolio entries to develop an awareness of roles and performances. The application of skills in the various controlled experiential settings (in both academic and workplace environments) also provides evidence of learning. This includes artefacts such as role plays and discussions with simulated patients; interactions with students of other health professions; and workplace mentor testimonials. In the latter stages there is a greater emphasis on critical analysis and problem solving through group tasks and the analysis of case histories.

Farland MZ, Sicut BL, Franks AS, Pater KS, Medina MS and Persky AM (2013) Best Practices for Implementing Team-Based Learning in Pharmacy Education. *American Journal of Pharmaceutical Education*; 77 (8) Article 177, pp1-10.

Jesus A, Gomes MJ and Cruz A (2012) A case-based learning model in therapeutics. *Innovations in Pharmacy*. 3 (4) Article 91, pp1-12.

Harden RM and Stamper N (1999) What is a spiral curriculum? *Medical Teacher* 21: 141-3

Harden RM (2000) The integration ladder: a tool for curriculum planning and evaluation. *Medical Education* 34: 551-7

Miller, G.E. (1990) The assessment of clinical skills/competence/performance. *Acad Med* 65: 563-7

Pearson ML and Hubball HT (2012) Curricular Integration in Pharmacy Education. *American Journal of Pharmaceutical Education* 76 (10): Article 204 1-8.

Assessment Methods:

At the University of Wolverhampton, a variety of modes of assessment will be used to support and test your learning and progress and to help you develop capabilities that are valued beyond your University studies and into your working life. Your course may include a variety of assessment activities:

Written examinations (including online examinations, open and closed book examinations and quizzes)
Coursework (for example, essays, reports, portfolios, project proposals and briefs, CVs, poster presentation)
Practical (for example, oral and video presentations, laboratory work, performances, practical skills assessment)

In the final year of your undergraduate degree, and at the end of your postgraduate degree, you are likely to be expected to write an extended piece of work or research, such as a dissertation or a practice-based piece of research.

Student Support:

A wide range of support for learning is available to MPharm students. Generic support includes the use of central services such as FSE's Student Office, for general enquiries, and the City Campus Learning Centre. The Learning Centre provides 24 hour, year round library facilities as well as electronic and literature search resources and run specific academic study skills sessions for students.

The development of study skills and clinical skills is a major feature of the course and 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 are signposted to 'drop-in' opportunities at the Learning Centres. For more specific support, students are 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 is 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 is 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.

