

Programme Specification: Undergraduate

For students starting in Academic Year 2017/2018

1. Course Summary

Names of programme(s) and award title(s)	BSc (Hons) Pharmaceutical Science, Technology and Business
Award type	Single Honours
Mode of study	Full time
Framework of Higher Education Qualification (FHEQ) level of final award	Level 6
Duration	3 years
Location of study	Keele University – main campus
Accreditation (if applicable)	Not applicable
Regulator	Office for Students (OfS)
Tuition Fees	<p>UK/EU students: Fee for 2017/18 is £9,250*</p> <p>International students: Fee for 2017/18 is £16,000**</p>
Additional Costs	Refer to section 18

How this information might change: Please read the important information at <http://www.keele.ac.uk/student-agreement/>. This explains how and why we may need to make changes to the information provided in this document and to help you understand how we will communicate with you if this happens.

2. What is a Single Honours programme?

The Single Honours programme described in this document allows you to focus more or less exclusively on Pharmaceutical Science, Technology and Business. In keeping with Keele's commitment to breadth in the curriculum, the programme also gives you the opportunity to take some modules outside Pharmaceutical Science, Technology and Business, in other disciplines and in modern foreign languages as part of a 360-credit Honours degree. Thus it enables you to gain, and be able to demonstrate, a distinctive range of graduate attributes.

* These fees are regulated by Government. We reserve the right to increase fees in subsequent years of study in response to changes in government policy and/or changes to the law. If permitted by such change in policy or law, we may increase your fees by an inflationary amount or such other measure as required by government policy or the law. Please refer to the accompanying Student Terms & Conditions. Further information on fees can be found at <http://www.keele.ac.uk/studentfunding/tuitionfees/>

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3. Overview of the Programme

The BSc in Pharmaceutical Science, Technology and Business (PSTaB) programme integrates a thorough exposition of the essential and applied pharmaceutical sciences with appropriate coverage of business and management skills that will prepare our graduates to be effective leaders in the global pharmaceutical industry. It is an innovative course that combines a study of the essential and applied pharmaceutical sciences with a thorough analysis of the global pharmaceutical industry. It aims to meet the needs of the industry by producing graduates who are pharmaceutically aware, who have the ability to think critically and creatively, who understand and can apply the essential concepts of sustainable development within the pharmaceutical industry, and who also have significant knowledge and understanding of business and management, thus facilitating the transition to employment and their immediate contribution.

In the final year of the programme you may wish to pursue core modules in science and business as well as optional modules. The optional modules are either provided by the School of Pharmacy or the Language Centre. There will be opportunities at year three of the programme, depending on entry level to your chosen language and availability, to take additional language modules (up to 30 credits). Further details can be obtained from the Language Centre, including extra-curricular (non-credit bearing) studies.

The degree programme is uniquely structured against the "spine" of the New Chemical Entity coming from research and is carefully defined against corporate strategy to the development and registration of a product for use in man, launch and commercialisation, life cycle management and generic manufacture. The multidisciplinary course will deliver a new generation of potential global industry leaders, with a broad knowledge of applied and cutting-edge aspects of pharmaceutical science and technology. Our graduates will have the business insight essential in the new industrial model to be able to buy and sell science and to participate in, manage and lead global product development teams.

4. Aims of the Programme

The global pharmaceutical research scientist and industry pharmaceutical business professional are, today, going to be more involved in the evaluation of scientific data and the business case involved in new science acquisition. In order to stay abreast of current developments in the pharmaceutical industry students must have a high-level awareness of both the science and the business of the global pharmaceutical industry. In particular, they must be aware of the teams they will be a member of and lead, but also understand the holistic nature of the global business and how different teams work together synergistically within the relevant frameworks, including sustainable development and ethical operation.

The overall aims of the PSTaB BSc programme are therefore to:

- provide the students with the knowledge, skills, attitudes and values to underpin studies in pharmaceutical science and business, and develop their competence in applying these skills.
- develop student's critical thinking, evaluation and decision-making skills in order to enable them to join the fast-paced and evolving modern pharmaceutical industry.
- facilitate student's development of the competencies required for autonomous practice and leadership in a diverse range of scientific and business settings.
- promote research awareness and its application to developing new products and delivering these in challenging and emerging markets.
- provide students with the skills to adapt and respond positively to change. In doing this, students will develop key transferable skills to prepare them for graduate employment.

A more full description of the subject-specific knowledge and skills, and the employability skills that are embedded within the programme is given later in this document.

5. What you will learn

The learning and teaching methods described in section 4 enable students to achieve the learning outcomes of the programme in a variety of ways. For example:

- **Lectures and associated independent study** enable students to broaden and deepen their existing knowledge and understanding of core and applied concepts of science and business, and to transfer that knowledge from theory into practice.
- **Laboratory work and practical skills-based workshops** enable students to integrate theoretical and practical knowledge, to develop and enhance their learning of new skills under the supervision of expert staff and to ensure safe and competent practice.
- **Small-group workshops, seminars and tutorials**, including individual and group presentations, provide opportunities for students to clarify and exchange ideas, and to question and challenge professional concepts.
- **Independent study and online learning** encourage students to reflect upon their learning and to take responsibility for its development, and to collaborate with others to share, explore, and evaluate ideas in greater depth.
- **Undertaking a research project** further develops the student's independent learning and research capability; it also enables them to plan, implement and document a piece of research with relevance to the pharmaceutical sciences. This piece of work encourages competence with IT and data analysis skills.

Keele Graduate attributes

Engagement with this programme will enable you to develop your intellectual, personal and professional capabilities. At Keele, we call these our ten Graduate Attributes and they include independent thinking, synthesizing information, creative problem solving, communicating clearly, and appreciating the social, environmental and global implications of your studies and activities. Our educational programme and learning environment is designed to help you to become a well-rounded graduate who is capable of making a positive and valued contribution in a complex and rapidly changing world, whichever spheres of life you engage in after your studies are completed.

Further information about the Keele Graduate Attributes can be found here: <http://www.keele.ac.uk/journey/>

In particular, the Personal Development section provides students with a number of opportunities to learn how to improve their performance and achieve their full potential during their studies. Most of these activities are embedded within the curriculum of the Pharmaceutical Science, Technology and Business BSc programme with additional workshops being provided for further skills development.

Keele also offers students the opportunity to gain a professional qualification from the Institute of Leadership and Management (ILM) completely free of charge. For a student to gain this additional qualification they must maintain a Keele University Skills Portfolio (KUSP) online to evidence their personal development. Students on the Pharmaceutical Science, Technology and Business BSc programme will be encouraged to become reflective learners and will be supported through review the content and the currency of their portfolio.

Please refer to the programme webpages for a statement of how you can achieve the Keele Graduate Attributes through full engagement in the programme and other educational opportunities at Keele. Further information about the ILM accreditation KUSP can be found on the Keele University Curriculum Development and Support webpages.

6. How is the Programme taught?

Learning and teaching methods used on the programme vary according to the discipline and nature of the subject matter at that stage of the course. All teaching is undertaken on the University campus in the appropriate classroom and laboratory environments and group sizes vary according to the subject matter. A variety of approaches to teaching are used on the programme:

- **Traditional and interactive lectures** in which the lecturer provides students with a framework and context for further reading and independent study. Some lectures may feature invited external speakers who are active researchers and practitioners from the pharmaceutical science and industry arenas.
- **Laboratory work** in which students develop the acquisition of key manipulative, preparative and analytical laboratory skills under the supervision of academic staff.
- **Workshops** facilitated by academic staff allow students to work together and develop practical skills by applying subject-specific knowledge to critically evaluate a piece of literature or to solving in-context problems, for example.
- **Individual and group presentations** where students research and present a topic to the whole group with time allowed for interactive questions and discussion, peer review and feedback.
- **Tutorials**, led by academic tutors or by students, which encourage topics of interest and relevance to be discussed in depth within a small group.
- **Online learning** using the Keele Virtual Learning Environment (KLE): this is used at all Levels of the programme and provides a platform for students to access a wide range of learning resources, to share online discussions, to submit work for assessment and to receive individual feedback that is specific to a particular assignment or task.

Independent study will be required throughout the programme, perhaps guided by academic staff or self-directed in relation to the various demands of each module and its assessment. This type of learning may be facilitated by use of various resources including those provided on the KLE. Independent study also forms an important part of the development of the final year research project, which is supported by a designated member of the academic staff.

One-to-one tutorials with members of staff are available to support all students on an individual basis, at their request, to enable them to discuss any particular identified areas of difficulty, and special learning needs they may have, and to give help and feedback during preparation of assessed work.

7. Teaching Staff

The permanent academic staff members contributing to the PSTaB programme are drawn from the staff of the University's School of Pharmacy along with contributions by staff from other Schools and external stakeholders, when appropriate. The staffing within the School of Pharmacy currently includes readers, senior lecturers, lecturers and academic-related and technical support staff, all of which contribute to a supportive environment for study. A number of staff have dual roles, in that they have contracts with the University but also hold contracts with other relevant stakeholders, including the NHS. Several of the current staff also have extensive experience of working within the pharmaceutical industry and are able to provide context and perspective to the business aspects of the PSTaB programme.

All current permanent academic staff are members of, or are working towards, membership of the Higher Education Academy. All current permanent academic staff hold academic qualifications to at least Masters level and the majority hold a PhD qualification in a discipline firmly rooted in pharmaceutical science. The staff group has extensive experience of teaching at undergraduate and postgraduate level and includes individuals with expertise in learning and teaching, and research. The work of all research-active staff has been published widely and shared via conference presentations, for example.

The University will attempt to minimise changes to our core teaching teams, however, delivery of the programme depends on having a sufficient number of staff with the relevant expertise to ensure that the programme is taught to the appropriate academic standard.

Staff turnover, for example where key members of staff leave, fall ill or go on research leave, may result in changes to the programme's content. The University will endeavour to ensure that any impact on students is limited if such changes occur.

8. What is the Structure of the Programme?

The academic year runs from September to June and is divided into two semesters. The number of weeks of teaching will vary from course to course, but you can generally expect to attend scheduled teaching sessions between the end of September and mid-December, and from mid-January to the end of April.

Our degree courses are organised into modules. Each module is usually a self-contained unit of study and each is usually assessed separately with the award of credits on the basis of 1 credit = 10 hours of student effort. An outline of the structure of the programme is provided in the tables below.

The PSTaB programme integrates development of students' knowledge and skills of the essential and applied pharmaceutical sciences contextualised by a thorough exposition of the requisite business and management skills. The three-year programme has been designed with a spiral curriculum in mind, with progressive reinforcement of concepts in a fully-contextualised manner. All modules in the PSTaB programme are compulsory though there may be elements of choice within some.

The first year of the programme adopts an integrated approach to developing students' knowledge of the physical and life sciences, and business alongside enriching their skills in numeracy, language and communication, which will be assessed formally. As the programme progresses students' knowledge and understanding of the sciences will be applied in the key areas of chemistry and pharmaceutical analysis, pharmacology and drug action, pharmaceuticals and formulation science, and research skills and ethics, whilst their business acumen will be developed through interactions with leading practitioners from the industrial arena and our own internal experts within the School of Pharmacy.

The final year will provide students with the ability to explore science and business topics of particular interest to them, alongside undertaking an extended research project at the cutting-edge of the pharmaceutical sciences. The final year programme will cover contemporary business and management aspects specific to the pharmaceutical industry, including accounts of regulatory affairs, global financial modelling, commercialization and the emergence of new markets, and aligning new working models with the global agenda for sustainable development. There are obvious opportunities within the programme for further integration of business and management topics through appropriate experiential interactions and placements with industrial partners.

Assessment at each Level of the programme is staged throughout the academic session, as far as possible, in order to spread the burden of assessments out across each year of study. For example, at Level 4 each of the examinations fall at the end of eight weeks of learning and teaching with other laboratory- and skills-based assessments being submitted throughout the academic session.

Year 1 (Level 4)

Core modules	Credits
Essential Topics in Pharmaceutical Science	30
Core Topics in Pharmaceutical Science I	30
Core Topics in Pharmaceutical Science II	30
The Business of Drug Discovery	15
Elective modules	
Language Module (Language Learning Unit)	15

The first year of the programme adopts an integrated approach to developing students' knowledge of the physical and life sciences, alongside coupled modules that are rich in business content and provide essential skills for students entering the global business environment. The Essential Topics and Core Topics modules are uncompromisingly science-rich and comprise large-group lecture presentations, laboratory classes and skills-based workshops, supported by bespoke small-group sessions that contextualise the module content. It is essential to note here that students will also study aspects of ethics that are relevant to both the science and business arenas, and will reflect upon their own attitudes and values. The Business of Drug Discovery will provide a detailed overview of the global pharmaceutical industry and will place the drug discovery process, which forms the spine for Level 4, firmly in the context of business, regulation and globalisation. The taught

programme at all levels will be supported by a series of plenary sessions delivered by people working in various arenas in the pharmaceutical industry.

Language and communication skills form a key part of the curriculum at Level 4 and are essential for assessments at all Levels of the PSTaB programme. The programme is designed for overseas non-EU students, which may include both native and non-native English speakers. All students will be assessed for fluency in English on entry and will be directed towards an appropriate choice of module from the range offered by the Language Learning Unit. For example, students for whom English is a second language and who lack English language skills in particular areas will be required to undertake ENL-90006 English for Academic Purposes, or a variant thereof; the assessments in this module will be directed towards supporting the business aspects of the curriculum, in particular. Any students who are native English speakers or are deemed to have well-developed English language skills will be directed to choose an alternative module at from the Language Learning Unit at a Level appropriate to their language skills, so that they may develop fluency in another language; for example, students aiming for employment in developing markets may choose to study a 15-credit module in Spanish or Mandarin. The Language Learning Unit provides language training for students with all levels of proficiency and it is important to note that, whilst developing student's spoken and written communication skills, a significant proportion of each module is devoted to the study of national culture and customs. Students will be encouraged to continue independently to develop skills in a second language throughout their studies.

Year 2 (Level 5)

Core modules	Credits
Applications of Pharmaceutical Science I	45
Applications of Pharmaceutical Science II	45
Pharmaceutical Business Development	30

As the programme progresses students' knowledge and understanding of the sciences will be applied in the key areas of chemistry and pharmaceutical analysis, pharmacology and drug action, and pharmaceutics and formulation science, whilst their business acumen will be developed in the core business and management module 'Pharmaceutical Business Development' through interactions with leading practitioners from the industrial arena.

The Applications of Pharmaceutical Science modules will cover the core aspects of pharmaceutics and formulation science, enriched by a comprehensive fully-formed programme of laboratory classes, and additional practical exercises reinforce the key concepts in product design and formulation. The modules together will cover all essential aspects of pharmacology, again supported by well-formed laboratory classes and non-laboratory practical exercises. Additional material covering advances in medicinal chemistry, metabolism in health and disease, and microbiology is incorporated with appropriate context. Advanced aspects of chemical analysis, separation science and spectrometry are covered with the emphasis upon quality assurance and control, accompanied by appropriate preparative laboratory work and practical exercises in analytical techniques, assays and calculations. Research methods will be covered to provide critical skills in research and data analysis, not all derived experimentally, to provide a link with and support the extended research project and other assessments at Level 6. In particular, students will be exposed to a more developed discussion of ethics within both the science and business arenas: students will be required to consider ethics as part of good governance in research and this will form part of their preparation for their Level 6 research project.

Year 3 (Level 6)

Compulsory modules	Module Code	Credits	Semester
Pharmaceutical Sciences Research Project	PHA-30025	30	1-2
The Pharmaceutical Industry at the Cutting Edge	PHA-30021	30	1-2
Advanced Topics in Pharmaceutical Science	PHA-30023	30	1-2
Optional modules	Module Code	Credits	Semester
Current Developments in Pharmaceutical Science	PHA-30019	30	1 – 2
Current Developments in Pharmaceutical Science II	PHA-30017	15	1 – 2

Applied Regenerative Medicine	LSC-30068	15	1
Language modules (in foreign languages or English, the latter as appropriate to support students)	Various	15	1 or 2 (depending on module selected)

Module rules:

A maximum of 30 credits of optional modules must be taken.

Available language modules (modern foreign languages) are listed subject to availability and compatibility with the School of Pharmacy timetable for compulsory modules. The choice of English language modules provided is available only to those students for whom English is a second language. The full list of currently available language modules is listed below; students would be expected to take a follow-on language module at the next level, i.e. if a student took SPN-90003 or SPN-90004 at Level 5 then they would be expected to continue by taking SPN-90005 or SPN-90006. Modules available are:

- British Sign Language 1 – 2 (MLX-90001/2)
- Chinese 1 – 6 (CHI-90001/2/3/4/5/6)
- French 1 – 10 (FRE-900001/2/3/4/5/6/7/8/9 and FRE-90010)
- German 1 – 10 (GER-900001/2/3/4/5/6/7/8/9 and GER-90010)
- Italian 1 – 2 (ITA-90001/2)
- Japanese 1 – 6 (JAP-90001/2/3/4/5/6)
- Russian 1 – 6 (RUS-90001/2/3/4/5/6)
- Spanish 1 – 6 (SPN-90001/2/3/4/5/6/7/8/9 and SPN-90010)
- ENL-10032 English for Academic Purposes 2 (EAP2)
- ENL-10033 English for Academic Purposes 3 (EAP3)
- ENL-90013 Academic English for Science Students

Note: odd-numbered Language Centre modules run in Semester 1, even-numbered modules in Semester 2.

The final year provides students with the opportunity to specialize in pharmaceutical science topics of particular interest to them alongside undertaking an extended research project at the cutting-edge of the pharmaceutical sciences. Contemporary business leadership and management aspects specific to the pharmaceutical industry are covered, including contemporaneous accounts of regulatory affairs, global financial modelling and emergence of new markets.

The extended Pharmaceutical Science Research Project spans the entire session, with the initial phase consisting of a thorough literature survey to support the subsequent body of project work. Current Developments in Pharmaceutical Science allows students to choose electives to study from a selection of topics at the forefront of science; students are able to select from two modules, one of 30 credits where two subjects will be studied, and a 15 credit module where one subject will be studied. Advanced Topics in Pharmaceutical Science is another core module which covers aspects of the programme which will bring students up to the cutting edge of science and technology, whilst the module The Pharmaceutical Industry at the Cutting Edge aims to do the same for the advanced business and management components. These advanced business and management topics no longer need to be balanced against aspects of science and technology so the content can be quite creative, rich in small group work and delivered within plenary sessions from visiting speakers. Key skills in team building, management and leadership of teams are embedded here, with students being expected to demonstrate the ability to practise in the industry environment.

For further information on the content of modules currently offered please visit:

www.keele.ac.uk/recordsandexams/az

Learning Outcomes

The learning outcomes for each Level of the programme are contained within the following tables, which describe the modules that comprise the course.

As would be expected, key employability skills are embedded throughout the PSTaB programme at all Levels.

Level 4: Essential Topics in Pharmaceutical Science (30 Credits)	
- Appreciate the pivotal role played by the gene in living organisms and discuss the molecular aspects of chromosome and gene structure, replication, expression and regulation.	<p>Examination</p> <p>Laboratory skills assessment</p> <p>Practical skills assessment</p>
- Appreciate and describe the main patterns of inheritance in humans, the nature of interactions between genes and the influence of gene interaction on inheritance patterns.	
- Demonstrate understanding of the dynamic nature of genes in populations and understand how changes in gene frequency serve as a mechanism of evolution.	
- Apply a knowledge of examples and possible causes of inherited and acquired genetic diseases to describe the importance of genetics in the study of human disease.	
- Outline the structures and roles of common biological molecules and describe their chemical and physical properties.	
- Demonstrate an appreciation of the opportunities to target specific cell structures and processes for the treatment of disease. Mode of assessment	
- Demonstrate knowledge and understanding, at a basic level, of the main scientific and technological principles supporting selected areas of biology and biomedicine.	
- Understand and describe the principles of structure and bonding which affect the 3-dimensional shape of molecules and assign appropriate stereochemical descriptions to organic and biological molecules.	
- Describe the basic architecture and cellular diversity of prokaryotic and eukaryotic (plant and animal) cells, making comparisons and distinctions between them.	
- Recognise and understand how the structural features, stereochemistry and functional groups responsible for chemical and physical properties can influence the biological activity of molecules and, hence, the drug design process.	
- Identify common organic molecular structures and functional groups and write suitable reaction mechanisms for their interconversion.	
- Demonstrate understanding of the general importance of compartmentalisation to cellular function in eukaryotes, and explain some of the principal roles of cellular organelles.	

- Describe the cellular and molecular interactions involved in the formation of tissues.	Examination Laboratory skills assessment Practical skills assessment
- Describe the structure and fundamental properties of biological membranes, distinguishing the roles played by the lipid and protein components of the membrane.	
- Describe the general mechanisms by which various molecules are recognised and transported across biological membranes.	
- Develop and employ a high level of experimental, analytical and reporting skills in the successful completion of appropriate manipulative practical exercises, including the extraction, isolation, synthesis and characterisation of pharmaceutically-relevant organic compounds.	
- Acquire data from experiments, analyse and manipulate it using appropriate techniques, and apply methods for the presentation of data, including statistical analysis and choosing an appropriate method of presentation.	
- Be able to use a range of IT facilities to research, perform calculations and present data and written assessments in an appropriate style.	
- Understand and apply the appropriate levels of numeracy and IT skills requisite for further study in pharmaceutical science at all Levels to perform common scientific calculations with precision and accuracy.	
- Communicate complex concepts effectively, both orally and in writing, in a manner that reflects professional practice.	

Level 4: Core Topics in Pharmaceutical Science I (30 Credits)	
- Recognise and understand how the structural features, stereochemistry and functional groups responsible for chemical and physical properties can influence the biological activity of molecules and, hence, the drug design process.	
- Identify common organic molecular structures and functional groups and write suitable reaction mechanisms for their interconversion.	
- Understand and demonstrate knowledge of the central role of metabolism in homeostasis, the key molecules involved and the thermodynamics controlling it.	
- Understand and describe the progress and control of key catabolic and anabolic metabolic pathways involving carbohydrates, fatty acids and amino acids.	

- Understand and describe oxidative metabolic processes for the production of ATP, including enzyme complexes found in the mitochondria.	Examination Laboratory skills assessment Practical skills assessment
- Describe the basic mechanisms by which proteins are targeted to the secretory pathway and cytoplasmic pathway in eukaryotic cells.	
- Understand and describe the integration of metabolic processes in the maintenance of homeostasis and the consequences of errors in metabolism.	
- Describe the normal anatomy and physiology of various systems within the human body and understand the causes and outcomes of the main types of pathology affecting these systems.	
- Understand and demonstrate knowledge of the basic thermodynamic principles that govern the progress of chemical reactions both in vitro and in vivo.	
- Understand the kinetics of a chemical or biological process, and describe and apply methods for determining the rate of that process both in vitro and in vivo.	
- Demonstrate an appreciation of the opportunities to target specific cell structures and processes for the treatment of disease.	
- Understand and describe biopharmaceutics in terms of the relationship between dosage form and interaction of the drug substance with patient physiology.	
- Understand and describe the basic aspects of formulation science related to drug distribution and drug action that are important in drug design and development	
- Develop and employ a high level of experimental, analytical and reporting skills in the successful completion of appropriate manipulative practical exercises, including the extraction, isolation, synthesis and characterisation of pharmaceutically-relevant organic compounds.	
- Acquire data from experiments, analyse and manipulate it using appropriate techniques, and apply methods for the presentation of data, including statistical analysis and choosing an appropriate method of presentation.	Examination
- Understand the purpose of equipment used in the practical study of physiology and be able to interpret and accurately represent data obtained from it.	Laboratory skills assessment Practical skills assessment

- Be able to use a range of IT facilities to research, perform calculations and present data and written assessments in an appropriate style.	
- Understand and apply the appropriate levels of numeracy and IT skills requisite for further study in pharmaceutical science at all Levels to perform common scientific calculations with precision and accuracy.	
- Communicate complex concepts effectively, both orally and in writing, in a manner that reflects professional practice.	

Level 4: Core Topics in Pharmaceutical Science II (30 Credits)	
- Describe the normal anatomy and physiology of various systems within the human body and understand the causes and outcomes of the main types of pathology affecting these systems.	Examination Laboratory skills assessment Practical skills assessment
- Understand and describe the process of drug discovery and development, from target disease to the design and isolation of a pure lead compound for formulation to provide a medicinal product.	
- Demonstrate an appreciation of the opportunities to target specific cell structures and processes for the treatment of disease.	
- Recognise and understand how the structural features, stereochemistry and functional groups responsible for chemical and physical properties can influence the biological activity of molecules and, hence, the drug design process.	
- Identify common organic molecular structures and functional groups and write suitable reaction mechanisms for their interconversion.	
- Describe the general mechanisms by which various molecules are recognised and transported across biological membranes.	
- Describe the underlying principles of quantitative pharmacology in relation to small organic molecules and biomolecules as therapeutic agents, and its relationship to biological processes and pharmaceutical products	
- Understand and describe the basic aspects of formulation science related to drug distribution and drug action that are important in drug design and	
- Describe why a variety of dosage forms are necessary, and the relative merits and demerits of the available forms.	
- Demonstrate an appreciation of the opportunities to target specific cell structures and processes for the treatment of disease.	
- Develop and employ a high level of experimental, analytical and reporting	

skills in the successful completion of appropriate manipulative practical exercises, including the extraction, isolation, synthesis and characterisation of pharmaceutically-relevant organic compounds.	Examination Laboratory skills assessment Practical skills assessment
- Acquire data from experiments, analyse and manipulate it using appropriate techniques, and apply methods for the presentation of data, including statistical analysis and choosing an appropriate method of presentation.	
- Understand the purpose of equipment used in the practical study of physiology and be able to interpret and accurately represent data obtained from it.	
- Be able to use a range of IT facilities to research, perform calculations and present data and written assessments in an appropriate style.	
- Understand and apply the appropriate levels of numeracy and IT skills requisite for further study in pharmaceutical science at all Levels to perform common scientific calculations with precision and accuracy.	
- Communicate complex concepts effectively, both orally and in writing, in a manner that reflects professional practice.	

Level 4: The Business of Drug Discovery (15 Credits)	
- Understand and describe the structure of the global pharmaceutical industry – past, present and future.	Report Oral Presentation Examination
- Explain in detail the role of strategic partnering and business development in the current global pharmaceutical environment.	
- Understand and describe the elements and terminology of corporate strategy in the global pharmaceutical industry.	
- Outline the team-based processes from drug discovery and commissioning (including financial structures and requirements), through scientific and clinical development, to marketing and post-market surveillance.	
- Understand and describe the drug discovery and product development cycle.	
- Understand the legal (i.e. intellectual property) and regulatory framework for the global pharmaceutical industry.	
- Communicate complex concepts effectively, both orally and in writing, in a manner that reflects professional work.	

Level 5: Applications of Pharmaceutical Science I (45 Credits)		
- Explain how physiological patient factors affect the choice of pharmacological agents to treat disease states based upon absorption, distribution, metabolism and excretion data	Examination Laboratory skills assessment Practical skills assessment	
- Explain how drug resistance and drug interactions have consequences for pharmaceutical development and efficacy / patient care		
- Explain the relationship between absorption, distribution, metabolism and elimination of drugs and their physicochemical properties and formulation		
- Compare and evaluate the efficiency and safety of different routes of drug administration		
- Explain the underpinning concepts in physical chemistry and materials science that underpin drug formulation		
- Evaluate and select processes and formulations appropriate to the manufacture of specified drug products		
- Explain the processes involved in the quality assurance of all aspects of pharmaceutical drug development, formulation and the manufacturing process		
- Describe in detail analytical techniques employed to assure quality and safety during the drug development process and the quality, safety and efficacy of the finished drug product		
- Demonstrate the relationship between the design of drug product formulation, properties of the formulation, in vitro behaviour and in vivo performance		
- Apply the physicochemical principles underlying the formulation of various dosage forms to the extemporaneous preparation of medicines		
- Describe the relevance of microbiology within healthcare practice, and the challenges presented by infection in the context of patient care		
- Describe in detail the metabolic interrelationships of the various tissues and organs of the human body, including the role of hormones in the integration of metabolism and the maintenance of homeostasis		
- Explain the common techniques used in the analysis of biological data to arrive at safe and appropriate drug selection for a patient		Examination Laboratory skills assessment Practical skills assessment
- Demonstrate competence in pharmaceutical calculations related to the pharmaceutical sciences		
- Demonstrate competence in the performance of laboratory techniques in		

the pharmaceutical sciences and the analysis of data generated therein	
- Perform appropriate laboratory experiments to study the design of pharmaceutical formulations and to control the quality of relevant pharmaceutical products	
- Communicate complex concepts effectively, both orally and in writing, in a manner that reflects professional practice	

Level 5: Applications of Pharmaceutical Science II (45 Credits)	
- Explain how physiological patient factors affect the choice of pharmacological agents to treat disease states based upon absorption, distribution, metabolism and excretion data	Examination Laboratory skills assessment Practical skills assessment
- Explain how drug resistance and drug interactions have consequences for pharmaceutical development and efficacy / patient care	
- Explain the relationship between absorption, distribution, metabolism and elimination of drugs and their physicochemical properties and formulation	
- Compare and evaluate the efficiency and safety of different routes of drug administration	
- Explain the underpinning concepts in physical chemistry and materials science that underpin drug formulation	
- Evaluate and select processes and formulations appropriate to the manufacture of specified drug products	
- Explain the processes involved in the quality assurance of all aspects of pharmaceutical drug development, formulation and the manufacturing process	
- Describe in detail analytical techniques employed to assure quality and safety during the drug development process and the quality, safety and efficacy of the finished drug product	
- Demonstrate the relationship between the design of drug product formulation, properties of the formulation, in vitro behaviour and in vivo performance	
- Apply the physicochemical principles underlying the formulation of various dosage forms to the extemporaneous preparation of medicines	
- Describe the relevance of microbiology within healthcare practice, and the challenges presented by infection in the context of patient care	

- Describe in detail the metabolic interrelationships of the various tissues and organs of the human body, including the role of hormones in the integration of metabolism and the maintenance of homeostasis	Examination Laboratory skills assessment Practical skills assessment
- Explain the common techniques used in the analysis of biological data to arrive at safe and appropriate drug selection for a patient	
- Demonstrate competence in pharmaceutical calculations related to the pharmaceutical sciences	
- Demonstrate competence in the performance of laboratory techniques in the pharmaceutical sciences and the analysis of data generated therein	
- Perform appropriate laboratory experiments to study the design of pharmaceutical formulations and to control the quality of relevant pharmaceutical products	
- Communicate complex concepts effectively, both orally and in writing, in a manner that reflects professional practice	

Level 5: Pharmaceutical Business Development (30 Credits)	
- Demonstrate a critical understanding of the global pharmaceutical processes, from drug discovery through development to market and post-market surveillance, for a pharmaceutical product.	Report Examination Mixed synoptic examination
- Demonstrate a systematic understanding of the manufacturing processes, both for new products and generics, in the context of regulatory approval, appropriate systems of quality assurance and the relevant underpinning sciences.	
- Demonstrate a critical understanding of the sciences and regulatory/legal structures that underpin the business of the global pharmaceutical industry.	
- Demonstrate a systematic understanding of the structures of the global pharmaceutical industry in the context of legal requirements.	
- Demonstrate a systematic understanding of the role and processes associated with patent protection and intellectual property in global pharmaceutical product development.	
- Critically evaluate the issues and pressures currently facing the global pharmaceutical industry.	
- Analyse and critically evaluate the global regulatory requirements for pharmaceutical products, including efficacy and toxicology data, in the context of the global marketplace, clinical trial requirements and	

pharmaceutical compliance.	Report
- Demonstrate a critical understanding of the regulatory requirements of the three major global regulatory authorities (EU, USA and Japan).	Examination Mixed synoptic examination
- Analyse, interpret and critically evaluate Administration, Distribution, Metabolism and Excretion (ADME) and similar data from studies of product evaluation.	
- Be able to use a range of IT facilities to research, perform calculations and present data and written assessments in an appropriate style.	
- Understand and apply the appropriate levels of numeracy and IT skills requisite for further study in pharmaceutical science at all Levels to perform common scientific calculations with precision and accuracy.	
- Communicate complex concepts effectively, both orally and in writing, in a manner that reflects professional practice.	

Level 6: Advanced Topics in Pharmacology and Pharmaceutics (30 Credits)	
- Demonstrate a systematic understanding of the actions of drugs in terms of their interactions with physiological systems.	Research report Examination Oral presentation
- Demonstrate a detailed knowledge of the use of drugs to correct disorders of physiological systems.	Research report Examination Oral presentation
- Describe and critically evaluate the role of pharmacotherapy in the management of disease.	Research report Examination Oral presentation
- Demonstrate detailed knowledge of the physicochemical properties of advanced and cutting-edge drug delivery systems.	Research report Examination Oral presentation
- Demonstrate a systematic understanding of the relationship between in vitro properties of drug delivery systems to their in vivo behaviour.	Research report Examination Oral presentation
- Select, with detailed rationale, appropriate drug delivery systems for specific patients to maximise the therapeutic benefits.	Research report Examination Oral presentation

- Review, consolidate, and extend knowledge and understanding of the properties and applications of current and emerging drug delivery systems.	Research report Examination Oral presentation
- Apply established techniques to acquire laboratory data and critically evaluate data from the literature about the properties of drug delivery systems.	Laboratory report
- Interpret complex data obtained through experiments to formulate conclusions about the actions of drugs in physiological systems.	Research report Laboratory report Examination Oral presentation
- Critically evaluate current research and advanced scholarship in pharmaceutical sciences relevant to the chosen research area.	Research report Examination Oral presentation
- Demonstrate an in-depth understanding of analytic and literature evaluation techniques.	Research report Laboratory report Examination Oral presentation
- Critically appraise published clinical and experimental data using a structured approach, in order to assess its quality and validity.	Research report Examination Oral presentation
- Communicate complex concepts effectively, both orally and in writing, in a manner that reflects professional work.	Research report Laboratory report Examination Oral presentation

Level 6: The Pharmaceutical Industry at the Cutting Edge (30 Credits)

- Understand systematically and critically appraise the clinical development of pharmaceutical products in the context of global (and hence, harmonisation) marketing, life-cycle management, post-market surveillance and in planning for future products / product extensions.	
- Demonstrate an in-depth understanding of global pharmaceutical manufacturing in the context of the total global supply chain, including global and local sourcing strategies, supply operations, outsourcing and supply agreements.	

- Demonstrate a systematic understanding and apply knowledge of leading edge topics in global product commercialisation with regard to its principles, limitations, key marketing and promotion principles, (legal and regulatory) codes of conduct and product termination, underpinned by a knowledge and understanding of the application of global patents and protection of intellectual property.	Report Group report Examination
- Demonstrate a systematic understanding and apply the principles of management training in facilitating successful pharmaceutical product development.	
- Demonstrate a systematic knowledge of concepts from the forefront of the arena of global pharmaceutical product development, from the key underpinning science to the applied and regulatory context.	
- Synthesise, evaluate and contextualise the key scientific, legal and business information to generate business proposals and product submission dossiers.	
- Demonstrate a systematic understanding of and practise the concepts of working within the complex team-based and inter-disciplinary global pharmaceutical industry.	
- Demonstrate an in-depth understanding of the principles of leadership within management teams and practise the application of these concepts within the complex team-based and inter-disciplinary global pharmaceutical industry.	
- Communicate complex concepts effectively, both orally and in writing, in a manner that reflects professional work.	

Level 6: Pharmaceutical Science Research Project (30 Credits)	
- Demonstrate a comprehensive understanding of research techniques and self-management skills in order to plan a programme of research at a professional level	Research Report
- Critically evaluate current research and advanced scholarship relevant to the chosen research area	
- Demonstrate comprehensive knowledge at the forefront of the project area	
- Demonstrate the ability to select and develop a research strategy appropriate to the chosen research area	
- Accurately undertake data acquisition in the chosen project area	

- Show self-direction and originality in tackling and solving problems	Presentation
- Produce a document detailing the research carried out and a critical appraisal of the findings, and any conclusions drawn and recommendations or hypotheses made as a consequence	
- Communicate progress reports and conclusions on the work carried out to specialist and non-specialist audiences	
- Communicate complex concepts effectively, both orally and in writing, in a manner that reflects professional work	

Level 6: Current Developments in Pharmaceutical Science (PHA-30019; 30 Credits) and Current Developments in Pharmaceutical Science II (PHA-30017; 15 credits)	
- Critically evaluate current research and advanced scholarship and practice in selected specialist topics within the pharmaceutical sciences.	Coursework
- Communicate complex concepts effectively, both orally and in writing, in a manner that reflects professional work.	

As noted, development of language and communication skills forms a key part of the curriculum at Level 4. All students will be assessed for fluency in English on entry: Those students for whom English is a second language and who lack English language skills in particular areas will be required to undertake a relevant module provided by the Language Learning Unit. During this module students will develop and appropriately employ a bank of general academic and subject-specific vocabulary, in general and academic discussions with peers and tutors. Students will develop skills in reading, analysis and information gathering from extended academic texts, interpreting any data presented, and representation of that information. Students will also research, prepare and construct an organised and coherent essay, written in an academic style and citing sources accurately and appropriately, and will prepare and deliver an academic presentation. The assessments in this module will be directed towards supporting the business aspects of the curriculum, in particular.

Any students who are native English speakers or are deemed to have well-developed English language skills will be directed to choose an alternative module at from the Language Learning Unit at a Level appropriate to their language skills, so that they may develop fluency in another language. The learning objectives in all of these modules are in broad alignment and the respective assessments will support further studies within the business aspects of the curriculum, in particular.

9. Final and intermediate awards

Credits required for each level of academic award are as follows:

Honours Degree	360 credits	You will require at least 120 credits at levels 4, 5 and 6 You must accumulate at least 255 credits in Pharmaceutical Science, Technology and Business (out of 360 credits overall), with at least 60 credits in each of the three years of study, to graduate with a named single honours degree in Pharmaceutical Science, Technology and Business.
Diploma in Higher Education	240 credits	You will require at least 120 credits at level 4 or higher and at

		least 120 credits at level 5 or higher
Certificate in Higher Education	120 credits	You will require at least 120 credits at level 4 or higher

10. How is the Programme assessed?

The wide variety of assessment methods used on the Pharmaceutical Science, Technology and Business programme at Keele reflects the broad range of knowledge and skills that are developed as you progress through the degree programme. Teaching staff take care to apply the principles of assessment laid out in the University's assessment strategy and pay particular attention to specifying clear assessment criteria and providing timely, regular and constructive feedback that helps to clarify things you did not understand and helps you to improve your performance. The following list is representative of the variety of assessment methods used within PSTaB:

- **Written examinations** test students' knowledge and their ability to apply that knowledge to solving in-context problems. Examinations may consist of multiple-choice questions, questions that require short written answers including calculations, and longer essay-style questions.
- **Laboratory skills assignments and reports** test the students' ability to undertake experimental work and obtain data of a high standard for further analysis. They require students to demonstrate their skills in preparative and experimental science, data acquisition and analysis, and written communication skills for the preparation of pre-laboratory tasks, completion of in-laboratory pro-forma reports, and writing laboratory reports with appropriate referencing. Students will often work in groups during laboratory exercises so team-working and honed communication skills are essential.
- **Written work and practical skills assignments** test the quality and application of subject knowledge. In addition they allow students to demonstrate their ability to carry out basic literature searches, communicate their ideas effectively in writing and support their arguments with appropriate referencing. Written pieces vary in their length depending upon the discipline area and subject matter. In some cases there may be an element of student choice in relation to the topic and content of the written work.
- **Oral presentations** assess student's subject knowledge and understanding, and may also serve to assess team-working skills. Crucially, they also test student's oral and visual communication skills, and peer assessment and feedback is used to facilitate reflection and personal skills development.
- **Research Project** is a student-led piece of independent research within one of the many disciplines that comprise pharmaceutical science, combining an in-depth literature review with experimental work. Supervisors support the student throughout the research project, providing discipline-specific guidance. This assessment develops the student's capacity as an independent learner and their ability to engage with the process of research. It also develops skills in many key areas, especially data handling and communication

Marks are awarded for summative assessments designed to assess students' achievement of learning outcomes. Students are also assessed formatively to enable them to monitor their own progress and to assist staff in identifying and addressing any specific learning needs. Feedback, including guidance on how students can improve the quality of their work, is also provided on all summative assessments within three working weeks of submission, unless there are compelling circumstances that make this impossible, and more informally in the course of tutorial and seminar discussions.

Students can meet with their Personal Tutor to obtain and clarify feedback at any time.

11. Contact Time and Expected Workload

This contact time measure is intended to provide you with an indication of the type of activity you are likely to undertake during this programme. The data is compiled based on module choices and learning patterns of students on similar programmes in previous years. Every effort is made to ensure this data is a realistic representation of what you are likely to experience, but changes to programmes, teaching methods and assessment methods mean this data is representative and not specific.

Undergraduate courses at Keele contain an element of module choice; therefore, individual students will experience a different mix of contact time and assessment types dependent upon their own individual choice of modules. The figures below are an example of activities that a student may expect on your chosen course by year/stage of study. Contact time includes scheduled activities such as: lecture, seminar, tutorial, project supervision, demonstration, practical classes and labs, supervised time in labs/workshop, fieldwork and external visits. The figures are based on 1,200 hours of student effort each year for full-time students.

Activity	Year 1 (Level 4)	Year 2 (Level 5)	Year 3 (Level 6)
Scheduled learning and teaching activities	34%	34%	34%
Guided independent Study	66%	66%	66%
Placements	0%	0%	0%

12. Accreditation

This programme does not have accreditation from an external body.

13. Regulations

The University Regulations form the framework for learning, teaching and assessment and other aspects of the student experience. Further information about the University Regulations can be found at: <http://www.keele.ac.uk/student-agreement/>

Attendance requirements

Absence from laboratory-based classes may result in the loss of marks if credit is given for work completed in the laboratory notebook or submitted as a pro-forma report during that particular session. Students may not be allowed to carry out experiments that have been missed without due cause. Repeated absence could result in failure in the assessment of laboratory work and failure to progress within the programme.

14. What are the typical admission requirements for the programme?

This programme as proposed is currently intended for overseas non-EU students only. Candidates must be able to satisfy the general requirements of Keele University and the School of Pharmacy.

Subject	A-level	Subjects not included	International Baccalaureate	BTEC	Access to Higher Education Diploma	GCSE requirements
Pharmaceutical Science, Technology and Business	BBB / ABC Biology and Chemistry at grade B or above. A pass in at least one Science Practical will be required.** ** Science practical only required from applicants taking reformed A level Biology, Chemistry or	General Studies and Critical Thinking	32 points to include Higher Level Chemistry and Biology at 6	DDD You must have taken sufficient Science units, please contact us for advice	Please contact us for advice	Maths @ B (or 6) or above, English at C (or 4) or above

Physics in England.					
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Applicants who are not currently undertaking any formal study or who have been out of formal education for more than 3 years and are not qualified to A-level or BTEC standard may be offered entry to the University's Foundation Year Programme.

Applicants for whom English is not a first language must provide evidence of a recognised qualification in English language. The minimum score for entry to the Programme is Academic IELTS 7.0 overall with 6.5 in each subtest.

Please note: All non-native English speaking students are required to undertake a diagnostic English language assessment on arrival at Keele, to determine whether English language support may help them succeed with their studies. An English language module may be compulsory for some students during their first year at Keele.

Students are only accepted into the first year of the course – there are no opportunities for Accreditation of Prior Learning (APL).

15. How are students supported on the programme?

Students are supported on entry and for the duration of the programme in many ways, including:

Personal Tutor

Students will be allocated a Personal Tutor for the duration of their studies, whose role is to offer pastoral support, advice and guidance on academic and non-academic issues. The Personal Tutor will be a member of staff from within the School of Pharmacy who teaches on the PSTaB programme. Students will meet with their Personal Tutor more than once per semester to discuss your progress and performance; in particular, formal meetings will be scheduled at various stages in the year to coincide with significant assessments so that students can receive rapid feedback concerning their performance in that assessment. Appointments to see the Personal Tutor can be made at any time. Personal Tutors can refer students on to a range of specialist health, welfare and financial services co-ordinated within the University.

Health and Safety

All students admitted to the PSTaB programme receive detailed training on health and safety in the laboratory and are provided with a Safety Handbook, safety glasses and a laboratory coat.

Students with Disability

Students admitted to the PSTaB programme with disabilities or medical problems will meet with a member of the University's Disability and Dyslexia Support department and the programme's Disability Officer at the very start of the course in order to discuss any special requirements not already catered for. Procedures will then be implemented according to the nature of the student's disability or medical problem. These procedures can range, for example, from allowing extra examination time for students diagnosed as dyslexic, to allocating additional staff or demonstrators in laboratory classes to help students with mobility problems.

16. Learning Resources

The PSTaB programme is operated by the School of Pharmacy and is based within the Hornbeam Building. Other School of Pharmacy facilities are located within the Jack Ashley Building and the Lennard-Jones Laboratories.

The Hornbeam Building contains a range of modern, well-equipped teaching rooms for use by the School of Pharmacy, including lecture theatres, flexible large-group teaching space and small-group seminar rooms. Students can reserve teaching rooms for informal private and group study. The majority of staff belonging to the School of Pharmacy are housed within the Hornbeam Building.

The Jack Ashley building contains modern, well-equipped teaching and research laboratory facilities for studies in pharmaceuticals and pharmaceutical science; students will undertake extended task-based and research projects here. The extensive range of preparative and analytical equipment for studies in formulation science located within the laboratories is regularly supplemented and renewed, and students use equipment that is of

research standard. Additionally, students will use the Pharmacy Practice Suite located in the Jack Ashley building for large- and small-group teaching, problem classes and tutorials, and assessments. The Jack Ashley building also houses the Keele Active Virtual Environment (KAVE); the KAVE is a physical room where three-dimensional 'stereoscopic' visuals display on three walls and the floor, to create a computer-generated virtual environment.

The Lennard-Jones Laboratories house the new, state-of-the-art Chemical and Pharmaceutical Science teaching laboratory and other teaching and research laboratories used by students on the PSTaB programme for chemistry and analytical science laboratory classes and medicinal chemistry research. Students will gain hands-on experience of research-grade equipment, including: FT-IR, UV-Vis and fluorescence spectrophotometers, polarimetry, high performance liquid chromatography (HPLC), gas chromatography-mass spectrometry (GC-MS) and nuclear magnetic resonance (NMR) spectroscopy.

Students have access to a wide range of other facilities on campus, including the main library which houses an extensive collection of books and other teaching materials recommended for students on the PSTaB programme. The library contains a number of large open-access and smaller, bookable IT suites, rooms for group and private study and areas for social interaction. In addition, the Chancellor's building houses a range of large lecture theatres, flat floor tutorial space and the main University food court. In addition to extensive networked IT facilities, all buildings on the main teaching campus are covered by a wireless network so students are able to access online facilities using their own devices.

The Keele Virtual Learning Environment (KLE) provides access to a wide range of learning resources for students on the PSTaB programme: lecture presentations, notes and additional supporting information, laboratory scripts and skills sheets, and other useful documents can be viewed and downloaded from the KLE. Students can engage with discussion groups and WIKIs designed for particular topics and themes. Students will also submit the majority of their work for formative and summative assessment online via the KLE, and marked work and feedback will be returned online, also via the KLE. The KLE is available off-campus and students can engage with the course materials whenever they need to, no matter wherever they are.

17. Other learning opportunities

The integrated teaching model used to teach students on the PSTaB programme does not currently provide opportunity to undertake placements or periods of study at other institutions, within the United Kingdom or overseas. However, should such opportunities arise the School will endeavour to provide appropriate guidance and support

Students may wish to arrange a period of study or placement outside of the normal curriculum; in this case also, the School will endeavour to offer appropriate guidance and support. However, it would be the student's responsibility to make suitable arrangements with regards to the timing and funding of such activities.

18. Additional costs

As to be expected there will be additional costs for inter-library loans and potential overdue library fines, print and graduation.

We do not anticipate any further additional costs for this undergraduate programme.

19. Quality management and enhancement

The Director of Undergraduate Studies (Pharmaceutical Science) is responsible for learning, teaching, assessment and feedback on the PSTaB programme, informed by the teaching team who participate in delivery of the programme. The quality and standards of learning in the School of Pharmacy are subject to a continuous process of monitoring, review and enhancement:

- The Learning and Teaching Committee of the School of Pharmacy is responsible for reviewing and monitoring quality management and enhancement procedures and activities across the School.
- Individual modules and the BSc (Hons) Pharmaceutical Science, Technology & Business Programme as a whole are reviewed and enhanced every year in the annual course review which takes place at the end

of the academic year.

- The programmes are run in accordance with the University’s Quality Assurance procedures and are subject to periodic reviews under the Internal Quality Audit (IQA) process.

Student evaluation of, and feedback on, the quality of learning on every PSTaB module takes place every year using a variety of different methods:

- The results of student evaluations of all modules are reported to module leaders and reviewed by the Programme Committee as part of the annual review process.
- Findings related to the PSTaB Programmes from the annual National Student Survey (NSS), and from regular surveys of the student experience conducted by the University, are subjected to careful analysis and a planned response at programme and School level.
- Feedback received from representatives of students in all three years of the PSTaB Programme is considered and acted on at regular meetings of the Programmes Staff/Student Liaison Committee.

The University appoints senior members of academic staff from other universities to act as external examiners on all programmes. They are responsible for:

- Approving examination questions
- Confirming all marks which contribute to a student’s degree
- Reviewing and giving advice on the structure and content of the programme and assessment procedures

Information about current external examiner(s) can be found here:

<http://www.keele.ac.uk/qa/externalexaminers/currentexternalexaminers/>

20. The principles of programme design

The PSTaB BSc Programme described in this document has been drawn up with reference to, and in accordance with the guidance set out in, the following documents:

- UK Quality Code for Higher Education, Quality Assurance Agency for Higher Education: <http://www.qaa.ac.uk/quality-code>
- Keele University Regulations and Guidance for Students and Staff: <http://www.keele.ac.uk/regulations>

21. Document Version History

Version history	Date	Notes
Date first created	October 2016	
Revision history	V2.0: May 2019	Major revision based on realignment of content, not delivery of new content, to reflect changes to the external environment that might affect the shared nature of the MPharm and BSc programmes in the School of Pharmacy. Removal of 45 credit modules to enhance student retention and to better align with other university programmes. Increased choice in business modules and the adoption of the language pathway for competency / advanced competency in a chosen language. In summary: (1) Greater divergence in BSc and MPharm programmes in the last few years, even greater differences will emerge in the next 3 – 5 years. (2) Greater alignment with university programmes (content, qualifying marks, module choice) notably in FNS.

		<p>(3) Strengthening the language pathways with further credit to allow “with competency” or “with advanced competency” to be added to the final degree award.</p> <p>(4) Removal of 45-credit modules from Year Two.</p> <p>LSC-30068 Applied Regenerative Medicine added following email from Gary Moss 25/3/19</p>
Date approved		