# Programme Specification: Undergraduate

# For students starting in Academic Year 2023/24

## 1. Course Summary

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| **Names of programme and award title(s)** | BSc (Hons) Pharmaceutical Science |
| **Award type** | Single Honours |
| **Mode of study** | Full-time |
| **Framework of Higher Education Qualification (FHEQ) level of final award** | Level 6 |
| **Normal length of the programme** | 3 years |
| **Maximum period of registration** | The normal length as specified above plus 3 years |
| **Location of study** | Keele Campus |
| **Accreditation (if applicable)** | Accreditation is currently being sought from appropriate professional bodies; this process is on-going. |
| **Regulator** | Office for Students (OfS) |
| **Tuition Fees** | **UK students:** Fee for 2023/24 is £9,250* **International students:** Fee for 2023/24 is £25,400** |

> *Please note that this document applies to Level 4 (Year 1) students only in 2023/24*

***How this information might change:*** *Please read the important information at* [http://www.keele.ac.uk/student-agreement/](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.*

*\* 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/](http://www.keele.ac.uk/studentfunding/tuitionfees/)

*\*\* We reserve the right to increase fees in subsequent years of study by an inflationary amount. Please refer to the accompanying Student Terms & Conditions for full details. Further information on fees can be found at* [http://www.keele.ac.uk/studentfunding/tuitionfees/](http://www.keele.ac.uk/studentfunding/tuitionfees/)

## 2. What is a Single Honours programme?

The Single Honours programme described in this document allows you to focus more or less exclusively on this subject. In keeping with Keele's commitment to breadth in the curriculum, the programme also gives you the opportunity to take some modules 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.

The BSc in Pharmaceutical Science currently has one optional module: at Year 1 of study (FHEQ Level 4) students can take a 15-credit language module offered by the Keele Language Centre. This emphasises the international nature of the programme and also offers the opportunity for support, as appropriate, in English language.

## 3. Overview of the Programme

The global pharmaceutical industry has experienced substantial change in recent years. Industry leaders must now understand how discoveries in science and technology translate to business opportunities within the pharmaceutical industry, whether in discovery, manufacturing, marketing and medicines supply and control. The employment market is becoming more challenging and this programme meets the need of the industry by producing graduates who are well-qualified in all aspects of the relevant applied sciences, who have well-developed key employability skills, and who also have significant knowledge and understanding of and insight into business and management - so you get more than just training in the core pharmaceutical sciences.

This course covers the main aspects of pharmaceutical discovery and development, product formulation, manufacture and quality assurance assessment, and explains how such pure and applied sciences fit into global business, legal and regulatory frameworks. This includes elements of clinical development and the role of the pharmaceutical scientist within the industry team that take a drug from research to the clinic.

As part of the preparation to enter the global pharmaceutical industry, there will be an opportunity to pursue a language pathway throughout the programme. In the first year you will take a language module in English (depending on fluency levels) or a modern foreign language for those fluent in English. This will ensure you have both a language and cultural understanding of nations outside your home country. For modern languages (not English language modules) you may wish to pursue a pathway through the programme that will provide you with recognition of this on your degree certificate. There will be opportunities at years two and three of the programme, depending on entry level to your chosen language and availability, to take up to 60 credits of language learning on this programme. If you achieve 60 credits of language learning as part of your programme you will have added to your degree certificate the additional recognition of having achieved "with competency in [Chosen Language]" or "with advanced competency in [Chosen Language]", depending on the level which you achieve. You can also take language modules as non-credit extracurricular study throughout your programme - further details can be obtained from the Language Centre.

The principal aim of the programme is to develop knowledge and skills in a wide variety of disciplines by demonstrating the linkages between seemingly disparate topics in science and technology that underpin all subsequent learning, and which are central to the successful delivery of new medicines to global markets.

## 4. Aims of the programme

The broad aims of the programme are to enable you to:

- Develop the key scientific skill that, in an integrated context, underpin the clinically relevant development of pharmaceutical products
- Understand the structures and frameworks in which the pharmaceutical industry operates, both nationally and globally

## 5. What you will learn

The intended learning outcomes of the programme (what students should know, understand and be able to do at the end of the programme), can be described under the following headings:

- Subject knowledge and understanding
- Subject specific skills
- Key or transferable skills (including employability skills)

**Subject knowledge and understanding**

Successful students will be able to:

- Understand the core principles of the pharmaceutical sciences as they are applied to the development, licencing and marketing of pharmaceutical products

**Subject specific skills**

Successful students will be able to:

- Understand the nature of pharmaceutical development, both in the laboratory and in the business

environments, and to use this knowledge in the development of new strategies to develop clinically relevant approaches to disease management and treatment

**Key or transferable skills (including employability skills)**

Successful students will be able to:

- Appreciate and understand how the core chemical and biological sciences integrate to underpin the successful development of pharmaceutical products, a core skills base which is directly applicable to a number of other industries (e.g. cosmetics, foods)

**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/

# 6. How is the programme taught?

Learning and teaching methods used on the programme vary according to the subject matter and level of the module. They include the following:

- Lectures, tutorials, workshops, problem-solving sessions, interactive and immersive 3D teaching in the Health Cinema, laboratory work (individual and group exercises) and integrated 'synoptic' assessments which integrate the differing science subjects with the business aspects of the programme to develop clinically relevant products for patients.

Apart from these formal activities, students are also provided with regular opportunities to talk through particular areas of difficulty, and any special learning needs they may have, with their Academic Mentors or module lecturers on a one-to-one basis.

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

- The use of a wide range of assessment skills allow us to focus on different aspects of the challenges faced in pharmaceutical development; for example, this might include the use of individual or group-based activities, oral presentation sessions or student-led workshops where decision making is both collective and led by students; research projects may also give students the ability to work on a major piece of novel research not only by themselves but in collaboration with students taking similar projects and within the setting of research groups with the School of Pharmacy and Bioengineering.

# 7. Teaching Staff

The staff who deliver this course are based predominately within the School of Pharmacy and Bioengineering and Bioengineering and have expertise in the core aspects of the pharmaceutical sciences: pharmacology, physiology, medicinal and organic chemistry and formulation and drug delivery. In addition, several members of the School's academic staff have previously worked in the pharmaceutical (and related) industry and who can frame their academic work within the context of their previous roles.

The BSc programme also makes significant use of expert external speakers who are, or have worked, in the pharmaceutical industry or related industries. This includes a range of business-focused roles and addresses with real world examples subjects as diverse as clinical development, marketing and branding of pharmaceutical products, the role of healthcare systems in the context of pharmaceutical sales and regulatory affairs.

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 programme to programme, 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.

There are two types of module delivered as part of your programme. They are:

- Compulsory modules - a module that you are required to study on this course;
- Optional modules - these allow you some limited choice of what to study from a list of modules;
- Global Challenge Pathways (students studying at Level 6 in 2023/24 may take electives instead) - a choice of modules from different subject areas within the University that count towards the overall credit requirement but not the number of subject-related credits.

Students at Level 4 and Level 5 in 2023/24 have the option of taking a Global Challenge Pathway, which includes one 15-credit module in each year of the degree. Alternatively, a language module or an additional optional module can be taken instead. Information about Global Challenge Pathways can be found after the module lists for Level 5.

For further information on the content of modules currently offered, please visit:
https://www.keele.ac.uk/recordsandexams/modulecatalogue/

A summary of the credit requirements per year is as follows, with a minimum of 90 subject credits (compulsory plus optional) required for each year.

| Year | Compulsory | Optional | | Electives | |
|---|---|---|---|---|---|
| | | Min | Max | Min | Max |
| Level 4 | 105 | 0 | 15 | 0 | 15 |
| Level 5 | 90 | 15 | 30 | 0 | 15 |
| Level 6 | 60 | 60 | 60 | 0 | 0 |

## Module Lists

### *Level 4*

| Compulsory modules | Module Code | Credits | Period |
|---|---|---|---|
| Human Anatomy and Physiology | PHA-10028 | 30 | Semester 1-2 |
| Biochemistry & Cell Biology | PHA-10030 | 30 | Semester 1-2 |
| Introduction to Pharmaceutical Science | PHA-10032 | 30 | Semester 1-2 |
| Introduction to Formulation Science | PHA-10036 | 15 | Semester 2 |

| Optional modules | Module Code | Credits | Period |
|---|---|---|---|
| Management in Context | MAN-10018 | 15 | Semester 1 |
| Marketing Principles | MAN-10019 | 15 | Semester 1 |
| Global Business Environment | MAN-10022 | 15 | Semester 1 |
| Introduction to International Business | MAN-10023 | 15 | Semester 2 |
| Multinational Enterprise Business Perspectives | MAN-10026 | 15 | Semester 2 |

**Level 4 Module Rules**

Students will take 105 credits of compulsory modules, PHA-10028, PHA-10030, PHA-10032 and PHA-10036.

PHA-10028 and PHA-10030 are shared with the BSc in Cell and Tissue Engineering; PHA-10032 is a bespoke module which focuses on introducing the core pharmaceutical sciences to students.

Students will therefore take 15 credits of optional modules. Students will have three pathways to select from:

1. Global Challenge Pathway
2. A module from those available from the Language Centre
3. A module from those available from the Business School

All optional module selections are subject to availability and compatibility with the School of Pharmacy & Bioengineering timetable for core modules.

*NB: Global Challenge Pathways (GCPs)* - students at Level 4 and Level 5 in 2023/24 have the option of taking a Global Challenge Pathway, which includes one 15-credit module in each year of the degree. Information on GCPs is shown under the Level 5 modules below.

**Language modules**

Students on this programme will also be able to study language modules offered by the Language Centre, as part of a Global Challenge Pathway. You can enrol on either a Modern Language module [more information available at this link] (Semester 1 only) or Teaching English to Speakers of Other Languages (TESOL) (Semesters 1 and 2) module (ENL-10053).

If you choose a Modern Language, you will automatically be enrolled on a Semester 2 Modern Language module as a continuation of your language of choice. Undertaking a Modern Languages module in Semester 2 is compulsory if you wish to continue to the language GCP the following academic year.

## *Level 5*

| Compulsory modules | Module Code | Credits | Period |
|---|---|---|---|
| Applied Pharmaceutical Science I | PHA-20016 | 30 | Semester 1 |
| Pharmaceutical Analysis And Quality Control | PHA-20014 | 30 | Semester 1-2 |
| Applied Pharmaceutical Science II | PHA-20018 | 30 | Semester 2 |

| Optional modules | Module Code | Credits | Period |
|---|---|---|---|
| Organisational Behaviour | MAN-20055 | 15 | Semester 1 |
| Operations and Quality Management | MAN-20053 | 15 | Semester 2 |

**Level 5 Module Rules**

Students will take 90 credits of compulsory modules, PHA-20016, PHA-20014 and PHA-20018.

Students will therefore take 30 credits of optional modules. Students will have two pathways to select from:

1. A module from those available from the Language Centre (one or two 15-credit modules, and when two such modules are selected this means that normally one module is taken in each semester and are consecutive and ascending in number).

2. A module from those available from the Business School (one, 15-credit module)

All optional module selections are subject to availability and compatibility with the School of Pharmacy & Bioengineering timetable for compulsory modules.

Students will be encouraged to take one optional module in each semester but it is appreciated that this might not always be possible. Where two or more optional modules are selected in the same academic year the

availability of modules will depend on the exact choice made in order to avoid overlap.

3. Available modules from the Global Challenge Pathway, based on availability and prior enrolment on a GCP module at Level 4.

**Global Challenge Pathways (GCPs)**

Students at Level 4 and Level 5 in 2023/24 have the option of taking a Global Challenge Pathway, which includes one 15-credit module in each year of the degree. Students at Level 5 will continue the Global Challenge Pathway they started at Level 4.

Global Challenge Pathways offer students the chance to fulfil an exciting, engaging route of interdisciplinary study. Choosing a pathway, students will be presented with a global issue or 'challenge' which directly relates to societal issues, needs and debates. They will be invited to take part in academic and external facing projects which address these issues, within an interdisciplinary community of students and staff. Students completing a Global Challenge Pathway will receive recognition on their degree certificate.

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| **Digital Futures** | The Digital Futures pathway offers you the opportunity to become an active contributor to current debates, cutting-edge research, and projects with external partners, addressing both the exciting potential and the challenges of disruptive digital transformation across all spheres of life. <br><br> Part of a diverse and interdisciplinary pathway community, you will engage in exciting, impactful collaborative project work in innovative formats. Engaged in real-world scenarios, you will use digital technology and creativity to promote inclusive, empowering, and sustainable change at local and global levels. <br><br> **Level 4 Module**: **A digital life: challenges and opportunities (GCP-10005)** <br><br> **Level 5 Module: Digital World - People, Spaces, and Data (GCP-20005)** |
| **Climate Change & Sustainability** | Through the Climate Change & Sustainability pathway you will develop the skills, understanding and drive to become agents of change to tackle climate change and wider sustainability challenges. <br><br> You will work with international partners to explore climate change and sustainability in different international contexts; lead your own projects to drive real change in your communities; and be part of educating others to help achieve a more sustainable future. <br><br> **Level 4 Module: Climate Change and Sustainable Futures: Global Perspectives (GCP-10009)** <br><br> **Level 5 Module: Climate Change and Sustainability: Action and Activism (GCP-20009)** |
| **Social Justice** | Students on this pathway will embark on a reflective journey drawing upon decolonising, feminist, and ethical perspectives on social justice, forging transformative outputs as agents of change. <br><br> You will enter a dialogue with local, national, and international partners from Universities, NGOs, International Human Rights Committees. You will engage with key societal challenges, for example Covid 19 as a social crisis with impact on gender and racial identities. The pathway will allow you to monitor and critically evaluate policies and human rights treaties, and produce and disseminate digitally fluent, international and sustainable project findings. <br><br> **Level 4 Module**: **Reflections on Social Injustices, Past and Present (GCP-10003)** <br><br> **Level 5 Module: Strategic Interventions for Social Justice (GCP-20003)** |

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| **Enterprise & the Future of Work** | If we are to achieve the promise of Sustainable Development Goals, solve the climate crisis and take advantage of the changes that the digital revolution provide, we need to understand the power of enterprise and prepare for future contexts of work, creativity and disruption.<br><br>Supporting you to be part of future-facing solutions, this pathway will give you the ability to make judgements on the utilisation of resources, labour and capital. It will support you in developing creative, original thinking, allowing you to collaborate on projects that persuade and effect change, setting you up to thrive in future environments of work and innovation.<br><br>**Level 4 Module: Enterprise and the Future of Work (GCP-10007)**<br><br>**Level 5 Module: Enterprise and the Future of Work: Collaborate to Innovate (GCP-20007)** |
| **Global Health Challenges** | By taking the global health challenge pathway you will develop solutions to improve the health and quality of life for particular people and communities, engaging with these groups to co-design interventions.<br><br>This pathway will provide you with skills that go beyond a focus on health and will allow you to develop your ability to work in a team and lead change in society. The knowledge, skills and work experience will complement your core degree and enhance your career opportunities and graduate aspirations.<br><br>**Level 4 Module: Key concepts and challenges in global health (GCP-10001)**<br><br>**Level 5 Module: Using Evidence to Improve Global Health (GCP-20001)** |

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| **Languages &<br>Intercultural<br>Awareness** | An understanding of language and culture opens the doorway to understanding what happens, why it happens and how you can make a difference. Why learn Russian now? How will an understanding of intercultural values impact on global development? How can you use English to work your way around the world? Importantly - how do language and culture impact on the UN Sustainability Goals?<br><br>The Languages and Intercultural Awareness pathway offers you four distinct strands.<br><br>The Language Specialist: Become a specialist in one of our languages and graduate with a degree title that includes '... with competency in (Language)'.<br><br>The Language Taster: Explore a new language every year<br><br>The Certificate in TESOL (Teaching English to Speakers of Other Languages): Train to teach English as a Foreign Language, gain a globally recognised teaching qualification and work with asylum seekers and refugees.<br><br>The Intercultural Explorer: Explore cultural practices around the world and discover how the power of language and culture can be forces for breaking down barriers and achieving intercultural understanding, but how they can also be used to create political and social barricades.<br><br>**Modules available:**<br><br>**The Language Specialist:**<br><br>Any Semester 1 Language Module (the level at which you enter will be determined by your previous language learning experiences).<br><br>**The Language Taster:**<br><br>Any Semester 1 Language Module (the level at which you enter will be determined by your previous language learning experiences)<br><br>**The Certificate in TESOL:**<br><br>ENL-10053 TESOL 1<br><br>ENL-20007 TESOL 2<br><br>**The Intercultural Explorer:**<br><br>ENL-10057 The stories we live by<br><br>ENL-20009 Who do you think you are? |

Information on Global Challenge Pathways can be found here:
https://www.keele.ac.uk/study/undergraduate/globalchallengepathways/

**Language modules**

You can enrol on the continuing Modern Language module [more information available at this link] (Semester 1 only) or the continuing TESOL (Semesters 1 and 2) module (ENL-20007).

If you choose a Modern Language, you will automatically be enrolled on a Semester 2 Modern Language module as a continuation of your GCP Modern Language of choice. Undertaking a Modern Languages module in Semester 2 is compulsory if you wish to continue to the language GCP the following academic year.

## *Level 6*

| Compulsory modules | Module Code | Credits | Period |
|---|---|---|---|
| The Pharmaceutical Industry at the Cutting Edge | PHA-30021 | 30 | Semester 1-2 |
| Pharmaceutical Science Research Project | PHA-30025 | 30 | Semester 1-2 |

| Optional modules | Module Code | Credits | Period |
|---|---|---|---|
| Current Developments in Pharmaceutical Science | PHA-30019 | 30 | Semester 1-2 |
| Advanced Topics in Pharmaceutical Science (Pharmacology) | PHA-30041 | 15 | Semester 1-2 |
| Advanced Topics in Pharmaceutical Science (Pharmaceutics & Drug Delivery) | PHA-30043 | 15 | Semester 1-2 |

**Level 6 Module Rules**

Students will take 60 credits of compulsory modules and 60 credits of optional modules.

Students will have two pathways to select from:

1. One or two modules from those available from the **Language Centre** (one or two 15-credit modules, and when two such modules are selected this means that normally one module is taken in each semester and are consecutive and ascending in number).

Semester One modules: BSL-90003/5, CHI-90003/5, FRE-90003/5/7/9/11, GER-90003/5/7/9/11, ITA-90003/5, JAP-90003/5, RUS90003/5, SPN-90003/5/7/9/11

Semester Two modules: BSL-90004/6, CHI-90004/6, FRE-90004/6/8/10/12, GER-90004/6/8/10/12, ITA-90003/5, JAP-90004/6, RUS90004/6, SPN-90004/6/8/10/12

2. A module from those available from the **School of Pharmacy and Bioengineering**

## Learning Outcomes

The table below sets out what students learn in the programme and the modules in which that learning takes place. Details of how learning outcomes are assessed through these modules can be found in module specifications.

### *Level 4*

| Subject Knowledge and Understanding | |
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| **Learning Outcome** | **Module in which this is delivered** |
| Demonstrate knowledge and understanding, at a basic level, of the main scientific and technological principles supporting selected | Human Anatomy and Physiology - PHA-10028 |
| Outline the structures and roles of common biological molecules and describe their chemical and physical properties | Human Anatomy and Physiology - PHA-10028 |
| Identify common organic molecular structures and functional groups and write suitable reaction mechanisms for their interconversion | Human Anatomy and Physiology - PHA-10028 |
| Demonstrate knowledge of the basic thermodynamic principles that govern the progress of chemical reactions both in vitro and in vivo | Human Anatomy and Physiology - PHA-10028 |

| Subject Knowledge and Understanding | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| Explain 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 | Human Anatomy and Physiology - PHA-10028 |
| Recognise 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 | Human Anatomy and Physiology - PHA-10028 |
| Develop and employ experimental, analytical and reporting skills in the successful completion of appropriate manipulative practical exercises | Human Anatomy and Physiology - PHA-10028 |
| 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 | Human Anatomy and Physiology - PHA-10028 |
| Recognise and apply appropriately the health and safety practices and policies required for a wide range of pharmaceutical science laboratory classes, including appropriate documentation | Human Anatomy and Physiology - PHA-10028 |
| Demonstrate 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 | Human Anatomy and Physiology - PHA-10028 |
| Recognise the opportunities to target specific cell structures and processes for the treatment of disease | Introduction to Pharmaceutical Science - PHA-10032 |
| Recognise and describe the integration of metabolic processes in the maintenance of homeostasis and the consequences of errors in metabolism | Introduction to Pharmaceutical Science - PHA-10032 |
| Recognise the pivotal role played by the gene in living organisms, including patterns of inheritance and human disease, and discuss the molecular aspects of chromosome and gene structure, replication, expression and regulation | Introduction to Pharmaceutical Science - PHA-10032 |
| Describe the basic architecture and cellular diversity of prokaryotic and eukaryotic (plant and animal) cells, making comparisons and distinctions between them | Introduction to Pharmaceutical Science - PHA-10032 |
| Recognise 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 | Introduction to Pharmaceutical Science - PHA-10032 |
| Recognise 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 | Introduction to Pharmaceutical Science - PHA-10032 |
| Identify common organic molecular structures and functional groups and write suitable reaction mechanisms for their interconversion | Introduction to Pharmaceutical Science - PHA-10032 |
| Describe the cellular and molecular interactions involved in the formation of tissues | Introduction to Pharmaceutical Science - PHA-10032 |

| Subject Knowledge and Understanding | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| Describe the structure, fundamental properties and transport across biological membranes, distinguishing the roles played by the lipid and protein components of the membrane | Introduction to Pharmaceutical Science - PHA-10032 |
| 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 | Biochemistry & Cell Biology - PHA-10030 |
| 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 | Biochemistry & Cell Biology - PHA-10030 |
| 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 | Biochemistry & Cell Biology - PHA-10030 |
| Describe the basic aspects of formulation science related to drug distribution and drug action that are important in drug design and development | Biochemistry & Cell Biology - PHA-10030 |
| Describe why a variety of dosage forms are necessary, and the relative merits and demerits of the available forms | Biochemistry & Cell Biology - PHA-10030 |


| Key or Transferable Skills (graduate attributes) | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| Develop an open and questioning approach to ideas, demonstrating curiosity, independence of thought and the ability to appreciate a range of perspectives on the natural and social worlds | Biochemistry & Cell Biology - PHA-10030<br>Human Anatomy and Physiology - PHA-10028<br>Introduction to Pharmaceutical Science - PHA-10032 |
| Develop an appreciation of the development and value of your chosen subjects of study, awareness of their contexts, the links between them, and awareness of the provisional and dynamic nature of knowledge | Introduction to Pharmaceutical Science - PHA-10032<br>Biochemistry & Cell Biology - PHA-10030<br>Human Anatomy and Physiology - PHA-10028 |
| Locate, evaluate and synthesise large amounts of frequently conflicting information, ideas and data | Introduction to Pharmaceutical Science - PHA-10032<br>Biochemistry & Cell Biology - PHA-10030<br>Human Anatomy and Physiology - PHA-10028 |
| Creatively to solve problems using a range of different approaches and techniques, and to determine which techniques are appropriate for the issue at hand | Biochemistry & Cell Biology - PHA-10030<br>Human Anatomy and Physiology - PHA-10028<br>Introduction to Pharmaceutical Science - PHA-10032 |
| Appreciate the social, environmental and global implications of your studies and other activities, including recognition of any ethical implications | Biochemistry & Cell Biology - PHA-10030<br>Introduction to Pharmaceutical Science - PHA-10032<br>Human Anatomy and Physiology - PHA-10028 |
| Communicate clearly and effectively in written and verbal forms for different purposes and to a variety of audiences | Introduction to Pharmaceutical Science - PHA-10032<br>Human Anatomy and Physiology - PHA-10028<br>Biochemistry & Cell Biology - PHA-10030 |
| Have the knowledge, skills, self-confidence and self-awareness actively to pursue their future goals | Introduction to Pharmaceutical Science - PHA-10032<br>Biochemistry & Cell Biology - PHA-10030<br>Human Anatomy and Physiology - PHA-10028 |
| Have the ability and motivation to participate responsibly and collaboratively as an active citizen in the communities in which you live and work | Biochemistry & Cell Biology - PHA-10030<br>Human Anatomy and Physiology - PHA-10028<br>Introduction to Pharmaceutical Science - PHA-10032 |

| Key or Transferable Skills (graduate attributes) | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| Professional and reflective approach, including qualities of leadership, responsibility, personal integrity, empathy, care and respect for others, accountability and self-regulation | Introduction to Pharmaceutical Science - PHA-10032<br>Human Anatomy and Physiology - PHA-10028<br>Biochemistry & Cell Biology - PHA-10030 |
| Flexibility to thrive in rapidly changing and uncertain external environments and to update skills and knowledge as circumstances require. | Human Anatomy and Physiology - PHA-10028<br>Introduction to Pharmaceutical Science - PHA-10032<br>Biochemistry & Cell Biology - PHA-10030 |
| Outline the process of drug design and development from identification of target to formulation | Introduction to Formulation Science - PHA-10036 |
| Demonstrate knowledge of the basic thermodynamic and kinetic principles that govern the progress of chemical reactions both in vitro and in vivo, including in the context of drug and formulation stability | Introduction to Formulation Science - PHA-10036 |
| Describe the basic aspects of formulation science related to drug distribution and drug action that are important in drug design and development, including why a variety of dosage forms is necessary and the relative merits and demerits of the available forms | Introduction to Formulation Science - PHA-10036 |
| Describe how formulation science can be translated across different, but related, fields and how underpinning knowledge can be applied to different end points | Introduction to Formulation Science - PHA-10036 |
| Describe how the physicochemical properties of molecules affect their formulation into medicines and the route of administration to patients | Introduction to Formulation Science - PHA-10036 |
| Describe and explain biopharmaceutics in terms of the relationship between dosage form and interaction of the drug substance with human physiology | Introduction to Formulation Science - PHA-10036 |
| Determine the purity and composition of compounds using appropriate practical and analytical techniques | Introduction to Formulation Science - PHA-10036 |
| Recognise and apply appropriately the health and safety practices and policies required for a wide range of pharmaceutical science laboratory classes, including appropriate documentation | Introduction to Formulation Science - PHA-10036 |
| 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 | Introduction to Formulation Science - PHA-10036 |
| Demonstrate 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 | Introduction to Formulation Science - PHA-10036 |
| Communicate complex concepts effectively, both orally and in writing in a manner, that reflects professional practice | Introduction to Formulation Science - PHA-10036 |

## *Level 5*

| Subject Knowledge and Understanding | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| Explain the processes involved in the quality control of all aspects of pharmaceutical drug development, formulation and the manufacturing process. | Pharmaceutical Analysis And Quality Control - PHA-20014 |
| 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. | Pharmaceutical Analysis And Quality Control - PHA-20014 |
| Explain the common techniques used in the analysis of biological data to arrive at safe and appropriate drug selection for a patient. | Pharmaceutical Analysis And Quality Control - PHA-20014 |
| Describe the role of pharmaceutical analysis and quality assurance methods in the context of national and international standards and regulatory processes. | Pharmaceutical Analysis And Quality Control - PHA-20014 |
| Describe the processes involved in the quality assurance of all aspects of pharmaceutical drug development, formulation and the manufacturing process, and how they are applied to the development and production of medicines. | Pharmaceutical Analysis And Quality Control - PHA-20014 |
| Explain the relationship between absorption, distribution, metabolism and elimination of drugs and their physicochemical properties and formulation. | Pharmaceutical Analysis And Quality Control - PHA-20014 |
| Compare and evaluate the efficiency and safety of different routes of drug administration. | Pharmaceutical Analysis And Quality Control - PHA-20014 |
| Demonstrate the relationship between the design of drug product formulation, properties of the formulation, in vitro behaviour and in vivo performance. | Pharmaceutical Analysis And Quality Control - PHA-20014 |
| Demonstrate competence in pharmaceutical calculations related to pharmaceutical quality assurance and quality systems. | Pharmaceutical Analysis And Quality Control - PHA-20014 |
| Demonstrate competence in the performance of laboratory techniques in the pharmaceutical sciences and the analysis of data generated therein. | Pharmaceutical Analysis And Quality Control - PHA-20014 |
| Demonstrate knowledge of and apply an integrated approach towards patient care which links pharmaceutical science and pharmaceutical business development. | Applied Pharmaceutical Science I - PHA-20016 |
| Explain how physiological patient factors affect the choice of pharmacological agents to treat disease states based upon absorption, distribution, metabolism and excretion data. | Applied Pharmaceutical Science I - PHA-20016 |
| Explain how drug resistance and drug interactions have consequences for pharmaceutical development and patient care. | Applied Pharmaceutical Science I - PHA-20016 |
| Explain the underpinning concepts in physical chemistry and materials science which underpin drug formulation. | Applied Pharmaceutical Science I - PHA-20016 |
| Evaluate and select processes and formulations appropriate to the manufacture of specified drug products. | Applied Pharmaceutical Science I - PHA-20016 |
| Describe the relevance of microbiology within healthcare practice, and the challenges presented by infection in the context of pharmaceutical development and patient care. | Applied Pharmaceutical Science I - PHA-20016 |

| Subject Knowledge and Understanding | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| 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. | Applied Pharmaceutical Science I - PHA-20016 |
| Demonstrate competence in pharmaceutical calculations related to pharmacology and pharmaceutics. | Applied Pharmaceutical Science I - PHA-20016 |
| Demonstrate knowledge of and apply an integrated approach towards patient care which links pharmaceutical science and pharmaceutical manufacturing. | Applied Pharmaceutical Science II - PHA-20018 |
| Explain how patient physiology and pathophysiology affect the drug choice in the context of absorption, distribution, metabolism and excretion (ADME) models. | Applied Pharmaceutical Science II - PHA-20018 |
| Explain the role of drug resistance and drug interactions in pharmaceutical development. | Applied Pharmaceutical Science II - PHA-20018 |
| Explain the underpinning concepts in physical chemistry and materials science which underpin the formulation of parenteral, solid and semi-solid dosage forms. | Applied Pharmaceutical Science II - PHA-20018 |
| Evaluate and select processes and formulations appropriate to the manufacture and testing of specified parenteral, solid and semi-solid dosage forms. | Applied Pharmaceutical Science II - PHA-20018 |
| Describe the relevance of microbiology within the context of medicinal product quality. | Applied Pharmaceutical Science II - PHA-20018 |
| 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. | Applied Pharmaceutical Science II - PHA-20018 |
| Demonstrate competence in pharmaceutical calculations related to pharmacology and pharmaceutics including a focus on parenteral, semi-solid, solid and particulate dose forms, with reference where appropriate to pharmacopoeial standards. | Applied Pharmaceutical Science II - PHA-20018 |
| Recognise the role of the skin in percutaneous absorption, including dermal and transdermal delivery. | Applied Pharmaceutical Science II - PHA-20018 |

| Key or Transferable Skills (graduate attributes) | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| Develop an open and questioning approach to ideas, demonstrating curiosity, independence of thought and the ability to appreciate a range of perspectives on the natural and social worlds | Applied Pharmaceutical Science II - PHA-20018<br>Applied Pharmaceutical Science I - PHA-20016<br>Pharmaceutical Analysis And Quality Control - PHA-20014 |
| Develop an appreciation of the development and value of your chosen subjects of study, awareness of their contexts, the links between them, and awareness of the provisional and dynamic nature of knowledge | Applied Pharmaceutical Science I - PHA-20016<br>Pharmaceutical Analysis And Quality Control - PHA-20014<br>Applied Pharmaceutical Science II - PHA-20018 |
| Acquire information literacy: the ability to locate, evaluate and synthesise large amounts of frequently conflicting information, ideas and data | Applied Pharmaceutical Science I - PHA-20016<br>Pharmaceutical Analysis And Quality Control - PHA-20014<br>Applied Pharmaceutical Science II - PHA-20018 |
| Develop the ability creatively to solve problems using a range of different approaches and techniques, and to determine which techniques are appropriate for the issue at hand | Applied Pharmaceutical Science I - PHA-20016<br>Applied Pharmaceutical Science II - PHA-20018<br>Pharmaceutical Analysis And Quality Control - PHA-20014 |
| Develop an appreciation of the social, environmental and global implications of your studies and other activities, including recognition of any ethical implications | Applied Pharmaceutical Science I - PHA-20016<br>Pharmaceutical Analysis And Quality Control - PHA-20014<br>Applied Pharmaceutical Science II - PHA-20018 |
| Develop the ability to communicate clearly and effectively in written and verbal forms for different purposes and to a variety of audiences | Applied Pharmaceutical Science II - PHA-20018<br>Applied Pharmaceutical Science I - PHA-20016<br>Pharmaceutical Analysis And Quality Control - PHA-20014 |
| Acquire the knowledge, skills, self-confidence and self-awareness actively to pursue your future goals | Applied Pharmaceutical Science II - PHA-20018<br>Pharmaceutical Analysis And Quality Control - PHA-20014<br>Applied Pharmaceutical Science I - PHA-20016 |
| Develop the ability and motivation to participate responsibly and collaboratively as an active citizen in the communities in which you live and work | Pharmaceutical Analysis And Quality Control - PHA-20014<br>Applied Pharmaceutical Science II - PHA-20018<br>Applied Pharmaceutical Science I - PHA-20016 |
| Foster a professional and reflective approach, including qualities of leadership, responsibility, personal integrity, empathy, care and respect for others, accountability and self-regulation | Applied Pharmaceutical Science II - PHA-20018<br>Applied Pharmaceutical Science I - PHA-20016<br>Pharmaceutical Analysis And Quality Control - PHA-20014 |
| Develop the flexibility to thrive in rapidly changing and uncertain external environments and to update skills and knowledge as circumstances require. | Applied Pharmaceutical Science I - PHA-20016<br>Pharmaceutical Analysis And Quality Control - PHA-20014<br>Applied Pharmaceutical Science II - PHA-20018 |

*Level 6*

| Subject Knowledge and Understanding | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| Demonstrate a comprehensive understanding of research techniques and self-management skills in order to plan a programme of research at a professional level | Pharmaceutical Science Research Project - PHA-30025 |

| Subject Knowledge and Understanding | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| Critically evaluate current research and advanced scholarship relevant to the chosen research area | Pharmaceutical Science Research Project - PHA-30025 |
| Demonstrate comprehensive knowledge at the forefront of the project area | Pharmaceutical Science Research Project - PHA-30025 |
| Demonstrate the ability to select and develop a research strategy appropriate to the chosen research area | Pharmaceutical Science Research Project - PHA-30025 |
| Accurately undertake data acquisition in the chosen project area | Pharmaceutical Science Research Project - PHA-30025 |
| Show self-direction and originality in tackling and solving problems | Pharmaceutical Science Research Project - PHA-30025 |
| 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 | Pharmaceutical Science Research Project - PHA-30025 |
| Communicate progress reports and conclusions on the work carried out to specialist and non-specialist audiences | Pharmaceutical Science Research Project - PHA-30025 |
| Communicate complex concepts effectively, both orally and in writing, in a manner that reflects professional work | Pharmaceutical Science Research Project - PHA-30025 |
| Critically evaluate current research and advanced scholarship and practice in selected specialist topics within the pharmaceutical sciences | Current Developments in Pharmaceutical Science - PHA-30019 |
| Communicate complex concepts effectively, both orally and in writing, in a manner that reflects professional practice | Current Developments in Pharmaceutical Science - PHA-30019 |
| 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 | The Pharmaceutical Industry at the Cutting Edge - PHA-30021 |
| 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 | The Pharmaceutical Industry at the Cutting Edge - PHA-30021 |
| 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 | The Pharmaceutical Industry at the Cutting Edge - PHA-30021 |
| Demonstrate a systematic understanding and apply the principles of management training in facilitating successful pharmaceutical product development | The Pharmaceutical Industry at the Cutting Edge - PHA-30021 |
| 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 | The Pharmaceutical Industry at the Cutting Edge - PHA-30021 |

| Subject Knowledge and Understanding | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| Synthesise, evaluate and contextualise the key scientific, legal and business information to generate business proposals and product submission dossiers | The Pharmaceutical Industry at the Cutting Edge - PHA-30021 |
| Demonstrate a systematic understanding of and practice the concepts of working within the complex team-based and inter-disciplinary global pharmaceutical industry | The Pharmaceutical Industry at the Cutting Edge - PHA-30021 |
| 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 | The Pharmaceutical Industry at the Cutting Edge - PHA-30021 |
| Communicate complex concepts effectively, both orally and in writing, in a manner that reflects professional work | The Pharmaceutical Industry at the Cutting Edge - PHA-30021 |
| Demonstrate a systematic understanding of the actions of drugs in terms of their interactions with physiological systems | Advanced Topics in Pharmaceutical Science (Pharmacology) - PHA-30041 |
| Demonstrate a detailed knowledge of the use of drugs to correct disorders of physiological systems | Advanced Topics in Pharmaceutical Science (Pharmacology) - PHA-30041 |
| Describe and critically evaluate the role of pharmacotherapy in the management of disease | Advanced Topics in Pharmaceutical Science (Pharmacology) - PHA-30041 |
| Demonstrate detailed knowledge of the physicochemical properties of advanced and cutting-edge drug delivery systems | Advanced Topics in Pharmaceutical Science (Pharmaceutics & Drug Delivery) - PHA-30043 |
| Demonstrate a systematic understanding of the relationship between in vitro properties of drug delivery systems to their in vivo behaviour | Advanced Topics in Pharmaceutical Science (Pharmaceutics & Drug Delivery) - PHA-30043 Advanced Topics in Pharmaceutical Science (Pharmacology) - PHA-30041 |
| Select, with detailed rationale, appropriate drug delivery systems for specific patients to maximise the therapeutic benefits | Advanced Topics in Pharmaceutical Science (Pharmaceutics & Drug Delivery) - PHA-30043 |
| Review, consolidate, and extend knowledge and understanding of the properties and applications of current and emerging drug delivery systems | Advanced Topics in Pharmaceutical Science (Pharmaceutics & Drug Delivery) - PHA-30043 |
| Apply established techniques to acquire laboratory data and critically evaluate data from the literature about the properties of drug delivery systems | Advanced Topics in Pharmaceutical Science (Pharmacology) - PHA-30041 Advanced Topics in Pharmaceutical Science (Pharmaceutics & Drug Delivery) - PHA-30043 |
| Interpret complex data obtained through experiments to formulate conclusions about the actions of drugs in physiological systems | Advanced Topics in Pharmaceutical Science (Pharmacology) - PHA-30041 Advanced Topics in Pharmaceutical Science (Pharmaceutics & Drug Delivery) - PHA-30043 |
| Critically evaluate current research and advanced scholarship in pharmaceutical sciences relevant to the chosen research area | Advanced Topics in Pharmaceutical Science (Pharmaceutics & Drug Delivery) - PHA-30043 Advanced Topics in Pharmaceutical Science (Pharmacology) - PHA-30041 |
| Demonstrate an in-depth understanding of analytic and literature evaluation techniques | Advanced Topics in Pharmaceutical Science (Pharmaceutics & Drug Delivery) - PHA-30043 Advanced Topics in Pharmaceutical Science (Pharmacology) - PHA-30041 |

| Subject Knowledge and Understanding | |
| --- | --- |
| **Learning Outcome** | **Module in which this is delivered** |
| Critically appraise published clinical and experimental data using a structured approach, in order to assess its quality and validity | Advanced Topics in Pharmaceutical Science (Pharmaceutics & Drug Delivery) - PHA-30043 Advanced Topics in Pharmaceutical Science (Pharmacology) - PHA-30041 |
| Communicate complex concepts effectively, both orally and in writing, in a manner that reflects professional work | Advanced Topics in Pharmaceutical Science (Pharmaceutics & Drug Delivery) - PHA-30043 Advanced Topics in Pharmaceutical Science (Pharmacology) - PHA-30041 |

| Key or Transferable Skills (graduate attributes) | |
| --- | --- |
| **Learning Outcome** | **Module in which this is delivered** |
| An open and questioning approach to ideas, demonstrating curiosity, independence of thought and the ability to appreciate a range of perspectives on the natural and social worlds | Pharmaceutical Science Research Project - PHA-30025 The Pharmaceutical Industry at the Cutting Edge - PHA-30021 Current Developments in Pharmaceutical Science - PHA-30019 |
| An appreciation of the development and value of your chosen subjects of study, awareness of their contexts, the links between them, and awareness of the provisional and dynamic nature of knowledge | Current Developments in Pharmaceutical Science - PHA-30019 Pharmaceutical Science Research Project - PHA-30025 The Pharmaceutical Industry at the Cutting Edge - PHA-30021 |
| Information literacy: the ability to locate, evaluate and synthesise large amounts of frequently conflicting information, ideas and data | Current Developments in Pharmaceutical Science - PHA-30019 Pharmaceutical Science Research Project - PHA-30025 The Pharmaceutical Industry at the Cutting Edge - PHA-30021 |
| The ability creatively to solve problems using a range of different approaches and techniques, and to determine which techniques are appropriate for the issue at hand | The Pharmaceutical Industry at the Cutting Edge - PHA-30021 Pharmaceutical Science Research Project - PHA-30025 Current Developments in Pharmaceutical Science - PHA-30019 |
| An appreciation of the social, environmental and global implications of your studies and other activities, including recognition of any ethical implications | The Pharmaceutical Industry at the Cutting Edge - PHA-30021 Current Developments in Pharmaceutical Science - PHA-30019 Pharmaceutical Science Research Project - PHA-30025 |
| The ability to communicate clearly and effectively in written and verbal forms for different purposes and to a variety of audiences | Pharmaceutical Science Research Project - PHA-30025 Current Developments in Pharmaceutical Science - PHA-30019 The Pharmaceutical Industry at the Cutting Edge - PHA-30021 |
| The knowledge, skills, self-confidence and self-awareness actively to pursue your future goals | Pharmaceutical Science Research Project - PHA-30025 The Pharmaceutical Industry at the Cutting Edge - PHA-30021 Current Developments in Pharmaceutical Science - PHA-30019 |
| The ability and motivation to participate responsibly and collaboratively as an active citizen in the communities in which you live and work | Pharmaceutical Science Research Project - PHA-30025 Current Developments in Pharmaceutical Science - PHA-30019 The Pharmaceutical Industry at the Cutting Edge - PHA-30021 |

| Key or Transferable Skills (graduate attributes) | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| A professional and reflective approach, including qualities of leadership, responsibility, personal integrity, empathy, care and respect for others, accountability and self-regulation | The Pharmaceutical Industry at the Cutting Edge - PHA-30021<br>Pharmaceutical Science Research Project - PHA-30025<br>Current Developments in Pharmaceutical Science - PHA-30019 |
| The flexibility to thrive in rapidly changing and uncertain external environments and to update skills and knowledge as circumstances require | Pharmaceutical Science Research Project - PHA-30025<br>Current Developments in Pharmaceutical Science - PHA-30019<br>The Pharmaceutical Industry at the Cutting Edge - PHA-30021 |

# 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<br><br>You must accumulate at least 270 credits in your main subject (out of 360 credits overall), with at least 90 credits in each of the three years of study, to graduate with a named single honours degree in this subject.<br><br>In addition, students whose credits include 60 credits for modules provided by the language centre can, depending on the CEFR-level of those modules, be additionally awarded the notation on their degree certificate of "with competency" or "with advanced competency" in their chosen language. |
| **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 this programme at Keele reflects the broad range of knowledge and skills that are developed as you progress through the degree programme. Teaching staff 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 on your programme:

- The assessments used in this programme reflect a wide range of academic practice and are also designed to be relevant to the needs of the industry. For example, the synoptic assessment collates and integrates learning across science and business at Level Five of the programme, whilst the use of batch record sheets in laboratory sessions reflect practice in industry (pharmaceutical and otherwise). The main modes of assessment are examinations (essay-based, short-answer questions and multiple choice questions), laboratory practical exercises (with associated report-writing and documentation completion, as well as physical sample preparation and analysis), workshops (including pharmaceutical calculations), group and individual presentations and synoptic exercises.

Marks are awarded for summative assessments designed to assess your achievement of learning outcomes. You will also be assessed formatively to enable you to monitor your own progress and to assist staff in identifying and addressing any specific learning needs. Feedback, including guidance on how you can improve the quality of your 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.

At all levels (4-6), Low Stakes Assessments (LSAs) have been introduced to aid student engagement on the

course. These contribute to a range of assessments at all levels.

## 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**

|  | **Scheduled learning and teaching activities** | **Guided independent Study** | **Placements** |
|---|---|---|---|
| **Year 1 (Level 4)** | 24% | 76% | 0% |
| **Year 2 (Level 5)** | 29% | 71% | 0% |
| **Year 3 (Level 6)** | 29% | 71% | 0% |

## 12. Accreditation

This programme is not currently accredited by an external body. However, discussions have begun with the Academy of Pharmaceutical Sciences and The Royal Society of Chemistry to begin the process of accreditation by both those bodies. Students will be updated as appropriate to any changes in the status of these processes.

## 13. University 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/

## 14. What are the typical admission requirements for the Programme?

See the relevant course page on the website for the admission requirements relevant to this programme: https://www.keele.ac.uk/study/

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 Science Foundation Year (SFY) programme. Progression from the SFY to the first year of the BSc (PSTB) requires students to achieve a minimum of 60% overall and in each module studied.

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 a minimum of 6.5 in each sub-component, or equivalent.

**English for Academic Purposes**

Please note: All new international students entering the university will sit a diagnostic language assessment. Using this assessment, the Language Centre may allocate you to an English language module which will become compulsory. This will replace any GCP modules. *NB:* students can take an EAP module only with the approval of the English Language Programme Director and are not able to take any other Language modules in the same academic year.

English Language Modules at Level 4:

- Business - ENL-90003 Academic English for Business Students (Part 1); ENL-90004 Academic English for Business Students (2)
- Science - ENL-90013 Academic English for Science Students
- General - ENL-90006 English for Academic Purposes 2; ENL-90001 English for Academic Purposes 3; ENL-90002 English for Academic Purposes 4

Recognition of Prior Learning (RPL) is considered on a case-by-case basis and those interested should contact the Programme Director. The University's guidelines on this can be found here: http://www.keele.ac.uk/qa/accreditationofpriorlearning/

## 15. How are students supported on the programme?

*Keele Online Learning Environment*

New students will be assigned a username and password that provides access to the main University network, email and the Internet. Keele Learning Environment (KLE) - The KLE is used by Keele to provide every student and member of staff with a personal teaching and learning workspace that can be accessed through the internet. This is where you will find all the teaching materials that are associated with the course. You will also find copies of all the BSc (PSTB) guidance documents and a section where you can access careers support information, as well as the teaching materials for the BSc course.

You should regularly access the KLE, ideally on a daily basis, since it provides the most accurate and up-to-date information with regard to your course. Online help for the KLE can be found here: http://www.keele.ac.uk/klehelp. New students will be provided with log-in details and an introductory session on the use of the KLE soon after registration.

*Communication with Students*

The School of Pharmacy and Bioengineering and other University services will contact you intermittently with important information related to your studies. The primary channel for communication will be your Keele email address. It is expected that you will check your Keele email regularly, and you are responsible for reading University emails and taking action if appropriate. The secondary channel for communication is through the post so please ensure that you keep your address details up-to-date on SCIMS. This information may include details of assessments and notification of changes to teaching sessions. The School of Pharmacy and Bioengineering will not send information to any personal email addresses.

*Sources of help and advice*

You will find that all staff associated with the School of Pharmacy and Bioengineering - for both the MPharm and BSc programmes - are friendly and approachable, and you should not feel worried or inhibited about going to see them at any time. Please do not hesitate to contact your Academic Mentor, your Year Tutor, the Director of Learning and Teaching for the BSc or MPharm or, if you prefer, any other member of staff if you require help or advice on any matter that affects your academic progress or any other aspect of your life at Keele.

*Academic Mentors*

Your Academic Mentor is a first point of contact for general guidance on academic and career development and, in consultation with yourself, may refer you to specialist academic support services within the University. Your Academic Mentor can also provide advice, support and general guidance on non-academic issues or, again, in consultation with yourself refer you to pastoral support services within the University, where necessary. Your Academic Mentor will be a member of staff associated with the School of Pharmacy and Bioengineering.

It is important that you inform your Academic Mentor or the year / module tutor of any circumstances, medical or otherwise, that may affect your academic work.

Your Academic Mentor may have particular office hours or you may have to arrange an appointment; you should contact your Academic Mentor by telephone or email if you wish to discuss a particular issue but do not hesitate to approach your Mentor immediately if there is a problem that you wish to discuss urgently. If you cannot contact your Academic Mentor, you may contact the Senior Mentor, Dr Gary Moss, Programme Director, who oversees the Academic Mentoring system for the BSc programme. You can find the University's Code of Practice for Academic Mentoring at: https://www.keele.ac.uk/policyzone/data/academicmentoringcodeofpractice/

*Reference requests*

You should always give the name and contact details of your Academic Mentor if you are asked to provide a contact for references when applying for jobs. It is courteous always to let your Mentor know each time that you give their contact details to someone, so that they are aware that they may be approached.

Your first point of contact should always be your Academic Mentor, but you may also approach other members of the academic staff to write a reference for you but only if more than one academic reference is required. In

these circumstances you must ask the permission of that person in advance. In addition to being a professional courtesy, this is to ensure that staff members are aware that they may be approached by employers.

Your Mentor or other referees will ensure that it is as accurate as possible and will familiarise themselves with both your academic performance and the levels of application and professionalism that you have demonstrated during your time on the course. Please note that if your attendance record is poor or if you have been found guilty of academic misconduct or unprofessional behaviour then this may be reflected in your reference, and hence may jeopardise your chance of success with your application. You should note that nowadays employers routinely ask whether students have been subject to fitness to practise investigations.

*Progress interviews with your Academic Mentor*

If you are new to the programme you will be introduced to your Academic Mentor in your second week.

All students will meet regularly with Academic Mentors throughout their time at Keele. There will be reminders in your timetable when the meetings are due throughout the year. The meetings are to give feedback on your academic progress, and to give you the opportunity to raise any matters of concern.

Meetings with your Mentor are treated in confidence. A note of the meeting will be kept on your personal record but access to this is limited. If it is necessary to keep details of sensitive information, such as medical conditions relating to missed assessments, then access to this type of information is strictly limited.

*Additional help and Guidance*

Additional information relating to student welfare and support can be found through:

*Advice and Support at Keele - ASK*

Located on the ground floor of KeeleSU (the Students' Union), ASK delivers independent advice on a whole range of issues, including academic, health, family, wellbeing, accommodation, finance, legal, international and employment. The advice and support that ASK offers is free, confidential, non-judgemental and impartial. Our trained Education and Welfare Advisors are here to help, just ASK. For more information, please visit www.keelesu.com/advice or come and see us between Mon-Fri 10.00am to 12.30pm and 1.00pm to 4.00pm.

# 16. Learning Resources

The PC suite in the Atrium of the Lennard-Jones laboratories is available during normal working hours and evenings. The PCs run a variety of programs relevant to the Pharmacy programme and you can access the Internet and email, but please show consideration for other users and don't spend excessive periods on social activities. You can also print lecture notes and laboratory scripts from these computers. You must not eat, drink or use a mobile telephone in the PC suite. Photocopiers for student use are available in the University Library.

## The University Library

The University Library's mission is to provide effective access to all forms of academic information in support of the University's teaching, learning and research. We have two Library sites, the main Campus Library and the Health Library at the Royal Stoke Hospital. We offer over 1,100 study spaces and extensive opening hours - the Campus Library is open 24/7 during semester and the Health Library seven days a week all year (except bank holidays). Students can work in a variety of study environments, ranging from group to silent study, and can also book rooms for either purpose. There's also a refreshment area in the Campus Library, and Wi-Fi access is available on both our sites. Our academic collections are provided both online and in print. We subscribe to around 20,000 e-journals, 300,000 e-books and have over 600,000 items on our shelves. Students can access many reading lists online, and our "Catalogue Plus" service can be used to find relevant information both in print and online via a single easy-to-use web catalogue. Books can normally be borrowed for two weeks, one week or one day, depending on demand for the title. Students can get help from our staff at the Library's InfoPoint, and throughout the year. Liaison Librarians provide an extensive range of training tailored to help students with their research and information skills. Find out more about our services from our website: http://www.keele.ac.uk/library/. Accessing e-journals off campus - Access to Keele's e-resources is through your Keele username and password. When you reach the journal home page look out for a link called "institutional log-in" or "Shibboleth log-in", select the UK Federation and then Keele University and log in using your IT Account username and password (the log-in you use to access the Campus network) when you reach the usual yellow Keele log-in screen. Visit http://www.keele.ac.uk/library/support/access/ for more information, including our Off-campus Access Step by Step guide and a series of short you-tube videos to assist with off-campus log-ins to each individual publisher.

Please note that past examination papers from the BSc Pharmaceutical Science programme are currently not made available via the library, or from any other source. While it is important that you are familiar with the format of exams and assessments, when it comes to passing it is much more important that you understand the material that you have learned in the module. Sample questions and / or sample exam papers will be made available via the KLE where appropriate to ensure that students are familiar with the style of questions used in

any given exam paper. If you have any comments concerning the provision of materials in the University Library you should ask your representative on the SSLC to raise the matter at a BSc (PSTB) Course Committee meeting.

**IT Services**

IT Services are responsible for your IT systems and networks throughout the University. The services include the wireless network, printing service, IT Suite and Labs, Laptop Loan and Laptop repair service. They provide help and advice on using Keele Systems such as the Keele Learning Environment, eVision, Office software or Google Mail and apps and advice when connecting to the wireless network (eduroam). Eduroam is now available at the Royal Stoke Hospital site, enabling student access to the internet whilst on placement.

The IT Service Desk is the first point of call for anything IT related. It is based in the Campus Library and IT Services building and is open 7 days per week throughout the Semester. For further information regarding IT Services, or to report a problem or seek advice please visit www.keele.ac.uk/it.

Within the School of Pharmacy and Bioengineering there is a team of IT technicians who are responsible for the day-to-day IT needs of the School, including network issues and more specialised software used by the School. They can be contacted at pharmacy.it@keele.ac.uk

Remember when using Keele University IT systems that you are bound by the IT Conditions of Use, a link which can be found at: www.keele.ac.uk/it. It is important that you familiarise yourself with these to ensure that you use the systems within the terms of the Acceptable Use Policy.

Keep yourself safe whilst online:

- Make sure that before connecting to the network your antivirus, web browser and operating system are all up to date.
- Protect your personal information. Secure your account by changing your password to something that is memorable but secure, a combination of capital and lowercase letter.
- Ensure that your online presence, particularly in social media, has the security set to a level you are comfortable with.
- If you receive an email or message that sounds too good to be true you are probably best deleting it. Do not give out personal information to a non-accredited website or link.

If in doubt about staying safe whilst online, check with someone you can trust like IT Services.

# 17. Other Learning Opportunities

**Study abroad (semester)**

Students on the programme have the potential opportunity to spend a semester abroad in their second year studying at one of Keele's international partner universities. Please note that students cannot take both a Global Challenge Pathway (GCP) and the semester abroad option.

Exactly which countries are available depends on the student's choice of degree subjects. An indicative list of countries is on the website (http://www.keele.ac.uk/studyabroad/partneruniversities/); however this does not guarantee the availability of study in a specific country as this is subject to the University's application process for studying abroad.

No additional tuition fees are payable for a single semester studying abroad but students do have to bear the costs of travelling to and from their destination university, accommodation, food and personal costs. Depending on the destination they are studying at additional costs may include visas, study permits, residence permits, and compulsory health checks. Students should expect the total costs of studying abroad to be greater than if they study in the UK, information is made available from the Global Education Team throughout the process, as costs will vary depending on destination.

Whilst students are studying abroad any Student Finance eligibility will continue, where applicable students may be eligible for specific travel or disability grants. Students who meet external eligibility criteria may be eligible for grants as part of this programme. Students studying outside of this programme may be eligible for income dependent bursaries at Keele. Students travel on a comprehensive Keele University insurance plan, for which there are currently no additional charges. Some governments and/or universities require additional compulsory health coverage plans; costs for this will be advised during the application process.

# 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 costs for this undergraduate programme.

# 19. Quality management and enhancement

The quality and standards of learning in this programme are subject to a continuous process of monitoring, review and enhancement.

- The School Education Committee is responsible for reviewing and monitoring quality management and enhancement procedures and activities across the School.
- Individual modules and the programme as a whole are reviewed and enhanced every year in the annual programme 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 Revalidation process.

Student evaluation of, and feedback on, the quality of learning on every 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 annual programme review.
- Findings related to the programme 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 programme is considered and acted on at regular meetings of the Student Staff Voice 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 programme described in this document has been drawn up with reference to, and in accordance with the guidance set out in, the following documents:

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

## Version History

### This document

**Date Approved:** 04 July 2023

### Previous documents

| Version No | Year | Owner | Date Approved | Summary of and rationale for changes |
|---|---|---|---|---|