Programme Specification: Undergraduate

For Academic Year 2025/26

1. Course Summary

Names of programme and award title(s)	Master in Biochemistry (MSci) Master in Biochemistry (MSci) with International Year (see Annex for details) Master in Biochemistry (MSci) with Work Placement Year (see Annex for details) Master in Biochemistry with Neuroscience (MSci) Master in Biochemistry with Neuroscience (MSci) with International Year (see Annex for details) Master in Biochemistry with Neuroscience (MSci) with Work Placement Year (see Annex for details)
Award type	Single Honours (Masters)
Mode of study	Full-time
Framework of Higher Education Qualification (FHEQ) level of final award	Level 7
Normal length of the programme	4 years; 5 years with either the International Year or Placement Year between years 2 and 3
Maximum period of registration	The normal length as specified above plus 3 years
Location of study	Keele Campus
Accreditation (if applicable)	This programme is not currently accredited.
Regulator	Office for Students (OfS)
Tuition Fees	**UK students:** Fee for 2025/26 is £9,535* **International students:** Fee for 2025/26 is £17,700** The fee for the international year abroad is calculated at 15% of the standard year fee The fee for the work placement year is calculated at 20% of the standard year fee

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.*

** 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/*

** *These fees are for new students. 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/*

2. What is an Integrated Master's programme?

The Master's level programme described in this document allows you to focus exclusively on the study of Biochemistry to an advanced level, with additional flexibility to tailor a route of study across the programme with a Neuroscience focus, depending on your interests. Integrated master's awards are delivered through a programme that combines study at a bachelor's degree with honours with study at master's level. As such, a student graduates with an integrated master's degree after a single four-year programme of study. The Integrated Masters programme described in this document allows graduates to gain enhanced skills and knowledge to master's level.

3. Overview of the Programme

The Keele Biochemistry programmes provide a broad and varied coverage of modern biochemistry, where you will investigate some of the most exciting areas of 21st century life science and medical research. Studying life at the molecular level, you will investigate contemporary topics in the biosciences, from unlocking the secrets of the human genome to the individually tailored molecular therapies of the future.

MSci Biochemistry:

For those choosing to follow the standard MSci Biochemistry route, you will develop a deeper understanding of important structure-function relationships of life's major building blocks including nucleic acids, carbohydrates and proteins, considering such topics as how knowledge of the three-dimensional structure of biological macromolecules gives us insight into the regulation of the activity of cells and their interactions within multicellular organisms. You will explore how this advances our understanding of diverse biological processes from the regulation of gene expression and the progress and control of major metabolic pathways to the structure and function of enzymes, antibodies, hormones and receptors. You will also consider how such knowledge is being applied in areas of biotechnology in diverse topics ranging from the production of novel therapeutics, to tackling wider environmental and societal issues. You will investigate how biochemical knowledge is applied in modern drug discovery, applying an understanding of the molecular principles underpinning the study of biochemistry and macromolecular structure to ligand-target interactions and rational drug design, as well as important structure-function relationships of medically important carbohydrates. The programme places particular emphasis on human and mammalian biochemistry and how this is advancing our understanding of the molecular basis of conditions ranging from diabetes and cancer to the interactions of microorganisms and viruses with their hosts as agents of infectious disease, and how this can be controlled.

MSci Biochemistry with Neuroscience route:

For those choosing to follow the MSci Biochemistry with Neuroscience route, your study of Biochemistry will take a more focused pathway through core areas of the discipline from understanding the structure-function relationships of the major building blocks of life including nucleic acids, carbohydrates and proteins to the regulation and control of major metabolic pathways, gene expression and cellular activity. As you progress through the course you will apply core knowledge of these topics to understanding the structure and function of antibodies, hormones and cell receptors and their roles within multicellular organisms, as well as experimental methods applied in areas of biotechnology and genetic engineering. Alongside study in core areas of Biochemistry you will also study a strand of Neuroscience focused modules across all three years of the course where you apply your knowledge of cellular biochemistry and molecular biology to the study of the nervous system. This will provide you with a strong grounding in key principles of neuroanatomy, neurophysiology and neuropharmacology. You will explore how such knowledge from across both disciplines is advancing our understanding of the molecular basis and treatment of conditions ranging from diabetes and cancer, to neuropathologies such as Alzheimer's and Parkinson's disease, schizophrenia and other disorders of the central and peripheral nervous systems.

MSci Biochemistry and MSci Biochemistry with Neuroscience routes:

A comprehensive laboratory programme runs throughout the course across both routes utilising our state-of-the-art David Attenborough laboratories, where you will develop key skills in diverse biochemical and molecular biology techniques as appropriate to your chosen pathway. Here you will directly apply theoretical knowledge from across the programme and develop skills in experimental study design and optimisation through experiential, enquiry-based learning, culminating in your final year research project. You will also develop key transferable and employability skills related to the critical evaluation of scientific literature, data analysis and interpretation, including computational and bioinformatics tools, effective communication in a variety of formats, and teamwork. Options to include a work placement year, study abroad for a semester or an international year of study provide further experiential learning opportunities developing additional employability skills. Shorter optional placement modules provide added flexibility for experiential learning alongside your studies in a range of industries and employer settings, including an education-focused optional module for those interested in a

career in teaching. A range of final year optional modules in areas of cutting-edge bioscience research gives you greater flexibility to tailor the structure and content of your programme to your own interests and career goals.

The MSci fourth year of study is designed to enable you to enhance your employability and subject-specific knowledge through development of advanced problem solving and communication skills. You will develop enhanced research skills in the critical evaluation of scientific literature and in the design and conduct of an authentic research study. An experiential period of professional practice immersed in research culture during the final year extended research project will support you in developing higher-level independent technical and analytical skills through hypothesis-driven enquiry, supported by your academic supervisor and wider research team. The skills and attributes developed here will be of particular value for those looking to continue in a research career, such as further study to PhD level, working in industry or wider bioscience sector.

Distinctive features of the course include:

- A contemporary curriculum, with a focus on biochemistry and molecular biology, and their applications to the study of health and disease, with a research-focused final year developing higher-level research and analytical skills;
- The option to follow a more focused route of study in Biochemistry alongside a suite of Neuroscience modules, applying key biochemical concepts to the study of the nervous system;
- Innovative and relevant assessments, designed to foster creativity and develop a diverse range of key employability skills and attributes;
- A core laboratory programme delivered in our state-of-the-art David Attenborough and Central Science Laboratories where you develop hands-on practical skills in the design and conduct of authentic research studies, with a wide range of final year research project choices supporting your final year extended MSci project;
- A comprehensive programme of academic and professional development workshops supporting you in acquiring and reflecting on key employability skills aligned with your career goals;
- Our Undergraduate Student Research Conference and MSci conference, where you will present the outcomes of your research projects in the context of a realistic research conference experience;
- The option to engage in deeper experiential learning opportunities through undertaking a Work Placement year between level 5 and level 6, or as shorter placement options alongside your studies, or to include study abroad either as a semester abroad at level 5 or an International Year between level 5 and level 6;
- The opportunity to study a language alongside your programme.

4. Aims of the programme

The broad aims of the programme are to:

- provide you with core knowledge and understanding to an advanced level in Biochemistry or Biochemistry with applications to the study of Neuroscience;
- produce skilled and motivated graduates who are suitably prepared for further study, particularly in a research environment or for employment in the bioscience industry or wider field;
- cultivate interest in the biosciences, particularly at the cellular and molecular level, within a caring and intellectually stimulating environment;
- promote the development of a range of employability skills, for use in all areas where numeracy and an objective, scientific approach to problem-solving are valued, including the critical appraisal and evaluation of data;
- promote the development of independent research skills to an advanced level through experiential and enquiry-based learning, supported with an in-depth final year research project as an extended period of professional practice, enabling you to undertake further relevant postgraduate study or enter employment.

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
- Intellectual skills
- Key or transferable skills (including employability skills)

Subject knowledge and understanding

Successful students will be able to demonstrate knowledge and understanding of:

- the chemistry that underlies biological process and their study, including chemical and thermodynamic principles applied to biochemical catalysis and the role of enzymes and other proteins in determining the function and fate of cells and organisms.
- the essential features of cell metabolism and its control, developing from a broad understanding of core

processes related to cellular respiration and photosynthesis to the application of this in context to acquired and inherited disease
- the principles that determine the three-dimensional structure of biological macromolecules (including nucleic acids, proteins and carbohydrates) and be able to explain detailed examples of how structure enables function, including the application of this knowledge in context to drug design
- the molecular basis of genetics and gene expression, including the structure, arrangement, expression, and regulation of genes, and relevant experimental methods for their study and/or manipulation
- the structure, function and organisation of a wide range of cell types (both prokaryotic and eukaryotic) and tissues, including subcellular organelles and transport processes
- the signal transduction mechanisms of extra- and intra-cellular receptors in cell signalling pathways controlling cellular activities and how these can be investigated experimentally
- the innate and adaptive immune system, including the main cell types involved, the structural basis for pathogen recognition and key effector functions related to host defence, and experimental methods for their study or manipulation
- experimental methods for the investigation of relevant areas of biochemistry and molecular biology, including the scientific method, hypothesis-driven investigation and the critical nature of evidence and scientific debate
- current developments in biochemistry and molecular biology, including areas of ethical or public concern
- the principles and applications of cutting-edge research methodologies and techniques in the study of Biochemistry and wider Biosciences to an advanced level

Successful students following the **MSci Biochemistry with Neuroscience** route will, in addition to more focused study in those areas listed above, be able to demonstrate knowledge and understanding of:

- cellular and gross anatomical features of, the developing and adult, peripheral and central nervous system
- neuronal function, from single cell to neuronal networks and the physiological principles underlying neuronal activity
- neuronal mechanisms of cognitive function and the relationship to the same phenomena at the behavioural level
- cellular and molecular mechanisms underlying select neuropathologies

Subject specific skills

Successful students will be able to:

- critically evaluate scientific literature to an advanced level with a full and critical understanding, while addressing such questions as content, context, aims, objectives, quality of information, and its interpretation and application
- demonstrate competence in a range of core and advanced laboratory techniques and employ a variety of methods (including computational studies related to bioinformatics and the use of small molecule and macromolecular databases) in investigating, acquiring, recording and analysing information relevant to biochemistry and molecular biology
- design, conduct, analyse, report and evaluate biochemical experiments, with critical appraisal of the validity, accuracy, calibration, precision and reproducibility of results and disseminate outcomes in a variety of formats
- critically evaluate complex methodologies and research techniques to an advanced level in areas of contemporary Biochemistry
- work safely and responsibly in the laboratory with awareness of standard procedures such as risk assessment, COSHH, and relevant health and safety regulations
- recognise philosophical and ethical issues relevant to the subject, including those relating to animal welfare and procedures for obtaining informed consent
- apply scientific method, planning and analytical skills to carry out an enquiry based, authentic research project with critical appraisal of research impact
- apply biochemical understanding to familiar and unfamiliar problems

Intellectual skills

Successful students will be able to:

- critically assess the merits of contrasting theories, paradigms, concepts or principles and develop reasoned arguments
- identify, analyse and solve problems by a variety of methods, either individually and/or cooperatively
- make critical interpretations, evaluations and judgements of data
- obtain, analyse and summarise several lines of subject-specific evidence to formulate and test hypotheses, with critical interpretation of quantitative and qualitative research findings
- take responsibility for their own learning and reflect upon that learning
- report on the outcomes of research and other scholarly activity in an appropriate academic style using and referencing relevant ideas and evidence, with a critical awareness of the importance of academic and research integrity

Key Employability skills

Successful students will be able to:

- develop an adaptable, flexible, sustainable and effective approach to learning and study, including time management, creativity and intellectual integrity
- acquire, analyse, synthesise, summarise and present information and ideas from a wide range of sources: textual, numerical, verbal, graphical
- prepare, process, interpret and present data, using appropriate qualitative and quantitative techniques, statistical programmes, spreadsheets and programs for acquiring and presenting data visually to an advanced level
- use a range of digital resources effectively and critically as a means of communication and a source of information
- cite and reference work in an appropriate manner, ensuring academic integrity
- communicate effectively to a variety of audiences by written, spoken and graphical means using appropriate techniques and scientific language
- develop skills necessary for self-managed and lifelong learning, including working independently, organisational, enterprise and knowledge transfer skills
- work with others to identify and achieve collaborative goals and responsibilities and perform in a respectful manner that is accepting of the viewpoints and opinions of others
- motivate themselves and sustain that motivation over an extended period of time
- identify and work towards targets for personal, academic and career development

Keele Graduate Attributes

The Keele Graduate Attributes are the qualities (skills, values and mindsets) which you will have the opportunity to develop during your time at Keele through both the formal curriculum and also through co- and extra-curricular activities (e.g., work experience, and engagement with the wider University community such as acting as ambassadors, volunteering, peer mentoring, student representation, membership and leadership of clubs and societies). Our Graduate Attributes consist of four themes: **academic expertise, professional skills, personal effectiveness, and social and ethical responsibility.** You will have opportunities to engage actively with the range of attributes throughout your time at Keele: through your academic studies, through self-assessing your own strengths, weaknesses, and development needs, and by setting personal development goals. You will have opportunities to discuss your progress in developing graduate attributes with, for example, Academic Mentors, to prepare for your future career and lives beyond Keele.

6. How is the programme taught?

Diversity, flexibility and inclusivity is at the heart of our Education Strategy. Your Student Voice helps us to shape what we do and we include students, local employers and professional bodies in our decision-making process.

The delivery of our programme will include the following types of activities:

- **Digital resources**: These include provision of short videos and directed reading, aligned with key learning outcomes and supporting campus-based lectures, tutorials and workshops focused on active learning through application of content as part of a 'flipped classroom' approach to delivery. This also gives you more flexibility to decide how, when and where to study, with the opportunity to submit questions based on the material anonymously in advance of taught sessions.
- **Campus-based tutorials and workshops**. Designed to promote active learning through application and discussion of core knowledge, building on pre-session digital resources. Tutorials and workshops help promote social learning, develop a sense of community and give you an opportunity to deepen your understanding of core issues, ask questions, reflect on your own learning, and discuss content with other students and your tutors. Other workshops will also support data analysis and report writing, developing wider academic skills including IT literacy and cutting-edge skills in computational and bioinformatic analysis.
- **Laboratory practicals.** A comprehensive laboratory programme covering a wide range of modern biochemical and molecular biology techniques, applying theoretical knowledge from across the course, training you in the skills needed for a career in biochemistry. You will develop skills in experimental design through enquiry-based learning, ensuring you develop both independent and team-based skills.
- **Case-based learning (CBL) tutorials**. Students are expected to play a full part and, often, to lead these discussions. In particular, case-based learning (CBL) is a student-centred style, based on case studies that help you contextualise content taught across other modules. You will also develop key employability skills such as leadership, communication and evidence-based problem solving.
- **Live, online tutorials, workshops and drop-in sessions**. These additional sessions to the core academic programme cover topics common to all students in the Life Sciences such as developing skills in effective note taking, literature analysis and science communication, and support development of employability skills through reflection on guest sessions delivered by alumni and invited speakers from industry and wider careers.
- **Independent study**. Based on directed reading from text books, research papers and other media to support your learning of the core material and deepen your understanding of the subject.

- Your third year **Research Project** gives you the opportunity to undertake a piece of independent experimental research supervised and supported by a member of staff in a selected area of contemporary Biochemistry aligned with your interests and supporting your progression to the MSci final year.
- **MSci study at level 7 (fourth year):** This will further develop your research skills in the critical evaluation of scientific literature and an extended research project will give you the opportunity to design and conduct an in-depth research project in an area of Biochemistry and/or Neuroscience, including formulating a complete research strategy and producing a grant proposal. Research skills in these areas will also be developed in a series of research seminars and journal club-style presentations/discussion in an Advanced Research Topics module.

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 by contacting module lecturers on a one-to-one basis.

7. Teaching Staff

University life is not just about the content of your degree. It is also an opportunity to network, to speak to people working in fields that excite you. Here in Life Sciences, you will meet a diverse range of staff that you can see by using the following link: https://www.keele.ac.uk/lifesci/people/.

We also invite speakers from the School of Allied Health Professions and Pharmacy, School of Medicine and the University Hospitals of North Midlands to enrich your learning.

Our staff include world-leading researchers, clinical practitioners and experts in learning and teaching. As part of their training, all staff complete post-graduate courses on learning and teaching. Some take this to Masters level and beyond, choosing to specialise in pedagogic research to ensure that our programmes are taught to the very highest standards. Members of the School of Life Sciences hold recognised or accredited teaching qualifications and the majority are Fellows or Associates of the Higher Education Academy (HEA), whilst a number are Senior

Fellows of the HEA. Several Life Sciences' staff members have been awarded Keele's prestigious Excellence in Teaching and Learning awards and several were awarded a KeeleSU Education Award for Academic Mentoring.

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.

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

This programme includes the option for you to take a Global Challenge Pathway. These modules offer you an exciting opportunity to work with students and staff from different disciplines to explore topical global issues such as power and conflict, health inequalities, climate change, generative AI, social justice, global citizenship, and enterprise from different perspectives.

Global Challenge Pathways can be taken as one 15-credit module at Levels 5 and 6. For more information about our Global Challenge Pathways please visit:
https://www.keele.ac.uk/study/undergraduate/globalchallengepathways/

Languages

Alternatively, you could choose to study a modern Language. Language modules are available separately for students at Level 4. At Levels 5 and 6 they are included within the Global Challenge Pathways.

If you choose the Language Specialist pathway, you will automatically be enrolled on a Semester 2 Modern Language module as a continuation of your language of choice as a faculty funded 'additional' module.

Undertaking a Modern Languages module in Semester 2 is compulsory if you wish to continue to the Language Specialist Global Challenge Pathway the following academic year.

For more information about Languages option modules available to you please visit the following webpages.

For new (Level 4) students please visit: https://www.keele.ac.uk/study/languagecentre/

For current (Level 5 and Level 6) students please visit: https://www.keele.ac.uk/students/academiclife/global-challenge-pathways/

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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.

MSci Biochemistry

Year	Compulsory	Optional	
		Min	Max
Level 4	120	0	0
Level 5	105	15	15
Level 6	75	45	45
Level 7	120	0	0

Module Lists

Level 4

Compulsory modules	Module Code	Credits	Period
Molecules of Life	LSC-10097	30	Semester 1
Molecular Principles and Applications of Biochemistry	LSC-10099	30	Semester 1-2
Human Physiology and Anatomy	LSC-10101	30	Semester 1-2
Practical and Academic Skills in Bioscience	LSC-10103	0	Semester 1-2
Molecular Cell Biology	LSC-10066	30	Semester 2

Level 4 Module Rules

LSC-10103: Practical and Academic Skills in Bioscience is a compulsory zero-credit module. All laboratory work across this level of study will be coordinated through this module and assessed within other credit-bearing modules across the year, where appropriate. This module will also develop wider academic skills and includes additional academic support and development material to enhance your overall student experience and develop key employability skills. The module will be passed via attendance to a minimum threshold of 70% of taught laboratory sessions and successful completion of a competency skills audit.

Level 5

Compulsory modules	Module Code	Credits	Period
Molecular, Cellular and Structural Immunology	LSC-20015	15	Semester 1
Microbes, Viruses and Parasites	LSC-20073	15	Semester 1
Applications of Molecular Biology	LSC-20131	15	Semester 1
Drug design	LSC-20087	15	Semester 1-2
Practical and Professional Skills in Bioscience	LSC-20127	0	Semester 1-2
Metabolism in Health and Disease	LSC-20016	15	Semester 2
Research and Analytical Skills	LSC-20056	15	Semester 2
Cell Signalling	LSC-20085	15	Semester 2

Optional modules	Module Code	Credits	Period
Human Genetics	LSC-20050	15	Semester 1
Flexible Work Placement (Level 5)	NAT-20011	15	Semester 1-2
Molecular Ecology and Plant Genetics	LSC-20125	15	Semester 2

Level 5 Module Rules

LSC-20127: Practical and Professional Skills in Bioscience is a compulsory zero-credit module. All laboratory work across this level of study will be coordinated through this module and assessed within other credit-bearing modules across the year, where appropriate. This module will also develop advanced academic skills in literature searching and analysis and includes additional career development workshops, enhancing your overall student experience and developing key employability skills. The module will be passed via attendance to a minimum threshold of 70% of taught laboratory sessions and successful completion of a competency skills audit.

Please note: You cannot take both Flexible Work Placement (Level 5) and Flexible Work Placement (Level 6)

Students studying abroad for one semester at level 5, will undertake relevant lab sessions in LSC-20127 for the semester they are studying at Keele and a pass mark will be based on attendance to a minimum of 70% of the taught laboratory sessions for that semester.

Students studying abroad for one semester will not be eligible to take LSC-20087: Drug Design and instead must take either LSC-20050: Human Genetics (semester 1) or LSC-20125: Molecular Ecology and Plant Genetics (semester 2), depending on which semester they are studying abroad.

Level 6

Compulsory modules	Module Code	Credits	Period
Case Studies in Biotechnology	LSC-30051	15	Semester 1
Professional Development in Bioscience	LSC-30090	0	Semester 1-2
Research Project	LSC-30102	30	Semester 1-2
Employability and Communication Skills in Bioscience	LSC-30106	15	Semester 1-2
Medical Glycobiology (Level 6)	LSC-30065	15	Semester 2

Optional modules	Module Code	Credits	Period
Human Parasitology	LSC-30036	15	Semester 1
Tropical Biology Field Course	LSC-30066	15	Semester 1
Omics Technologies	LSC-30092	15	Semester 1
Structural Immunology	LSC-30110	15	Semester 1
Flexible Work Placement (Level 6)	NAT-30008	15	Semester 1-2
Professional Experience in Education	NAT-30012	15	Semester 1-2
Cancer Biology	LSC-30061	15	Semester 2
Epidemiology	LSC-30084	15	Semester 2

Level 6 Module Rules

Please note: You cannot take both Flexible Work Placement (Level 5) and Flexible Work Placement (Level 6). You also cannot take both Flexible Work Placement (Level 6) and Professional Experience in Education.

Global Challenge Pathways (GCPs)

Students have the option of taking a Global Challenge Pathway, which includes one 15-credit module at Levels 4, 5 and 6, or one 15-credit module at Levels 5 and 6. Students who started a Global Challenge Pathway at Level 4 will continue with the same pathway at Level 5. Students joining Global Challenge Pathways at Level 5 can join any pathway (except TESOL). Students at Level 6 will continue with the same Global Challenge Pathway they studied at Levels 4 and/or Level 5.

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.

Digital Futures	The Digital Futures pathway offers you the opportunity to take an active role in 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. Part of a diverse and interdisciplinary pathway community, you will engage in exciting, impactful collaborative project work in innovative formats on areas that matter most to you. Engaged in real-world scenarios as digital citizens, you will expand, deepen, and mobilise knowledge and skills to drive inclusive, empowering, and sustainable change at local and global levels. **Level 4 Module**: **A digital life: challenges and opportunities (GCP-10005)** **Level 5 Module: Digital World - People, Spaces, and Data (GCP-20005)** **Level 6 Module: Digital Citizenship and Sustainable Futures (GCP-30005)**

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. You will hear from international partners to learn about climate change and sustainability in different international contexts; lead your own projects to drive real change in your communities; and be part of educating and supporting others to help achieve a more sustainable future. **Level 4 Module: Climate Change and Sustainable Futures: Global Perspectives (GCP-10009)** **Level 5 Module: Climate Change and Sustainability: Action and Activism (GCP-20009)** **Level 6 Module: Skills for Sustainability (GCP-30009)**
Social Justice	The Social Justice pathway is based upon a transformative methodology which centres the student's role as 'agents of change' to reflect upon decolonising and feminist, perspectives on social justice, to forge critical outputs to transform the Sustainable Development Goals. You will develop research and engagement skills with local, national, and international partners from Universities, NGOs, International Human Rights frameworks. You will engage with key societal challenges focused upon the Sustainable Development Goals, to develop an intersectional response from identity-based perspectives on race, gender, sexualities and disabilities. 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. **Level 4 Module**: **Reflections on Social Injustices, Past and Present (GCP-10003)** **Level 5 Module: Strategic Interventions for Social Justice (GCP-20003)** **Level 6 Module: Transforming Social Justice; Global Perspectives (GCP-30003)**
Enterprise & the Future of Work	In order to meet the challenges set out in the UN's Sustainable Development Goals we need to understand the power of enterprise and prepare for the future contexts of work, creativity and disruption. By providing you with the skills, knowledge and understanding of global challenges this pathway will prepare you to be part of future-facing solutions. This module 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. **Level 4 Module: Enterprise and the Future of Work (GCP-10007)** **Level 5 Module: Enterprise and the Future of Work: Collaborate to Innovate (GCP-20007)** **Level 6 Module: Enterprise and the Future of Work: Designing Change (GCP-30007)**

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. 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. **Level 4 Module: Key concepts and challenges in global health (GCP-10001)** **Level 5 Module: Using Evidence to Improve Global Health (GCP-20001)** **Level 6 Module: Working to Improve Global Health (GCP-30001)**
Languages & Intercultural Awareness	Communication within and across cultures is inseparable from language, and development of intercultural awareness can enable you to actively contribute to the shaping of an international future. The Language and Intercultural Awareness pathway allows you to engage in genuine interdisciplinary and international exchange and to understand and explore the link between language, culture and communication. Each of the strands we offer provides you with skills and direct experience for active engagement in working to face global challenges. **The Language Specialist**: Become a specialist in one of our languages and graduate with a degree title that includes '... with competency in (Language)' or '... with advanced competency in (Language)'. **The Language Taster:** Explore a new language every year. **The Certificate in TESOL** (Teaching English to Speakers of Other Languages): ***(NB: only available if starting from Level 4)*** Enhance your undergraduate degree by studying the Trinity College Certificate in Teaching English to Speakers of Other Languages (TESOL). As an internationally recognised qualification, you can teach around the world, enabling you to travel whilst helping people develop their English Language Skills. You will also develop many transferable skills which will enhance your future employability. **The Intercultural Explorer:** Through an interdisciplinary understanding of intercultural communication - as both an academic discipline and as a tool to promote and engage in global activity, you will explore the concept of culture. Module content and assessments allow you to examine in-depth the role of both culture and language in, for example, the UN sustainability goals. **Modules available:** **The Language Specialist:** Any Semester 1 Language Module (the level at which you enter will be determined by your previous language learning experiences). **The Language Taster:** Any Semester 1 Language Module (the level at which you enter will be determined by your previous language learning experiences) **The Certificate in TESOL (NB: only available if starting from Level 4):** ENL-10053 TESOL 1 ENL-20007 TESOL 2 ENL-30009 TESOL 3 **The Intercultural Explorer:** ENL-10057 The stories we live by 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/

Level 7

Compulsory modules	Module Code	Credits	Period
Advanced Research Topics in Biochemistry	LSC-40061	30	Semester 1
Literature Review and Grant Proposal	LSC-40065	30	Semester 1
MSci Extended Research Project	LSC-40063	60	Semester 1-2

MSci Biochemistry with Neuroscience

Year	Compulsory	Optional
Level 4	120	0
Level 5	90	30
Level 6	75	45
Level 7	90	30

Module Lists

Level 4

Compulsory modules	Module Code	Credits	Period
Molecules of Life	LSC-10097	30	Semester 1
Introduction to Neuroscience	LSC-10047	30	Semester 1-2
Human Physiology and Anatomy	LSC-10101	30	Semester 1-2
Practical and Academic Skills in Bioscience	LSC-10103	0	Semester 1-2
Molecular Cell Biology	LSC-10066	30	Semester 2

Level 4 Module Rules

LSC-10103: Practical and Academic Skills in Bioscience is a compulsory zero-credit module. All laboratory work across this level of study will be coordinated through this module and assessed within other credit-bearing modules across the year, where appropriate. This module will also develop wider academic skills and includes additional academic support and development material to enhance your overall student experience and develop key employability skills. The module will be passed via attendance to a minimum threshold of 70% of taught laboratory sessions and successful completion of a competency skills audit.

Level 5

Compulsory modules	Module Code	Credits	Period
Applications of Molecular Biology	LSC-20131	15	Semester 1
Molecular, Cellular and Structural Immunology	LSC-20015	15	Semester 1
Neuroscience Research Methods	LSC-20078	30	Semester 1-2
Practical and Professional Skills in Bioscience	LSC-20127	0	Semester 1-2
Metabolism in Health and Disease	LSC-20016	15	Semester 2
Cell Signalling	LSC-20085	15	Semester 2

Optional modules	Module Code	Credits	Period
Neurophysiology	LSC-20135	15	Semester 1
Neurodevelopment	LSC-20077	15	Semester 1
Neuropharmacology	LSC-20061	15	Semester 2
Cellular and Molecular Neuroscience	LSC-20133	15	Semester 1
Flexible Work Placement (Level 5)	NAT-20011	15	Semester 1-2

Level 5 Module Rules

LSC-20127: Practical and Professional Skills in Bioscience is a compulsory zero-credit module. All laboratory work across this level of study will be coordinated through this module and assessed within other credit-bearing modules across the year, where appropriate. This module will also develop advanced academic skills in literature searching and analysis and includes additional career development workshops, enhancing your overall student experience and developing key employability skills. The module will be passed via attendance to a minimum threshold of 70% of taught laboratory sessions and successful completion of a skills audit.

Students must choose a minimum of 15 credits from LSC-20135, LSC-20077, LSC-20133 and LSC-20061.

Please note: You cannot take both Flexible Work Placement (Level 5) and Flexible Work Placement (Level 6)

Students studying abroad for one semester at level 5, will undertake relevant lab sessions in LSC-20127 for the semester they are studying at Keele and a pass mark will be based on attendance to a minimum of 70% of the taught laboratory sessions for that semester.

Students studying abroad for one semester will not be eligible to take LSC-20087: Drug Design and instead must take either LSC-20050: Human Genetics (semester 1) or LSC-20125: Molecular Ecology and Plant Genetics (semester 2), depending on which semester they are studying abroad.

Level 6

Compulsory modules	Module Code	Credits	Period
Employability and Communication Skills in Bioscience	LSC-30106	15	Semester 1-2
Neuropathology	LSC-30118	15	Semester 1
Medical Glycobiology	LSC-30065	15	Semester 2
Research Project	LSC-30102	30	Semester 1-2
Professional Development in Bioscience	LSC-30090	0	Semester 1-2

Optional modules	Module Code	Credits	Period
Structural Immunology	LSC-30110	15	Semester 1
Human Parasitology	LSC-30036	15	Semester 1
Omics Technologies	LSC-30092	15	Semester 1
Models in Neuroscience Research	LSC-30104	15	Semester 1
Tropical Biology Field Course	LSC-30066	15	Semester 1
Cancer Biology	LSC-30061	15	Semester 2
Current Topics in Neuroscience	LSC-30042	15	Semester 2
Regeneration and Repair in the Nervous System	LSC-30039	15	Semester 2
Flexible Work Placement (Level-6)	NAT-30008	15	Semester 1-2
Professional Experience in Education	NAT-30012	15	Semester 1-2

Level 6 Module Rules

Please note: You cannot take both Flexible Work Placement (Level 5) and Flexible Work Placement (Level 6). You also cannot take both Flexible Work Placement (Level 6) and Professional Experience in Education.

Level 7

Compulsory modules	Module Code	Credits	Period
Literature Review and Grant Proposal	LSC-40065	30	Semester 1
MSci Extended Research Project	LSC-40063	60	Semester 1-2

Optional modules	Module Code	Credits	Period
Advanced Research Topics in Biochemistry	LSC-40061	30	Semester 1
Advanced Research Topics in Neuroscience	LSC-40115	30	Semester 1

Level 7 Module Rules

LSC-40115: Advanced Research Topics in Neuroscience is only available for students on the MSci Biochemistry with Neuroscience route. All other MSci Biochemistry students must take LSC-40061: Advanced Research Topics in Biochemistry.

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	
Learning Outcome	**Module in which this is delivered**
the chemistry that underlies biological process and their study, including chemical and thermodynamic principles applied to biochemical catalysis and the role of enzymes and other proteins in determining the function and fate of cells and organisms.	Molecules of Life - LSC-10097 Molecular Cell Biology - LSC-10066 Molecular Principles and Applications of Biochemistry - LSC-10099
the essential features of cell metabolism and its control, developing from a broad understanding of core processes related to cellular respiration and photosynthesis to the application of this in context to acquired and inherited disease	Molecular Principles and Applications of Biochemistry - LSC-10099 Molecules of Life - LSC-10097
the principles that determine the three-dimensional structure of biological macromolecules (including nucleic acids, proteins and carbohydrates) and be able to explain detailed examples of how structure enables function, including the application of this knowledge in context to drug design	Molecules of Life - LSC-10097 Molecular Principles and Applications of Biochemistry - LSC-10099
the molecular basis of genetics and gene expression, including the structure, arrangement, expression, and regulation of genes, and relevant experimental methods for their study and/or manipulation	Molecular Cell Biology - LSC-10066 Relevant examples will be expanded in the CBL sessions associated with LSC-10099: Molecular Principles and Applications of Biochemistry
the structure, function and organisation of a wide range of cell types (both prokaryotic and eukaryotic) and tissues, including subcellular organelles and transport processes	Molecular Cell Biology - LSC-10066 Human Physiology and Anatomy - LSC-10101 Relevant examples will be expanded in the CBL sessions associated with LSC-10099: Molecular Principles and Applications of Biochemistry
the signal transduction mechanisms of extra- and intra-cellular receptors in cell signalling pathways controlling cellular activities and how these can be investigated experimentally	Molecular Cell Biology - LSC-10066 Relevant examples will be expanded in the CBL sessions associated with LSC-10099: Molecular Principles and Applications of Biochemistry
the innate and adaptive immune system, including the main cell types involved, the structural basis for pathogen recognition and key effector functions related to host defence, and experimental methods for their study or manipulation	Human Physiology and Anatomy - LSC-10101
experimental methods for the investigation of relevant areas of biochemistry and molecular biology, including the scientific method, hypothesis-driven investigation and the critical nature of evidence and scientific debate	Molecules of Life - LSC-10097 Practical and Academic Skills in Bioscience - LSC-10103 Molecular Principles and Applications of Biochemistry - LSC-10099
cellular and gross anatomical features of, the developing and adult, peripheral and central nervous system	LSC-10047: Introduction to Neuroscience
neuronal function, from single cell to neuronal networks and the physiological principles underlying neuronal activity	LSC-10047: Introduction to Neuroscience
neuronal mechanisms of cognitive function and the relationship to the same phenomena at the behavioural level	LSC-10047: Introduction to Neuroscience
cellular and molecular mechanisms underlying select neuropathologies	LSC-10047: Introduction to Neuroscience
current developments in biochemistry and molecular biology, including areas of ethical or public concern	All modules

Subject Knowledge and Understanding	
Learning Outcome	**Module in which this is delivered**
the principles and applications of cutting-edge research methodologies and techniques in the study of Biochemistry and wider Biosciences to an advanced level	All modules, particularly LSC-10099 Molecular Principles and Applications of Biochemistry and LSC-10103: Practical and Academic Skills in Bioscience

Subject Specific Skills	
Learning Outcome	**Module in which this is delivered**
critically evaluate scientific literature to an advanced level with a full and critical understanding, while addressing such questions as content, context, aims, objectives, quality of information, and its interpretation and application	All modules
demonstrate competence in a range of core and advanced laboratory techniques and employ a variety of methods (including computational studies related to bioinformatics and the use of small molecule and macromolecular databases) in investigating, acquiring, recording and analysing information relevant to biochemistry and molecular biology	All modules, particularly the practical component of LSC-10103: Practical and Academic Skills in Bioscience
design, conduct, analyse, report and evaluate biochemical experiments, with critical appraisal of the validity, accuracy, calibration, precision and reproducibility of results and disseminate outcomes in a variety of formats	Molecules of Life - LSC-10097 Practical and Academic Skills in Bioscience - LSC-10103 Molecular Principles and Applications of Biochemistry - LSC-10099
critically evaluate complex methodologies and research techniques to an advanced level in areas of contemporary Biochemistry	All modules, particularly LSC-10099 Molecular Principles and Applications of Biochemistry and LSC-10103: Practical and Academic Skills in Bioscience
work safely and responsibly in the laboratory with awareness of standard procedures such as risk assessment, COSHH, and relevant health and safety regulations	Practical and Academic Skills in Bioscience - LSC-10103
recognise philosophical and ethical issues relevant to the subject, including those relating to animal welfare and procedures for obtaining informed consent	Molecular Cell Biology - LSC-10066 Practical and Academic Skills in Bioscience - LSC-10103 Molecular Principles and Applications of Biochemistry - LSC-10099
apply scientific method, planning and analytical skills to carry out an enquiry based, authentic research project with critical appraisal of research impact	Practical and Academic Skills in Bioscience - LSC-10103 Molecular Principles and Applications of Biochemistry - LSC-10099
apply biochemical understanding to familiar and unfamiliar problems	All modules, particularly the practical component of LSC-10103: Practical and Academic Skills in Bioscience and CBL sessions in LSC-10099: Molecular Principles and Applications of Biochemistry

Intellectual skills	
Learning Outcome	**Module in which this is delivered**
critically assess the merits of contrasting theories, paradigms, concepts or principles and develop reasoned arguments	All modules
identify, analyse and solve problems by a variety of methods, either individually and/or cooperatively	All modules, particularly LSC-10103: Practical and Academic Skills in Bioscience and LSC-10099: Molecular Principles and Applications of Biochemistry
make critical interpretations, evaluations and judgements of data	All modules, particularly the practical component of LSC-10103: Practical and Academic Skills in Bioscience
obtain, analyse and summarise several lines of subject-specific evidence to formulate and test hypotheses, with critical interpretation of quantitative and qualitative research findings	Molecular Principles and Applications of Biochemistry - LSC-10099 Practical and Academic Skills in Bioscience - LSC-10103 Molecules of Life - LSC-10097
take responsibility for their own learning and reflect upon that learning	All modules
report on the outcomes of research and other scholarly activity in an appropriate academic style using and referencing relevant ideas and evidence, with an awareness of the importance of academic and research integrity	All modules

Key or Transferable Skills (graduate attributes)	
Learning Outcome	**Module in which this is delivered**
develop an adaptable, flexible, sustainable and effective approach to learning and study, including time management, creativity and intellectual integrity	All modules
acquire, analyse, synthesise, summarise and present information and ideas from a wide range of sources: textual, numerical, verbal, graphical	All modules
prepare, process, interpret and present data, using appropriate qualitative and quantitative techniques, statistical programmes, spreadsheets and programs for acquiring and presenting data visually to an advanced level	All modules with a practical component/data analysis based on content developed in LSC-10103: Practical and Academic Skills in Bioscience
use a range of digital resources effectively and critically as a means of communication and a source of information	All modules
cite and reference work in an appropriate manner, ensuring academic integrity	All modules
communicate effectively to a variety of audiences by written, spoken and graphical means using appropriate techniques and scientific language	All modules
develop skills necessary for self-managed and lifelong learning, including working independently, organisational, enterprise and knowledge transfer skills	All modules
work with others to identify and achieve collaborative goals and responsibilities and perform in a respectful manner that is accepting of the viewpoints and opinions of others	All modules, particularly LSC-10103: Practical and Academic Skills in Bioscience and LSC-10099: Molecular Principles and Applications of Biochemistry
motivate themselves and sustain that motivation over an extended period of time	All modules
identify and work towards targets for personal, academic and career development	All modules and via academic mentors

Level 5

Subject Knowledge and Understanding	
Learning Outcome	**Module in which this is delivered**
the chemistry that underlies biological process and their study, including chemical and thermodynamic principles applied to biochemical catalysis and the role of enzymes and other proteins in determining the function and fate of cells and organisms.	Metabolism in Health and Disease - LSC-20016 Drug design - LSC-20087 Cell Signalling - LSC-20085
the essential features of cell metabolism and its control, developing from a broad understanding of core processes related to cellular respiration and photosynthesis to the application of this in context to acquired and inherited disease	Metabolism in Health and Disease - LSC-20016

Subject Knowledge and Understanding	
Learning Outcome	**Module in which this is delivered**
the principles that determine the three-dimensional structure of biological macromolecules (including nucleic acids, proteins and carbohydrates) and be able to explain detailed examples of how structure enables function, including the application of this knowledge in context to drug design	Drug design - LSC-20087 Molecular, Cellular and Structural Immunology - LSC-20015 Applications of Molecular Biology - LSC-20131
the molecular basis of genetics and gene expression, including the structure, arrangement, expression, and regulation of genes, and relevant experimental methods for their study and/or manipulation	Applications of Molecular Biology - LSC-20131 Molecular Ecology and Plant Genetics - LSC-20125 Human Genetics - LSC-20050
the structure, function and organisation of a wide range of cell types (both prokaryotic and eukaryotic) and tissues, including subcellular organelles and transport processes	Microbes, Viruses and Parasites - LSC-20073 Molecular, Cellular and Structural Immunology - LSC-20015 Metabolism in Health and Disease - LSC-20016
the signal transduction mechanisms of extra- and intra-cellular receptors in cell signalling pathways controlling cellular activities and how these can be investigated experimentally	Molecular, Cellular and Structural Immunology - LSC-20015 Metabolism in Health and Disease - LSC-20016 Drug design - LSC-20087 Cell Signalling - LSC-20085
the innate and adaptive immune system, including the main cell types involved, the structural basis for pathogen recognition and key effector functions related to host defence, and experimental methods for their study or manipulation	Microbes, Viruses and Parasites - LSC-20073 Molecular, Cellular and Structural Immunology - LSC-20015
experimental methods for the investigation of relevant areas of biochemistry and molecular biology, including the scientific method, hypothesis-driven investigation and the critical nature of evidence and scientific debate	All modules, particularly the practical component of LSC-20127: Practical and Professional Skills in Bioscience
cellular and gross anatomical features of, the developing and adult, peripheral and central nervous system	LSC-20078: Neuroscience Research Methods LSC-20077: Neurodevelopment
neuronal function, from single cell to neuronal networks and the physiological principles underlying neuronal activity	LSC-20078: Neuroscience Research Methods LSC-20077: Neurodevelopment LSC-20135: Neurophysiology
neuronal mechanisms of cognitive function and the relationship to the same phenomena at the behavioural level	LSC-20078: Neuroscience Research Methods LSC-20077: Neurodevelopment
cellular and molecular mechanisms underlying select neuropathologies	LSC-20078: Neuroscience Research Methods LSC-20061: Neuropharmacology LSC-20135: Neurophysiology LSC-20133: Cellular and Molecular Neuroscience
current developments in biochemistry and molecular biology, including areas of ethical or public concern	All modules
the principles and applications of cutting-edge research methodologies and techniques in the study of Biochemistry and wider Biosciences to an advanced level	All modules, particularly LSC-20127: Practical and Professional Skills in Bioscience, LSC-20087: Drug Design or LSC-20078: Neuroscience Research Methods

Subject Specific Skills	
Learning Outcome	**Module in which this is delivered**
critically evaluate scientific literature to an advanced level with a full and critical understanding, while addressing such questions as content, context, aims, objectives, quality of information, and its interpretation and application	All modules
demonstrate competence in a range of core and advanced laboratory techniques and employ a variety of methods (including computational studies related to bioinformatics and the use of small molecule and macromolecular databases) in investigating, acquiring, recording and analysing information relevant to biochemistry and molecular biology	Research and Analytical Skills - LSC-20056 Applications of Molecular Biology - LSC-20131 Drug design - LSC-20087 Practical and Professional Skills in Bioscience - LSC-20127
design, conduct, analyse, report and evaluate biochemical experiments, with critical appraisal of the validity, accuracy, calibration, precision and reproducibility of results and disseminate outcomes in a variety of formats	Molecular, Cellular and Structural Immunology - LSC-20015 Research and Analytical Skills - LSC-20056 Metabolism in Health and Disease - LSC-20016 Practical and Professional Skills in Bioscience - LSC-20127
critically evaluate complex methodologies and research techniques to an advanced level in areas of contemporary Biochemistry	Molecular, Cellular and Structural Immunology - LSC-20015 Practical and Professional Skills in Bioscience - LSC-20127 Drug design - LSC-20087
work safely and responsibly in the laboratory with awareness of standard procedures such as risk assessment, COSHH, and relevant health and safety regulations	Practical and Professional Skills in Bioscience - LSC-20127
recognise philosophical and ethical issues relevant to the subject, including those relating to animal welfare and procedures for obtaining informed consent	All modules
apply scientific method, planning and analytical skills to carry out an enquiry based, authentic research project with critical appraisal of research impact	Research and Analytical Skills - LSC-20056 Practical and Professional Skills in Bioscience - LSC-20127 Molecular, Cellular and Structural Immunology - LSC-20015 Metabolism in Health and Disease - LSC-20016 LSC-20078: Neuroscience Research Methods
apply biochemical understanding to familiar and unfamiliar problems	All modules

Intellectual skills	
Learning Outcome	**Module in which this is delivered**
critically assess the merits of contrasting theories, paradigms, concepts or principles and develop reasoned arguments	All modules
identify, analyse and solve problems by a variety of methods, either individually and/or cooperatively	All modules
make critical interpretations, evaluations and judgements of data	All modules
obtain, analyse and summarise several lines of subject-specific evidence to formulate and test hypotheses, with critical interpretation of quantitative and qualitative research findings	All modules, in particular LSC-20016: Metabolism in Health and Disease, LSC-20056: Research and Analytical Skills, LSC-20127: Practical and Professional Skills in Bioscience
take responsibility for their own learning and reflect upon that learning	All modules
report on the outcomes of research and other scholarly activity in an appropriate academic style using and referencing relevant ideas and evidence, with a critical awareness of the importance of academic and research integrity	All modules

Key or Transferable Skills (graduate attributes)	
Learning Outcome	**Module in which this is delivered**
develop an adaptable, flexible, sustainable and effective approach to learning and study, including time management, creativity and intellectual integrity	All modules
acquire, analyse, synthesise, summarise and present information and ideas from a wide range of sources: textual, numerical, verbal, graphical	All modules
prepare, process, interpret and present data, using appropriate qualitative and quantitative techniques, statistical programmes, spreadsheets and programs for acquiring and presenting data visually	Drug design - LSC-20087 Research and Analytical Skills - LSC-20056 Metabolism in Health and Disease - LSC-20016 Molecular, Cellular and Structural Immunology - LSC-20015
use a range of digital resources effectively and critically as a means of communication and a source of information	All modules
cite and reference work in an appropriate manner, ensuring academic integrity	All modules
communicate effectively to a variety of audiences by written, spoken and graphical means using appropriate techniques and scientific language	All modules
develop skills necessary for self-managed and lifelong learning, including working independently, organisational, enterprise and knowledge transfer skills	All modules
work with others to identify and achieve collaborative goals and responsibilities and perform in a respectful manner that is accepting of the viewpoints and opinions of others	All modules, particularly LSC-20127: Practical and Professional Skills in Bioscience
motivate themselves and sustain that motivation over an extended period of time	All modules
identify and work towards targets for personal, academic and career development	All modules and via academic mentors

Level 6

Subject Knowledge and Understanding	
Learning Outcome	**Module in which this is delivered**
the chemistry that underlies biological process and their study, including chemical and thermodynamic principles applied to biochemical catalysis and the role of enzymes and other proteins in determining the function and fate of cells and organisms.	Medical Glycobiology (Level 6) - LSC-30065 Structural Immunology - LSC-30110

Subject Knowledge and Understanding	
Learning Outcome	**Module in which this is delivered**
the essential features of cell metabolism and its control, developing from a broad understanding of core processes related to cellular respiration and photosynthesis to the application of this in context to acquired and inherited disease	Medical Glycobiology (Level 6) - LSC-30065 Cancer Biology - LSC-30061
the principles that determine the three-dimensional structure of biological macromolecules (including nucleic acids, proteins and carbohydrates) and be able to explain detailed examples of how structure enables function, including the application of this knowledge in context to drug design	Medical Glycobiology (Level 6) - LSC-30065 Structural Immunology - LSC-30110
the molecular basis of genetics and gene expression, including the structure, arrangement, expression, and regulation of genes, and relevant experimental methods for their study and/or manipulation	Omics Technologies - LSC-30092 Cancer Biology - LSC-30061
the structure, function and organisation of a wide range of cell types (both prokaryotic and eukaryotic), including subcellular organelles and transport processes	Human Parasitology - LSC-30036 Cancer Biology - LSC-30061 Medical Glycobiology (Level 6) - LSC-30065
the signal transduction mechanisms of extra- and intra-cellular receptors in cell signalling pathways controlling cellular activities and how these can be investigated experimentally	Human Parasitology - LSC-30036 Structural Immunology - LSC-30110 Medical Glycobiology (Level 6) - LSC-30065 Cancer Biology - LSC-30061
the innate and adaptive immune system, including the main cell types involved, the structural basis for pathogen recognition and key effector functions related to host defence and experimental methods for their study or manipulation	Human Parasitology - LSC-30036 Structural Immunology - LSC-30110 Cancer Biology - LSC-30061
experimental methods for the investigation of relevant areas of biochemistry and molecular biology, including the scientific method, hypothesisdriven investigation and the critical nature of evidence and scientific debate	Research Project - LSC-30102 Tropical Biology Field Course - LSC-30066 Employability and Communication Skills in Bioscience - LSC-30106 NAT-30010 Natural Sciences Placement
cellular and gross anatomical features of, the developing and adult, peripheral and central nervous system	LSC-30118: Neuropathology LSC-30042: Current Topics in Neuroscience LSC-30039: Regeneration and Repair in the Nervous System
neuronal function, from single cell to neuronal networks and the physiological principles underlying neuronal activity	LSC-30118: Neuropathology LSC-30042: Current Topics in Neuroscience LSC-30039: Regeneration and Repair in the Nervous System LSC-30104: Models in Neuroscience Research
neuronal mechanisms of cognitive function and the relationship to the same phenomena at the behavioural level	LSC-30118: Neuropathology LSC-30042: Current Topics in Neuroscience
cellular and molecular mechanisms underlying select neuropathologies	Medical Glycobiology (Level 6) - LSC-30065 LSC-30063: Brain Disease LSC-30042: Current Topics in Neuroscience LSC-30039: Regeneration and Repair in the Nervous System LSC-30104: Models in Neuroscience Research LSC-30118: Neuropathology
current developments in biochemistry and molecular biology, including areas of ethical or public concern	All modules

Subject Knowledge and Understanding	
Learning Outcome	**Module in which this is delivered**
the principles and applications of cutting-edge research methodologies and techniques in the study of Biochemistry and wider Biosciences to an advanced level	All modules, particularly LSC-30102 Research Project

Subject Specific Skills	
Learning Outcome	**Module in which this is delivered**
critically evaluate scientific literature to an advanced level with a full and critical understanding, while addressing such questions as content, context, aims, objectives, quality of information, and its interpretation and application	All modules
demonstrate competence in a range of core and advanced laboratory techniques and employ a variety of methods (including computational studies related to bioinformatics and the use of small molecule and macromolecular databases) in investigating, acquiring, recording and analysing information relevant to biochemistry and molecular biology	Research Project - LSC-30102 Omics Technologies - LSC-30092 NAT-30010 Natural Sciences Placement
design, conduct, analyse, report and evaluate biochemical experiments, with critical appraisal of the validity, accuracy, calibration, precision and reproducibility of results and disseminate outcomes in a variety of formats	Research Project - LSC-30102 NAT-30010 Natural Sciences Placement
critically evaluate complex methodologies and research techniques to an advanced level in areas of contemporary Biochemistry	All modules, particularly LSC-30102: Research Project
work safely and responsibly in the laboratory with awareness of standard procedures such as risk assessment, COSHH, and relevant health and safety regulations	Research Project - LSC-30102 NAT-30010 Natural Sciences Placement
recognise philosophical and ethical issues relevant to the subject, including those relating to animal welfare and procedures for obtaining informed consent	Research Project - LSC-30102 NAT-30010 Natural Sciences Placement
apply scientific method, planning and analytical skills to carry out an enquiry based, authentic research project with critical appraisal of research impact	Research Project - LSC-30102 NAT-30010 Natural Sciences Placement
apply biochemical understanding to familiar and unfamiliar problems	All modules

Intellectual skills	
Learning Outcome	**Module in which this is delivered**
critically assess the merits of contrasting theories, paradigms, concepts or principles and develop reasoned arguments	All modules
identify, analyse and solve problems by a variety of methods, either individually and/or cooperatively	All modules, particularly LSC-30102: Research Project
make critical interpretations, evaluations and judgements of data	All modules
obtain, analyse and summarise several lines of subject-specific evidence to formulate and test hypotheses, with critical interpretation of quantitative and qualitative research findings	All modules, particularly LSC-30102: Research Project
take responsibility for their own learning and reflect upon that learning	All modules
report on the outcomes of research and other scholarly activity in an appropriate academic style using and referencing relevant ideas and evidence, with a critical awareness of the importance of academic and research integrity	All modules

Key or Transferable Skills (graduate attributes)	
Learning Outcome	**Module in which this is delivered**
develop an adaptable, flexible, sustainable and effective approach to learning and study, including time management, creativity and intellectual integrity	All modules
acquire, analyse, synthesise, summarise and present information and ideas from a wide range of sources: textual, numerical, verbal, graphical	All modules
prepare, process, interpret and present data, using appropriate qualitative and quantitative techniques, statistical programmes, spreadsheets and programs for acquiring and presenting data visually	All modules, particularly LSC-30102: Research Project, LSC-30084: Epidemiology, LSC-30092: Omics Technologies
use a range of digital resources effectively and critically as a means of communication and a source of information	All modules
cite and reference work in an appropriate manner, ensuring academic integrity	All modules
communicate effectively to a variety of audiences by written, spoken and graphical means using appropriate techniques and scientific language	All modules
develop skills necessary for self-managed and lifelong learning, including working independently, organisational, enterprise and knowledge transfer skills	All modules
work with others to identify and achieve collaborative goals and responsibilities and perform in a respectful manner that is accepting of the viewpoints and opinions of others	All modules will have some elements of group work/discussion/debate, in particular LSC-30051: Case Studies in Biotechnology
motivate themselves and sustain that motivation over an extended period of time	All modules
identify and work towards targets for personal, academic and career development	All modules and via academic mentors

Level 7

These are in addition to the programme learning outcomes listed in the previous tables for levels 4-6, all of which are also developed, where appropriate, in modules across level 7 of the MSci programme.

Subject Knowledge and Understanding	
Learning Outcome	**Module in which this is delivered**
the chemistry that underlies biological process and their study, including chemical and thermodynamic principles applied to biochemical catalysis and the role of enzymes and other proteins in determining the function and fate of cells and organisms.	All modules
the essential features of cell metabolism and its control, developing from a broad understanding of core processes related to cellular respiration and photosynthesis to the application of this in context to acquired and inherited disease	All modules
the principles that determine the three-dimensional structure of biological macromolecules (including nucleic acids, proteins and carbohydrates) and be able to explain detailed examples of how structure enables function, including the application of this knowledge in context to drug design	All modules
the molecular basis of genetics and gene expression, including the structure, arrangement, expression, and regulation of genes, and relevant experimental methods for their study and/or manipulation	All modules
the structure, function and organisation of a wide range of cell types (both prokaryotic and eukaryotic) and tissues, including subcellular organelles and transport processes	All modules
the signal transduction mechanisms of extra- and intra-cellular receptors in cell signalling pathways controlling cellular activities and how these can be investigated experimentally	All modules
the innate and adaptive immune system, including the main cell types involved, the structural basis for pathogen recognition and key effector functions related to host defence, and experimental methods for their study or manipulation	All modules
experimental methods for the investigation of relevant areas of biochemistry and molecular biology, including the scientific method, hypothesis-driven investigation and the critical nature of evidence and scientific debate	All modules
current developments in biochemistry and molecular biology, including areas of ethical or public concern	All modules
the principles and applications of cutting-edge research methodologies and techniques in the study of Biochemistry and wider Biosciences to an advanced level	All modules

Subject Specific Skills	
Learning Outcome	**Module in which this is delivered**
critically evaluate scientific literature to an advanced level with a full and critical understanding, while addressing such questions as content, context, aims, objectives, quality of information, and its interpretation and application	All modules
demonstrate competence in a range of core and advanced laboratory techniques and employ a variety of methods (including computational studies related to bioinformatics and the use of small molecule and macromolecular databases) in investigating, acquiring, recording and analysing information relevant to biochemistry and molecular biology	MSci Extended Research Project - LSC-40063 Advanced Research Topics in Biochemistry - LSC-40061 LSC-40115: Advanced Research Topics in Neuroscience
design, conduct, analyse, report and evaluate biochemical experiments, with critical appraisal of the validity, accuracy, calibration, precision and reproducibility of results and disseminate outcomes in a variety of formats	MSci Extended Research Project - LSC-40063
critically evaluate complex methodologies and research techniques to an advanced level in areas of contemporary Biochemistry	All modules
work safely and responsibly in the laboratory with awareness of standard procedures such as risk assessment, COSHH, and relevant health and safety regulations	MSci Extended Research Project - LSC-40063
recognise philosophical and ethical issues relevant to the subject, including those relating to animal welfare and procedures for obtaining informed consent	All modules
apply scientific method, planning and analytical skills to carry out an enquiry based, authentic research project with critical appraisal of research impact	MSci Extended Research Project - LSC-40063
apply biochemical understanding to familiar and unfamiliar problems	All modules

Intellectual skills	
Learning Outcome	**Module in which this is delivered**
critically assess the merits of contrasting theories, paradigms, concepts or principles and develop reasoned arguments	All modules
identify, analyse and solve problems by a variety of methods, either individually and/or cooperatively	All modules, particularly LSC-40063: MSci Extended Research Project
make critical interpretations, evaluations and judgements of data	All modules
obtain, analyse and summarise several lines of subject-specific evidence to formulate and test hypotheses, with critical interpretation of quantitative and qualitative research findings	All modules, particularly LSC-40063: MSci Extended Research Project
take responsibility for their own learning and reflect upon that learning	All modules
report on the outcomes of research and other scholarly activity in an appropriate academic style using and referencing relevant ideas and evidence, with a critical awareness of the importance of academic and research integrity	All modules

Key or Transferable Skills (graduate attributes)	
Learning Outcome	**Module in which this is delivered**
develop an adaptable, flexible, sustainable and effective approach to learning and study, including time management, creativity and intellectual integrity	All modules
acquire, analyse, synthesise, summarise and present information and ideas from a wide range of sources: textual, numerical, verbal, graphical	All modules
prepare, process, interpret and present data, using appropriate qualitative and quantitative techniques, statistical programmes, spreadsheets and programs for acquiring and presenting data visually	All modules, particularly LSC-40063: MSci Extended Research Project
use a range of digital resources effectively and critically as a means of communication and a source of information	All modules
cite and reference work in an appropriate manner, ensuring academic integrity	All modules
communicate effectively to a variety of audiences by written, spoken and graphical means using appropriate techniques and scientific language	All modules
develop skills necessary for self-managed and lifelong learning, including working independently, organisational, enterprise and knowledge transfer skills	All modules
work with others to identify and achieve collaborative goals and responsibilities and perform in a respectful manner that is accepting of the viewpoints and opinions of others	All modules will have some elements of group work/discussion/debate, in particular LSC-40061: Advanced Research Topics in Biochemistry/LSC-40115: Advanced Research Topics in Neuroscience and the environment of the research group students will work in during their MSci Extended Research Project
motivate themselves and sustain that motivation over an extended period of time	All modules
identify and work towards targets for personal, academic and career development	All modules and via academic mentors

9. Final and intermediate awards

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

Master's Degree **Master in Biochemistry (MSci)** **Master in Biochemistry with Neuroscience (MSci)**	480 credits	You will require at least 120 credits at levels 4, 5, 6 and 7 You must accumulate at least 360 credits in your main subject (out of 480 credits overall) to graduate with a named single honours degree in this subject.
Honours Degree **BSc (Hons) Biochemistry** **BSc (Hons) Biochemistry with Neuroscience**	360 credits	You will require at least 120 credits at levels 4, 5 and 6 You must accumulate a minimum of 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.
Diploma in Higher Education in Biochemistry **Diploma in Higher Education in Biochemistry with Neuroscience**	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 in Biochemistry **Certificate in Higher Education in Biochemistry with Neuroscience**	120 credits	You will require at least 120 credits at level 4 or higher

International Year option: in addition to the above students must pass a module covering the international year in order to graduate with a named degree including the 'international year' wording. Students who do not complete, or fail the international year, will be transferred to the four-year version of the MSci programme.

Work Placement Year option: in addition to the above students must pass a non-credit bearing module covering the work placement year in order to graduate with a named degree including the 'with Work Placement Year' wording. Students who do not complete, or fail the work placement year, will be transferred to the four-year version of the MSci programme.

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.

Our assessment strategy will help you to develop and evidence your ability to:

Provide evidence-based solutions to current scientific problems. Most often this is assessed through a range of case report, portfolios and literature reviews.

Present scientific findings. Often these are lab reports or experimental projects that test your ability to pose scientific hypotheses, design experiments, understand methodologies, present findings, analyse data and situate your work in the current literature. Other assessments will also develop your skills in accessing, manipulating and presenting the outcomes of computational investigations, including in bioinformatics and the use of small molecule and macromolecular databases.

Communicate effectively with a range of audiences. These can include scientific posters, patient information leaflets, wikis, blogs or oral presentations, as well as more standard laboratory reports, proformas and literature reviews.

Work professionally. Your final year, independent research project will give you an opportunity to demonstrate a range of professional skills such as leadership, innovation, time keeping, communication and the ability to work safely and ethically.

Work effectively in a team. Most often this is assessed through group presentations but can also include competencies such as working together in the lab or other group assignments, such as an assessment where you will work in a group on the optimisation and production of commercial laboratory assay kit for metabolite quantification.

Solve problems in a time-limited fashion. Often in the work environment we are asked to solve problems in a relatively short amount of time. Online tests and end-of-semester, online, open-book examinations will help you to evidence these skills.

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, which we aim to provide within three working weeks of submission. This is often phrased in terms of strengths, weaknesses and ways to improve to help you focus on key areas that can improve the quality of your work in the future.

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)	29.8%	70.2%	0%
Year 2 (Level 5)	39.3%	60.7%	0%
Year 3 (Level 6)	23.5%	76.5%	0%
Year 4 (Level 7)	30.1%	69.9%	0%

12. Accreditation

This programme does not have accreditation from an external body.

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/

If this programme has any exemptions, variations or additions to the University Regulations these will be detailed in an Annex at the end of this document titled 'Programme-specific regulations'.

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/

English for Academic Purposes

Please note: All new international students entering the university will provide a sample of Academic English during their registration Using this sample, 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

English Language Modules at Level 5:

- 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

English Language Modules at Level 6:

- Business - ENL-90003 Academic English for Business Students (Part 1); ENL-90004 Academic English for Business Students (2); ENL-90005 Advanced Business English Communication
- 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: https://www.keele.ac.uk/qa/programmesandmodules/recognitionofpriorlearning/

15. How are students supported on the programme?

The School of Life Sciences operates an open door policy. This means that you can contact any of our staff via email to request a meeting or discus any problem that you may be experiencing.

In addition to the open door policy, you can also contact the following people across Life Sciences for help and support:

- Programme Director or Director of Education for programme-, discipline- or School-related issues
- Module Manager for module-related issues
- Demonstrators for help during labs
- Academic mentors for academic help and guidance
- Student Experience and Support Officers for more personal or pastoral help
- Early Resolution Officer to help advocate for you, for example, if you would like to raise a complaint
- Student Voice are a group of students from your programme that can advocate for you to the School

Student Services also offer a comprehensive range of specialist services that help you at any time from enrolment to graduation. The following link will provide more information:

https://www.keele.ac.uk/students/studentservices/

16. Learning Resources

Workshops and tutorials are delivered in modern teaching rooms across the University, including up-to-date PC suites for data analysis and bioinformatics workshops.

Practical sessions are held in dedicated teaching laboratories within the School of Life Sciences over recent years these have been completely refitted, providing modern and well-equipped facilities supporting delivery of a diverse practical programmes (including the David Attenborough laboratories, opened in person by Sir David in 2019). Final year MSci extended research projects will be held in one of our state-of-the-art research laboratories working with a lead academic supervisor.

The learning resources available to you on the Programme include:

- An extensive collection of books and journals held in the University Library on campus, or the health library situated at the University Hospital of North Staffordshire.
- Access to a comprehensive range of ebooks, journals and published papers all available online
- The Keele Learning Environment (KLE) which provides easy access to a wide range of learning resources including learning materials and other guidance/supporting resources, this includes a range of digital resources (bitesize lecture recordings, directed reading, interactive content (e.g. quizzes) and review questions. These support active learning campus-based teaching sessions focused on application and discussion of core learning materials.
- Microsoft Teams for further content development and to facilitate live and interactive discussions, Q&A etc

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.

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 studying in Erasmus+ destinations 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.

Students studying abroad for one semester at level 5, will undertake relevant lab sessions in LSC-20127 for the semester they are studying at Keele and a pass mark will be based on attendance to a minimum of 70% of the taught laboratory sessions for that semester.

Students studying abroad for one semester will not be eligible to take LSC-20087: Drug Design and instead must take either LSC-20050: Human Genetics (semester 1) or LSC-20125: Molecular Ecology and Plant Genetics (semester 2), depending on which semester they are studying abroad.

Study Abroad (International Year)

A summary of the International Year, which is a potential option for students after completion of year 2 (Level 5), is provided in the Annex for the International Year.

Work Placement Year

Students have the opportunity to apply directly for the 4-year 'with Work Placement Year' degree programme or to transfer onto the 4-year degree programme at the end of Year-1 and in Year-2 at the end of Semester 1. Students who are initially registered for the 4-year degree programme may transfer onto the 3-year degree programme at any point in time, prior to undertaking their year-long placement. Eligibility rules are included in the

Annex.

Students wishing to take the work placement year should meet with the Programme Director to obtain their signature to confirm agreement before they will be allowed to commence their placement.

International students who require a Tier 4 visa must check with the Immigration Compliance Team prior to commencing any form of placement.

A summary of the Work Placement Year, which is a potential option for students after completion of year 2 (Level 5), is provided in the Annex for the Work Placement Year.

Secondments. These are shorter work-based placements that usually take place over the summer in between Level 5 and 6 and usually last between 2-8 weeks. They can be based locally in one of our research labs here at Keele, nationally or internationally. For example, often some our students will travel to Malaysia to work with our partner Universiti Sains Malaysia.

Tropical field trip. You could apply for our School tropical field course that takes place in Malaysia. These are often more conservational in nature, but again provide fantastic international experience and of course, will complement and broaden your programme of study in Biochemistry.

Operation Wallacea. This is a private company that supports a wide range of student projects with a particular focus on biodiversity and climate research. More information can be found at: https://www.opwall.com

Note: the opportunities described above are limited and dependent on external providers. We may not be able to offer them every year and there will be additional costs if you do successfully secure a place. We discuss all of these options in more detail across Level 4 and Level 5 so you can make an informed decision.

Other opportunities. There are a number of schemes available from e.g. the Wellcome Trust that provide bursaries for students to gain laboratory experience in the summer vacation between level 5 and 6. Staff in Life Sciences have hosted these bursaries in the past and students who are interested can approach staff, who will have to submit an application on the students' behalf to the funding bodies (usually in January or February). Staff may also be willing to host students in their laboratories during the summer vacation on a voluntary basis. Other learning opportunities for Biochemistry students vary from year to year but include the opportunity to hear from, and talk to, a range of guest speakers and presenters including researchers from around the world. Some of these activities are timetabled as part of taught modules, others are organised separately as part of a school-wide seminar programme, but are widely advertised and undergraduate students are always welcome to attend.

18. Additional Costs

Activity	Estimated Cost
Field course- optional hosted at USM, Malaysia	£1,200
Replacement lab coat (if allocated one is lost)	£10
Total estimated additional costs	£1,210

These costs have been forecast by the University as accurately as possible but may be subject to change as a result of factors outside of our control (for example, increase in costs for external services). Forecast costs are reviewed on an annual basis to ensure they remain representative. Where additional costs are in direct control of the University we will ensure increases do not exceed 5%.

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 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 Postgraduate Taught Experience Survey (PTES), 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 on 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. QAA Subject Benchmark Statement: Biosciences (2023) https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements/subject-benchmark-statement-biosciences
c. Keele University Regulations and Guidance for Students and Staff: http://www.keele.ac.uk/regulations

d. Royal Society of Biology Degree Accreditation Handbook:
https://www.rsb.org.uk/images/Degree_Accreditation_Handbook_July16.pdf

21. Annex - International Year

MSci Biochemistry with International Year; MSci Biochemistry with Neuroscience with International Year

International Year Programme
At Level 5 you can apply to transfer onto our International Year pathway. If successful, you will have an additional year of study at one of our international partner Universities once you have completed Level 5 here at Keele. Students who successfully complete both the second year (Level 5) and the International Year will be permitted to progress to Level 6. Students who fail to satisfy the examiners in respect of the International Year will normally revert to the standard programme and progress to Level 6 on that basis. The failure will be recorded on the student's final transcript. Study at Level 4, Level 5, Level 6 and Level 7 will be as per the main body of this document. The additional detail contained in this annex will pertain solely to students registered for the International Year option.
International Year Programme Aims
In addition to the programme aims for Biochemistry, we also aim to: 1. Enhance your personal development to give you an insight into the international dimension of Biochemistry 2. Give you an experience of a different culture, academically, professionally and socially
Entry Requirements for the International Year

Students may apply to the 4-year programme during Level 5. Admission to the International Year is subject to successful application, interview and references from appropriate staff.

The criteria to be applied are:

- Academic Performance (an average of 55% across all modules in Semester 1 at Level 5 is normally required. Places on the International Year are then conditional on achieving an average mark of 55% across all Level 5 modules. Students with up to 15 credits of re-assessment who meet the 55% requirement may progress to the International Year. Where no Semester 1 marks have been awarded performance in 1st year marks and ongoing 2nd year assessments are taken into account)
- General Aptitude (to be demonstrated by application for study abroad, interview during the 2nd semester of year 2 (Level 5), and by recommendation of the student's Academic Mentor, 1st and 2nd year tutors and programme director)

Students may not register for both an International Year and a Placement Year.

Student Support

We have a dedicated Study Abroad tutor within Life Sciences that will will stay in touch with you throughout your International Year, effectively acting as an additional Academic Mentor. There is also support available for Keele's Global Opportunities Team (https://www.keele.ac.uk/study/studyabroad/)

Learning Outcomes

In addition to the learning outcomes specified in the main text of the Biochemistry Programme Specification, students who complete a Keele undergraduate programme with International Year will be able to:

1. Describe, discuss and reflect upon the cultural and international differences and similarities of different learning environments
2. Discuss the benefits and challenges of global citizenship and internationalisation
3. Explain how their perspective on their academic discipline has been influenced by locating it within an international setting.
4. Use independent research skills to identify relevant information resources on a range of subjects related, or complementary, to Biochemistry.
5. Demonstrate the use of critical thinking skills, augmented by creativity and curiosity, in discussing the application of their International Year studies to Biochemistry.

These learning outcomes will all be assessed by the submission of a satisfactory individual learning agreement, the successful completion of assessments at the partner institution and the submission of the reflective portfolio element of the international year module.

Regulations

Students registered for the International Year are subject to the programme-specific regulations (if any) and the University regulations. In addition, during the International Year, the following regulations will apply:

Students undertaking the International Year must complete 120 credits, which must comprise at least 40% in the student's discipline area.

This may impact on your choice of modules to study, for example you will have to choose certain modules to ensure you have the discipline specific credits required.

Students are barred from studying any module with significant overlap to the Level 6 modules they will study on their return. Significant overlap with Level 5 modules previously studied should also be avoided.

Additional costs for the International Year

Tuition fees for students on the International Year will be charged at 15% of the annual tuition fees for that year of study, as set out in Section 1. The International Year can be included in your Student Finance allocation, to find out more about your personal eligibility see: www.gov.uk

Students will 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 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.

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 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.

22. Annex - Work Placement Year

MSci Biochemistry with Work Placement Year; MSci Biochemistry with Neuroscience with Work Placement Year

Work Placement Year summary

Students registered for this programme may apply to transfer during level 4 or 5 to the 'with Work Placement Year' option. Students accepted onto this programme will have an extra year of study (the Work Placement Year) with a relevant placement provider after they have completed Level 5 at Keele.

Students who successfully complete both the second year (Level 5) and the Work Placement Year will be permitted to progress to Level 6. Students who fail to satisfactorily complete the Work Placement Year will normally revert to the 4-year programme and progress to Level 6 on that basis. The failure will be recorded on the student's final transcript.

Study at Level 4, Level 5, Level 6 and Level 7 will be as per the main body of this document. The additional detail contained in this annex will pertain solely to students registered for the Work Placement Year option.

Work Placement Year Programme Aims

In addition to the programme aims for Biochemistry, we also aim to:

- Provide experience of working in a subject-related laboratory or work place within an industrial, academic or public institution either in the UK or abroad.

Entry Requirements for the Work Placement Year

Admission to the Work Placement Year is subject to successful application, interview and references from appropriate staff. Students have the opportunity to apply directly for the 4-year 'with work placement year' degree programme, or to transfer onto the 4-year programme at the end of Year-1 and in Year-2 at the end of Semester 1. Students who are initially registered for the 4-year degree programme may transfer onto the 3-year degree programme at any point in time, prior to undertaking the year-long work placement. Students who fail to pass the work placement year, and those who fail to meet the minimum requirements of the work placement year module, (* or equivalent, work placement), will be automatically transferred onto the 3- year degree programme.

* We recommend where possible students undertake a placement of between 9 - 12 months on a full-time basis to maximize academic and personal growth. However, the Faculty of Natural Sciences Work / Professional Placement Year mandates a minimum of 24 weeks in duration, ideally on a full-time basis, but no less than 21 hours per week. This enables those undertaking an unpaid placement to work on a part-time basis alongside their placement.

The criteria to be applied are:

- A good University attendance record and be in 'good academic standing'.
- Academic Performance (an average of 50% across all modules in Semester 1 at Level 5 is normally required. Places on the Work Placement Year are then conditional on achieving an average mark of 50% across all Level 5 modules. Students with up to 15 credits of re-assessment who meet the 50% requirement may progress to the Work Placement Year. Where no Semester 1 marks have been awarded performance in 1st year marks and ongoing 2nd year assessments are taken into account)
- General Aptitude (to be demonstrated by application(s) to relevant placement providers with prior agreement from the Programme Lead, interview during the 2nd semester of year 2 (Level 5), and by recommendation of the student's Academic Mentor, 1st and 2nd year tutors and Programme Lead)
- Students undertaking work placements will be expected to complete a Health and Safety checklist prior to commencing their work experience and will be required to satisfy the Health and Safety regulations of the company or organisation at which they are based.
- *(International students only)* Due to visa requirements, it is not possible for international students who require a Tier 4 Visa to apply for direct entry onto the 4-year with Work Placement Year degree programme. Students wishing to transfer onto this programme should discuss this with student support, the academic tutor for the work placement year, and the Programme Lead. Students should be aware that there are visa implications for this transfer, and it is the student's responsibility to complete any and all necessary processes to be eligible for this programme. There may be additional costs, including applying for a new Visa from outside of the UK for international students associated with a transfer to the work placement programme.

Students may not register for both an International Year and a Work Placement Year.

Student Support

We have a dedicated Industrial Placement tutor within Life Sciences that can act as a point of contact for you before, during or after your placement year. You will also be assigned a Placement Supervisor. This will be an academic member of the School who will maintain regular contact with you throughout your placement and will become your project supervisor at Level 6. The School Director of Education will also act as an important contact throughout the process, that you can contact them in strict confidence at any point during your placement if you have any concerns about your placement provider or overall experience

Learning Outcomes

In addition to the learning outcomes specified in the main text of the Programme Specification, students who complete the 'with Work Placement Year' option will be able to:

- Demonstrate an ability to successfully work within their placement institution and to learn practical skills and develop their science base within the scope of their work project.

These learning outcomes will be assessed through the non-credit bearing Work Placement Year module (NAT-30010).

Regulations

Students registered for the 'with Work Placement Year' option are subject to programme-specific regulations (if any) and the University regulations. In addition, during the Work Placement Year, the following regulations will apply:

- Students undertaking the Work Placement Year must successfully complete the 30-credit 'Work Placement Year' module (NAT-30010).
- In order to ensure a high quality placement experience, each placement agency will sign up to a placement contract (analogous to a service level agreement).
- Once a student has been accepted by a placement organisation, the student will make a pre-placement visit and a member of staff identified within the placement contract will be assigned as the placement supervisor. The placement supervisor will be responsible for ensuring that the placement experience meets the agreed contract agreed with the University.
- The placement student will also sign up an agreement outlining his/her responsibilities in relation to the requirements of each organisation.

Students will be expected to behave professionally in terms of:

(i) conforming to the work practices of the organisation; and

(ii) remembering that they are representatives of the University and their actions will reflect on the School and have an impact on that organisation's willingness (or otherwise) to remain engaged with the placement.

Additional costs for the Work Placement Year

Tuition fees for students on the Work Placement Year will be charged at 20% of the annual tuition fees for that year of study, as set out in Section 1. The Work Placement Year can be included in your Student Finance allocation; to find out more about your personal eligibility see: www.gov.uk

Students will have to bear the costs of travelling to and from their placement provider, accommodation, food and personal costs. Depending on the placement provider additional costs may include parking permits, travel and transport, suitable clothing, DBS checks, and compulsory health checks.

A small stipend may be available to students from the placement provider during the placement but this will need to be explored on a placement-by-placement basis as some organisations, such as charities, may not have any extra money available. Students should budget with the assumption that their placement will be unpaid.

Eligibility for student finance will depend on the type of placement and whether it is paid or not. If it is paid, this is likely to affect student finance eligibility, however if it is voluntary and therefore unpaid, should not affect student finance eligibility. Students are required to confirm eligibility with their student finance provider.

International students who require a Tier 4 visa should check with the Immigration Compliance team prior to commencing any type of paid placement to ensure that they are not contravening their visa requirements.

23. Annex - Programme-specific regulations

Programme Regulations: MSci Biochemistry

Final Award and Award Titles	MSci Biochemisty MSci Biochemistry with International Year MSci Biochemistry with Work Placement Year MSci Biochemistry with Neuroscience MSci Biochemistry with Neuroscience with International Year MSci Biochemistry with Neuroscience with Work Placement Year
Intermediate Award(s)	BSc (Hons) Biochemistry Diploma in Higher Education in Biochemistry Certificate in Higher Education in Biochemistry BSc (Hons) Biochemistry with Neuroscience Diploma in Higher Education in Biochemistry with Neuroscience Certificate in Higher Education in Biochemistry with Neuroscience
Last modified	January 2025
Programme Specification	https://www.keele.ac.uk/qa/programmespecifications

The University's Academic Regulations which can be found on the Keele University website (https://www.keele.ac.uk/regulations/)[1] apply to and regulate the programme, other than in instances where the specific programme regulations listed below over-ride them. These programme regulations list:

- *Exemptions* which are characterised by the omission of the relevant regulation.
- *Variations* which are characterised by the replacement of part of the regulation with alternative wording.
- *Additional Requirements* which set out what additional rules that apply to students in relation to this programme.

The following **exemptions, variations** and **additional requirements** to the University regulations have been checked by Academic Services and have been approved by the Faculty Education Committee.

A) EXEMPTIONS

The clause(s) listed below describe where an exemption from the University's Academic Regulations exists:

For the whole duration of their studies, students on this Programme are exempt from the following regulations:

- **No exemptions apply.**

B) VARIATIONS

The clause(s) listed below describe where a variation from the University's Academic Regulations exists:

No variations apply

Additional Requirements

The programme requirements listed below are in addition to the University's Academic Regulations:

Additional requirement 1: Laboratory, lecture and tutorial classes

1.1 Wearing a laboratory coat is compulsory in all classes held in laboratories. Students will not be allowed to attend the laboratory class without a laboratory coat.

1.2 Students must wear appropriate clothing in the laboratories, including sensible footwear. Closed shoes and low heels should be worn. This is to avoid tripping and to protect the feet in the case of spillages. Long hair must be tied back. Students who are inappropriately dressed may, at the discretion of the member of staff in charge, be excluded from the class and recorded as being absent without good cause.

1.3 Students who arrive late to laboratory classes may, at the discretion of the member of staff in charge, be excluded from the class and recorded as being absent without good cause.

1.4 Students who display serious misconduct in any class may, at the discretion of the member of staff in charge, be excluded from the class and recorded as being absent without good cause. Serious misconduct involves wilful damage to property, injury or threat to persons, or persistent disruption of teaching.

1.5 The unauthorised use of mobile phones or headphones is not permitted in any class.

1.6 Students are not permitted to record, video or photograph taught sessions or meetings with staff, except with the permission in advance of the staff concerned. Permission will be given where this is part of an approved disability adjustment. Any permission to record, video or photograph is for personal use only and all recordings, videos or photographs remain the property of the presenter and Keele University.

1.7 Students are required to read and follow the procedures in the School of Life Sciences Safety Handbook, which is available from the Life Science Noticeboard on the KLE.

Additional requirement 2: Study Abroad and Field Course

3.1 A student who has completed a semester abroad will not normally be eligible to transfer onto the International Year option.

3.2 Students taking the final year module LSC-30066: Tropical Biology Field Course will undertake field work in Malaysia between level 5 and 6. Students must achieve the following criteria to be eligible to attend:

- **Academic Performance:** an average of 55% across all modules in Semester 1 at Level 5 is normally required. Places on the course are then conditional on achieving an average mark of 55% across all Level 5 modules. You will still be eligible to apply if you have up to 15 credits of re-assessment, but still meet the 55% requirement. Where no Semester 1 marks have been awarded, performance at Level 4 and ongoing Level 5 assessments are considered.
- **General Aptitude:** demonstrated through interview during Level 5, semester 2 and by recommendation of your academic mentor, year tutors and/or programme director.

At least one male and one female academic member of staff from the School of Life Sciences will accompany you on the field course to offer support.

There are additional costs associated with the tropical field course that change each year. These will be discussed at Level 5 before you need to decide to apply.

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[1] References to University Regulations in this document apply to the content of the University's Regulatory Framework as set out on the University website here https://www.keele.ac.uk/regulations/.

Version History

This document

Date Approved: 05 March 2025

Previous documents

Version No	Year	Owner	Date Approved	Summary of and rationale for changes
1	2024/25	DAVID WATSON	14 June 2024	
1	2023/24	DAVID WATSON	08 February 2023	
1	2022/23	DAVID WATSON	01 April 2022	
1	2021/22	DAVID WATSON	08 February 2021	
1	2020/21	CLAIRE EVANS	20 May 2020	