Programme Specification: Undergraduate

For Academic Year 2026/27

1. Course Summary

Names of programme and award title(s)	BSc (Hons) Physics with Mathematics BSc (Hons) Physics with Mathematics with International Year (see Annex for details) BSc (Hons) Physics with Mathematics with Work Placement Year (see Annex for details)
Award type	Single Honours
Mode of study	Full-time
Framework of Higher Education Qualification (FHEQ) level of final award	Level 6
Normal length of the programme	3 years; 4 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 accredited by the Institute of Physics (IOP). For further details see the section on Accreditation below.
Regulator	Office for Students (OfS)
Tuition Fees	**UK students:** Fee for 2026/27 is £9,790* **International students:** Fee for 2026/27 is £18,200** 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 a Single Honours programme?

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

3. Overview of the Programme

Physics and Mathematics are both deeply connected subjects, and pivotal in gaining insight into how the world works. Mathematics is the essential framework to describe physical phenomena precisely. Equations and formulas allow relationships between different physical quantities to be expressed and mathematical models predict the behavior of systems under various conditions. Studying this subject combination helps develop strong analytical and critical thinking skills and can lead to a more profound comprehension of the subject and the mathematical theories that underpin it. The additional, more specialised mathematics topics in this programme will teach you advanced techniques and skills to solve real-world problems at the interface of Physics and Mathematics, including modelling complex dynamical time-variable systems using systematic approximation techniques, in fields as diverse as chaos theory, heat flows, climate and weather and even traffic management.

In the first two years of study at Keele University you will be taught a solid foundation in core physics concepts, graduate skills and attributes defined by the Institute of Physics (IoP) accreditation framework. You will start with physical concepts you are already familiar with, whilst enhancing your critical thinking and problem-solving skills essential in a huge variety of careers. As your degree progresses, you will be exposed to more advanced concepts and techniques, with more opportunities to apply these to real-world problems. You will develop pure mathematical knowledge and skills, as well as fully understand their use in a physical context. Your learning will be supported through interactive teaching, workshops and small group activities as well as frequent opportunities to apply key concepts in laboratory classes and other practical exercises.¿

In your final year you will tackle frontier topics in Physics and Mathematics. You will have opportunities for individual advanced project work which can be aligned to your own interests and career goals, as well as work and educational placements. The Physics option modules allow you to delve deeper into quantum physics and other areas of cutting-edge Physics. The range of Mathematics option modules also gives you the choice to further develop advanced physical and mathematical skills in cross-over topics like fluid mechanics and wave propagation. You will have the opportunity to develop your own research interests and to explore frontier topics guided by our world-leading researchers - from real-world applications and modelling to "blue-skies" physics.

What can you expect? As a scientist, you will acquire both theoretical and practical knowledge. This includes fundamental knowledge and techniques in both physics and mathematics, but also the problem-solving, experimental, programming and teamworking skills that are highly valued by employers in a broad range of sectors.

Our staff are passionate about providing you with a supportive environment, innovative learning materials, plenty of tutor support, with an "open-door" policy, and meaningful interactions. We work in collaboration with our students to continuously improve our practice and your experience. The programme has been designed to give maximum flexibility with many options in the final year, which allows students to pick options within their broad field of interest and to study topics in some depth.

And the best part? Graduating from our Physics with Mathematics programme opens doors. Whether you are eyeing postgraduate studies or moving straight into a challenging career, you will be well-prepared. Our modular approach blends traditional lectures with hands-on lab work, problem-solving sessions, innovative assessments and small-group tutorials. Mathematics, computing and transferable skills training are interwoven throughout the curriculum. The advanced mathematical skills developed will further enhance your data analysis skills and modelling real-world problems, opening a wide range of career opportunities including engineering, data science, finance and research.

4. Aims of the programme

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

- achieve a knowledge and understanding of the fundamentals of physics and mathematics and be able to apply this knowledge and understanding to solving problems;
- demonstrate the application of physics and mathematics across topic boundaries and in unrehearsed contexts;
- develop competence in mathematical, statistical and numerical techniques and employ these to solve physical problems;
- develop competence in laboratory activities, safe working practices and computer programming by the end of year 2 and undertake project work both individually and within a team by the end of year 3;
- acquire the skills required to assimilate new knowledge and to communicate your work and ideas in a

variety of formats;
- acquire a range of subject-specific skills including how to formulate and tackle problems in physics and mathematics; how to plan, manage, execute and report the results of an investigation; how to use mathematics to describe the physical world; and how to deploy these skills to tackle issues within the subject;
- Develop your knowledge, understanding and skills relevant to mathematics, including logical argument, rigorous mathematical proof, problem solving and mathematical modelling;
- acquire a range of cognitive, generic and transferable skills including problem-solving skills, investigative skills, analytic skills, communication skills, IT skills, time management skills and interpersonal skills;
- appreciate recent developments in physics and mathematics.

Employability

The programme will enable you to:

- engage in independent learning, and make effective use of textbooks, research papers and other learning resources;
- critically analyse data, understand statistical information and use information responsibly and ethically;
- plan projects and investigations, and perform an evaluation of the possible costs and benefits of a course of action;
- develop a range of technical and transferable skills which would enable entry to employment across a range of professions that place high value on the analytical, computational, statistical and experimental skills gained within a Physics with Mathematics degree programme and value the ability to communicate complex ideas and information to a variety of audiences.

5. What you will learn

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

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

Subject knowledge and understanding

The Single Honours Physics with Mathematics programme at Keele University provides a solid foundation in physics and mathematics. It covers essential topics such as classical, statistical and quantum mechanics, electromagnetism, optics, wave phenomena, thermodynamics, solid-state physics, atomic and nuclear physics. Additionally, the programme explores broader areas of physics and mathematical techniques and frontier topics, along with more advanced computational techniques, and statistical methods to address real-world physical challenges.

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

- **Core Principles and Application**: Knowledge of the fundamental principles of Physics and Mathematics and competence in applying these principles to diverse areas of the subject.
- **Problem Solving**: The ability to solve problems using appropriate mathematical and computational tools including the ability to make sensible approximations.
- **Experimental Skills**: The ability to design, execute, and analyse critically, an experiment or investigation and draw valid conclusions.
- **Uncertainty Assessment**: The ability to estimate levels of uncertainty in their results, compare their results with expected outcomes, theoretical predictions or published data, evaluate the significance of their results in this context and assess risk.
- **Advanced Knowledge and Critical Reading**: The development of a wider knowledge and understanding of advanced topics and their applications, and the acquisition of skills in critical reading and understanding of published work in Physics.

Subject specific skills

Successful students will be able to:

- **Laboratory Safety**: The ability to work safely in a laboratory and a knowledge and awareness of standard safety procedures.
- **Laboratory Equipment**: A sound familiarity with laboratory apparatus and techniques.
- **Computational Skills:** Competency in using appropriate software packages, computer systems and programming languages for data analysis and information retrieval.
- **Numerical and Statistical Skills**: An ability in numerical manipulation and estimation, statistical interpretation and the ability to present and interpret information graphically.
- **Mathematical Modelling**: An ability to use mathematical analysis and computational techniques to model

physical behaviour.
- **Scientific Communication**: An ability to research, record and communicate scientific information, in particular through clear and accurate scientific reports and presentations.
- **Critical Thinking and Adaptability**: An ability to question, learn and assimilate knowledge and to evolve their views of the world in response to that new knowledge.
- **Research Contribution**: an ability to contribute through research to the development of knowledge in Physics.
- **Independent and Collaborative Work**: An ability to acquire knowledge and understanding of science themselves, and to work productively on scientific problems on an individual basis or in a team.

Key or transferable skills (including employability skills)

Successful students will be able to:

- **Self-directed Learning**: Manage their own learning and make appropriate use of textbooks, research-based materials and other learning resources.
- **Information Literacy**: Research information and make responsible use of it.
- **Communication**: Make effective written and oral presentations for a variety of target audiences and using a variety of media.
- **Quantitative Analysis**: Proficient in interpreting and manipulating numerical and statistical data.
- **Estimation Skills:** Capable of making accurate and sensible estimates based on available data.
- **Cost-Benefit Analysis**: Evaluate the costs and benefits of their actions.
- **Digital Literacy:** Skilled in using software packages and programming languages for data analysis, simulation and numerical modeling.
- **Problem Solving**: Formulate a problem and solve it using mathematical or computational methods, including computer programming.
- **Research Skills**: Plan, manage, execute and report an investigation.
- **Knowledge Sharing**: Learn and gain understanding and to pass on that understanding to others.
- **Collaboration**: Work effectively both as an individual and as part of a team.
- **Motivation:** Sustain motivation for a long time.
- **Responsibility**: Recognise their responsibilities as an individual and as part of a team or an organisation.

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, environmental 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?

Learning and teaching methods used on the programme vary according to the subject matter and level of the module. Both for Physics and Mathematics they include the following:

- **Lectures**: Core knowledge is conveyed through lectures, which also outline academic content and provide examples, interactive problems, discussions and case studies.
- **Tutorials**: These sessions emphasise cooperative learning in a more informal setting, allowing students to apply their knowledge while getting immediate feedback from academic staff.
- **Laboratory Classes**: Reinforce lecture material and develop experimental and transferable skills.
- **Computational Laboratory Classes**: Focus on programming, practical applications and problem-solving.
- **Exercise/Problem-Solving Classes**: Enhance critical thinking and problem-solving abilities.
- **Team-based learning**: a collaborative approach in small groups.
- **Problem Sheet Assignments**: Encourage independent learning and critical analysis.
- **Group and Individual Projects**: Foster teamwork and investigative skills, supervised and supported by academic staff.
- **Directed Reading and Independent Study**: Students engage in self-directed learning.
- **Literature Research Tasks**: Develop critical abilities and discernment.
- **Use of e-Learning/Keele Learning Environment (KLE)**: Modules utilise the KLE for resources, including lecture notes, screencasts, video-capture of teaching sessions, handbooks, quizzes, and additional reading materials.
- **One-on-One Support**: Students can discuss difficulties and special learning needs with Academic Mentors or module lecturers.

In a typical week, students can expect to participate in a variety of activities. These include attending lectures where core knowledge is explained, and examples are provided. Tutorials and problem classes emphasise cooperative learning, while laboratory work and computational classes reinforce lecture material and develop transferable skills. Additionally, students engage in independent learning through directed reading, literature research, and assessed problem sheets. This approach not only enhances their understanding but also cultivates critical thinking abilities. Students are encouraged to manage their time effectively, take responsibility for their learning, and adopt a reflective, self-critical mindset. The Keele Learning Environment (KLE) plays a central role, providing resources such as lecture notes, access to video-capture of teaching sessions, module handbooks, electronic notebooks, collaborative pages and much more.

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 mentor or module lecturers on a one-to-one basis.

7. Teaching Staff

A dynamic group of staff with a broad range of expertise teach on the programme and bring a wealth of experience acquired through research and scholarship across a diverse set of areas. Some current staff members are internationally recognised leaders in their field and manage research groups comprising postgraduate research students and postdoctoral researchers, some of whom contribute to the teaching on the programme.

All research-active staff are involved in teaching, and many also take on administrative roles. You can find information about the teaching and research profiles of the staff who currently deliver the programme on the following websites Keele University Physics and Astrophysics website & Keele University Computer Science and Mathematics website.

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/

Modern Languages or Certificate in TESOL

Alternatively, you could choose to study modules with the University Language Centre. The Language Centre offers three pathways; The Language Specialist, The Language Taster, and The Trinity Certificate in Teaching English to Speakers of Other Language (TESOL). Language Centre modules are available separately for students at Levels 4 and 5. At Level 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 Language Centre option modules available to you please visit the following webpages.

For Level 4 and 5 students please visit: https://www.keele.ac.uk/study/languagecentre/languagecentreoptions/

For 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, including the list of elective modules, please visit: https://www.keele.ac.uk/recordsandexams/modulecatalogue/

A summary of the credit requirements per year is as follows.

Year	Compulsory	Optional	
		Min	Max
Level 4	120	0	0
Level 5	105	15	15
Level 6	60	60	60

Module Lists

Level 4

Compulsory modules	Module Code	Credits	Period
Mathematical Methods	MAT-10043	15	Semester 1
Gravitation, Relativity and Matter	PHY-10035	15	Semester 1
Scientific Programming	PHY-10028	15	Semester 1-2
Practical and Academic Skills for Physics	PHY-10037	15	Semester 1-2
Fundamental and Applied Mathematics for Physics	PHY-10038	30	Semester 1-2
Physics Career Planning and Employability Skills	PHY-10042	0	Semester 1-2
Differential Equations and Multivariable Calculus	MAT-10075	15	Semester 2
Electricity, Magnetism and Waves	PHY-10036	15	Semester 2

Level 5

Compulsory modules	Module Code	Credits	Period
Linear Differential Equations	MAT-20041	15	Semester 1
The Quantum World	PHY-20043	15	Semester 1
Optics and Thermodynamics	PHY-20061	15	Semester 1
Practical and Professional Skills for Physics	PHY-20047	15	Semester 1-2
Analytical and Numerical Techniques	PHY-20051	15	Semester 1-2
Physics Career Planning and Employability Skills	PHY-20059	0	Semester 1-2
Complex Variable I and Vector Calculus	MAT-20047	15	Semester 2
Nuclear Physics	PHY-20045	15	Semester 2

Optional modules	Module Code	Credits	Period
Probability	MAT-20023	15	Semester 1
Flexible Work Placement (Level 5)	NAT-20011	15	Semester 1-2
Dynamics	MAT-20005	15	Semester 2
Radiation Physics	PHY-20029	15	Semester 2

Level 5 Module Rules

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

Level 6

Compulsory modules	Module Code	Credits	Period
Electromagnetism and Solid State Physics	PHY-30051	15	Semester 1
Physics Research Project and Professional Development	PHY-30045	30	Semester 1-2
Physics Career Planning and Employability Skills	PHY-30067	0	Semester 1-2
Synoptic Physics and Real-World Applications	PHY-30053	15	Semester 2

Optional modules	Module Code	Credits	Period
Non-linear Differential Equations	MAT-30002	15	Semester 1
Partial Differential Equations	MAT-30003	15	Semester 1
Data Analysis and Modelling	PHY-30059	15	Semester 1
Advanced Topics Semester 1	PHY-30061	15	Semester 1
Flexible Work Placement (Level 6)	NAT-30008	15	Semester 1-2
Professional Experience in Education	NAT-30012	15	Semester 1-2
Research and Communication	PHY-30065	15	Semester 1-2
Fluid Mechanics	MAT-30004	15	Semester 2
Waves	MAT-30011	15	Semester 2
Quantum Physics	PHY-30055	15	Semester 2
Advanced Topics Semester 2	PHY-30063	15	Semester 2

Level 6 Module Rules

You pick 60 credits of modules from the list of module options.

You must choose a minimum of 30 credits from the list of Mathematics option modules.

You can choose either Advanced Topics Semester 1 or Advanced Topics Semester 2, but not both.

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.

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**
Physics and Mathematics Knowledge: Recall basic knowledge and theories based on taught contents and use these to explain familiar concepts using appropriate terminology.	Mathematical Methods - MAT-10043 Differential Equations and Multivariable Calculus - MAT-10075 Gravitation, Relativity and Matter - PHY-10035 Electricity, Magnetism and Waves - PHY-10036 Fundamental and Applied Mathematics for Physics - PHY-10038
Problem Solving: Apply knowledge and understanding of fundamental principles and concepts to solve qualitative and quantitative problems.	Mathematical Methods - MAT-10043 Differential Equations and Multivariable Calculus - MAT-10075 Scientific Programming - PHY-10028 Gravitation, Relativity and Matter - PHY-10035 Electricity, Magnetism and Waves - PHY-10036 Practical and Academic Skills for Physics - PHY-10037 Fundamental and Applied Mathematics for Physics - PHY-10038
Interdisciplinarity and Global Awareness: Identify the multidisciplinary nature of science and describe the application of physics and mathematics in solving current and future challenges in the world.	Mathematical Methods - MAT-10043 Differential Equations and Multivariable Calculus - MAT-10075 Scientific Programming - PHY-10028 Gravitation, Relativity and Matter - PHY-10035 Electricity, Magnetism and Waves - PHY-10036 Practical and Academic Skills for Physics - PHY-10037 Fundamental and Applied Mathematics for Physics - PHY-10038

Subject Specific Skills	
Learning Outcome	**Module in which this is delivered**
Safety and Ethics: Demonstrate skills in standard safety procedures and appropriate behaviour in laboratory environments, and show awareness of risk assessments.	Practical and Academic Skills for Physics - PHY-10037
Practical Competence: Safely and competently operate standard laboratory instrumentation and equipment.	Practical and Academic Skills for Physics - PHY-10037
Scientific Investigation: Observe, record and document experiments, with systematic record keeping, estimate levels of uncertainty¿and demonstrate a practical and reflective understanding of the principles of scientific experimentation and inquiry.	Practical and Academic Skills for Physics - PHY-10037
IT Proficiency: Competency in using specialist software packages/systems and programming languages for data analysis and information retrieval.	Scientific Programming - PHY-10028 Practical and Academic Skills for Physics - PHY-10037
Numerical Skills: An ability in numerical manipulation and estimation, statistical interpretation and the ability to present and interpret information graphically.	Mathematical Methods - MAT-10043 Differential Equations and Multivariable Calculus - MAT-10075 Scientific Programming - PHY-10028 Practical and Academic Skills for Physics - PHY-10037 Fundamental and Applied Mathematics for Physics - PHY-10038

Key or Transferable Skills (graduate attributes)	
Learning Outcome	**Module in which this is delivered**
Research Skills: Engage with the scientific literature, including the use of online scientific databases, identifying appropriate sources of information and correctly citing information.	Practical and Academic Skills for Physics - PHY-10037
Scientific Communication: Communicate information and ideas verbally and in writing, selecting appropriate content for a lay audience.	Mathematical Methods - MAT-10043 Differential Equations and Multivariable Calculus - MAT-10075 Practical and Academic Skills for Physics - PHY-10037
Reflective Practice and Professionalism: Demonstrate the ability to engage with learning opportunities individually and collaboratively, reflecting and acting on feedback to enhance your quality of work and working successfully in a group environment, contributing to team outputs.	Practical and Academic Skills for Physics - PHY-10037 Fundamental and Applied Mathematics for Physics - PHY-10038

Level 5

Subject Knowledge and Understanding	
Learning Outcome	**Module in which this is delivered**
Physics Knowledge: Recall knowledge and theories in physics on course content and use them to predict and explain familiar concepts using appropriate terminology.	Radiation Physics - PHY-20029 The Quantum World - PHY-20043 Nuclear Physics - PHY-20045 Optics and Thermodynamics - PHY-20061
Mathematics Knowledge and Skills: Recall and apply basic knowledge and theories based on taught content and concepts.	Dynamics - MAT-20005 Probability - MAT-20023 Linear Differential Equations - MAT-20041 Complex Variable I and Vector Calculus - MAT-20047
Problem Solving: Apply knowledge and understanding of physics and mathematical theories, principles and concepts to solve in-depth qualitative and quantitative problems which may intersect multiple branches of science.	Dynamics - MAT-20005 Probability - MAT-20023 Linear Differential Equations - MAT-20041 Complex Variable I and Vector Calculus - MAT-20047 Radiation Physics - PHY-20029 The Quantum World - PHY-20043 Nuclear Physics - PHY-20045 Optics and Thermodynamics - PHY-20061
Interdisciplinarity and Global Awareness: Recognise the relationships and interfaces between physics and mathematics, and appreciate their contribution to the innovations that characterise the modern world, and the potential of scientists to develop solutions to current and future challenges.	Dynamics - MAT-20005 Probability - MAT-20023 Linear Differential Equations - MAT-20041 Complex Variable I and Vector Calculus - MAT-20047 Radiation Physics - PHY-20029 The Quantum World - PHY-20043 Nuclear Physics - PHY-20045 Optics and Thermodynamics - PHY-20061

Subject Specific Skills	
Learning Outcome	**Module in which this is delivered**
Safety and Ethics: Demonstrate skills in the specific handling techniques for hazardous substances and safe working practices in specialised laboratory environments, and understanding and implementation of risk assessments.	Radiation Physics - PHY-20029 Practical and Professional Skills for Physics - PHY-20047
Practical Competence: Gain individual familiarity with specialist laboratory instrumentation, equipment and techniques, and judge their appropriate use cases.	Radiation Physics - PHY-20029 Practical and Professional Skills for Physics - PHY-20047
Scientific Investigation: Construct and maintain systematic, reliable and detailed records of experimental observations informed by theoretical underpinnings and best professional practice, and recognise, evaluate and critique the methods and findings of scientific experimentation and inquiry.	Radiation Physics - PHY-20029 Practical and Professional Skills for Physics - PHY-20047
IT Proficiency: Deploy computational techniques including specialist software and programming languages to manipulate and present scientific information and analysis of data.	Practical and Professional Skills for Physics - PHY-20047 Analytical and Numerical Techniques - PHY-20051
Numerical Skills: The ability to select and deploy appropriate mathematical or statistical analysis techniques.	Dynamics - MAT-20005 Probability - MAT-20023 Linear Differential Equations - MAT-20041 Complex Variable I and Vector Calculus - MAT-20047 The Quantum World - PHY-20043 Analytical and Numerical Techniques - PHY-20051

Key or Transferable Skills (graduate attributes)	
Learning Outcome	**Module in which this is delivered**
Research Skills: Engage with the scientific literature, including the use of online scientific databases, making appropriate use of peer reviewed sources in constructing scientific reports and correctly citing information.	Practical and Professional Skills for Physics - PHY-20047
Scientific Communication: Communicate information and ideas verbally and in writing, selecting appropriate content for a scientific audience and producing presentation materials of a professional quality.	Dynamics - MAT-20005 Probability - MAT-20023 Linear Differential Equations - MAT-20041 Complex Variable I and Vector Calculus - MAT-20047 Practical and Professional Skills for Physics - PHY-20047
Reflective Practice and Professionalism: Demonstrate the ability to engage with learning opportunities individually and collaboratively, reflecting on the development of employability skills and working successfully in a group environment, contributing to team outputs.	Practical and Professional Skills for Physics - PHY-20047

Level 6

Subject Knowledge and Understanding	
Learning Outcome	**Module in which this is delivered**
Physics Knowledge: Describe and discuss the full breadth of key Physics concepts confidently, accurately and in detail, using appropriate terminology, including selected aspects at the forefront of Physics.	Physics Research Project and Professional Development - PHY-30045 Electromagnetism and Solid State Physics - PHY-30051 Synoptic Physics and Real-World Applications - PHY-30053 Quantum Physics - PHY-30055 Data Analysis and Modelling - PHY-30059 Advanced Topics Semester 1 - PHY-30061 Advanced Topics Semester 2 - PHY-30063 Research and Communication - PHY-30065
Mathematics Knowledge and Skills: Describe and discuss the full breadth of key mathematical concepts confidently, accurately and in detail, using appropriate terminology.	Non-linear Differential Equations - MAT-30002 Partial Differential Equations - MAT-30003 Fluid Mechanics - MAT-30004 Waves - MAT-30011
Problem Solving: Apply knowledge, understanding and critical judgement of modern scientific theories and practices to solve new, qualitative and quantitative problems that may be multi-layered and/or cross disciplinary in nature.	Non-linear Differential Equations - MAT-30002 Partial Differential Equations - MAT-30003 Fluid Mechanics - MAT-30004 Waves - MAT-30011 Electromagnetism and Solid State Physics - PHY-30051 Synoptic Physics and Real-World Applications - PHY-30053 Quantum Physics - PHY-30055 Data Analysis and Modelling - PHY-30059 Advanced Topics Semester 1 - PHY-30061 Advanced Topics Semester 2 - PHY-30063
Interdisciplinarity and Global Awareness: Apply Physics concepts effectively in a multidisciplinary environment, appreciating the contribution of Physics to the innovations that characterise the modern world, and the potential of physicists to develop solutions to current and future challenges.	Physics Research Project and Professional Development - PHY-30045 Electromagnetism and Solid State Physics - PHY-30051 Synoptic Physics and Real-World Applications - PHY-30053 Quantum Physics - PHY-30055 Data Analysis and Modelling - PHY-30059 Advanced Topics Semester 1 - PHY-30061 Advanced Topics Semester 2 - PHY-30063 Research and Communication - PHY-30065

Subject Specific Skills	
Learning Outcome	**Module in which this is delivered**
Safety and Ethics: Demonstrate skills in the design and implementation of safe laboratory procedures and processes, including production of new risk assessments, COSHH documentation and/or research ethics documentation as appropriate.	Physics Research Project and Professional Development - PHY-30045
Practical Competence: Use independent judgement to select and operate the appropriate advanced laboratory instrumentation, equipment, techniques and tools to address new questions.	Physics Research Project and Professional Development - PHY-30045
Scientific Investigation: Plan, formulate and test original hypotheses by designing, observing, recording and interpreting data collections, professionally documenting methodologies and findings, and evaluate the results of open-ended and original scientific investigations.	Physics Research Project and Professional Development - PHY-30045
IT Proficiency: Deploy programming languages and computational methods for data analysis to solve physical problems and evaluate data, using a broad range of general and specialist software to investigate, interpret and manipulate physical information.	Physics Research Project and Professional Development - PHY-30045 Synoptic Physics and Real-World Applications - PHY-30053 Data Analysis and Modelling - PHY-30059
Numerical Skills: The ability to confidentially deploy mathematical or statistical analysis techniques applied to complex physical problems.	Non-linear Differential Equations - MAT-30002 Partial Differential Equations - MAT-30003 Fluid Mechanics - MAT-30004 Waves - MAT-30011 Physics Research Project and Professional Development - PHY-30045 Electromagnetism and Solid State Physics - PHY-30051 Synoptic Physics and Real-World Applications - PHY-30053 Quantum Physics - PHY-30055 Data Analysis and Modelling - PHY-30059 Advanced Topics Semester 1 - PHY-30061 Advanced Topics Semester 2 - PHY-30063 Research and Communication - PHY-30065

Key or Transferable Skills (graduate attributes)	
Learning Outcome	**Module in which this is delivered**
Research Skills: Engage with peer reviewed Scientific literature, evaluating, interpreting and synthesizing physical information to construct and critically evaluate scientific research.	Physics Research Project and Professional Development - PHY-30045 Synoptic Physics and Real-World Applications - PHY-30053 Research and Communication - PHY-30065
Scientific Communication: Communicate effectively in both oral and written formats, selecting appropriate content, media and methods for the audience, purpose and subject, and using a broad range of general and specialist software to create materials for presentation.	Physics Research Project and Professional Development - PHY-30045 Synoptic Physics and Real-World Applications - PHY-30053 Research and Communication - PHY-30065
Reflective Practice and Professionalism: Demonstrate the ability to plan, review and manage progress individually and collaboratively, working successfully with others, reviewing and managing progress, prioritising tasks and meeting deadlines.	Physics Research Project and Professional Development - PHY-30045 Synoptic Physics and Real-World Applications - PHY-30053 Research and Communication - PHY-30065

9. Final and intermediate awards

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

BSc (Hons) Physics with Mathematics	360 credits	You will require at least 120 credits at levels 4, 5 and 6 You must accumulate at least 270 credits in your main subject (out of 360 credits overall), with at least 90 credits in each of the three years of study, to graduate with a named single honours degree in this subject.
Diploma in Higher Education	240 credits	You will require at least 120 credits at level 4 or higher and at least 120 credits at level 5 or higher
Certificate in Higher Education	120 credits	You will require at least 120 credits at level 4 or higher

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 three-year version of the 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 three-year version of the 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. The following list is representative of the variety of assessment methods used on your programme:

- **End of Module Examinations**: These assess students' ability to describe, explain, and critically discuss subject principles, knowledge and understanding, apply them to real-world scenarios, and solve problems within the discipline.
- **Assessed Problem Sheets**: Students solve numerical and other problems, drawing on scientific understanding, knowledge, and experimental techniques. Research, communication, programming and mathematical skills are also evaluated.
- **Coursework:** normally consists of regular short assignments designed to assess, in more depth than class tests, a student's knowledge and understanding of the course material. Some of these assignments may be computer-based, and some may take the form of short reports.
- **Laboratory and Project Reports**: Formal summaries of laboratory work test students' practical understanding and their ability to present and analyse results.
- **Observation of Laboratory Skills and Notebooks**: Various assessments during practical work ensure accurate communication, good practices, and safety awareness.
- **Oral and Poster Presentations**: Students demonstrate their ability to convey complex concepts clearly to professional audiences, to their peers, employers or the general public.
- **In-Class Exercises and Tests**: Assessments via conventional or online platforms evaluate subject knowledge and its application. In some modules the class tests are computer-based, e.g., the Möbius software package.
- **Dissertation**: Students engage with advanced physics topics, research, and communicate effectively through extended writing.
- **Computing Tests**: Specifically assess computational skills and coding abilities related to physics problem-solving.
- **Mini-Projects**: Minor assessments that test subject knowledge and various skills.
- **Risk Assessments**: Students design experiments and consider safety aspects.
- **Teamwork**: Working effectively in groups is an important programme learning outcome and is assessed with team reports and presentations.
- **Short reports:** for which students are required to write up their own account of small group studies and discussions on particular topics.
- **Skills Portfolios:** Designed to help students audit their skills, both physics and mathematics-related and transferable, and to plan their careers.

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

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)	33.8%	66.2%	0%
Year 2 (Level 5)	37.9%	62.1%	0%
Year 3 (Level 6)	28.3%	71.8%	0%

12. Accreditation

This programme is accredited by the Institute of Physics (IOP).

Graduates with accredited BSc degrees are eligible for Membership of the IOP and can follow a route to professional registration for Chartered Physicist (CPhys) status.

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:

- 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:

- 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:

- 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?

Support for student learning on the Programme is provided in the following ways:

Open-Door Policy: All academic staff in Physics and Mathematics follow an open-door policy for students. If they are available during working hours, students can seek help and guidance. If staff members are busy, they will schedule a future meeting.

Additional Support:

- **Keele Learning Environment (KLE):** Physics and Mathematics modules are supported by learning materials accessible via the KLE at https://students.keele.ac.uk/webapps/login/.
- **Academic Mentor:** Students are assigned an Academic Mentor throughout their studies. Mentors meet with first-year students during the first week of the semester and subsequently at least four times per year to discuss progress and offer support.
- **Students with Disabilities:** Disability Coordinator, Examinations Office, support staff and Student Services assist students with long-term disabilities.
- **Health and Safety:** Students receive safety briefings during induction and before the first lab session. They must read the Safety Handbook and adhere to safety regulations. The handbook is available on the KLE under "Physics and Astrophysics Information."
- **Stay Informed:** Regularly check the KLE for updated course and teaching materials related to Physics and Mathematics modules.

16. Learning Resources

The Central Science Laboratory (CSL) has modern, well-equipped undergraduate Physics teaching laboratory and there are dedicated computing laboratories. Students can use these computing laboratories for work (including remote access) when the lab is not booked for teaching sessions. The Level 6 Physics project laboratories are located in the Lennard-Jones Building. There is an on-campus observatory with a 24-inch reflecting telescope along with a variety of smaller instruments. The campus benefits from a low carbon energy park (6 MWp of solar panels and two wind turbines) that generates 50% of campus electricity, and a smart energy network offering access to massive datasets for projects and analysis.

Mathematics is taught, primarily, in lecture theatres equipped with boards and screens for use with either visualisers or PC tablets. All modules provide partial or full lecture notes in electronic form. There is a computer laboratory within Mathematics and, in addition, as part of the School of Computing and Mathematics, students have access to the large computer science laboratory. There is also a room reserved exclusively for private study.

The learning resources available to students on the Programme include:

- the extensive collection of books and journals relevant to undergraduate study held in the University library (much of this material is also accessible online);
- detailed notes and other resources supplied in certain modules;
- the Keele Learning Environment (KLE) which provides easy access to a range of learning resources including lecture notes, examples with solutions, past examination papers, module details and reading lists, and guidance notes for project work.

17. Other Learning Opportunities

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.

18. Additional Costs

There are no additional costs for this course. However, students may incur general expenses related to university study, such as for printing, textbooks and other materials. Students who undertake a placement may be responsible for additional costs, such as travel, accommodation, and subsistence costs. For further information, please refer to the additional costs information.

All core textbooks are available in the main University Library. To increase the availability of these resources, eBooks are also purchased alongside the printed text where available; these can be accessed through the University Library Catalogue. Additional costs may be incurred if the student wishes to purchase any book for themselves. The core textbooks can be purchased for approximately £120.

Students are eligible for Associate Membership of the Institute of Physics (IOP) for £15 per annum.

If you elect to take one of the optional modules:

- NAT-20011: Flexible Work Placement (Level 5)
- NAT-30008: Flexible Work Placement (Level 6)
- NAT-30012: Professional Experience in Education

You will have to bear the costs of travelling to and from your placement provider, and if necessary, 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 from the placement provider for work placements, 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.

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.

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%.

19. Quality management and enhancement

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

- The School Education Committee is responsible for reviewing and monitoring quality management and enhancement procedures and activities across the School.
- Individual modules and the programme as a whole are reviewed and enhanced every year in the annual programme review which takes place at the end of the academic year.
- The programmes are run in accordance with the University's Quality Assurance procedures and are subject to periodic reviews under the Revalidation process.

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

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

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

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

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

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

20. The principles of programme design

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

a. UK Quality Code for Higher Education, Quality Assurance Agency for Higher Education: http://www.qaa.ac.uk/quality-code

b. QAA Subject Benchmark Statement: subject-benchmark-statement-physics-astronomy-and- astrophysics.pdf (qaa.ac.uk)

c. Keele University Regulations and Guidance for Students and Staff: http://www.keele.ac.uk/regulations

d. Degree accreditation and recognition | Institute of Physics (iop.org)

21. Annex - International Year

BSc (Hons) Physics with Mathematics with International Year

International Year Programme

Students registered for this Single Honours programme may either be admitted for or apply to transfer during their period of study at Level 5 to the International Year option. Students accepted onto this option will have an extra year of study (the International Year) at an international partner institution after they have completed Year 2 (Level 5) 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 and Level 6 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 specified in the main body of this document, the international year programme of study aims to provide students with:

1. Personal development as a student and a researcher with an appreciation of the international dimension of their subject
2. 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

Students will be supported whilst on the International Year via the following methods:

- Phone or Skype conversations with Study Abroad tutor, in line with recommended Academic Mentoring meeting points.
- Support from the University's Global Education Team

Learning Outcomes

In addition to the learning outcomes specified in the main text of the 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. Communicate effectively in an international setting;
5. Reflect on previous learning within an international context.

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

BSc (Hons) Physics with Mathematics with Work Placement Year

Work Placement Year summary

Students registered for this programme may either be admitted for or apply to transfer during their studies to the 'with Work Placement Year' option (NB: for Combined Honours students the rules relating to the work placement year in the subject where the placement is organised are to be followed). 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 Year 2 (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 3-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 and Level 6 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 specified in the main body of this document, the Work Placement Year aims to provide students with:

- Personal development as a student, and a researcher, with an appreciation of the work placement and applied dimension of physics
- Experience of work in a work placement setting with the associated academic, safety and professional requirements

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 Work 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.

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)
- 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

Students will be supported whilst on the Work Placement Year via the following methods:

- Regular contact between the student and a named member of staff who will be assigned to the student as their University supervisor. The University supervisor will be in regular contact with the student throughout the year, and be on hand to provide advice (pastoral or academic) and liaise with the Placement supervisor on the student's behalf if required.
- Two formal contacts with the student during the placement year: the University supervisor will visit the student in their placement organization at around 5 weeks after the placement has commenced, and then visit again (or conduct a telephone/video call tutorial) at around 15 weeks into the placement.
- Weekly supervision sessions will take place with the placement supervisor (or his/her nominee) throughout the duration of the placement.

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:

1. Apply the theories and laboratory skills learnt to real situations in the workplace to design, plan, risk asses, and critically evaluate practical investigations
2. Develop key professional skills in the accurate documentation of information; the analysis of various types of data; and the planning and execution of tasks safely.
3. Develop employability skills in the presentation and communication of data; the writing of reports; and the ability to work effectively, individually, and as part of a team
4. Explain how their perspective on physics has been influenced by working within the work placement setting

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

1. An oral presentation on the placement year
2. A placement portfolio containing a reflective diary on the students work and experience, an evaluation of the students' performance by the placement host, and a report on the work done.

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 zero-credit rated '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: BSc (Hons) Physics with Mathematics

Final Award and Award Titles	BSc (Hons) Physics with Mathematics BSc (Hons) Physics with Mathematics with International Year BSc (Hons) Physics with Mathematics with Work Placement Year
Intermediate Award(s)	Diploma in Higher Education Certificate in Higher Education
Last modified	October 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:

Variation 1:

Failure to engage appropriately with a module's coursework assessment items without good cause (that is, by failing to submit more than 50% of coursework items) may result in reassessment being denied.

Variation 2: Condonement

The PHY-30045 Physics Research Project and Professional Development module at Level 6 must be passed at 40% and is not eligible for condonement due to accreditation requirements. All other Level 6 modules are eligible for condonement as defined in Regulation D5.

C) ADDITIONAL REQUIREMENTS

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

Additional requirement 1: Laboratory Classes

Laboratory and practical classes are compulsory and are an essential part in fulfilling the intended learning outcomes of modules of which they are part, and a requirement of Institute of Physics accreditation. Failure to attend a significant number (at least 70%) of laboratory/practical classes per semester without good cause will result in failure of the relevant modules with no reassessment being offered.

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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: 01 April 2026

Previous documents

Version No	Year	Owner	Date Approved	Summary of and rationale for changes
1	2025/26	JOANA MARIA OLIVEIRA	01 April 2025	