Undergraduate Programme Specification

Session	2025/26	**Last Modified**	
Named Award Title	BSc (Hons) Physics (Sandwich Available) 2023 Single		
Award Title for Each Award	BSc (Hons) Physics (Sandwich Available) 2023 BSc Physics Dip HE Science Cert HE Science		
Date of Approval	2024		
Details of Cohort Applies to	All students on the programme		
Awarding Institution	University of the West of Scotland	**Teaching Institution(s)**	University of the West of Scotland
Language of Instruction & Examination		English	
Award Accredited by		Institute of Physics	
Maximum Period of Registration		8 Years	
Duration of Study			
Full-time	4 Years	**Part-time**	
Placement (compulsory)	N/A		
Mode of Study	☒ Full-time ☒ Part-time		
Campus	☐ Ayr ☐ Dumfries	☐ Lanarkshire ☐ London ☒ Paisley	☐ Online / Distance Learning ☐ Other (specify)
School	**Computing, Engineering and Physical Sciences**		
Divisional Programme Board	**Engineering Physical Sciences**		
Programme Leader	Gregory V Morozov		

Admissions Criteria
Candidates must be able to satisfy the general admission requirements of the University of the West of Scotland as specified in Chapter 2 of the University Regulatory Framework together with the following programme requirements:

SQA National Qualifications:

BCCC at Higher including Mathematics and Physics OR
BCCC at Higher including Mathematics at B grade and National 5 Physics at B grade
CCD at Advanced Higher including Mathematics and Physics for direct entry to Year 2

Or GCE
CC at A Level including Mathematics and Physics OR
BCC at A Level including Mathematics and Physics for direct entry to Year 2

Or SQA National Qualifications / Edexcel Foundation
SQA HNC (Grade A)/BTEC Level 4 HNC in Physics, Applied Sciences or a relevant discipline

Other Required Qualifications/Experience
Year 1: Summer school mathematics and physics modules (Level 6)
International Baccalaureate (IB) Diploma: 24 points (4, 4 at HL)
Year 2 (direct entry):
International Baccalaureate (IB) Diploma: 28 points

Applicants may also be considered with other academic, vocational or professional qualifications deemed to be equivalent.

Further desirable skills pre-application

General Overview
The BSc (Hons) Physics with Sandwich degree programme at UWS presents a unique opportunity for interested students to study one of the most fundamental and instrumental sciences of the 21st
century. Physics (from Physis, Greek for nature) is an experimental science dealing with matter, space and time via fundamental concepts such as force, energy, mass and charge.

The individual modules incorporate the delivery of physics fundamentals and research underpinned by advanced methodologies reflecting the high level of expertise of our physics academics. This unique course meets the expectations of the QAA's framework document and related criteria set out by the Institute of Physics (IoP), which in 2021 renewed our accreditation.

The first two years of the physics programme include a comprehensive overview of core physics, mathematics and programming concepts. These ideas are covered across a range of modules including Introductory Physics A and B, Applied Mathematics, Mathematical Analysis, Computational Methods, Mathematics for Physics, Classical Mechanics, Optics and Electronics, Properties of Matter and Modern Physics.

The third and fourth years of the physics programme include more advanced modules such as Mathematics for Physics 2, Quantum Mechanics, Electromagnetism, Atom Nuclei and Particles, Statistical Physics and Thermodynamics, Solid State Physics, Capstone project

module and optional module choices from modules such as Numerical Analysis, Imaging and Nuclear Medicine, Advanced Optics, Detectors and Nuclear Lab Skills, Selected Topics in Theoretical Physics, Fundamentals of Nuclear Physics, Applications of Nuclear Physics and Optical System Design.

As part of the individual research project in the final year, students are able to act as junior members of research groups in the department and work autonomously on undergraduate research projects while being mentored by PhD students, postdoctoral fellows and academic colleagues.

All modules promote the critical evaluation of obtained results and their comparison with expected outcomes, theoretical predictions or published data. The delivery of the programme is done via lectures, tutorials, and laboratory work. Small size collaborative tutorial classes embed the learning in detail through problem solving and foster an environment communication and teamwork.

After graduation the students will be able to pursue their scientific careers in the form of MSc or PhD projects, some of which will be available here at UWS. Furthermore, the student may work towards a career in industry. Career paths of our recent graduates include teaching, medical physics, nuclear safety, ultrasonics, artificial intelligence, photonics, defence sector, etc.

Typical Delivery Method
Face-to-face lectures and tutorials as well as practical laboratory sessions.

Any additional costs
Optional costs for the purchase of books/printed materials and/or computing hardware facilities.

Graduate Attributes, Employability & Personal Development Planning
Employability skills can be summarised as: High level of technological expertise geared towards problem solving and project progress, numeracy, literacy, transferable skills with regard to computer use, project leadership, teamwork and management of peers, dissemination of scientific results.

The employability skills and attributes which students will gain experience in developing, applying and reflecting upon during the degree programme are:
• Cognitive Skills (attention to detail, analysis and judgement):
- Undertake critical analysis, evaluation and/or synthesis of ideas, concepts, information and issues.
- Identify and analyse routine professional problems and issues.
- Draw on a range of sources in making judgements.
- Demonstrate technical skills in mathematics and computer programming.
• Generic competencies (planning & organisation, influencing, written communication, questioning, listening, teamworking, interpersonal sensitivity, organisational sensitivity and lifelong learning and development):
- Well developed skills for the gathering, evaluation, analysis and presentation of information, ideas, concepts and quantitative and/or qualitative data, drawing on a wide range of current sources. This will include the use of computational resources as appropriate to the subject.
- Communication of the results of their own and other work accurately and reliably in a range of different contexts using specialist concepts, constructs and techniques of the subject.

- Identifying and addressing their own learning needs including being able to draw on a range of current research, development and professional materials.
- Interpreting, using and evaluating numerical and graphical data to achieve goals and targets.
- Making formal and informal presentations on standard/mainstream topics in the subject/discipline to a range of audiences.
- Work under guidance with qualified practitioners.
- Practise in ways which take account of own and others' roles and responsibilities.
- Take some responsibility for the work of others and for a range of resources.
• Personal capabilities (creativity, decisiveness, initiative, adaptability/flexibility, achievement orientation, tolerance for stress and leadership):
- Application of their subject and transferable skills to contexts where criteria for decisions and the
scope of the task may be well defined but where personal responsibility, initiative and decision-making is also required.
- Exercising autonomy and initiative in some activities at a professional level.
• Practical and professional elements (professional expertise, process operation and image):
- Show familiarity and competence in the use of routine materials, practices and skills.
- Practise in a range of professional level contexts which include a degree of unpredictability.
- Deal with ethical and professional issues in accordance with current professional and/or ethical codes or practices, seeking guidance where appropriate.

We have defined a set of Graduate Attributes that are the skills, personal qualities and understanding to be developed through your university experience that will prepare for life and work in the 21st century (https://www.uws.ac.uk/current-students/your-graduate-attributes/).
The Graduate Attributes relevant to this course are listed below.

Academic: critical thinker; analytical; inquiring; knowledgeable; digitally literate; problem solver;
autonomous; incisive; innovative
Personal: effective communicator; influential; motivated
Professional: collaborative; research-minded; enterprising; ambitious; driven.

Work Based Learning/Placement Details
Student will have the opportunity for a one-year placement in industry or a research institution in the UK or Europe. The Physics staff are happy to initiate contacts with known providers of sandwich
placements. Details will depend on the chosen project.

The sandwich placement is designed for students to gain and reflect on work experience attained during their time in the workplace. The experience may also contribute towards meeting the membership requirements of a Professional body. Students undertaking a sandwich placement are required to undertake PDP and maintain a portfolio from which they will be required to produce a comprehensive learning log report charting their development during placement. This is assessed on a pass/fail basis only with the majority of ongoing assessment being formative in nature.

The student will be required, through reflection, to explore their own role within their placement organisation and to take account of the roles and responsibilities of themselves and others in the context of the structure in which they operate. On successful completion of the placement,

the learner will be more employable as a result of having developed their ability to integrate essential generic skills and attributes with subject/discipline related knowledge.

The placement will be governed by a tripartite learning agreement between the student, placement
provider and the University which defines the learning outcomes and confirms elements of support and commitment from all parties. The agreement will be signed by each party prior to the start of the placement, and it is expected that Schools will continue to use their existing placement systems for the management of such agreements.

Learning Outcomes
At the end of the placement the student will be able to:
• L1 Critically relate elements of the placement work experience to the main themes and issues of
academic student of physics relevant within the workplace and be confident in articulating this to others.
• L2 Analyse organisational cultures and structures with particular relevance to the current workplace and exhibit the ability to critically evaluate employee roles in an applied setting.
• L3 Recognise, critically assess and be able to clearly demonstrate to others the personal development and application of essential employability skills and attributes within a real work situation.

Assessment
Assessment will be based on pass/fail only and all assessment elements must be passed for progression as part of the Sandwich programme. Assignments will be open to external examiner in accordance with University regulations.

In order to submit for assessment students need to:
• Attend the workplace(s) in which they have been placed for a minimum total of 36 weeks (180 full
working days) and have their employer(s) confirm their attendance.
• Receive a satisfactory assessment of work performance from their workplace supervisor(s) and
academic tutor (based on two interviews and other evidence as required).
• Maintain a PDP portfolio and use this to submit a satisfactory learning log report reflecting on the
placement experience (minimum 2,000 words).
• Successfully complete a subject related project (minimum 3,000 words or equivalent).
Where a student's sandwich placement is made up of two separate planned period of work experience (i.e. a "Thin Sandwich"), the PDP portfolio report and subject related report will normally be submitted and assessed during the second period of placement. Assessment of the first period of placement will relate to satisfactory performance in the workplace. Mitigating circumstances will be taken into consideration in accordance with University regulations.

Reassessment
• Minimum period in work: It is essential that the student completes at least 36 weeks (180 working
days) in employment. If the student does not meet this minimum requirement, then they cannot pass the placement.
• Catch up: Where through no fault of their own a student has been unable to attain at least 36 weeks placement experience they will be entitled to secure the additional work experience required through a suitable additional period of work experience provided this is agreed in advance with the Programme Team.

• Retake of Placement: a repeat or alternative placement will only be considered on health or other
mitigating grounds or where the placement is terminated due to no fault of the student. In such cases the student will receive counselling from the placement tutor on how best to proceed.
• Satisfactory Performance: The first interview will be used to assess the student's progress. If it is
considered that the student's performance is less than expected at that stage, the student will be advised of this and of the elements of their performance that need to improve. If the student's performance is assessed as unsatisfactory at the second interview, then the student will be given further advice on the steps they need to take to achieve a satisfactory assessment and will be reassessed through a third interview at the end of their placement period. Interviews will normally be conducted within the workplace unless a suitable alternative method is agreed by all parties.
• Reflective Report from PDP: If the reflective report is unsatisfactory, the student will be given the
opportunity to resubmit in line with University regulations.
• Subject related report: If the subject related report is unsatisfactory the student will be given the opportunity to resubmit in line with University regulations.

Progression/Award
• Placement students will be assigned to a specific Subject and Programme Panel.
• The relevant Programme Panel will consider the performance of each sandwich placement student enrolled on that Programme and decide eligibility for reassessment, progression and awards in accordance with University Regulations, in particular Regulation 7.10.4
• A student who fails the sandwich placement after reassessment will no longer be eligible for a "with sandwich" award. They will either progress to level 9 or 10 (as appropriate) of a non-sandwich equivalent programme or exit with an equivalent non-sandwich award.

Attendance and Engagement
In line with the Student Attendance and Engagement Procedure, Students are academically engaged if they are regularly attending and participating in timetabled on-campus and online teaching sessions, asynchronous online learning activities, course-related learning resources, and complete assessments and submit these on time.

For the purposes of this programme, academic engagement equates to the following:

Equality and Diversity
The University's Equality, Diversity and Human Rights Procedure can be accessed at the following link: UWS Equality, Diversity and Human Rights Code.

Programme structures and requirements, SCQF level, term, module name and code, credits and awards (Chapter 1, Regulatory Framework)

Learning Outcomes

SCQF LEVEL 7 Learning Outcomes	
Knowledge and Understanding	
A1	Demonstrate a broad general knowledge of the physics topics covered (Mechanics, Electromagnetism, Waves, Heat, Gravitation, and core Maths)
A2	To apply knowledge and understanding to solve relevant numerical and non-numerical problems
A3	Record simple experimental procedures in individual work
A4	
A5	
Practice - Applied Knowledge and Understanding	
B1	Use the skills of observation, recording of measurements and problem solving in both theoretical and practical situations
B2	Use skills to plan and perform small scientific projects in the laboratory
B3	Use some of the basic and routine professional skills, techniques and practices
B4	
B5	
Communication, ICT and Numeracy Skills	
C1	Use a range of forms of communication, both spoken and written
C2	Use graphical and numerical skills in combination
C3	Be able to summarise and present scientific individual work effort for critical peer evaluation
C4	
C5	
Generic Cognitive Skills - Problem Solving, Analysis, Evaluation	
D1	Use a range of approaches to address problems in a routine context within physics
D2	Critical analysis of obtained experimental data
D3	Present and evaluate arguments, information and ideas in physics
D4	Use a range of numerical and graphical skills in combination
D5	
Autonomy, Accountability and Working with Others	
E1	Exercise initiative and independence in practical situations
E2	Work in partnership with others in practical classes, taking account of each other's roles and responsibilities
E3	Work with others in support of current professional practise under tutorial guidance

E4	
E5	

Level 7 Modules

CORE

SCQF Level	Module Code	Module Title	Credit	Term			Footnotes
				1	2	3	
7	PHYS07006	Introductory Physics A	20	☒	☐	☐	
7	MATH07011	Applied Mathematics	20	☒	☐	☐	
7	APPD07001	ASPIRE	20	☒	☐	☐	
7	PHYS07007	Introductory Physics B	20	☐	☒	☐	
7	MATH07009	Single Variable Calculus	20	☐	☒	☐	
7	MATH07008	Python Fundamentals	20	☐	☒	☐	
Footnotes for Core Modules							

Level 7 Modules

OPTION

SCQF Level	Module Code	Module Title	Credit	Term			Footnotes
				1	2	3	
				☐	☐	☐	
				☐	☐	☐	
				☐	☐	☐	
				☐	☐	☐	
				☐	☐	☐	
				☐	☐	☐	
Footnotes for Option Modules							

Level 7
Criteria for Progression and Award
Please refer to UWS Regulatory Framework for related regulations

Progression to level SCQF 8 is available to students who fulfil the university progression requirements and who have obtained at least a C pass in each of the core modules at SCQF 7.

A student may exit with a Cert HE Physical Sciences, with:

- a minimum of 120 credit points achieved at Level 7 or above, and;
- at least 80 credit points are achieved from any CHEM/FORS/MATH/PHYS modules.

SCQF LEVEL 8 Learning Outcomes	
Knowledge and Understanding	
A1	Demonstrate a broad knowledge of physics at the appropriate level, with detailed knowledge in some areas
A2	Demonstrate understanding of a limited range of core theories, principles and concepts
A3	
A4	
A5	
Practice - Applied Knowledge and Understanding	
B1	Carry out routine investigations in a lab situation
B2	Adapt routine practices within accepted standards
B3	
B4	
B5	
Communication, ICT and Numeracy Skills	
C1	Convey complex information on a topic to an audience
C2	Use a range of applications to obtain, process and interpret data
C3	
C4	
C5	
Generic Cognitive Skills - Problem Solving, Analysis, Evaluation	
D1	Understanding core issues of depicted physics problems
D2	Solving of smaller scale theoretical and hand-on laboratory work problems
D3	
D4	
D5	
Autonomy, Accountability and Working with Others	
E1	Work in close partnership with peers on problems
E2	
E3	
E4	
E5	

Level 8 Modules

CORE

SCQF Level	Module Code	Module Title	Credit	Term			Footnotes
				1	2	3	
8	PHYS08007	Classical Mechanics	20	☒	☐	☐	
8	PHYS08002	Optics & Electronics	20	☒	☐	☐	
8	PHYS08006	Mathematics for Physics	20	☒	☐	☐	
8	PHYS08004	Properties of Matter	20	☐	☒	☐	
8	PHYS08009	Modern Physics	20	☐	☒	☐	
8	APPD08001	ASPIRE 2	20	☐	☒	☐	
Footnotes for Core Modules							

Level 8 Modules

OPTION

SCQF Level	Module Code	Module Title	Credit	Term			Footnotes
				1	2	3	
				☐	☐	☐	
				☐	☐	☐	
				☐	☐	☐	
				☐	☐	☐	
				☐	☐	☐	
				☐	☐	☐	
Footnotes for Option Modules							

Level 8
Criteria for Progression and Award
Please refer to UWS Regulatory Framework for related regulations

Progression to level SCQF 9 is available to students who fulfil the university progression requirements and who have obtained at least a C pass in each of the core modules at SCQF 8.

A student may exit with a Dip HE Physical Sciences, with:

- a minimum of 240 credit points, where;
- at least 100 credit points are achieved at Level 8 or above, and;
- at least 80 credit points are achieved from any CHEM/FORS/MATH/PHYS modules at Level 7
- at least 80 credit points are achieved from any CHEM/FORS/MATH/PHYS modules at Level 8.

SCQF LEVEL 9 Learning Outcomes (Maximum of 5 per heading)	
Knowledge and Understanding	
A1	Demonstrate a broad and integrated knowledge and understanding of the main areas of physics (quantum mechanics, electromagnetism, atoms, nuclei and particles)
A2	Demonstrate a critical evaluation of modern day physics knowledge
A3	Utilise mathematical techniques and construct mathematical arguments at an advanced level
A4	
A5	
Practice - Applied Knowledge and Understanding	
B1	Practise routine methods of enquiry in a lab setting, including topics with a degree of unpredictability
B2	Use information retrieval system present at the university for further reading and understanding of modern day physics concepts
B3	Discuss outcomes in detail with peers and supervisors
B4	
B5	
Communication, ICT and Numeracy Skills	
C1	Write formal reports which include elements of interpretation and evaluation of numerical data
C2	Be able to make a formal presentation on a topic as a member of a group
C3	Be able to lead own project
C4	
C5	
Generic Cognitive Skills - Problem Solving, Analysis, Evaluation	
D1	Undertake critical analysis; evaluate information and synthesise ideas
D2	Benchmark own findings with standard results as depicted in modern day physics
D3	Critical evaluate sources of uncertainties and limits of modern day physics understanding
D4	
D5	
Autonomy, Accountability and Working with Others	
E1	Exercise autonomy and initiative in practical classes and in intermediate problem solving exercises
E2	Work with others in a group to produce a presentation of intermediate level
E3	
E4	
E5	

Level 9 Modules

CORE

SCQF Level	Module Code	Module Title	Credit	Term			Footnotes
				1	2	3	
9	PHYS09008	Quantum Mechanics	20	☒	☐	☐	
9	PHYS09012	Mathematics for Physics 2	20	☒	☐	☐	
9	PHYS09003	Electromagnetism	20	☐	☒	☐	
9	PHYS09013	Atoms, Nuclei & Particles	20	☐	☒	☐	
				☐	☐	☐	
				☐	☐	☐	
Footnotes for Core Modules							

Level 9 Modules

OPTION

SCQF Level	Module Code	Module Title	Credit	Term			Footnotes
				1	2	3	
9	MATH09014	Numerical Analysis	20	☒	☐	☐	
9	PHYS09009	Imaging & Nuclear Medicine	20	☒	☐	☐	
9	PHYS09001	Advanced Optics	20	☐	☒	☐	
9	PHYS09014	Detectors & Nuclear Lab Skills	20	☐	☒	☐	
		Any other Level 8/9/10 Module	20	☒	☒	☐	
				☐	☐	☐	
Footnotes for Option Modules							

Level 9
Criteria for Progression and Award
Please refer to UWS Regulatory Framework for related regulations

Progression to level SCQF 10 is available to students who fulfil the university progression requirements and who have obtained at least a C pass in each of the core modules at SCQF 9. Students may, subject to availability, be able to undertake a sandwich placement for one academic year, before proceeding to SCQF level 10.

A student may exit with a BSc Physics, with a minimum of 360 credit points. The Progression and Awards Board will award distinction to candidates for undergraduate awards other than Honours degrees where a mean mark of 70% or above is achieved by candidates at their first attempt.

SCQF LEVEL 10 Learning Outcomes (Maximum of 5 per heading)	
Knowledge and Understanding	
A1	Demonstrate knowledge that integrates the principal topics in advanced physics at the required level (project, advanced topics in experimental and theoretical physics)
A2	Demonstrate a detailed knowledge and understanding of at least one specialism
A3	
A4	
A5	
Practice - Applied Knowledge and Understanding	
B1	Execute a defined project of research or investigation and identify relevant outcomes
B2	Use a range of skills and practices associated with a specialist area of study
B3	
B4	
B5	
Communication, ICT and Numeracy Skills	
C1	Make a formal presentation on a specialised topic to an informed audience
C2	Be able to defend own project results under peer scrutiny
C3	Be able to communicate with peers and senior colleagues
C4	
C5	
Generic Cognitive Skills - Problem Solving, Analysis, Evaluation	
D1	Be able to make judgements where data is limited, in a practical or theoretical situation
D2	Critically identify, define and analyse complex physics problems and issues
D3	
D4	
D5	
Autonomy, Accountability and Working with Others	
E1	Exercise autonomy and initiative in practical classes and in advanced problem-solving exercises
E2	Work with others in a group to produce a presentation of advanced level
E3	
E4	
E5	

Level 10 Modules

CORE

SCQF Level	Module Code	Module Title	Credit	Term			Footnotes
				1	2	3	
10	PHYS10003	Project & Professional Skills		☒	☒	☐	
10	PHYS10015	Statistical Physics & Thermodynamics		☒	☐	☐	
10	PHYS10009	Solid State Physics		☐	☒	☐	
9	PHYS09008	Quantum Mechanics		☒	☐	☐	1
				☐	☐	☐	
				☐	☐	☐	

Footnotes for Core Modules

1. Core module for students from Changchun University of Science and Technology (CUST) joining the Physics Programme at Level 10.

Level 10 Modules

OPTION

SCQF Level	Module Code	Module Title	Credit	Term			Footnotes
				1	2	3	
10	PHYS10016	Principles of Nuclear Physics	20	☒	☐	☐	
10	PHYS10013	Selected Topics in Theoretical Physics	20	☒	☐	☐	
10	PHYS10014	Optical System Design	20	☐	☒	☐	
10	PHYS10012	Applications of Nuclear Physics	20	☐	☒	☐	
		Any other Level 9/10 Module	20	☒	☒	☐	
				☐	☐	☐	

Footnotes for Option Modules

Level 10
Criteria for Award
Please refer to UWS Regulatory Framework for related regulations

Students will exit with an award of BSc (Hons) Physics with a minimum of 480 points. Students who have done a sandwich year will be entitled to BSc (Hons) Physics (Sandwich)

Honours degrees are classified in accordance with the Institute of Physics (IoP) recommendation:

- All credits from third year (Level 9) contribute 50% towards the final classification.
- All credits from fourth year (Level 10) contribute 50% towards the final classification.

Note that the module PHYS10003 Project & Professional Skills has a double weighting.

The standard university regulations for classification of honours degree awards are superseded by the above criteria.

Students who enter the programme directly at Level 10 will have their degrees classified on the basis of the 120 credits they study. Institute of Physics accreditation applies only to those students who have progressed from Level 9.

Regulations of Assessment
Candidates will be bound by the general assessment regulations of the University as specified in the University Regulatory Framework. An overview of the assessment details is provided in the Student Handbook and the assessment criteria for each module is provided in the module descriptor which forms part of the module pack issued to students. For further details on assessment please refer to Chapter 3 of the Regulatory Framework. To qualify for an award of the University, students must complete all the programme requirements and must meet the credit minima detailed in Chapter 1 of the Regulatory Framework.

Combined Studies
There may be instances where a student has been unsuccessful in meeting the award criteria for the named award and for other more generic named awards existing within the School. Provided that they have met the credit requirements in line with the SCQF credit minima (please see Regulation 1.21), they will be eligible for a Combined Studies award (please see Regulation 1.61). For students studying BA, BAcc, or BD awards the award will be BA Combined Studies. For students studying BEng or BSc awards, the award will be BSc Combined Studies.

Version no: 1

Change/Version Control

What	**When**	**Who**
Updated names of modules: Computational Methods -> Python Fundamentals and Mathematical Analysis -> Single Variable Calculus.	June 19 2025	G V Morozov
Clarified the degree classification rules for BSc (Hons) Physics	June 19 2025	G V Morozov
Added summer school entry route	June 19 2025	G V Morozov