

# Programme Specification: Undergraduate

## For students starting in Academic Year 2022/2023

### 1. Course Summary

Name of programme & award title with UCAS code	Physics with Education [F3X3]
Awarding Institution	Aberystwyth University
Individual Accreditation(s)	Accredited by the Institute of Physics (IOP) for the purpose of partially meeting the educational requirement for Chartered Physicist.
Final Award	Bachelor of Science
Date of Publication	September 2023
QAA Subject Benchmark	<p><b>Information provided by Department of Physics</b>          Details of the QAA Benchmark statement for Physics, Astronomy and Astrophysics can be found <a href="#">here</a></p> <p><b>Information provided by School of Education</b>          Education Studies</p>

How this information might change: Please read the important information at <https://www.aber.ac.uk/en/study-with-us/ug-studies/terms-conditions/>. This explains how and why we may need to make changes to the information provided in this document and to help you understand how we will communicate with you if this happens.

### 2: Duration

Programme	Years
Physics with Education [F3X3]	3

### 3: Educational aims of the programme

### **Information provided by Department of Physics**

- To provide a single honours degree scheme that is designed to meet the needs of those physicists who are thinking of a career in teaching, or who wish to work in science communication. The degree provides a sound background in education together with a firm grounding in physics. The degree is made up from a core of fundamental physics modules comprising some two-thirds of the course (eighty credits per year), the remaining one-third is composed of modules from the School of Education and Lifelong Learning (forty credits per year).
- To provide, through an Institute of Physics accredited programme, a thorough understanding of the core principles of physics within the general areas of classical and quantum physics.
- To ensure that research activity informs the learning and teaching process.
- To produce graduates with competence in subject-specific skills of scientific methodology, experimental techniques, modelling, numerical and computational methods and problem solving.
- To provide training in, and use of, a wide range of transferable key skills needed for employment at a graduate level.

### **Information provided by School of Education**

- to provide students with an opportunity to develop a knowledge and understanding of the processes of learning and teaching
- to help students understand the methodologies of disciplines which can contribute to the inter-disciplinary study of learning and teaching, especially psychology, linguistics and sociology
- to help students develop critical and independent thinking, and problem-solving abilities
- to provide a theoretical grounding for students who want to train eventually to be professional school teachers
- to provide some bilingual provision, Welsh and English, for students from bilingual communities

## **4: Intended learning outcomes**

### **Information provided by Department of Physics**

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas:

## **5: Knowledge and understanding**

### **Information provided by Department of Physics**

- Fundamental concepts of a core of physics.
- Applications of these fundamentals to advanced topics approaching the frontiers of the subject where practicable.
- Appropriate working knowledge of mathematical techniques.
- A range of skills in practical physics, including experimental work, data manipulation and numerical modelling.

Teaching, learning and assessment methods used to enable outcomes to be achieved and demonstrated

- Lectures
- Problem classes
- Seminars
- Laboratory work
- Group and individual projects
- Visiting lecturer series

Assessment

- Time-constrained examinations
- Open and closed book tests

- Problem sheets
- Laboratory diaries and reports
- Project reports
- Oral presentations
- Computer programmes and assignments

### **Information provided by School of Education**

On completion of the programme, students should be able to demonstrate knowledge and understanding of the following:

- psychological theories of learning and teaching
- school curricula and related historical, political and social issues
- the aims, methods and criteria of assessment
- literacy
- linguistic and sociolinguistic studies of language in education
- bilingualism, bilingual communities and bilingual education
- language acquisition
- health and schools

The above topics are taught through modules which use the following learning and teaching activities:

- i. lectures
- ii. seminars provide opportunities for individual-presentations and group-discussions
- iii. workshops
- iv. one-to-one tutorials in the case of modules which are based on undergraduate dissertations
- v. one-to-one sessions with a Personal Tutor are available

### **Assessment**

The following methods of assessment are variously used:

- i. end-of-semester unseen written examination
- ii. written assignments within the semester
- iii. written project within the semester
- iv. undergraduate dissertation of 10000 words
- v. poster presentation
- vi. oral presentation

The methods of assessment are accompanied by the following criteria of assessment:

- i. presentation
- ii. coverage
- iii. sources
- iv. knowledge and understanding

v. critical evaluation

vi. evidence and coherent argument

## **6: Skills and other attributes**

### **Information provided by Department of Physics**

#### Intellectual skills

- Acquisition of analytical and problem-solving skills
- Numerical skills
- Planning, execution and reporting of an experiment or investigation
- Experience of independent work in physics
- Development of mathematical and computing skills used to model and describe the physical world

Teaching, learning and assessment methods used to enable outcomes to be achieved and demonstrated (examples)

- Seminars
- Laboratory classes
- Group and individual projects
- Lectures

#### Assessment

- Example sheets
- Laboratory diaries and reports
- Group and individual project reports
- Time constrained examinations
- Oral presentations
- Open and closed book tests

### **Information provided by School of Education**

#### 10.2.1 Intellectual skills

- understand strategies - electronic and otherwise - to retrieve data and information from various sources (books, journals, reports, databases, Web pages)
- interpret accurately source materials
- synthesise ideas from various sources
- analyse both qualitative and quantitative data competently applying analytic concepts from an appropriate theory and methodology
- evaluate critically source material
- understand different methods of data collection
- argue coherently by analysing evidence and applying logical thinking
- formulate and test hypotheses
- plan and conduct investigations

The teaching activities are the same as those listed in 10.1. All the above skills are promoted in lectures through direct instruction or through exposure to them; they are also promoted through their encounter in the source materials which are recommended to the students. 'Understanding methods of data collection', 'formulating and testing hypotheses', and 'planning and conducting investigations' are especially promoted through the one-to-one sessions for undergraduate dissertations.

The assessment methods and their criteria are the same as those which are listed in 10.1. Retrieving information is more appropriately assessed by assignments, projects, and dissertations because of the greater amount of time which they give to students. Understanding data collection, formulating and testing hypotheses, and planning and conducting investigations are more appropriately assessed by projects and dissertations for the same reason.

## **7: Transferable/Key skills**

### **Information provided by Department of Physics**

- Problem-solving and analytical skills
- Working in groups
- Time-management and planning
- Written and oral communication skills
- IT skills
- Independent learning skills
- Investigative skills

Teaching, learning and assessment methods used to enable outcomes to be achieved and demonstrated

- Group project work
- Individual project work
- Oral examinations
- Example sheets

### **Information provided by School of Education**

On completion of the programme the student will be able to:

- Work independently
- Work in a team
- Appreciate the views and beliefs of others through their critical evaluation
- Listen discriminately
- Communicate orally
- Communicate in writing
- Use electronic media to communicate
- Word-process
- Use the Web
- Manage time and work to deadlines
- Research issues
- Solve problems
- Adapt to change
- Develop career awareness

The teaching activities are the same as those listed in 10.1. Lectures encourage the evaluation of the views of others, discriminate listening, managing time, researching issues and solving problems. Project work and one-to-one tutorials encourage the same range of skills, but the former also promotes team work in the co-operative investigation of a topic, and the latter promotes independent work. The flexibility of seminars promote the majority of the skills. Careers awareness is encouraged by the direct relationship between a joint honours degree in Education, progression to teacher training, and a career as a professional school teacher.

An awareness of change is encouraged through studying the historical development of different aspects of a discipline.

The assessment methods are the same as those listed in 10.1. Working independently, appreciating the views of others, communicating in writing, word-processing, managing time, researching issues, solving problems are necessary skills to perform adequately on all the methods of assessment (although traditional examinations promote handwritten scripts rather than word-processed ones). The following are not formally assessed but are all promoted: listening discriminately, communicating orally, communicating through electronic media, adapting to change, and career awareness. Working in a team is not formally assessed but is an important factor in successful performance on joint project work, and also in seminars.

## 8: Work-based learning (where appropriate)

## 9: What is the structure of the programme?

### Year 1 Core modules

#### Core (80 Credits)

Name	Module Code	Credits	Semester
Calculus	<a href="#">MP10610</a>	10	Semester 1
Classical Physics	<a href="#">PH11010</a>	10	Semester 1
Forces and Energy	<a href="#">PH11120</a>	20	Semester 2
Forces and Energy	<a href="#">PH11120</a>	20	Semester 2
Modern Physics	<a href="#">PH14310</a>	10	Semester 2
Laboratory Techniques for Experimental Physics (10 Credits)	<a href="#">PH15510</a>	10	Semester 2
Laboratory Techniques for Experimental Physics (10 Credits)	<a href="#">PH15510</a>	10	Semester 2
Algebra and Differential Equations	<a href="#">PH16210</a>	10	Semester 1
Classical Dynamics	<a href="#">PM14010</a>	10	Semester 1

#### Core (40 Credits)

Name	Module Code	Credits	Semester
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The Learner and the Learning Environment	<a href="#">ED13820</a>	20	Semester 2
Children's Development and Learning	<a href="#">ED14520</a>	20	Semester 1

## Year 2 Core modules

### Core (80 Credits)

Name	Module Code	Credits	Semester
Thermodynamics	<a href="#">PH21510</a>	10	Semester 1
Optics	<a href="#">PH22010</a>	10	Semester 2
Electricity and Magnetism	<a href="#">PH22510</a>	10	Semester 2
Principles of Quantum Mechanics	<a href="#">PH23010</a>	10	Semester 2
Numerical Techniques for Physicists	<a href="#">PH26600</a>	0	Semester 1
Numerical Techniques for Physicists	<a href="#">PH26620</a>	20	Semester 2
Mathematical Physics	<a href="#">PM26020</a>	20	Semester 1

### Core (20 Credits)

Name	Module Code	Credits	Semester
Psychology of Learning and Thinking	<a href="#">ED20120</a>	20	Semester 1

## Year 2

**Options** Choose 20 credits (one) from the list below

Name	Module Code	Credits	Semester
Llythrennedd Mewn Plant Ifanc	<a href="#">AD20220</a>	20	Semester 1

Dulliau Ymchwil	<a href="#">AD20320</a>	20	Semester 2
Gweithio Gyda Phlant	<a href="#">AD20600</a>	0	Semester 1
Gweithio Gyda Phlant	<a href="#">AD20620</a>	20	Semester 2
Diogelu ac Ymarfer Proffesiynol	<a href="#">AD24320</a>	20	Semester 1
Literacy in Young Children	<a href="#">ED20220</a>	20	Semester 1
Research Methods	<a href="#">ED20320</a>	20	Semester 2
Education, Diversity and Equality	<a href="#">ED20420</a>	20	Semester 1
Working with Children	<a href="#">ED20600</a>	0	Semester 1
Working with Children	<a href="#">ED20620</a>	20	Semester 2
Making Sense of the Curriculum	<a href="#">ED20820</a>	20	Semester 2
Discourses Language and Education	<a href="#">ED22420</a>	20	Semester 2
Safeguarding and Professional Practice	<a href="#">ED24320</a>	20	Semester 1

## Final Year Core modules

### Core (60 Credits)

Name	Module Code	Credits	Semester
Concepts in Condensed Matter Physics	<a href="#">PH32410</a>	10	Semester 1
Particles, Quanta and Fields	<a href="#">PH33000</a>	0	Semester 1
Particles, Quanta and Fields	<a href="#">PH33020</a>	20	Semester 2
Practical Research Skills (10 credits)	<a href="#">PH35110</a>	10	Semester 1

Project (20 Credits)	<a href="#">PH35620</a>	20	Semester 2
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### Core (20 Credits)

Name	Module Code	Credits	Semester
Critically Reflecting and Evaluating Learning and Skills	<a href="#">ED30120</a>	20	Semester 1
Critically Reflecting and Evaluating Learning and Skills	<a href="#">ED30120</a>	20	Semester 1

### Final Year

**Options** Students take a further 20 credits at Physics Level-3 subject to pre-requisites, timetable and approval by Degree Scheme Coordinator

**Options** Choose 20 credits (one) from the list below

Name	Module Code	Credits	Semester
Datblygiad Mathemategol yn y Blynyddoedd Cynnar	<a href="#">AD30320</a>	20	Semester 2
Hawliau Plant	<a href="#">AD30620</a>	20	Semester 1
Cyfathrebu	<a href="#">AD34720</a>	20	Semester 2
Datblygiad Emosiynol a Chymdeithasol	<a href="#">AD34820</a>	20	Semester 2
Mathematical Development in the Early Years	<a href="#">ED30320</a>	20	Semester 2
Special Educational Needs	<a href="#">ED30420</a>	20	Semester 1
Children's Rights	<a href="#">ED30620</a>	20	Semester 1
Communication	<a href="#">ED34720</a>	20	Semester 2
Emotional and Social Development	<a href="#">ED34820</a>	20	Semester 2

## 10: University Regulations

Details of University Regulations can be found at <https://www.aber.ac.uk/en/academic-registry/handbook/regulations/>

## **11: Support for students and their learning**

## **12: Entry Requirements**

### **Information provided by Department of Physics**

Details of Degree Course Requirements can be found by [clicking this link](#).

Applications submitted on the basis of other qualifications and applications from mature candidates are welcomed and will be considered on an individual basis.

### **Information provided by School of Education**

280 UCAS points and requirements of other departments

Details of entry requirements for the scheme can be found at <https://courses.aber.ac.uk/>

## **13: Methods for evaluating and improving the quality and standards of teaching and learning**

## **14: Regulation of Assessment**

Academic Regulations are published as Appendix 2 of the Academic Quality Handbook: <https://www.aber.ac.uk/en/aqro/handbook/app-2/>

## **15: External Examiners**

External Examiners fulfill an essential part of the University's Quality Assurance. Annual reports by External Examiners are considered by Faculties and Academic Board at university level.

## **16: Indicators of quality and standards**

### **Information provided by Department of Physics**

- External examiner's reports
- Institute of Physics Report
- University departmental audits
- QAA institutional reviews

The Department Quality Audit questionnaire serves as a checklist about the current requirements of the University's Academic Quality Handbook. The periodic Department Reviews provide an opportunity to evaluate the effectiveness of quality assurance processes and for the University to assure itself that management of quality and standards which are the responsibility of the University as a whole are being delivered successfully.