Programme Specification: Undergraduate
For students starting in Academic Year 2022/2023

1.Course Summary

Name of programme & award title with UCAS code	Engineering Physics (with integrated year in industry) [179G]
Awarding Institution	Aberystwyth University
Final Award	Bachelor of Engineering
Date of Publication	September 2023
QAA Subject Benchmark	**Information provided by Department of Physics** This Programme Specification has been designed to conform to the QAA Benchmark Statements for Physics and Engineering http://www.qaa.ac.uk/en/Publications/Documents/SBS-Physics-Astronomy-and-Astrophysics-17.pdf Institute of Physics accreditation to be requested for this new degree scheme

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
Engineering Physics (with integrated year in industry) [179G]	4

3: Educational aims of the programme

Information provided by Department of Physics

1. To provide a thorough understanding of the core principles of physics and its application in engineering and technology.

2. To apply research activity to inform the learning and teaching.

3. To produce graduates with competence in subject-specific skills: problem solving, scientific methodology, experimental techniques, modelling, numerical and computational methods.

4. To provide training in, and use of, a wide range of transferable key skills needed for employment at a graduate level.

5. To develop a systematic approach and the logical and practical steps necessary for, often complex, concepts to become reality.

6. To gain skills in solving problems by applying their numerical, computational, analytical and technical skills, using appropriate tools.

7. To provide awareness of risk, cost and value and of social, cultural, environmental, health and safety, economic and wider professional responsibilities.

8. To appreciate the global dimensions of engineering, commerce and communication.

9. To develop the ability to formulate and operate within appropriate codes of conduct, when faced with an ethical issue.

10. To develop a professional outlook and ability to work in teams as effective communicators.

11. To enable students to learn about an organisation and its area of work, providing an opportunity to evaluate future career paths.

4: Intended learning outcomes

5: Knowledge and understanding

Information provided by Department of Physics

By the end of their programme, all students are expected to be able to demonstrate:

A1-A6

A1 Understanding of fundamental concepts of a core of physics

A2 Ability to apply these fundamental concepts to advanced topics approaching the frontiers of the subject

A3 Appropriate working knowledge of mathematical techniques

A4 A range of skills in practical physics, including experimental work, data manipulation and numerical modelling

A5 Knowledge of engineering, the management of engineering projects, and their legal, social, ethical and professional aspects

A6 Ability to interpret topics and results in terms of relevant literature and to construct and communicate the arguments logically

Learning and Teaching

Teaching and learning methods used to enable the outcomes to be achieved and demonstrated encompass:

• Lectures (A1-A6)

• Problem-solving workshops (A1,A3-A4)

• Feedback classes (A1-A3)

• Laboratory work (A4)

• Group and individual project work (A4,A6)

Assessment Strtegies and Methods Assessment methods include:

• Time-constrained examinations (A1-A3,A5)

• Open- and closed-book tests (A1-A3)• Examples sheets (A1-A3)

• Laboratory diaries and reports (A4)

• Literature searches and reviews (A6)

• Project reports (A4,A6)

• Oral/Poster presentations (A4-A6)

• Job application (A5)

• Mathematical and numerical exercises (A1,A3)

• Computational exercises (A4)

6: Skills and other attributes

Information provided by Department of Physics

10.2.1 Intellectual Skills

1 By the end of their programme, all students are expected to be able to demonstrate:

B1-B5

B1 Analytical and problem-solving skills.
B2 Numerical skills.
B3 Ability to plan, execute and report on an experiment or investigation.
B4 Capability of independent work and group work in physics.
B5 Ability to develop mathematical and computing skills used to model and describe the physical world .

Learning and Teaching

Teaching and learning methods used to enable the outcomes to be achieved and demonstrated include:

• Problem-solving workshops (B1-B2,B5)

• Laboratory classes (B3-B5)

• Group and individual projects (B1-B5)

• Lectures (B1-B2) .

Assessment methods include:

• Example sheets (B1-B2)

• Laboratory diaries and reports (B3)

• Group and individual project reports (B3-B5)

• Time constrained examinations (B1-B2)

• Oral presentations (B3)

• Open- and closed-book tests (B1-B2).

10.2.2 Professional practical skills / Discipline Specific Skills.

By the end of their programme, all students are expected to be able to demonstrate:

C1 Competency in working in a practical laboratory .

C2 Ability to estimate uncertainties in measurements and results.

C3 Ability to assess and minimise risks in practical situations.

C4 The use of numerical, IT and computing skills to support practical work .

C5 Competency in recording practical work in laboratory diaries and reporting on the work in written accounts and oral presentations .

C6 Competency in carrying out a literature review and reporting on a major project via written and oral presentations .

C7 The use of industry-led approaches, concepts, skills, methods and theories in a work-based context.

Learning and Teaching

Teaching and learning methods used to enable the outcomes to be achieved and demonstrated include:

• Laboratory classes (C1-C5)

• Project work (C1-C6)

• Oral presentations (C5-C6)

• Lectures and workshops (C2-C6)

• Integrated year in industry (C7) .

Assessment Strategies and Methods

Assessment methods include:

• Laboratory diaries and reports (C1-C5)

• Group and individual project reports (C1-C6)

• Oral presentations (C5-C6)

• Coursework examples (C2)

• Computational and numerical exercises (C4)

• Integrated year in industry reports (C7)

7: Transferable/Key skills

Information provided by Department of Physics

By the end of their programme, all students are expected to be able to demonstrate:

D1-D7

D1 Problem-solving, analytical and investigative skills

D2 Ability to work independently and in groups

D3 Time-management and planning skills

D4 Ability to communicate in writing and orally

D5 Ability to apply IT skills

D6 Professional behavior including appreciation of the requirements: to be objective, unbiased and truthful; to acknowledge the work of others; and to adopt a safe working environment.

D7 Valued transferable and professional skills during a work placement, providing a competitive edge in the graduate job market.

Learning and Teaching

Teaching and learning methods used to enable the outcomes to be achieved and demonstrated include:

• Project work (D1-D6)

• Laboratory classes (D1-D6)

• Lectures (D1)

• Workshops (D1)

• Integrated year in industry (D7)

Assessment Strategies and Methods

Assessment strategies and methods include:

• Group and individual project work (D1-D6)

• Laboratory diaries and reports (D1,D4-D6)

• Oral presentations (D4)

• Written project reports (D4,D6)

• Example sheets (D1-D2)

• Integrated year in industry reports (D7)

8: Work-based learning (where appropriate)

Information provided by Department of Physics

With Year in Industry

9: What is the structure of the programme?

Year 1 Core modules

Core (120 Credits)

Name	Module Code	Credits	Semester
Calculus	MP10610	10	Semester 1
Further Algebra and Calculus	MP11010	10	Semester 2
Classical Physics	PH11010	10	Semester 1
Forces and Energy	PH11120	20	Semester 2
Forces and Energy	PH11120	20	Semester 2
Physics Career Planning and Skills Development	PH12910	10	Semester 2
Modern Physics	PH14310	10	Semester 2
Laboratory Techniques for Experimental Physics (20 Credits)	PH15700	0	Semester 1
Laboratory Techniques for Experimental Physics (20 Credits)	PH15700	0	Semester 1
Laboratory Techniques for Experimental Physics (20 Credits)	PH15720	20	Semester 2
Laboratory Techniques for Experimental Physics (20 Credits)	PH15720	20	Semester 2
Algebra and Differential Equations	PH16210	10	Semester 1
Communication and Technology	PH19510	10	Semester 1
Classical Dynamics	PM14010	10	Semester 1

Year 2 Core modules

Core (120 Credits)

Name	Module Code	Credits	Semester
Thermodynamics	PH21510	10	Semester 1
Optics	PH22010	10	Semester 2
Electricity and Magnetism	PH22510	10	Semester 2
Principles of Quantum Mechanics	PH23010	10	Semester 2
Sensors, Electronics & Instrumentation	PH24520	20	Semester 1
Practical Research Skills	PH25720	20	Semester 2
Numerical Techniques for Physicists	PH26600	0	Semester 1
Numerical Techniques for Physicists	PH26620	20	Semester 2
Mathematical Physics	PM26020	20	Semester 1

Year 3 Core modules

Core (120 Credits) During your Year in Industry your registration will be:

Name	Module Code	Credits	Semester
Year In Industry	PHS0100	0	Semester 1
Year In Industry	PHS0160	60	Semester 2
Year In Industry	PHS0200	0	Semester 1
Year In Industry	PHS0260	60	Semester 2

Final Year Core modules

Core (120 Credits)

Name	Module Code	Credits	Semester
Systems Engineering	CS33020	20	Semester 1
Concepts in Condensed Matter Physics	PH32410	10	Semester 1
Particles, Quanta and Fields	PH33000	0	Semester 1
Particles, Quanta and Fields	PH33020	20	Semester 2
Engineering Control Theory	PH33310	10	Semester 1
Semiconductor Technology	PH33610	10	Semester 2
Project (with project management)	PH37000	0	Semester 1
Project (with project management)	PH37040	40	Semester 2
Professional Skills in Engineering	PH38210	10	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

Information provided by Department of Physics

12: Entry Requirements

Information provided by Department of Physics

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

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

Information provided by Department of Physics

All taught study schemes are subject to annual monitoring and periodic review, which provide the University with assurance that schemes are meeting their aims, and also identify areas of good practice and disseminate this information in order to enhance the provision.

14: Regulation of Assessment

Information provided by Department of Physics

15. Regulation of Assessment Academic Regulations are published as part of the Academic Quality Handbook: https://www.aber.ac.uk/en/aqro/handbook/

15.1 External Examiners External examiners fulfill an essential part of the University's Quality Assurance. Annual reports by external examiners are considered by Institutes and by the Quality Assurance Committee at university level.

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 Universityâ€™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

The Institute / Department Quality Audit questionnaire serves as a checklist about the current requirements of the University's Academic Quality Handbook. The periodic Institute and Department Performance Audit (IDPA) provides 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.

In addition to standard University procedures and audits the Physics principle quality standards are those provided through accreditation of degrees by the Institute of Physics.

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