

School of Physics, Astronomy and Mathematics

Title of Programme: BSc Honours Physics and Astrophysics Programme

Programme Code: EIPHY

Programme Specification

This programme specification is relevant to students entering:
01 September 2015

Associate Dean of School (Academic Quality Assurance):
Stephen Kane

Signature



Programme Specification BSc Honours Physics and Astrophysics programme

This programme specification (PS) is designed for prospective students, enrolled students, academic staff and potential employers. It provides a concise summary of the main features of the programme and the intended learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the teaching, learning and assessment methods, learning outcomes and content for each module can be found in Definitive Module Documents (DMDs) and Module Guides.

Section 1

Awarding Institution/Body	University of Hertfordshire
Teaching Institution	University of Hertfordshire
University/partner campuses	College Lane, Bayfordbury Observatory
Programme accredited by	Institute of Physics
Final Award	BSc Hons
All Final Award titles	<ol style="list-style-type: none">1. Physics2. Astrophysics3. Physics with a Year Abroad4. Astrophysics with a Year Abroad5. Physics (Sandwich)6. Astrophysics (Sandwich)
FHEQ level of award	6
UCAS code(s)	<ol style="list-style-type: none">1. F300 BSc (Hons) Physics2. F501 BSc (Hons) Astrophysics3. F301 BSc (Hons) Physics with a Year Abroad4. F510 BSc (Hons) Astrophysics with a Year Abroad
Language of Delivery	English

A. Programme Rationale

The Physics and Astrophysics programme aims to train physicists and astrophysicists to a level commensurate with the requirements of the profession. The modules are designed to reflect the importance of fundamental concepts and ideas that underpin physics and astrophysics. They aim to instill in the student an appreciation of the beauty of the physical world and the remarkable success that analytical, observational and experimental techniques have achieved in predicting and explaining its behaviour. Emphasis is placed on practical work in the laboratories, at the observatory and in computer suites.

The programme endeavours to recruit students with a genuine enthusiasm and interest in the subject area. It seeks to foster a creative spirit in students to help them fulfill their potential, to become creative scientists and to become successful in a wide range of graduate professions where logical and analytical thinking is required.

The common level 4 studies and other core elements, reflect the belief that there is a backbone of physical theory and supporting mathematics which must underpin the whole programme. The final year Investigation tests a wide variety of skills and brings together various aspects of the course.

Communication skills are addressed directly within the programme through compulsory modules at levels 4 and 5 and are continually supported by requirements for written coursework, individual and team work and a level 6 Investigation. In particular, electronic communication is introduced at the outset and is used thereafter both in the taught modules and projects. At level 5 students have to choose one of two modules that address professional issues relevant to a professional career. One

module is aimed at career physicists whilst the other is tailored specifically to the teaching of physics and mathematics in schools.

B. Educational Aims of the Programme

The programme has been devised in accordance with the University's graduate attributes of programmes of study as set out in [UPR TL03](#).

Additionally this programme aims to:

- offer an education and training based on the core requirements of the Institute of Physics that is suited to the abilities and career aspirations of students and which, by offering choices of study path, will help them realise their own potential and provide the opportunity for postgraduate work in physics and astrophysics
- offer potential postgraduate students a platform which will enable them to embark upon further study in areas such as physics, astrophysics and other related disciplines
- develop competence in communicating scientific results to other experts and to non-specialists, including the use of computers and software packages for information retrieval and presentation;
- develop the ability to approach problem-solving activities using physical insight and laboratory/observatory skills aided where appropriate, by computer-based techniques.

C. Intended Learning Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills and other attributes in the following areas. The programme outcomes are referenced to the QAA benchmark statements for Physics, Astronomy and Astrophysics and the Framework for Higher Education Qualifications in England, Wales and Northern Ireland (2008), and relate to the typical student. Additionally, the SEEC Credit Level Descriptors for Further and Higher Education 2010 have been used as a guiding framework for curriculum design.

Knowledge and Understanding of:	Teaching/learning methods & strategies	Assessment
A1- the fundamental concepts, ideas and theories of Physics and Astrophysics; to advanced levels in physics for the Physics award, and to advanced levels in astrophysics for the Astrophysics awards.	Acquisition of knowledge and understanding of A1 through to A4 is via a combination of lectures, workshops, problem-based learning, electronic resources, small group tutorials, coursework, directed study, feedback from assessment and practical work at each level, together with an investigation undertaken at level 6.	Knowledge and understanding are assessed through a combination of unseen examinations (A1, A2), practical examinations (A2, A3, A4), in-course assessments (A1-A4) in the form of laboratory reports and logbooks (A2, A3, A4), class tests (A1, A2), coursework assignments (A1-A4), project report (A1-A4), oral and poster presentation (A1-A4).
A2- the mathematical and computational techniques used to frame and solve physical problems;	Throughout, the learner is encouraged to undertake independent study both to supplement and consolidate what is being taught/learned and to broaden their individual knowledge and understanding of the subject.	
A3 - the techniques of practical work in Physics; to advanced levels in physics for the Physics award,		
A4 – the techniques of practical work in Astrophysics; to advanced levels in astrophysics for the Astrophysics awards	Additional support is provided by StudyNet, the Mathematics Drop-In Centre and the in the case of level 4, personal tutors.	

Intellectual skills - able to:	Teaching/learning methods & strategies	Assessment
<p>B1- formulate and tackle problems in physics and astrophysics; to advanced levels in physics for the Physics award, and to advanced levels in astrophysics for the Astrophysics awards.</p> <p>B2- plan, execute and report the results of an experiment or an investigation; to advanced levels in physics for the Physics award, and to advanced levels in astrophysics for the Astrophysics awards.</p> <p>B3- use mathematics and computing to describe the physical world or an investigation.</p> <p>And in the case of Sandwich/Year Abroad students</p> <p>B4- obtain experience of working in a suitable environment alongside professionals or others engaged in scientific work.</p>	<p>Intellectual skills are developed throughout the programme by the methods and strategies outlined in section A above.</p> <p>Learning Outcomes B1-B3 are developed through tutorial exercises, workshops, coursework, group-work, laboratory or observatory work and project work.</p> <p>Acquisition of Learning Outcome B4 is through a professional placement in a suitable scientific or commercial organisation.</p> <p>Throughout, the learner is encouraged to develop intellectual skills further by independent study</p>	<p>Intellectual skills are assessed through a combination of unseen examinations (B1, B3), practical examinations (B3), assessed individual in-course assignments (B1-B3), laboratory/observatory reports (B2), workbooks and logbooks (B1-B3), class tests (B1,B3), presentations (B1-B3) and final year project report (B1-B3).</p> <p>B4 is assessed by written/verbal reports from the student, the placement organisation and the placement tutor.</p>
Practical skills - able to:	Teaching/learning methods & strategies	Assessment
<p>C1- perform experimental work and draw conclusions;</p> <p>C2- apply appropriate analytical and modelling techniques to physical problems; to advanced levels in physics for the Physics award,</p> <p>C3 – apply appropriate analytical and modeling techniques to astrophysical problems; to advanced levels in astrophysics for the Astrophysics award,</p>	<p>Practical skills are developed through a series of laboratory classes at levels 4 to 5 (C1, C2, C3) and a level 6 project (C2, C3).</p> <p>Throughout, the learner is expected to consolidate their development of practical computing skills by use of appropriate personal computers available in the learning resources centre.</p>	<p>Practical skills are assessed through laboratory reports (C1) and coursework and assignments (C1, C2).</p>

Transferable skills - able to:	Teaching/learning methods & strategies	Assessment
D1- communicate effectively, both orally and in writing;	Transferable skills are developed through problem solving workshops and group presentations (D1-D3), individual assignments (D1, D3), writing practical reports (D1) and project work (D1-D3). Throughout, the learner is encouraged to develop transferable skills by maintaining a record of evidence and completing a personal development plan.	Transferable skills are assessed through a combination of group presentations (D1-D3), individual assignments (D1, D3), written practical reports (D1-D3), project posters and reports) (D1-D3).
D2- work effectively in a team;		
D3- demonstrate time, personal management and IT skills.		

D. Programme Structures, Features, Levels, Modules, and Credits

The programme is offered in full-time (3 years), sandwich/year abroad (4 years) and part-time (5 or 6 years) modes, and leads to the award of a

1. BSc Hons Degree in Physics
2. BSc Hons Degree in Astrophysics.

In addition there are non-honours degrees (BSc degrees) with the same two titles as for the BSc Honours degrees.

Entry is normally at level 4 (with suitable A-level or equivalent qualifications), but is possible at level 5 or 6 with suitable qualifications (e.g. successful completion of relevant studies at the correct level at another institution). Intake is normally semester A (September).

Professional and Statutory Regulatory Bodies

The BSc physics award is accredited by the Institute of Physics and graduates may apply for associate membership of the society. The BSc astrophysics award is accredited by the Institute of Physics.

Work-Based Learning, including Sandwich Programmes

An award in the sandwich mode is made if at least 36 weeks of approved, supervised work experience is undertaken in addition to the period required for full-time award.

Programme Structure

The programme structure and progression information below (Table 1a and 1b) is provided for the Honours award. Any interim awards are identified in Table 1b. The Programme Learning Outcomes detailed above are developed and assessed through the constituent modules. Table 2 (in section 2) identifies where each learning outcome is assessed.

Table 1a Outline Programme Structure

BSc (Hons) Physics

Mode of study Full time/Part time

Entry point Semester A

Level 4 BSc (Hons) Physics

Compulsory Modules

Module Title	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Mathematical Techniques 1	4PAM0007	30	English	50	50	0	AB
Contemporary Physics	4PAM0009	30	English	60	40	0	AB
The Physical Universe	4PAM1013	30	English	60	40	0	AB
Applications of Computing	4PAM0023	15	English	0	100	0	B
Laboratory Physics 1	4PAM0016	15	English	0	100	0	A
Small Group Tutorial	4PAM1027	0	English	0	100	0	AB

Level 5 BSc (Hons) Physics

Module Title	Module Code	Credit Points	Pre-req	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Mathematical Techniques 2	5PAM0012	15	4PAM0007	English	80	20	0	A
Professional Skills*	5PAM0024	15		English	0	100	0	A
Professional Teaching Skills*	5PAM0028	15		English	0	100	0	A
Quantum Physics	5PAM0027	15	4PAM0009	English	60	40	0	B
Thermal and Condensed Matter Physics	5PAM0013	30	4PAM0009 Or 4PAM1013	English	80	20	0	AB
Optical Physics & Electromagnetism	5PAM0026	30	4PAM0009 Or 4PAM1013	English	60	40	0	AB

* Exactly one of these two.

Module Title	Module Code	Credit Points	Pre-req	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Differential Equations	5PAM1001	15	4PAM0007	English	80	20	0	B
Mechanics	5PAM1003	15	4PAM0007	English	70	30	0	B
Laboratory Physics 2	5PAM0023	15	4PAM0016	English	0	100	0	B

Optional sandwich year

Module Title	Module Code	Credit Points	Pre-req	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Professional Placement	6PAM0011	0		English	0	100	0	AB
Year Abroad	6PAM0030	0		English	0	100	0	AB

Level 6 BSc (Hons) Physics

Compulsory Modules Module Title	Module Code	Credit Points	Pre-req	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Computational Physics*	6PAM1004	15	4PAM0023	English	0	100	0	A
Contemporary Quantum Physics	6PAM1007	15	5PAM0027	English	0	100	0	B
Waves & Fluids	6PAM0014	30	5PAM0026	English	60	40	0	AB
Investigations in Physics*	6PAM1016	15		English	0	100	0	B
Project*	6PAM0026	30		English	0	100	0	AB

* Students enrolled on the programme on or before the academic year 2012/13 or returning from placement in 2013/14 and 2014/15 have the option of taking 6PAM0026 instead of 6PAM1004 and 6PAM1016

Optional Modules Module Title	Module Code	Credit Points	Pre-req	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Rocket Performance and Propulsion	6AAD0026	15		English	60	40	0	A
Quantum Computing A*	6COM0247	15	4PAM0009	English	0	100	0	A
Quantum Computing B*	6COM0260	15	6COM0247	English	100	0	0	B
Space Dynamics	6PAM0027	15	4PAM0023	English	0	100	0	B
Physics of Stars	6PAM0015	30	5PAM0013	English	60	40	0	AB
Nonlinear Systems	6PAM1019	15	4PAM0007	English	80	20	0	B
Boundary Value Problems	6PAM0022	30	5PAM0012	English	80	20	0	AB

* only relevant to academic year 2015/2016

BSc (Hons) Astrophysics

Mode of study Full time/Part time

Entry point Semester A

Level 4 BSc (Hons) Astrophysics

Compulsory Modules Module Title	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Mathematical Techniques 1	4PAM0007	30	English	50	50	0	AB
Contemporary Physics	4PAM0009	30	English	60	40	0	AB
The Physical Universe	4PAM1013	30	English	60	40	0	AB
Applications of Computing	4PAM0023	15	English	0	100	0	B
Laboratory Physics 1	4PAM0016	15	English	0	100	0	A
Small Group Tutorial	4PAM1027	0	English	0	100	0	AB

Level 5 BSc (Hons) Astrophysics

Module Title	Module Code	Credit Points	Pre-req	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Compulsory Modules								
Mathematical Techniques 2	5PAM0012	15	4PAM0007	English	80	20	0	A
Professional Skills*	5PAM0024	15		English	0	100	0	A
Professional Teaching Skills*	5PAM0028	15		English	0	100	0	A
Quantum Physics	5PAM0027	15	4PAM0009	English	60	40	0	B
Solar System Physics	5PAM0025	30	4PAM0009 Or 4PAM1013	English	60	40	0	AB
Optical Physics & Electromagnetism	5PAM0026	30	4PAM0009 Or 4PAM1013	English	60	40	0	AB

* Exactly one of these two.

Module Title	Module Code	Credit Points	Pre-req	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Optional Modules								
Differential Equations	5PAM1001	15	4PAM0007	English	80	20	0	B
Mechanics	5PAM1003	15	4PAM0007	English	70	30	0	B
Laboratory Physics 2	5PAM0023	15	4PAM0016	English	0	100	0	B

Optional sandwich year

Module Title	Module Code	Credit Points	Pre-req	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Optional Modules								
Professional Placement	6PAM0011	0		English	0	100	0	AB
Year Abroad	6PAM0030	0		English	0	100	0	AB

Level 6 BSc (Hons) Astrophysics

Module Title	Module Code	Credit Points	Pre-req	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Compulsory Modules								
Computational Physics*	6PAM1004	15	4PAM0023	English	0	100	0	A
Physics of Stars	6PAM0015	30	5PAM0025	English	60	40	0	AB
Cosmology and Large Scale Structure	6PAM1001	30	5PAM0025	English	60	40	0	AB
Investigations in Physics*	6PAM1016	15		English	0	100	0	B
Project*	6PAM0026	30		English	0	100	0	AB

*Students enrolled on the programme on or before the academic year 2012/13 or returning from placement in 2013/14 and 2014/15 have the option of taking 6PAM0026 instead of 6PAM1004 and 6PAM1016

Optional Modules Module Title	Module Code	Credit Points	Pre-req	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Rocket Performance and Propulsion	6AAD0026	15		English	60	40	0	A
Quantum Computing A*	6COM0247	15	4PAM0009	English	0	100	0	A
Quantum Computing B*	6COM0260	15	6COM0247	English	100	0	0	B
Space Dynamics	6PAM0027	15	4PAM0023	English	0	100	0	B
Contemporary Quantum Physics	6PAM1007	15	5PAM0027	English	0	100	0	B
Nonlinear Systems	6PAM1019	15	4PAM0007	English	80	20	0	B
Waves & Fluids	6PAM0014	30	5PAM0026	English	60	40	0	AB
Boundary Value Problems	6PAM0022	30	5PAM0012	English	80	20	0	AB

* only relates to academic year 2015-2016

Progression to level 5 requires a minimum of 90 credits. The maximum study rate in such an instance would be 150 credits and students would be expected to remedy any failed modules from level 4 in the first instance.

Progression to non-honours level 5 with 75 credits may be permissible. The maximum study rate in such an instance would normally be 120 credits and students would be expected to remedy any failed modules from level 4 in the first instance

Progression to level 6 requires 210 credits. The maximum study rate in such an instance would be 150 credits and students would be expected to remedy any failed modules from level 5 in the first instance.

Progression to non-honours level 6 with 180 credits may be permissible. The maximum study rate in such an instance would normally be 120 credits and students would be expected to remedy any failed modules from level 5 in the first instance

The award of an Honours degree in Physics or Astrophysics requires 360 credit points passed with a minimum of at least 120 at level 6.

Honours classification

The University has approved structure and assessment regulations common to all programmes. Full details are provided in [UPR AS14](#), Section D.

Table 1b Final and interim awards available

The programme provides the following final and interim awards:

Award	Minimum requirements	Available at end of Level
University Certificate	45 credit points at level 4	4
Certificate of Higher Education	120 credit points at level 4	4, 5
University Diploma	180 credit points including at least 60 at level 5	5, 6
Diploma of Higher Education Physics or Astrophysics	240 credit points including at least 120 at level 5	5, 6
BSc	300 credit points including 180 at level 6/5 of which 60 must be at level 6	6
BSc Physics (Sandwich) or Astrophysics (Sandwich)	300 credit points including 180 at level 6/5 of which 60 must be at level 6. Minimum of a 36 week approved and supervised placement plus have must perform satisfactorily as assessed by the Professional Training Certification Panel.	6
BSc Physics with a Year Abroad or Astrophysics with a Year Abroad	300 credit points including 180 at level 6/5 of which 60 must be at level 6. With one academic year of study at an approved institution in Europe or world-wide and must perform satisfactorily as assessed by the Professional Training Certification Panel.	6
BSc (Hons)	360 credit points including 240 at level 6/5 of which 120 must be at level 6	6
BSc (Hons) Physics (Sandwich) or Astrophysics (Sandwich)	360 credit points including 240 at level 6/5 of which 120 must be at level 6. Minimum of a 36 week approved and supervised placement plus have must perform satisfactorily as assessed by the Professional Training Certification Panel.	6
BSc (Hons) Physics with a Year Abroad or Astrophysics with a Year Abroad	360 credit points including 240 at level 6/5 of which 120 must be at level 6. With one academic year of study at an approved institution in Europe or world-wide and must perform satisfactorily as assessed by the Professional Training Certification Panel.	6

E. Support for students and their learning

Students are supported by;

- A Programme Tutor to help students understand the programme/award structure.
- A designated Student Administrator.
- Personal Tutors to provide academic and pastoral support.
- Placement Tutors to oversee students on sandwich or undertaking a year abroad.
- Project Tutors to guide students through their final year Project.
- Student representatives on programme committees.
- An induction week at the beginning of each new academic session.
- Overseas Orientation.
- English language support.
- Undergraduate bursaries.
- Laboratories and an Observatory.
- Module option talks, which provide students with the opportunity to receive information relating to modules on offer for the following academic year.
- Module delivery information given out at the commencement of each module.

- Computing laboratories
- Industrial Training Placements Office.
- StudyNet, a versatile on-line inter-active intranet and learning environment.
- Access to extensive digital and print collections of information resources.
- Attractive modern study environment in Learning Resources Centres.
- A substantial Student Centre that provides advice on issues such as finance, University regulations, legal matters, accommodation, international student support, etc.
- Office of Dean of Students, incorporating Chaplaincy, Counselling and Nursery.
- Medical Centre.
- A Mathematics Drop-in Centre.
- A University-based Disabled Student Co-ordinator.
- An Equal Opportunities Officer.
- The Students' Union.
- Guided student-centred learning through the use of StudyNet.
- A Careers Service for all current students and graduates.

F. Entry requirements

The normal entry requirements for the programme are:

- 320 points from minimum of two GCE/VCE A-levels (normally including GCE A-level Physics and Mathematics or VCE A-level Science) or one VCE Double Award in Science. All key skills and other tariff points counted;

or

- BTEC ND/NC with 5 merits in science or engineering;

plus

- GCSE English and Mathematics at grade C or above.

The programme is subject to the University's Principles, Policies, Regulations and Procedures for the Admission of Students to Undergraduate and Taught Postgraduate Programmes and will take account of University policy and guidelines for assessing accredited prior certificated learning (APCL) and accredited prior experiential learning (APEL)

If you wish to receive a copy of the latest Programme Annual Monitoring and Evaluation Report (AMER) and/or the External Examiner's Report for the programme, please email a request to aqo@herts.ac.uk

Section 2

Programme management

Relevant QAA subject benchmarking statements	Physics, Astronomy and Astrophysics
Date of validation/last periodic review	February 13
Date of production/ last revision of PS	June 2015
Relevant intakes	All students entering September 2015
Administrative School	School of Physics, Astronomy and Mathematics

Table 3 Course structure

Course details					
Course code	Course description			JACS	
EIPHY	BSc/BSc (Honours) Physics and Astrophysics (Physics)			F300	
Course Instances					
Instances code	Intake	Stream	Instances Year	Location:	Mode of study
PHY1S	A	Physics	1	Hatfield	Full-time/sandwich
PHY2S	A	Physics	2	Hatfield	Full-time/sandwich
PHYU2SNH	A	Physics	2	Hatfield	Full-time/sandwich
PHY3S	A	Physics	3	Hatfield	Sandwich Placement/Study Abroad
PHYU3SNH	A	Physics	3	Hatfield	Full-time/sandwich
PHY3F	A	Physics	3	Hatfield	Full-time
PHYU3FNH	A	Physics	3	Hatfield	Full-time
PHYU4SNH	A	Physics	4	Hatfield	Sandwich
PHY4S	A	Physics	4	Hatfield	Sandwich
PHYP1P	A	Physics	1	Hatfield	Part-time
PHY2P	A	Physics	2	Hatfield	Part-time
PHYP3P	A	Physics	3	Hatfield	Part-time
PHYP4P	A	Physics	4	Hatfield	Part-time
PHYP5P	A	Physics	5	Hatfield	Part-time
PHYP6P	A	Physics	6	Hatfield	Part-time

Table 3 Course structure

Course details					
Course code	Course description			JACS	
EIPHYAP	BSc/BSc (Honours) Physics and Astrophysics (Astrophysics)			F510	
Course Instances					
Instances code	Intake	Stream	Instances Year	Location:	Mode of study
AST1S	A	Astrophysics	1	Hatfield	Full-time/sandwich
AST2S	A	Astrophysics	2	Hatfield	Full-time/sandwich
AST3S	A	Astrophysics	3	Hatfield	Sandwich Placement
AST3F	A	Astrophysics	3	Hatfield	Full-time
AST4S	A	Astrophysics	4	Hatfield	Sandwich
ASTP1P	A	Astrophysics	1	Hatfield	Part-time
ASTP2P	A	Astrophysics	2	Hatfield	Part-time
ASTP3P	A	Astrophysics	3	Hatfield	Part-time
ASTP4P	A	Astrophysics	4	Hatfield	Part-time
ASTP5P	A	Astrophysics	5	Hatfield	Part-time
ASTP6P	A	Astrophysics	6	Hatfield	Part-time

The programme is managed by;

- Dean of School;
- Associate Deans of School (AQA and L&T) who have overall responsibility in Physics, Astronomy and Mathematics;
- a Programme Tutor who is responsible for the day-to-day management of the programme;
- an Admissions Tutor with specific responsibility for open days and selection;
- a Placements Tutor to assist with procurement of placements and to advise on placements;
- a designated Administrator to deal with day-to-day administration associated with the programme;
- Module Co-ordinators who are responsible for individual modules; a programme committee, the membership of which includes student representatives, academic staff teaching modules, Dean and Associate Dean of School and chaired by the Programme Tutor

Programme-specific assessment regulations

The programme is compliant with the University's generic assessment regulations (Structure and Assessment Regulations for Academic Programmes, [UPR AS14](#)) with the exception of those listed below, which have been specifically approved by the University for students enrolling on the programme from academic year 2013-2014 onwards:

Course Code	Course Instance	Award Title	Modules (child instance codes and Title)	Must be included in Award degree algorithm
EIPHY	PHY3F, PHY4S, PHYP5P, PHYP6P	BSc (Hons) Physics	All level 5 and level 6 modules to be included in the degree classification calculation at a ratio of 25% level 5 and 75% level 6	yes

Course Code	Course Instance	Award Title	Modules (child instance codes and Title)	Must be included in Award degree algorithm
EIPHYAP	AST3F, AST4S, ASTP5P, ASTP6P	BSc (Hons) Astrophysics	All level 5 and level 6 modules to be included in the degree classification calculation at a ratio of 25% level 5 and 75% level 6	yes

Students enrolling on the programme prior to academic year 2013-2014 will be subject to the following classification algorithm:

Course Code	Course Instance	Award Title	Modules (child instance codes and Title)	Must be included in Award degree algorithm
EIPHY	PHY3F, PHY4S, PHYP5P, PHYP6P	BSc (Hons) Physics	6PAM1016 Investigations in Physics 6PAM1004 Computational Physics	yes

Course Code	Course Instance	Award Title	Modules (child instance codes and Title)	Must be included in Award degree algorithm
EIPHYAP	AST3F, AST4S, ASTP5P, ASTP6P	BSc (Hons) Astrophysics	6PAM1016 Investigations in Physics 6PAM1004 Computational Physics	yes

Further points of clarification and interpretation relevant to this specific programme are given below:

- Progression from one level to the next depends on meeting the pre-requisite requirements of specific chosen modules as detailed in Table 1a to 1d and 1e above.
- To be eligible for any of the above awards a student must attain pass grades in compulsory courses listed in Table 1a to 1d.
- In the case of a Sandwich or Year Abroad award, students must also perform satisfactorily in the professional training year, as assessed by the Placement Tutor.
- The maximum length of time that a student can remain registered on the programme is: 5 years for Full-time, 6 years for Sandwich and 6 years for Part-time.

Other sources of information

- Definitive Module Documents
- Module Guides
- Student Handbook
- A-Z guide
<http://www.studynet1.herts.ac.uk/ptl/common/support.nsf/support?ReadForm>
- University of Hertfordshire Course website:
<http://www.herts.ac.uk/courses/>
- QAA Benchmark Statement website:
<http://www.qaa.ac.uk/AssuringStandardsAndQuality/subject-guidance/Pages/Subject-benchmark-statements.aspx>
- The Framework for Higher Education Qualifications in England, Wales and Northern Ireland, 2008:
<http://www.qaa.ac.uk/AssuringStandardsAndQuality/Qualifications/Pages/default.aspx>

- SEEC Credit Level Descriptors for Further and Higher Education 2010:
<http://www.seec.org.uk/sites/seec.org.uk/files/SEEC%20Level%20Descriptors%202010.pdf>
- External Quality Review report website:
<http://www.qaa.ac.uk/reviews/reports/instReports.asp?ukprn=10007147>
- Professional or Statutory Regulatory Body information: <http://www.iop.org>
- UNISTATS website:
<http://www.unistats.com/>
- University of Hertfordshire Academic Quality website:
(StudyNet → Staff → Department Lists → Academic Quality Office)
- Structure & Assessment Regulations - Undergraduate & Taught Postgraduate Programmes, UPR AS14:
<http://sitem.herts.ac.uk/secreg/upr/AS14.htm>
- Learning and Teaching Policy and Graduate Attributes, UPR TL03:
<http://sitem.herts.ac.uk/secreg/upr/TL03.htm>
- Admissions - Undergraduate & Taught Postgraduate Students, UPR SA03:
<http://sitem.herts.ac.uk/secreg/upr/SA03.htm>
- Academic Quality, UPR AS17:
<http://sitem.herts.ac.uk/secreg/upr/AS17.htm>
Index of UPRs for students:
http://sitem.herts.ac.uk/secreg/upr_azlist_info.htm
- Information on Programme and Module External Examiners
<http://www.studynet1.herts.ac.uk/ptl/common/studentcentre.nsf/Teaching+Documents/184A221E5EECA6B780257A5C00250BA9?OpenDocument>

Other information relevant to the programme

Successful Honours students will be eligible for Graduate membership of the Institute of Physics (IoP) and can apply for Chartered Physicist status. The IoP is the professional body for physics in the UK.

University policies relevant to the Programme

The University undertakes to use all reasonable endeavours to deliver, assess and administer this programme in accordance with this Programme Specification. At the same time it is recognised that it is in the nature of academic developments that changes, for example to the structure, curriculum, and assessment of a programme may be necessary in order to ensure that the programme remains up to date, in response to issues raised as a result of on-going monitoring and evaluation, and/or in order to conform to new regulatory requirements imposed by this institution, by professional or statutory bodies, or by national or governmental bodies.

The programme operates within the guidelines and policies relating to equal opportunities and environmental issues which may be agreed from time to time by the Board of Governors and/or the Academic Board of the University.

Where the programme is offered in collaboration with another institution these policies and guidelines will normally be those of the partner institution.

The programme operates in accordance with the University's Regulations Governing Studies Involving the Use of Human Subjects ([UPR RE01](#)) agreed from time to time by the Academic Board of the University. However, where the programme is offered in collaboration with another institution (for example through a franchise arrangement for all or part of the programme) then specific approval must be obtained from the University for the operation of the programme within ethical guidelines prepared by the partner institution. The partner institution will be responsible for all insurance liability in connection with the observance of ethical guidelines.

Signed



Date 15/06/2015

Stephen Kane
Associate Dean of School (Academic Quality Assurance)

If you would like this information in an alternative format please contact:
School Administration Manager: Suzanne Locke (s.f.locke@herts.ac.uk)

BSc Honours Physics**Table 2: Development of Programme Learning Outcomes in the Constituent Modules**

This map identifies where the programme learning outcomes are assessed in the constituent modules. It provides (i) an aid to academic staff in understanding how individual modules contribute to the programme aims (ii) a checklist for quality control purposes and (iii) a means to help students monitor their own learning, personal and professional development as the programme progresses.

Programme Learning Outcomes (as identified in section 1 and the following page)

		Knowledge & Understanding			Intellectual Skills				Practical Skills		Transferable Skills		
		A1	A2	A3	B1	B2	B3	B4	C1	C2	D1	D2	D3
Level 4	Module Title	Module Code											
	Mathematical Techniques 1	4PAM0007		x									
	Contemporary Physics	4PAM0009	x							x			
	The Physical Universe	4PAM1013	x		x		x						
	Applications of Computing	4PAM0023						x					
	Small Group Tutorial	4PAM1027	x	x		x		x		x			
Level 5	Laboratory Physics 1	4PAM0016			x		x		x			x	
	Mathematical Techniques 2	5PAM0012		x				x					
	Laboratory Physics 2	5PAM0023			x		x		x			x	
	Professional Skills	5PAM0024									x	x	x
	Optical Physics & Electromagnetism	5PAM0026	x							x			
	Quantum Physics	5PAM0027	x			x							
	Differential Equations	5PAM1001		x				x					
	Mechanics	5PAM1003		x				x					
	Professional Teaching Skills	5PAM0028									x	x	x
	Professional Placement (Placement Yr)	6PAM0011											
	Year Abroad	6PAM0030											
	Nonlinear Systems	6PAM0007		x					x				
	Level 6	Waves & Fluids	6PAM0014	x		x				x	x		
Physics of Stars		6PAM0015	x		x								
Space Dynamics		6PAM0027		x		x				x	x	x	x
Computational Physics		6PAM1004		x				x		x			
Cosmology and Large Scale Structure		6PAM1001	x		x								
Contemporary Quantum Physics		6PAM1007	x	x		x				x	x		
Rocket Performance and Propulsion		6AAD0026		x				x		x			
Boundary Value Problems		6PAM0022		x				x					
Investigations in Physics		6PAM1016									x		x
Project		6PAM0026									x		x
Quantum Computing A	6COM0247	x	x				x						
Quantum Computing B	6COM0260	x	x				x						

BSc Honours Astrophysics**Table 2: Development of Programme Learning Outcomes in the Constituent Modules**

This map identifies where the programme learning outcomes are assessed in the constituent modules. It provides (i) an aid to academic staff in understanding how individual modules contribute to the programme aims (ii) a checklist for quality control purposes and (iii) a means to help students monitor their own learning, personal and professional development as the programme progresses.

Programme Learning Outcomes (as identified in section 1 and the following page)

	Module Title	Module Code	Knowledge & Understanding			Intellectual Skills				Practical Skills		Transferable Skills		
			A1	A2	A4	B1	B2	B3	B4	C1	C3	D1	D2	D3
Level 4	Mathematical Techniques 1	4PAM0007		x				x						
	Contemporary Physics	4PAM0009	x							x				
	The Physical Universe	4PAM1013	x		x		x							
	Applications of Computing	4PAM0023						x						
	Small Group Tutorial	4PAM1027	x	x		x		x			x			
Level 5	Laboratory Physics 1	4PAM0016			x		x			x			x	
	Mathematical Techniques 2	5PAM0012		x				x						
	Laboratory Physics 2	5PAM0023			x		x			x			x	
	Professional Skills	5PAM0024										x	x	x
	Optical Physics & Electromagnetism	5PAM0026	x								x			
	Quantum Physics	5PAM0027	x			x								
	Differential Equations	5PAM1001		x				x						
	Mechanics	5PAM1003		x				x						
	Professional Teaching Skills	5PAM0028										x	x	x
	Professional Placement (Placement Yr)	6PAM0011												
	Year Abroad	6PAM0030												
	Nonlinear Systems	6PAM0007		x					x					
	Level 6	Waves & Fluids	6PAM0014	x		x					x	x		
Physics of Stars		6PAM0015	x		x									
Space Dynamics		6PAM0027		x		x					x	x	x	x
Computational Physics		6PAM1004		x				x			x			
Cosmology and Large Scale Structure		6PAM1001	x		x									
Contemporary Quantum Physics		6PAM1007	x	x		x					x	x		
Rocket Performance and Propulsion		6AAD0026		x				x			x			
Boundary Value Problems		6PAM0022		x				x						
Investigations in Physics		6PAM1016										x		x
Project		6PAM0026										x		x
Quantum Computing A	6COM0247	x	x					x						
Quantum Computing B	6COM0260	x	x					x						

Key to Programme Learning Outcomes

Knowledge and Understanding e.g.

- A1. The fundamental concepts, ideas and theories of Physics and Astrophysics; to advanced levels in physics for the Physics award, and to advanced levels in astrophysics for the Astrophysics awards.
- A2. The mathematical and computational techniques used to frame and solve physical problems;
- A3. The techniques of practical work in Physics and Astrophysics; to advanced levels in physics for the Physics award,
- A4. The techniques of practical work in Astrophysics; to advanced levels in astrophysics for the Astrophysics awards

Intellectual Skills e.g.

- B1. Formulate and tackle problems in physics and astrophysics; to advanced levels in physics for the Physics award, and to advanced levels in astrophysics for the Astrophysics awards.
- B2. Plan, execute and report the results of an experiment or an investigation; to advanced levels in physics for the Physics award, and to advanced levels in astrophysics for the Astrophysics awards.
- B3. Use mathematics and computing to describe the physical world or an investigation
- B4. Obtain experience of working in a suitable environment alongside professionals or others engaged in scientific work.

Practical Skills

- C1. Perform experimental work and draw conclusions;
- C2. Apply appropriate analytical and modelling techniques to physical problems; to advanced levels in physics for the Physics award,
- C3. Apply appropriate analytical and modeling techniques to astrophysical problems; to advanced levels in astrophysics for the Astrophysics award,

Transferable Skills

- D1. Communicate effectively, both orally and in writing;
- D2. Work effectively in a team;
- D3. Demonstrate time, personal management and IT skills.