Programme Title: BSc Astrophysics

Programme Specification (UG)

Awarding body / institution:	Queen Mary University of London
Teaching institution:	Queen Mary University of London
Name of final award and programme title:	BSc Astrophysics
Name of interim award(s):	CertHE; DipHE
Duration of study / period of registration:	Three Years
QMUL programme code / UCAS code(s):	F526
QAA Benchmark Group:	Physics
FHEQ Level of Award :	Level 6
Programme accredited by:	Institute of Physics
Date Programme Specification approved:	
Responsible School / Institute:	School of Physical and Chemical Sciences

Schools / Institutes which will also be involved in teaching part of the programme:

Collaborative institution(s) / organisation(s) involved in delivering the programme:

Programme outline

This programme is an Institute of Physics (IoP) accredited BSc in Astrophysics comprising of three years full time study. The programme covers the whole of the "core of Physics" as specified by the IoP in the compulsory modules and is structured to allow for increasing module choice in the second and third years of study. A BSc graduate should be able to enter further training at MSc level or enter any of a number of other careers which use the transferable skills gained during their studies. In this degree programme students will learn fundamental principles of physics and mathematics and apply them to the study of planetary systems, stars, galaxies and the universe as a whole.

Aims of the programme

We aim to:
i. teach physics of high quality within an excellent research environment;
ii. recruit students able to benefit from a university education;
iii. provide a programme that enables students with a variety of educational backgrounds to pursue physics as a subject;

iv. provide access to such variety of modules, including those from other disciplines, as to enable students to tailor their studies to their own needs and interests;
v. instill in our students an understanding of the working of the physical world;
vi. encourage students to develop transferable skills that are applicable to a variety of careers;
vii. provide a programme that prepares students, where appropriate, for a range of professional careers in physics.
viii. provide opportunities for students to appreciate the beauty of physics and to develop a desire for learning.

What will you be expected to achieve?

All programmes share a set of common learning outcomes. As student graduating with a BSc should:

Please note that the following information is only applicable to students who commenced their Level 4 studies in 2017/18, or 2018/19

In each year of undergraduate study, students are required to study modules to the value of at least 10 credits, which align to one or more of the following themes:

- networking
- multi- and inter-disciplinarity
- international perspectives
- enterprising perspectives.

These modules will be identified through the Module Directory, and / or by your School or Institute as your studies progress.

Academic Content:	
A 1	Have acquired a core knowledge of physics, possibly with experience of another pure or applied science;
A 2	Have seen and understood the application of core physics to one or two specialised areas of study;
A 3	Have acquired an understanding of the workings of the physical world;
A 4	Be able to appreciate the role of science in general, and of physics in particular, within a broader range of human cultural activity.

Disciplinary Skills - able to:	
B 1	communicate acquired knowledge of physics;

B 2	use computers for word-processing, spreadsheet computing and the acquisition and manipulation of data, in measurement and the analysis of uncertainties of observation, use high-level computer languages, write scientific reports and communicate technical material via oral presentation;

Attributes:	
C 1	To acquire and apply knowledge in a rigorous way.
C 2	To connect information and ideas within their field of study.
C 3	To adapt their understanding to new and unfamiliar settings.
C 4	To develop the ability to reflect upon and asses their own progress.
C 5	To use quantitative data confidently and competently.
C 6	To apply scientific methods to the analysis of problems.
C 7	To use communication technologies competently.
C 8	To explain and argue clearly and concisely.
C 9	To apply their analytical skills to investigate unfamiliar problems.
C 10	To use information for evidence-based decision-making and creative thinking.

How will you learn?

Our programme is constructed within a modular course structure in which each student takes eight or nine modules per year. Our overall strategy is to achieve a balance, appropriate to the aims of each course unit, between teaching (lectures; practical laboratory work; small-group tutorials) and learning by students (peer discussion; exercise classes; coursework and essay assignments; independent work in laboratories and computer studies; teach-yourself computer packages and the Internet; videos; textbooks and supplementary reading).
Exercise classes or laboratories are provided for all compulsory modules which are used to develop the specific skills needed. Two general physics laboratories are used to develop experimental skills, including the acquisition of data and the analysis of uncertainties of observation. In addition students learn to write a scientific account of their experimental observation. Finally, a compulsory independent project is used to develop students' investigative and communication skills. Students studying Astrophysics normally undertake their project under the supervision of a member of the Astronomy Unit.

How will you be assessed?

Assessment is by a mixture of continuous assessment and formal written examinations at the end of each year. We use a variety of in-course assessments to enable students to get quick feedback as to their performance. These include weekly coursework (marked and returned on a weekly basis), essay assignments, mid-term tests carried out in a lecture slot, performance in exercise classes and tutorials, laboratory and project reports. These in-course assessments are combined with formal final written examination results and oral examinations (on project modules) to produce the final mark for each course unit. The precise mixture of in-course and final exam marks to give the overall mark varies between different course units and is specified in the detailed course unit description given in the Student Handbook and on the relevant QMPlus module web page.

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How is the programme structured?

Please specify the structure of the programme diets for all variants of the programme (e.g. full-time, part-time - if applicable). The description should be sufficiently detailed to fully define the structure of the diet.

The programme consists of compulsory and elective modules. All undergraduate students at Queen Mary take 120 credits a year. A BSc degree consists of 360 credits. Most modules are worth 15 credits which means that students normally take 8 modules a year. In your third year students normally study for a project worth 30 credits. Students are required to take all modules marked as 'compulsory'. Where modules are indicated as "elective" or "suggested" or "optional" students may choose whether or not to take the module. Where there is space in the curriculum at level 5 and 6, students may take up to 15 credits per academic year from another School at Queen Mary. Students who chose this option are responsible for finding their own modules and complying with all registration requirements. Finally, the programme includes one compulsory non credit bearing (study only) module in the first and second years: SPA3000 Basic Mathematical Techniques and SPA5000 Communication Skills for Physicists.

Academic Year of Study FT - Year 1

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Professional Skills for Scientists	SPA4601	15	4	Compulsory	1	Semester 2
Mathematical Techniques 1	SPA4121	15	4	Compulsory	1	Semester 1
Classical Physics	SPA4401	15	4	Compulsory	1	Semester 1
Scientific Measurement	SPA4103	15	4	Compulsory	1	Semester 1
Modern Physics	SPA4402	15	4	Compulsory	1	Semester 1
Electric and Magnetic Fields	SPA4210	15	4	Compulsory	1	Semester 2
Mathematical Techniques 2	SPA4122	15	4	Compulsory	1	Semester 2
Basic Mathematical Techniques	SPA3000	0	4	Study only	1	Semesters 1 & 2
Our Universe	SPA4101	15	4	Compulsory	1	Semester 2

Academic Year of Study FT - Year 2

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Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Thermodynamics	SPA5219	15	5	Compulsory	2	Semester 1
Quantum Mechanics A	SPA5319	15	5	Compulsory	2	Semester 1
Nuclear Physics and Astrophysics	SPA5302	15	5	Elective	2	Semester 1
Condensed Matter A	SPA5228	15	5	Compulsory	2	Semester 2
Electromagnetic Waves and Optics	SPA5222	15	5	Compulsory	2	Semester 2
Mathematical Techniques 3	SPA5218	15	5	Elective	2	Semester 1
Planetary Systems	SPA5241	15	5	Compulsory	2	Semester 2
Stars	SPA5307	15	5	Compulsory	2	Semester 2
Communication Skills for Scientists	SPA5000	0	5	Study only	2	Semester 1
Introduction to Scientific Computing	SPA5666	15	5	Compulsory	2	Semester 1

Academic Year of Study FT - Year 3

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Statistical Physics	SPA6403	15	6	Compulsory	3	Semester 2
Extended Independent Project	SPA6776	30	6	Compulsory	3	Semester 2
The Physics of Galaxies	SPA6305	15	6	Compulsory	3	Semester 2
Spacetime and Gravity	SPA6308	15	6	Compulsory	3	Semester 1
Statistical Data Analysis	SPA6328	15	6	Elective	3	Semester 1

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Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Quantum Mechanics B	SPA6413	15	6	Elective	3	Semester 1
Elementary Particle Physics	SPA6306	15	6	Elective	3	Semester 2
Physical Cosmology	SPA6311	15	6	Compulsory	3	Semester 1
Group Project for Physicists	SPA6543	15	6	Elective	3	Semester 2
Condensed Matter B	SPA6312	15	6	Elective	3	Semester 2
Quantum Mechanics and Symmetry	SPA6325	15	6	Elective	3	Semester 2
Computational Condensed Matter Physics	SPA6315	15	6	Elective	3	Semester 1
Mathematical Techniques 3	SPA5218	15	5	Elective	3	Semester 1

What are the entry requirements?

Overall tariff score required: 320 points. A-level: grade A or B in physics and mathematics or vice versa and a B in any other subject except General Studies.
International Baccalaureate: 32 points overall with 6 in both HL(Higher Level) Physics and HL Mathematics.
European Baccalaureate: 75 % overall 7/6 in maths/physics in any order.

Access courses to HE (Higher Education) with speciality in Maths, Physics or Science: 60 credits overall, to include 45 credits at level 3, with al least 30 at Distinction and 15 at Merit, which must include both Maths and Physics.

How will the quality of the programme be managed and enhanced? How do we listen to and act on your feedback?

The Staff-Student Liaison Committee provides a formal means of communication and discussion between schools/institutes and its students. The committee consists of student representatives from each year in the school/institute together with appropriate representation from staff within the school/institute. It is designed to respond to the needs of students, as well as act as a forum for discussing programme and module developments. Staff-Student Liaison Committees meet regularly throughout the year. Each school/institute operates a Learning and Teaching Committee, or equivalent, which advises the School/Institute Director of Taught Programmes on all matters relating to the delivery of taught programmes at school level including monitoring the application of relevant QM policies and reviewing all proposals for module and programme approval and amendment before submission to Taught Programmes Board. Student views are incorporated in the committee's work in a number of ways, such as through student membership, or consideration of student surveys.

All schools/institutes operate an Annual Programme Review of their taught undergraduate and postgraduate provision. APR is a continuous process of reflection and action planning which is owned by those responsible for programme delivery; the main document of reference for this process is the Taught Programmes Action Plan (TPAP) which is the summary of the school/ institute's work throughout the year to monitor academic standards and to improve the student experience. Students' views are considered in this process through analysis of the NSS and module evaluations.

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What academic support is available?

The School of Physical and Chemical Sciences provides each student with an academic advisor, normally the same member of staff for the duration of a student's studies, who can provide academic and pastoral guidance. Additionally the School has a dedicated Student Support Officer who is available to discuss any student related problem. The School runs an open door policy which encourages the students to come and talk to their advisor, other academics or the dedicated Student Support Officer. The School also actively participates in the QMUL Peer Assisted Study Scheme (PASS).
The Senior Tutor has overall responsibility for academic support and pastoral care within the School. The Senior Tutor also has a key role in overseeing the School's attendance policy. The Senior Tutor will address any problems that cannot be resolved by a student's academic adviser or the Student Support Officer.

How inclusive is the programme for all students, including those with disabilities?

Queen Mary has a central Disability and Dyslexia Service (DDS) that offers support for all students with disabilities, specific learning difficulties and mental health issues. The DDS supports all Queen Mary students: full-time, part-time, undergraduate, postgraduate, UK and international at all campuses and all sites.

Students can access advice, guidance and support in the following areas:
• Finding out if you have a specific learning difficulty like dyslexia
• Applying for funding through the Disabled Students' Allowance (DSA)
• Arranging DSA assessments of need
• Special arrangements in examinations
• Accessing loaned equipment (e.g. digital recorders)
• Specialist one-to-one "study skills" tuition
• Ensuring access to course materials in alternative formats (e.g. Braille)
• Providing educational support workers (e.g. note-takers, readers, library assistants)
• Mentoring support for students with mental health issues and conditions on the autistic spectrum.

Programme-specific rules and facts

This programme follows the standard QM progression criteria and degree classification algorithm. The final degree classification is determined by the college mark which is a weighted average of the first, second and third year averages in the ratio 1:3:6 respectively.

Links with employers, placement opportunities and transferable skills

The School actively participates in the South East Physics Network (SEPNet) summer internship programme as well as funding a small number of internal, paid summer internships. The School works closely with the Careers Service to provide a series of bespoke events for physics students and has also recently prepared a careers booklet, in conjunction with the Institute of Physics, detailing careers opportunities for students of physics and explaining the necessary skill sets required for each area of work. The programme also includes the third year optional module SPA6543 Group Project for Physicists which directly involves external industrial partners in setting the projects.

Programme Specification Approval

Queen Mary University of London

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Person completing Programme Specification:	Gary Welch
Person responsible for management of programme:	Craig Agnor
Date Programme Specification produced / amended by School / Institute Learning and Teaching Committee:	11 Mar 2021
Date Programme Specification approved by Taught Programmes Board:	

Queen Mary University of London