Programme Specification[1]

1. Programme Title(s) and Code(s):

Programme Title	*UCAS Code*	*GU Code*
BSc Honours (Combined) in Astronomy (and another subject)		F500-2208H

2. Academic Session:

2018-19

3. SCQF Level (see Scottish Credit and Qualifications Framework Levels):

10

4. Credits:

480

5. Entrance Requirements:

Please refer to the current undergraduate prospectus at
http://www.gla.ac.uk/undergraduate/degrees/astronomy/

6. ATAS Certificate Requirement (see Academic Technology Approval Scheme):

ATAS Certificate not required

7. Attendance Type:

Full Time

8. Programme Aims:

Astronomy involves the observational and theoretical study of the astrophysical universe, ranging from solar system objects through stars, to galaxies and the structure of the universe as a whole. It draws on all branches of physics, including nuclear and particle physics, electromagnetism, dynamics and gravitation, with principles of optics and materials physics

[1] This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if full advantage is taken of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each course can be found in course handbooks and other programme documentation and online at www.gla.ac.uk/

The accuracy of the information in this document is reviewed periodically by the University and may be checked by the Quality Assurance Agency for Higher Education.

entering via astronomical instrumentation. In this BSc half-programme we aim to give the student an understanding of the principles and methods of modern astronomy, and the skills to apply this understanding to a range of theoretical and practical problems. In order to illustrate this, we draw on a wide variety of research and applications including work performed in the School of Physics & Astronomy.

Specific Aims of the Programme

(1) To present an integrated course of study providing students with knowledge and understanding of the astrophysical universe, and of the methods and principles of astrophysical enquiry;

(2) To illustrate the application of methods of mathematics and physics in an astrophysical context;

(3) To provide the opportunity to study in depth a choice of topics relevant to aspects of modern astronomy;

(4) To provide training and experience in the principles and practice of astronomical observation and measurement and in the reduction and analysis of observational data;

(5) To develop the students' ability to work effectively, singly and in small groups, to reinforce their individual responsibility for their own learning and understanding and to develop further their communication skills.

9. Intended Learning Outcomes of Programme:

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

Knowledge and Understanding

On completion of the programme students will be able to:

- Demonstrate knowledge and understanding of the following core areas: Stellar Structure and Evolution, Galaxies, Instruments for Optical and Radio Astronomy, Astronomical Data Analysis;
- Demonstrate knowledge and understanding of one each of the following pairs of optional subjects: High Energy Astrophysics or Circumstellar Matter, Cosmology or Planetary Systems

Skills and Other Attributes

Subject-specific/practical skills

On completion of the programme students will be able to:

- Programme straightforward procedures in a high level computer language, or use professional-level astronomical software, to solve physical problems and analyse data from astronomical sources;
- Plan and execute experimental investigations of physical processes using both bench and astronomical equipment;
- Evaluate uncertainties inherent in experimental measurements;
- Make a critical analysis and draw valid conclusions from the results of experimental investigations;
- Use library and web abstract and article services to conduct an in-depth scientific literature survey;
- Write clear and concise reports in a scientific style;

Intellectual skills

On completion of the programme students will be able to

- Describe and analyse quantitatively processes, relationships and techniques related to the areas covered in the contributory courses;
- Write down, and, where appropriate, either prove or discuss the underlying basis of physical laws related to topics in these areas;
- Apply ideas and techniques discussed in the courses to solve general classes of problems related to topics included in the course component outlines. These problems may include straightforward unseen elements;
- Develop awareness of applications of the topics included in the course component outlines, and appreciation of their relationship to other topics in course components taken, and the wider field;

Transferable/key skills

On completion of the programme students will be able to:

- Perform an in-depth literature study of a scientific topic;
- Prepare and give an audio-visual presentation on a scientific topic, and a detailed written report;
- Write a report containing a full description of the aims, methods, outcomes and conclusions of a piece of laboratory work;
- Apply logical analysis to problem solving;
- Interact positively with colleagues in a small group context;
- Appreciate the nature of open problems.

10. Typical Learning and Teaching Approaches:

Knowledge and understanding:

Lectures and class tutorials
Small group supervisions
Laboratory and project work
Private study

Intellectual skills:

Lectures and class tutorials
Small group supervisions
Experimental and computational laboratory work
Private study

Subject-specific/practical skills:

Laboratory work
Self-study seminar project

Transferable/key skills:

Skills workshop

Seminar project
Small group supervisions

11. Typical Assessment Methods:

Knowledge and understanding:

Written examinations
Written reports of laboratory work
Multiple choice questions

Intellectual skills:

Written examinations
Written reports of laboratory work
Oral presentation and written report of seminar project work
Multiple choice questions

Subject-specific/practical skills:

Written reports of laboratory work
Oral presentation and written report of seminar project work

Transferable/key skills:

Written reports of laboratory work
Oral presentation and written report of seminar project work.

12. Programme Structure and Features:

The B.Sc. Honours programme in Astronomy and another *subject* lasts 4 years and contains a minimum of 480 credits, as required by the regulations of the College of Science and Engineering, set out in the University Calendar. The other subject can be Physics, Mathematics, Applied Mathematics or (for the M.A. degree) one of a number of Arts subjects.

A minimum of 120 credits must be taken in Years 1 to 4. The courses which can be taken in years 3 and 4 are subject to timetabling constraints and to students having taken prerequisite courses in an earlier semester or year. In the sample degree programme listed below, all compulsory courses are taken as soon as possible.

Year 1
Astronomy 1 [ASTRO1001] (40 credits)
Mathematics 1R [MATHS1001] or 1X [MATHS1004] and Mathematics 1S [MATHS1002], or 1Y [MATHS1005] (20 credits each)
Additional classes (40 credits, and which should satisfy the requirements of *subject*).

Year 2
Astronomy 2 [ASTRO2001] (30 credits)
Mathematics 2A, 2B and 2D [MATHS2001, 2004 AND 2006] (10 credits each)
Additional classes (A minimum of 60 credits, and which should satisfy the requirements of *subject*).

Year 3

15 credits of compulsory courses as listed:

ASK1H Astronomy Project Skills 1 [ASTRO4003P] (15 credits)

Plus 45 credits of elective courses chosen from the following list:

Stellar Structure & Evolution [ASTRO4011] (15 credits, alternate years, starting 2009-10),
High Energy Astrophysics [ASTRO4009] (15 credits, alternate years, starting 2009-10),
Galaxies [ASTRO4008] (15 credits, alternate years, starting 2009-10),
Heliophysics and Stellar Atmospheres [ASTRO4005] (15 credits, alternate years, starting 2009-10),
Instruments for Optical & Radio Astronomy [ASTRO4010] (15 credits, alternate years, starting 2008-09),
Cosmology [ASTRO4006] (15 credits, alternate years, starting 2008-09)
Astronomical Data Analysis [ASTRO4001] (15 credits, alternate years, starting 2008-09)
Exploring Planetary Systems [ASTRO4007] (15 credits, alternate years, starting 2008-09)

Plus 60 credits of courses from *subject*.

Year 4

15 credits of compulsory courses as listed:

ASK2H Astro Skills 2 [ASTRO4004P] (15 credits)

Plus 45 credits of elective courses chosen from the following list:

High Energy Astrophysics [ASTRO4009] (15 credits, alternate years, starting AA01H Stellar Structure & Evolution [ASTRO4011] (15 credits, alternate years, starting 2009-10),
High Energy Astrophysics [ASTRO4009] (15 credits, alternate years, starting 2009-10),
Galaxies [ASTRO4008] (15 credits, alternate years, starting 2009-10),
Heliophysics and Stellar Atmospheres [ASTRO4005] (15 credits, alternate years, starting 2009-10),
Instruments for Optical & Radio Astronomy [ASTRO4010] (15 credits, alternate years, starting 2008-09),
Cosmology [ASTRO4006] (15 credits, alternate years, starting 2008-09)
Astronomical Data Analysis [ASTRO4001] (15 credits, alternate years, starting 2008-09)
Exploring Planetary Systems [ASTRO4007] (15 credits, alternate years, starting 2008-09)

Plus 60 credits of courses from *subject*.

Assessment

The programme is assessed on the basis of performance in compulsory and elective courses taken in years 3 and 4.

The programme includes 90 compulsory credits at H-level and at least 30 credits of elective courses at H-level. If a greater number of elective courses is taken than required, the performance in elective courses will be based on the best combination of elective courses meeting the minimum requirement.

The classification of marks for each course is made according to the University Code of Assessment and the programme assessment is based on the average mark of all contributing courses, weighted according to the number of credits for each course.

Lecture Course assessment: 90 minute written paper for each 15-credit lecture course.

Astro Skills 1 and 2: continuous assessment. These will include assessment of an oral

presentation on a seminar project topic and assessment of a written report on an experiment carried out.

Progress Requirements

In addition to Science Faculties general progress requirements :

Year 1 to Year 2: Astronomy 1, Mathematics 1R or 1X and Mathematics 1S, or 1Y normally all at grade D3 or better. Requirements of other subject;

Year 2 to Year 3: Astronomy 2 at C3 or better, plus Mathematics 2A and 2B and 2D at an average of D3 or better, all normally at first diet of examination. Requirements of other subject;

Year 3 to Year 4: An average grade of D3 or better over all 3rd year courses. Requirements of other subject.

Marks which define progression are awarded in accordance with the University Code of Assessment.

Exit Awards

At the end of Year 3, students who satisfy the University requirements, may graduate with a Designated BSc Joint Degree in Astronomy and *subject*.

13. Programme Accredited By:

14. Location(s):

Glasgow

15. College:

College of Science and Engineering

16. Lead School/Institute:

Physics and Astronomy [REG30600000]

17. Is this programme collaborative with another institution:

No

18. Awarding Institution(s):

University of Glasgow

19. Teaching Institution(s):

20. Language of Instruction:

English

21. Language of Assessment:

English

22. Relevant QAA Subject Benchmark Statements (see Quality Assurance Agency for Higher Education) and Other External or Internal Reference Points:

This Programme Specification is informed by the QAA Benchmark Statement for Physics, Astronomy and Astrophysics which can be found at : http:/www.qaa.ac.uk/academicinfrastructure/benchmark/honours/physics.pdf

23. Additional Relevant Information (if applicable):

Support for students is provided by the Postgraduate/Undergraduate Adviser(s) of Studies supported by University resources such LEADS (www.gla.ac.uk/myglasgow/leads/), Counselling & Psychological Services (www.gla.ac.uk/services/counselling/), the Disability Service (www.gla.ac.uk/services/studentdisability/) and the Careers Service (www.gla.ac.uk/services/careers/).
Further information for intending students is available on the School of Physics and Astronomy Website at http://www.gla.ac.uk/schools/physics/

24. Online Learning:

No

25. Date of approval:	19/12/2018