

PX158-10 Astronomy

22/23

Department

Physics

Level

Undergraduate Level 1

Module leader

Daniel Bayliss

Credit value

10

Module duration

10 weeks

Assessment

100% exam

Study location

University of Warwick main campus, Coventry

Description

Introductory description

Astronomy is the study of everything that occurs beyond the Earth's atmosphere. The module covers the concepts and techniques that are the basis of astronomy. It investigates a diverse range of astronomical objects, ranging from planets, to stars and galaxies, to the Universe as a whole. We focus on the fundamental properties of these objects, such as their masses, sizes, distances and temperatures. We will see that understanding of what is observed requires understanding of fundamental physics, particularly in relation to gravity and light, as well as mathematics.

[Module web page](#)

Module aims

To describe the constituent objects of the Universe and the physics needed to estimate their distances, sizes, masses and natures. The module will show how our knowledge of the Universe beyond Earth relies upon the application physical theories and experimental techniques.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

Description of the main constituents of the Universe with typical sizes, masses and distances covering: planets, stars, blackholes, and galaxies.

Angles, distances & sizes: angular size and the small-angle approximation; trigonometric parallax; simple astronomical telescopes, spectrographs, and detectors.

Masses: the Doppler effect and the measurement of speed from spectra; the use of speeds and sizes to derive masses in the Solar System, binary stars, star clusters and galaxies.

Physical properties of stars: stellar temperatures; spectra and elemental compositions. Physical conditions within stars.

Galaxies: the Milky Way; galaxy types, galaxy evolution.

The Universe: Hubble's discovery of the expansion of the Universe; implication of a finite age; the Big Bang, the Cosmic Microwave Background; the composition of the Universe.

Learning outcomes

By the end of the module, students should be able to:

- Demonstrate understanding, and make use, of concepts in astronomy, including astronomical coordinates, angles, fluxes, and magnitudes
- Identify, describe, and demonstrate understanding of the main constituents of the Universe, including planets, stars, black holes, and galaxies
- Describe the techniques and methods for measuring the distances and masses of stars and galaxies

Indicative reading list

Marc Kutner, Astronomy: a Physical perspective, CUP.

[View reading list on Talis Aspire](#)

Subject specific skills

Knowledge of mathematics and physics. Skills in modelling, reasoning, thinking.

Transferable skills

Analytical, communication, problem-solving, self-study

Study

Study time

| Type | Required |
|---------------|-----------------------------|
| Lectures | 30 sessions of 1 hour (30%) |
| Private study | 70 hours (70%) |
| Total | 100 hours |

Private study description

Working through lecture notes, solving problems, wider reading, discussing with others taking the module, revising for exam, practising on past exam papers

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group B

| | Weighting | Study time |
|-----------------------|-----------|------------|
| In-person Examination | 100% | |
| Answer 4 questions | | |

- Answerbook Pink (12 page)
- Students may use a calculator

Feedback on assessment

Personal tutor, group feedback

[Past exam papers for PX158](#)

Availability

Courses

This module is Core for:

- UPXA-F300 Undergraduate Physics (BSc)

- Year 1 of F300 Physics
- Year 1 of F300 Physics
- Year 1 of F300 Physics
- UPXA-F303 Undergraduate Physics (MPhys)
 - Year 1 of F300 Physics
 - Year 1 of F303 Physics (MPhys)
- UPXA-F3F5 Undergraduate Physics with Astrophysics (BSc)
 - Year 1 of F3F5 Physics with Astrophysics
 - Year 1 of F3F5 Physics with Astrophysics
- Year 1 of UPXA-F3FA Undergraduate Physics with Astrophysics (MPhys)

This module is Option list B for:

- Year 1 of UMAA-G105 Undergraduate Master of Mathematics (with Intercalated Year)
- UMAA-G100 Undergraduate Mathematics (BSc)
 - Year 1 of G100 Mathematics
 - Year 1 of G100 Mathematics
 - Year 1 of G100 Mathematics
- UMAA-G103 Undergraduate Mathematics (MMath)
 - Year 1 of G100 Mathematics
 - Year 1 of G103 Mathematics (MMath)
 - Year 1 of G103 Mathematics (MMath)
- Year 1 of UMAA-G106 Undergraduate Mathematics (MMath) with Study in Europe
- Year 1 of UMAA-G1NC Undergraduate Mathematics and Business Studies
- Year 1 of UMAA-G1N2 Undergraduate Mathematics and Business Studies (with Intercalated Year)
- Year 1 of UMAA-GL11 Undergraduate Mathematics and Economics
- Year 1 of UECA-GL12 Undergraduate Mathematics and Economics (with Intercalated Year)
- Year 1 of UMAA-G101 Undergraduate Mathematics with Intercalated Year