ASTR170

Introductory Astronomy: Our Place in the Universe

S1 Day 2019

Dept of Physics and Astronomy

Contents

General Information

Unit convenor and teaching staff
Unit Convenor
Matt Owers
astr170@mq.edu.au
E6B 2.703

Lecturer
Devika Kotachery
astr170@mq.edu.au

Laboratory Manager
Adam Joyce
adam.joyce@mq.edu.au

Devika Kotachery
devika.kamath@mq.edu.au

Credit points
3

Prerequisites

Corequisites

Co-badged status

Unit description
This is a foundation unit in astronomy, suitable for aspiring physicists/astronomers and non-scientists alike. No prior knowledge of astronomy or physics is required. This unit gives a broad underpinning of basic astronomical subjects and concepts with minimal mathematical content. A diverse range of astronomical topics are covered, starting with the solar system, including comets and asteroids; and then increasing in scale to Galactic stars, nebulae, the interstellar medium, our own Milky Way galaxy, galaxy clusters, quasars, black holes and basic cosmology. Key fundamental physical principles, theories and observational technologies are covered. Experimental work is both hands-on and computer based, and covers such areas as galaxy classification, eclipses, spectroscopy and geometrical optics. A session at the Macquarie University Observatory forms a recommended part of the practical work.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are

available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

On successful completion of this unit, you will be able to:

Knowledge of the structure and lifecycle of stars, including our Sun.

Knowledge of the layout and contents of our Solar System.

Knowledge of how galaxies form, their basic structure and how they relate to the cosmology of the universe.

Demonstrate understanding of practical and conceptual topics in observational astronomy.

Be able to conduct, analyse, and draw conclusions from hands-on experimental work.

Demonstrate foundational learning skills including active engagement in their learning process.

General Assessment Information

ASTR170 Late Submission Policy:

Assessments received after the deadline will be subject to a 10% deduction for each day, or part-day, late. (So, e.g. 0–24 hours late = 10% deduction; 24–48 hours late = 20% deduction, etc). Work will not be accepted more than 5 days (120 hours) after the due date and time.

Note: extensions to due dates may be granted if a Disruption to Studies is submitted and approved.

See https://students.mq.edu.au/study/my-study-program/special-consideration/disruption-to-studies

Assessment Tasks

Name	Weighting	Hurdle	Due
Assignment 1 - Short Questions	5%	No	5/04/19
Assignment 2 - Quiz	5%	No	31/05/19
Assignment 3 - Observatory	10%	No	07/06/19
Labs	30%	Yes	See below
Exam	50%	No	University Examination Period

Assignment 1 - Short Questions

Due: **5/04/19**

Weighting: **5%**

This assignment will consist of short-answer questions. Assignments must be submitted on iLearn. The due date is 5pm Friday 5th April 2019.

On successful completion you will be able to:

- Knowledge of the structure and lifecycle of stars, including our Sun.
- Demonstrate understanding of practical and conceptual topics in observational astronomy.

Assignment 2 - Quiz

Due: **31/05/19**
Weighting: **5%**

This assignment will be an online quiz. The assignments must be submitted on iLearn. The due date is 5pm Friday 31st of May 2019.

On successful completion you will be able to:

- Knowledge of the layout and contents of our Solar System.
- Knowledge of how galaxies form, their basic structure and how they relate to the cosmology of the universe.
- Demonstrate understanding of practical and conceptual topics in observational astronomy.

Assignment 3 - Observatory

Due: **07/06/19**
Weighting: **10%**

This assignment will require observing the sky at night. Assignments must be submitted on iLearn. The due date is 5pm Friday 7th June 2019.

On successful completion you will be able to:

- Demonstrate understanding of practical and conceptual topics in observational astronomy.
- Be able to conduct, analyse, and draw conclusions from hands-on experimental work.

Labs

Due: **See below**
Weighting: **30%**
This is a hurdle assessment task (see assessment policy for more information on hurdle assessment tasks)

Each student must attend five (5) practical sessions and complete five (5) laboratory exercises starting in **Week 5**. The lab assessment is based on in-lab work only. The lab schedule is presented below (see 'Delivery and Resources').

Attendance at labs is a hurdle requirement. You must attend at least 5 lab sessions to have the potential to pass the unit.

On successful completion you will be able to:

- Demonstrate understanding of practical and conceptual topics in observational astronomy.
- Be able to conduct, analyse, and draw conclusions from hands-on experimental work.
- Demonstrate foundational learning skills including active engagement in their learning process.

Exam

Due: **University Examination Period**
Weighting: **50%**

A two-hour final exam consisting of multiple-choice and short-answer questions will take place in the university exam period. No material will be allowed in the exam room.

If you receive special consideration for the final exam, a supplementary exam will be scheduled in the week of July 15-26 2019. By making a special consideration application for the final exam you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application. Approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

On successful completion you will be able to:

- Knowledge of the structure and lifecycle of stars, including our Sun.
- Knowledge of the layout and contents of our Solar System.
- Knowledge of how galaxies form, their basic structure and how they relate to the cosmology of the universe.
- Demonstrate understanding of practical and conceptual topics in observational astronomy.

Delivery and Resources

Lectures:

- Monday 12-1pm - 29 Wallys Walk - T1 Theatre
- Thursday 10-11am - 29 Wallys Walk - T1 Theatre and
- Thursday 2-3pm - 14 Sir Christopher Ondaatje Ave - Mason Theatre

Lectures are automatically recorded and will be available on iLearn, along with the lecture slides. Lectures will also be live streamed. The following link provides all information on lecture recordings and live streaming.

https://students.mq.edu.au/support/study/tools-and-resources/ilearn/ilearn-quick-guides-for-students/lecture-recordings

Labs:

The labs will be held in E7B (14 Sir Christopher Ondaatje Avenue) rooms 213 and 209 (enter through 213). Students are required to do 5 labs, but have the option of doing a 6th (which they can do in the extra week). Only marks from the best 5 labs will be counted. The lab schedule is as follows:

	Week 5	Week 6	Week 7		Week 8	Week 9	Week 10	Week 11	Week 12
Monday (10am-12pm and 1pm-3pm)	Lab 1	Lab 2	Lab 3	Mid Semester Break	Lab 4	Lab 5	Extra Week		
Tuesday (10am-12pm)	Lab 1	Lab 2	Lab 3		Lab 4	Lab 5	Extra Week		
Wednesday (10am-12pm)	Lab 1	Lab 2	Lab 3		Lab 4	Lab 5	Extra Week		
Thursday (11am-1pm)	Lab 1	Lab 2	Lab 3		Lab 4	Lab 5	Extra Week		
Friday (10am-12pm and 3pm-5pm)	Lab 1	Lab 2	Lab3		Lab 4	Lab 5	Extra Week		

A mandatory lab notebook will be available from the bookstore after Week 3.

Please note that health and safety regulations specify that fully-enclosed footwear must be worn in the labs. (i.e. you will not be admitted if you are wearing sandals etc.)

In Week 2 we will hold special planetarium sessions during the labs.

Textbook:

The lectures are based upon the following textbook, which is not absolutely required for the course, but is *strongly* recommended to enhance the learning process:

- *Foundations of Astronomy*, 13th Edition Michael A. Seeds and Dana Backman ISBN-10: 1305079159 | ISBN-13: 9781305079151

Earlier editions of the textbook are acceptable.

Unit Schedule

Week	Lecturer	Topic	Textbook Chapters
1	M. Owers	Introduction, the night sky and celestial motions, moon phases & eclipses	1, 2, 3
2	M. Owers	Origins of modern astronomy, gravity, light & atoms (1)	4, 5, 7
3	M. Owers	Light & atoms (2), telescopes, the Sun	7, 6, 8
4	M. Owers	Introduction to the stars, the interstellar medium	9, 10
5	M. Owers	Star formation, Stellar structure and evolution	11, 12
6	M. Owers	Stellar death, Neutron stars & black holes	13
7	D. Kamath	Life in the Universe, The Milky Way Galaxy	14, 15
8	D. Kamath	Other Galaxies	16
9	D. Kamath	Active galaxies & supermassive black holes	17
10	D. Kamath	Modern cosmology I	18
11	D. Kamath	Modern Cosmology II	18
12	D. Kamath	Origin of the solar system and extrasolar planets, Earth and other planets	19-25
13	All	Revision Week	

N.B. This schedule is flexible, and subject to change.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and

Teaching:

- Academic Appeals Policy
- Academic Integrity Policy
- Academic Progression Policy
- Assessment Policy
- Fitness to Practice Procedure
- Grade Appeal Policy
- Complaint Management Procedure for Students and Members of the Public
- Special Consideration Policy *(**Note:** The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.)*

Undergraduate students seeking more policy resources can visit the Student Policy Gateway (https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/study/getting-started/student-conduct

Results

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- Workshops
- StudyWise
- Academic Integrity Module for Students
- Ask a Learning Adviser

Student Services and Support

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

If you are a Global MBA student contact globalmba.support@mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

Learning outcome

- Demonstrate foundational learning skills including active engagement in their learning process.

Assessment task

- Labs

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Knowledge of the structure and lifecycle of stars, including our Sun.
- Knowledge of the layout and contents of our Solar System.
- Knowledge of how galaxies form, their basic structure and how they relate to the cosmology of the universe.
- Demonstrate understanding of practical and conceptual topics in observational astronomy.

Assessment tasks

- Assignment 1 - Short Questions
- Assignment 2 - Quiz
- Assignment 3 - Observatory
- Labs
- Exam

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- Knowledge of the structure and lifecycle of stars, including our Sun.
- Knowledge of the layout and contents of our Solar System.
- Knowledge of how galaxies form, their basic structure and how they relate to the cosmology of the universe.
- Demonstrate understanding of practical and conceptual topics in observational astronomy.
- Be able to conduct, analyse, and draw conclusions from hands-on experimental work.

Assessment tasks

- Assignment 1 - Short Questions
- Assignment 2 - Quiz
- Assignment 3 - Observatory
- Labs
- Exam

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- Demonstrate understanding of practical and conceptual topics in observational astronomy.
- Be able to conduct, analyse, and draw conclusions from hands-on experimental work.

Assessment tasks

- Assignment 1 - Short Questions
- Assignment 2 - Quiz
- Assignment 3 - Observatory
- Labs
- Exam