ASTR2020

Observational Astronomy

Session 2, Weekday attendance, North Ryde 2021

Department of Physics and Astronomy

Contents

Session 2 Learning and Teaching Update

The decision has been made to conduct study online for the remainder of Session 2 for all units WITHOUT mandatory on-campus learning activities. Exams for Session 2 will also be online where possible to do so.

This is due to the extension of the lockdown orders and to provide certainty around arrangements for the remainder of Session 2. We hope to return to campus beyond Session 2 as soon as it is safe and appropriate to do so.

Some classes/teaching activities cannot be moved online and must be taught on campus. You should already know if you are in one of these classes/teaching activities and your unit convenor will provide you with more information via iLearn. If you want to confirm, see the list of units with mandatory on-campus classes/teaching activities.

Visit the MQ COVID-19 information page for more detail.

General Information

Unit convenor and teaching staff
Lee Spitler
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Joanne Dawson
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Credit points
10

Prerequisites
PHYS201 or PHYS2010

Corequisites

Co-badged status

Unit description
Following an introduction to some of the key objects in the sky, this unit is based around a major experimental project in observational astronomy. Lectures, labs and workshops in the first half of the unit provide students with the tools needed to design and execute an open-ended observational project in the 2nd half. Topics on observational astronomy (e.g. galaxies, stars, exoplanets) are covered alongside data and instrumentation requirements. Hands-on lab and project work provide a foundation in optical and radio telescope design and instrumentation. Python programming for image processing and analysis of large datasets are introduced and developed in the labs and major project. Modern project management tools and best-practice in experimental design are incorporated into the unit.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://students.mq.edu.au/important-dates

Learning Outcomes

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

ULO1: design experiments suitable for gaining new knowledge about physical phenomena.

ULO2: demonstrate an understanding of a range of instrumentation topics and apply a subset of that knowledge to project work.

ULO3: work effectively in small teams and jointly manage a project.

ULO4: describe and discuss a range of topics in observational astronomy.

ULO5: Apply python computer programming and industry-standard software tools to real-world situations.

General Assessment Information

This unit has hurdle requirements, specifying a minimum standard that must be attained in aspects of the unit. To pass this unit you must obtain a mark of at least:

- 50% in the unit overall

as well as:

- 40% in the midsession examination

Students getting between 30 and 39% in the midsession exam will be given a second chance to meet the 40% hurdle pass mark.

Late Assessments Policy

The non-examination assessment components should be submitted by the due date and time.

The penalty for late submission is deduction of 5% of the possible mark for that item for each 24 hour period (or part) overdue. Assessments will not be accepted for marking if submitted more than 1 week past the due date. Extensions to the due dates for assignments, practical assessments, and project will only be considered if requested with valid reason *prior to the due date*.

Students anticipating or experiencing difficulties in meeting a deadline should discuss this with one of the lecturers in the first instance, ideally ahead of the deadline, if at all possible. Students should also be familiar with the University's Disruptions to Study policy (http://www.mq.edu.au/policy/docs/disruption_studies/policy.html).

Assessment Tasks

Name	Weighting	Hurdle	Due
Lab reports	20%	No	Week 5
Midession exam	20%	Yes	Week 6
Project report	60%	No	Milestones throughout semester - see iLearn

Lab reports

Assessment Type [1]: Lab report
Indicative Time on Task [2]: 20 hours
Due: **Week 5**
Weighting: **20%**

Reports from laboratory experiments in the first half of the session.

On successful completion you will be able to:

- design experiments suitable for gaining new knowledge about physical phenomena.
- demonstrate an understanding of a range of instrumentation topics and apply a subset of that knowledge to project work.
- work effectively in small teams and jointly manage a project.
- describe and discuss a range of topics in observational astronomy.
- Apply python computer programming and industry-standard software tools to real-world situations.

Midession exam

Assessment Type [1]: Quiz/Test
Indicative Time on Task [2]: 10 hours
Due: **Week 6**
Weighting: **20%**
This is a hurdle assessment task (see assessment policy for more information on hurdle assessment tasks)

Exam on the lecture content from the first half of the unit.

On successful completion you will be able to:

- design experiments suitable for gaining new knowledge about physical phenomena.
- demonstrate an understanding of a range of instrumentation topics and apply a subset of that knowledge to project work.
- describe and discuss a range of topics in observational astronomy.

Project report

Assessment Type [1]: Report
Indicative Time on Task [2]: 24 hours
Due: **Milestones throughout semester - see iLearn**
Weighting: **60%**

Report on your major project, covering its planning, execution and results.

On successful completion you will be able to:

- design experiments suitable for gaining new knowledge about physical phenomena.
- demonstrate an understanding of a range of instrumentation topics and apply a subset of that knowledge to project work.
- work effectively in small teams and jointly manage a project.
- describe and discuss a range of topics in observational astronomy.
- Apply python computer programming and industry-standard software tools to real-world situations.

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[1] If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the Learning Skills Unit for academic skills support.

[2] Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

Major Project

This is an observational astronomy project, where students plan for and collect astronomy data. They process it and extract results, which is captured in a write-up.

Lectures

Traditional lectures on astronomy will be provided as recordings on iLearn. These will cover the midsem exam material.

Workshops

Workshops in the first half will be a venue for working on questions that will be covered in the midsem exam.

Workshops in the second half will cover tools and methods to support the Major Project work. Most of the Workshops will be interactive sessions with the tools introduced.

Labs

Labs provide hands-on python programming and experience working with astronomy data. Labs provide important way to learn tools in preparation for the Major Project.

Python programming resources

The Major Project and standards labs requires use of the Python programming language. There are signficant resources online about how to program with python and specific tools for writing astronomy code:

- http://learn.astropy.org/
- https://www.datacamp.com/community/tutorials/python-numpy-tutorial
- https://www.scipy.org/getting-started.html
- https://www.codecademy.com/learn/learn-python-3

Software tools

Students will get to select and use various software tools to help manage their Major Project work. Some examples will include:

- Communications & Project management
    - https://slack.com/
    - https://trello.com/
    - https://zoom.us/
    - https://www.facebook.com/groups/
- Coding
    - https://github.com/
    - https://datastudio.google.com/
- File and document sharing
    - https://drive.google.com/
    - https://www.office.com/
    - https://www.overleaf.com/

Unit Schedule

Week	Theme	Special note
	Observational basics	
	Solar system and exoplanets	
	Stars	
	Milky Way and nearby galaxies	
	High redshift, cosmology	

Week	Theme	Special note
	Revision	Mid-term exam. Observing starts.
	Major Project work	
	Major Project work	
	Major Project work	
	Major Project work	
	Major Project work	
	Major Project work	
	Major Project work	Individual interviews.
	Major Project work	Final Major Project report due.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://policies.mq.edu.au). 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

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

To find other policies relating to Teaching and Learning, visit Policy Central (https://policies.mq.edu.au) and use the search tool.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/admin/other-resources/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 help you improve your marks and take control of your study.

- Getting help with your assignment
- Workshops
- StudyWise
- Academic Integrity Module

The Library provides online and face to face support to help you find and use relevant information resources.

- Subject and Research Guides
- Ask a Librarian

Student Enquiry Service

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

Equity 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.

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.

Changes from Previous Offering

Lecture content now covers introductory material in astronomy.

New projects will be offered for the Major Project.