PHYS7911

Physics and Astronomy Advanced Lab

Session 1, In person-scheduled-weekday, North Ryde 2022

School of Mathematical and Physical Sciences

Contents

General Information

Unit convenor and teaching staff
Convener
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E6B 2.610

Credit points
10

Prerequisites
Admission to MRes

Corequisites

Co-badged status

Unit description
This unit will provide students with a bespoke research-based learning path in physics and/or astronomy, tailored to the students' individual development needs. Students will complete a short research project within an active research group, mentored by unit staff as well as by research leaders. Students will write a formal report on their project, including reviewing relevant background literature and supporting theory.

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:

ULO1: apply advanced research skills in an authentic context.

ULO2: use sophisticated instrumentation and/or software tools effectively.

ULO3: identify and articulate how a research project fits within the context of, and contributes to, a wider field of research.

ULO4: demonstrate an understanding of concepts and theory that underpin advanced devices and/or techniques.

ULO5: analyse, interpret and present new research results correctly and coherently, in

accordance with discipline standards.

General Assessment Information

Students will be assessed on a final written report consisting of four sections:

1. Literature review (25%)
2. Introduction and theory (25%)
3. Methods, results and analysis (40%)
4. Conclusions and outlook (10%)

The report is expected to be no longer than 20 pages in length.

Students will hand in a draft of each section of the report at different stages throughout the semester, and receive detailed feedback.

Draft sections of the written report are due in Week 4 (Literature review), Week 7 (Introduction and theory), Week 10 (Methods, results, analysis) and Week 11 (Conclusions, outlook, future work). Detailed feedback and guidance on each section will be provided by the unit convenor / supervisor in the following week.

In Week 6, students are expected to orally present their progress to date to the entire class in 10-15 minute presentations (unassessed in 2022 S1, but feedback will be provided).

Final report due on the Friday of Week 13 at 5pm (this is a university-mandated time).

Assessment Tasks

Name	Weighting	Hurdle	Due
Project background report	50%	No	03/06/2022
Project report	50%	No	03/06/2022

Project background report

Assessment Type [1]: Report
Indicative Time on Task [2]: 14 hours
Due: **03/06/2022**
Weighting: **50%**

Formal report documenting relevant background literature and supporting theory for the student project.

On successful completion you will be able to:

- identify and articulate how a research project fits within the context of, and contributes to, a wider field of research.
- demonstrate an understanding of concepts and theory that underpin advanced devices and/or techniques.

Project report

Assessment Type [1]: Project
Indicative Time on Task [2]: 21 hours
Due: **03/06/2022**
Weighting: **50%**

Formal report documenting their project work, including, data generated, analysis, and outcomes.

On successful completion you will be able to:

- apply advanced research skills in an authentic context.
- use sophisticated instrumentation and/or software tools effectively.
- demonstrate an understanding of concepts and theory that underpin advanced devices and/or techniques.
- analyse, interpret and present new research results correctly and coherently, in accordance with discipline standards.

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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 Writing Centre 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

This unit focuses on learning advanced concepts and acquiring important generic and technical research skills in physics within the context of a research project. Delivery of the unit is therefore primarily through supervised laboratory experiments and independent reading, with weekly meetings for discussion, feedback and guidance with the supervisor and (at times) the unit convenor, and additional consultation as required. Laboratory projects are placed within an active research group in the School, and students will work closely in the lab with senior PhD

students, postdocs and/or academics from that research group.

Laboratory projects will consist of fifteen days in the laboratory spread over the semester, e.g. a day per week for ten weeks with a one-week block during semester break. Timetabling of laboratory days will be arranged between the student and the supervising research group.

Students will be provided with relevant reading material including scientific papers and text book chapters, and will also conduct literature searches to supplement their reading.

Regular meetings with the unit convenor for progress updates, discussion of reading materials, theory, etc., will be arranged between the student and the unit convenor.

Classes

15 days of laboratory experiments, spread over the semester and arranged for mutually-agreeable days between students and laboratory supervisors.

Weekly meetings with unit convenor / supervisor for discussion of project progress, theory, research context, experimental aspects, etc., starting from week 2.

Required and Recommended Texts and/or Materials

Research papers, textbook chapters, or other reading material as advised by unit convenor and laboratory supervisors.

Part of the unit will involve online searching and accessing of current literature.

Unit Schedule

The unit will begin in Week 2 with an introduction to the unit and the research projects available. By the end of Week 2 students will be allocated to research projects, be introduced to laboratory supervisors, and be given initial reading material. Weekly research days (a total of 15) will be organised between the students and the supervising researchers, to be one day per week for most of the semester with a larger block timetabled for in or around the mid-semester break. Weekly individual meetings with the unit convenor will be arranged to start in Week 3. Additional classes may be arranged where necessary to cover common topics or questions.

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

- Assessment Procedure
- Complaints Resolution 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

Academic Integrity

At Macquarie, we believe academic integrity – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free online writing and maths support, academic skills development and wellbeing consultations.

Student Support

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

The Writing Centre

The Writing Centre provides resources to develop your English language proficiency, academic writing, and communication skills.

- Workshops
- Chat with a WriteWISE peer writing leader
- Access StudyWISE
- Upload an assignment to Studiosity
- Complete the 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 Services and Support

Macquarie University offers a range of Student Support Services including:

- IT Support
- Accessibility and disability support with study
- Mental health support
- Safety support to respond to bullying, harassment, sexual harassment and sexual assault
- Social support including information about finances, tenancy and legal issues

Student Enquiries

Got a question? Ask us via AskMQ, or contact Service Connect.

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.