



# MTRN3026

## Mechatronic Systems

Session 2, Special circumstance, North Ryde 2020

*School of Engineering*

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#### Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

#### Notice

As part of [Phase 3 of our return to campus plan](#), most units will now run tutorials, seminars and other small group learning activities on campus for the second half-year, while keeping an online version available for those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face and online activities for your unit, please go to [timetable viewer](#). To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

## General Information

Unit convenor and teaching staff

Subhas Mukhopadhyay

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Credit points

10

Prerequisites

MTRN2060 or ELEC260

Corequisites

Co-badged status

Unit description

This unit builds on the instrumentation foundation of MTRN2060 and the system control concepts of ELEC3024. It introduces a number of mechatronic specific topics including AC electric motors and drives, pneumatics, application specific integrated circuits, and advanced control. It requires the application of design and modelling procedures developed in prerequisites, and through medium-scale projects, prepares students to undertake advanced projects.

## 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:** Describe and differentiate the components of mechatronic systems

**ULO2:** analyse the performance of AC motor drives and controller

**ULO3:** apply pneumatics, and PLCs integrated with pneumatics, to control mechatronic systems

**ULO4:** demonstrate understanding of modelling of mechatronic systems and kinematics of robotic systems

## General Assessment Information

### Grading and passing requirement for unit

In order to pass this unit a student must obtain a mark of 50 or more for the unit (i.e. obtain a passing grade P/ CR/ D/ HD).

For further details about grading, please refer below in the policies and procedures section.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<a href="#">Practical Laboratory Report#1</a>	10%	Yes	Week#4
<a href="#">Self-study topic and presentation</a>	10%	No	Week#12
<a href="#">Test#2</a>	20%	No	Week#8
<a href="#">Test#3</a>	30%	Yes	Week#14
<a href="#">Test#1</a>	10%	No	Week#3
<a href="#">Practical Laboratory Report #2</a>	10%	No	Week#8
<a href="#">Practical Laboratory Report #3</a>	10%	Yes	Week#13

### Practical Laboratory Report#1

Assessment Type <sup>1</sup>: Lab report

Indicative Time on Task <sup>2</sup>: 8 hours

Due: **Week#4**

Weighting: **10%**

**This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)**

The students will conduct practical laboratory and write a report on the first activity. The report will be due on Week#5.

On successful completion you will be able to:

- Describe and differentiate the components of mechatronic systems

## Self-study topic and presentation

Assessment Type <sup>1</sup>: Presentation

Indicative Time on Task <sup>2</sup>: 15 hours

Due: **Week#12**

Weighting: **10%**

The student will choose a topic of their choice and study by themselves. On Week#12, they have to give a presentation. They also need to write a report of 2 pages including around 5 papers.

On successful completion you will be able to:

- Describe and differentiate the components of mechatronic systems
- analyse the performance of AC motor drives and controller
- apply pneumatics, and PLCs integrated with pneumatics, to control mechatronic systems
- demonstrate understanding of modelling of mechatronic systems and kinematics of robotic systems

## Test#2

Assessment Type <sup>1</sup>: Quiz/Test

Indicative Time on Task <sup>2</sup>: 10 hours

Due: **Week#8**

Weighting: **20%**

Test#2 will be on the topics from Week#4 to Week#8

On successful completion you will be able to:

- Describe and differentiate the components of mechatronic systems
- analyse the performance of AC motor drives and controller

## Test#3

Assessment Type <sup>1</sup>: Quiz/Test

Indicative Time on Task <sup>2</sup>: 20 hours

Due: **Week#14**

Weighting: **30%**

**This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)**

Test#3 will be the equivalent of the Final examination and will be held on Week#14.

On successful completion you will be able to:

- Describe and differentiate the components of mechatronic systems
- apply pneumatics, and PLCs integrated with pneumatics, to control mechatronic systems

## Test#1

Assessment Type <sup>1</sup>: Quiz/Test

Indicative Time on Task <sup>2</sup>: 6 hours

Due: **Week#3**

Weighting: **10%**

Test #1 on the taught topics from Week#1 to #3.

On successful completion you will be able to:

- Describe and differentiate the components of mechatronic systems
- demonstrate understanding of modelling of mechatronic systems and kinematics of robotic systems

## Practical Laboratory Report #2

Assessment Type <sup>1</sup>: Lab report

Indicative Time on Task <sup>2</sup>: 8 hours

Due: **Week#8**

Weighting: **10%**

The students will conduct practical laboratory and write a report on the 2nd activity. The report will be due on Week#9.

On successful completion you will be able to:

- Describe and differentiate the components of mechatronic systems
- apply pneumatics, and PLCs integrated with pneumatics, to control mechatronic systems

## Practical Laboratory Report #3

Assessment Type <sup>1</sup>: Lab report

Indicative Time on Task <sup>2</sup>: 8 hours

Due: **Week#13**

Weighting: **10%**

**This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)**

The students will conduct practical laboratory and write a report on the third activity. The report will be due on Week#13.

On successful completion you will be able to:

- Describe and differentiate the components of mechatronic systems
- demonstrate understanding of modelling of mechatronic systems and kinematics of robotic systems

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<sup>1</sup> 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.

<sup>2</sup> 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

The materials will be available in iLearn

## Unit Schedule

Refer to iLearn and lecture notes for the unit schedule

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](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.*)

Students seeking more policy resources can visit the [Student Policy Gateway](https://students.mq.edu.au/support/study/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](http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<http://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](http://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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](http://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 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](http://ask.mq.edu.au)

If you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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/](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.

## Change with respected to 2019

The content has been changed due to removal of the unit MTRN3062, some of the contents have been added in the MTRN3026. The practical activities have been changed significantly with some on line components.