



ELEC3076

Electronic Devices and Systems

Session 2, In person-scheduled-weekday, North Ryde 2026

School of Engineering

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General Information

Unit convenor and teaching staff

Unit convenor

Binesh Puthen Veetil

binesh.puthenveetil@mq.edu.au

9WW 290

Fridays 12pm-1pm

Credit points

10

Prerequisites

ELEC2005 or admission to MEngElecEng

Corequisites

Co-badged status

Unit description

This unit builds on linear and nonlinear circuit design, and further develops the topics of analogue circuit theory and practice with an emphasis on the circuit and system design. It covers semiconductor devices, circuit simulations, transistor amplifiers, operational-amplifiers, mixers and power amplifiers. It will also deal with advanced topics which may include noise and non-linear design issues. Students will get hands-on experience in designing and building small signal amplifiers, power amplifiers and mixers as well as working with professional software packages for circuit design and analysis.

Learning in this unit enhances student understanding of global challenges identified by the United Nations Sustainable Development Goals ([UNSDGs](#)) Industry, Innovation and Infrastructure

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: explain basic semiconductor devices, their operation and non-linear behaviour

ULO2: apply nonlinear device concepts to design and analyse transistor amplifiers

ULO3: apply mathematical methods to analyse nonlinear electronic systems in the

frequency domain

ULO4: analyse the operation of power amplifiers in the time and frequency domains

ULO5: design, simulate, implement, test and debug electronic circuits and systems

ULO6: demonstrate active self-learning, critical thinking, problem-solving, technical writing and time-management skills, individually and in a team.

General Assessment Information

Requirements to pass the unit: 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. There are no hurdles.

Attendance and participation: We strongly encourage all students to actively participate in all learning activities. Regular engagement is crucial for your success in this unit, as these activities provide opportunities to deepen your understanding of the material, collaborate with peers, and receive valuable feedback from instructors, to assist in completing the unit assessments. Your active participation not only enhances your own learning experience but also contributes to a vibrant and dynamic learning environment for everyone.

On-campus activities commence in week 1. But there will be **NO PRACTICAL CLASSES in week 1**. If you are unable to return to campus for the start of session, contact the unit convenor immediately.

Late Assessment Submission: Late assessments are not accepted in this unit unless a [Special Consideration](#) has been submitted and approved. Submission due time for written assessments is set at **11:55 pm**. A 1-hour grace period is provided to students who experience a technical concern.

Short Extensions: Students are allowed to request an extra 3 calendar days to complete eligible assessments. Eligible assignments in this unit is the 'Take-home Assignment'.

Release dates: Results for the **take-home assignment** will be released **by 1 November 2026**. Results for the **lab task demonstration** will be released **by 13 November 2026**. Results for the **final examination** will be released in accordance with the University's official examination results publication schedule.

Special Consideration: The [Special Consideration Policy](#) aims to support students who have been impacted by short-term circumstances or events that are serious, unavoidable and significantly disruptive, and which may affect their performance in assessment. If you experience circumstances or events that affect your ability to complete the assessments in this unit on time, please inform the convenor and submit a Special Consideration request through <https://connect.mq.edu.au>.

Assessment Tasks

Name	Weighting	Hurdle	Due	Groupwork/Individual	Short Extension	AI Approach
Take-home assignment	20%	No	11/10/2026	Individual	Yes	Open
Lab task demonstration	30%	No	30/10/2026	Individual	No	Observed
Final Exam	50%	No	University exam period (TBA)	Individual	No	Observed

Take-home assignment

Assessment Type ¹: Problem-based task

Indicative Time on Task ²: 4 hours

Due: **11/10/2026**

Weighting: **20%**

Groupwork/Individual: Individual

Short extension ³: Yes

AI Approach: Open

The take-home assignment consists of design, analysis, and concept problems related to various electronic circuits and devices covered in the unit. The assignment will test students' ability to identify circuit functionalities, detect errors, debug circuits, use the correct components, and calculate circuit parameters.

On successful completion you will be able to:

- explain basic semiconductor devices, their operation and non-linear behaviour
- apply nonlinear device concepts to design and analyse transistor amplifiers
- apply mathematical methods to analyse nonlinear electronic systems in the frequency domain
- demonstrate active self-learning, critical thinking, problem-solving, technical writing and time-management skills, individually and in a team.

Lab task demonstration

Assessment Type ¹: Practice-based task

Indicative Time on Task ²: 2 hours

Due: **30/10/2026**

Weighting: **30%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

The lab task demonstration is designed to assess students' learning and skills in practice-based activities developed throughout the unit. There will be one invigilated lab task demonstration in the final weeks of the semester. Students are expected to design and implement circuits and demonstrate their outputs. Marks are awarded for demonstrating skills in circuit design, implementation, wiring, debugging, testing, and the ability to use key professional instruments.

On successful completion you will be able to:

- design, simulate, implement, test and debug electronic circuits and systems
- demonstrate active self-learning, critical thinking, problem-solving, technical writing and time-management skills, individually and in a team.

Final Exam

Assessment Type ¹: Examination

Indicative Time on Task ²: 2 hours

Due: **University exam period (TBA)**

Weighting: **50%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

You will undertake a final examination during the formal examination period.

On successful completion you will be able to:

- explain basic semiconductor devices, their operation and non-linear behaviour
- apply nonlinear device concepts to design and analyse transistor amplifiers
- apply mathematical methods to analyse nonlinear electronic systems in the frequency domain
- analyse the operation of power amplifiers in the time and frequency domains
- demonstrate active self-learning, critical thinking, problem-solving, technical writing and time-management skills, individually and in a team.

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
- [Academic Success](#) 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.

³ An automatic short extension is available for some assessments. Apply through the [Service](#)

[Connect Portal.](#)

Delivery and Resources

Week1 classes: On-campus activities commence in week 1. If you are unable to return to campus for the start of session, contact the unit convenor immediately. There will be **NO PRACTICAL CLASSES in week 1.**

Method of Communication: We will communicate with you via your university email and through announcements on iLearn. Queries to convenors can either be placed on the iLearn discussion board or sent to the unit convenor via the contact email on iLearn.

Textbook: Sedra and Smith- Microelectronic Circuits 6th Edition. The material will also cover other books and journal articles. Reading recommendations will be provided through iLearn.

Technology and Software: All the learning and assessment resources will be made available on iLearn. Classroom recordings will be available via Echo360. Typical electronic and electrical instruments such as voltage and current sources, voltmeters, ammeters, oscilloscopes and spectrum analysers will be used in the lab. Analog Discovery 2 lab is also used. LTSPICE software will be used for circuit simulation.

You will need a logbook (either digital or a bound notebook only for this purpose and no loose sheets) for the lab.

You will need a calculator for various numerical exercises throughout the session. **Note that only calculators with no text-recall function are permitted for the final exam.**

Unit Schedule

Refer to iLearn and lecture notes for the unit schedule.

Also note, on-campus classes will start in week 1. There will be no laboratory classes in week 1

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.mq.edu.au\)](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 \(https://students.mq.edu.au/su\)](https://students.mq.edu.au/su)

[upport/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 connect.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/>

Academic Success

[Academic Success](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Ask a Study Coach](#)
- [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 Advocacy](#) provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via the [Service Connect Portal](#), or contact [Service Connect](#).

IT Help

For help with University computer systems and technology, visit <https://students.mq.edu.au/support/technology/service-desk>.

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

Student feedback from the previous offering of this unit was positive overall, with students pleased with the clarity around assessment requirements and the level of support from teaching staff. As such, no change to the delivery of the unit is planned, however we will continue to strive to improve the level of support and the level of student engagement.

Unit information based on version 2026.02 of the [Handbook](#)