

ELEC 1003 ELECTRICAL FUNDAMENTALS

Credit Points 10

Legacy Code 300021

Coordinator Tara Hamilton ([https://directory.westernsydney.edu.au/search/name/Tara Hamilton/](https://directory.westernsydney.edu.au/search/name/Tara%20Hamilton/))

Description This subject introduces key concepts in electrical engineering, including charge, current, voltage, power, Ohm's and Kirchhoff's laws, and circuit analysis techniques such as Thevenin's and Norton's theorems. Students will explore resistor-capacitor circuits, time constants, basic electronics and their equivalent in other fields. Core principles are applied to practical circuits devices as well as to electrical equivalent e.g. mechanical, building a strong theoretical and hands-on foundation. By the end of the subject, students will be equipped with essential knowledge and skills that support further study and form the basis for careers in engineering and related technical fields.

School Eng, Design & Built Env

Discipline Electrical And Electronic Engineering And Technology

Student Contribution Band HECS Band 2 10cp

Check your fees via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Level Undergraduate Level 1 subject

Equivalent Subjects ELEC 1005 Electrical Fundamentals (WSTC)
ELEC 1004 Electrical Fundamentals (WSTC Assoc Deg)

Learning Outcomes

On successful completion of this subject, students should be able to:

1. Explain the elements in electric circuits and electronic devices.
2. Apply appropriate techniques in the analysis of circuits in both Time and Frequency Domains.
3. Analyse the principles of capacitors and inductors as energy storage elements and their first order circuits in both Time and Frequency Domains.
4. Explain and analyse electrical equivalent circuits of mechanical phenomenon.
5. Select and use appropriate equipment to measure electrical quantities in a safe manner.
6. Assemble, debug and analyse basic electrical circuits.

Subject Content

1. Introduction to basic electrical quantities
2. Kirchhoff's current and voltage laws
3. Series and parallel resistors, current and the voltage divider rules
4. Nodal and Loop analysis, The principle of superposition and Thevenin and Norton equivalent circuits
5. Energy storage elements, capacitors and inductors (include Transformers). Transient Response of first-order circuits
6. An introduction to Electronics
7. An introduction to the Frequency Domain Analysis
8. Logic gates and number systems

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/ Group Task	Mandatory
Quiz	2 submissions in total, to be submitted in class after specified tutorials, quiz submission via vUWS	20	N	Individual	Y
Practical	2 Lab submission in class after lab sessions	20	N	Individual	Y
Practical Exam	2 hours	40	N	Individual	Y

Summer

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/ Group Task	Mandatory
In class test	4 x Inclass tests 15 minutes per test.	10	N	Individual	
Intra-session exam	1 hour and 30 minutes	20	N	Individual	
Practical	5 x Laboratories 3 hours per practical	20	N	Individual	
Final Exam	2 hours	50	N	Individual	

Teaching Periods

Sydney City Campus - Term 2 (2025)

Sydney City

On-site

Subject Contact Ehsan Gatavi ([https://directory.westernsydney.edu.au/search/name/Ehsan Gatavi/](https://directory.westernsydney.edu.au/search/name/Ehsan%20Gatavi/))

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ELEC1003_25-SC2_SC_1#subjects)

Spring (2025)

Penrith (Kingswood)

Hybrid

Subject Contact Tara Hamilton ([https://directory.westernsydney.edu.au/search/name/Tara Hamilton/](https://directory.westernsydney.edu.au/search/name/Tara%20Hamilton/))

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ELEC1003_25-SPR_KW_3#subjects)

Parramatta City - Macquarie St

Hybrid

Subject Contact Tara Hamilton ([https://directory.westernsydney.edu.au/search/name/Tara Hamilton/](https://directory.westernsydney.edu.au/search/name/Tara%20Hamilton/))

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ELEC1003_25-SPR_PC_3#subjects)

Summer (2025)

Parramatta City - Macquarie St

On-site

Subject Contact Tara Hamilton ([https://directory.westernsydney.edu.au/search/name/Tara Hamilton/](https://directory.westernsydney.edu.au/search/name/Tara%20Hamilton/))

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ELEC1003_25-SUM_PC_1#subjects)