

# ELEC 1003 ELECTRICAL FUNDAMENTALS

**Credit Points** 10

**Legacy Code** 300021

**Coordinator** Jamal Rizk (<https://directory.westernsydney.edu.au/search/name/Jamal Rizk/>)

**Description** This subject introduces essential electrical engineering concepts that provide students with the basic requirements for analysing, designing, building, and testing simple engineering systems. Students use techniques for analysing different types of circuits based on their knowledge of electrical theory and the characteristics of power, electrical energy, signals, and electrical circuit components. Students have practical activities including conducting experiments in learning how electrical systems work. Students are introduced to Electrical Machines and Renewable Energy systems for a fundamental understanding.

**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/](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 an electric circuit
2. Apply the basic principles of analysing an electric circuit
3. Apply nodal, mesh, superposition, Thevenin's analysis DC electric circuits.
4. Apply the principles of capacitors and inductors as energy storage elements and their first order circuits.
5. Explain characteristics of electronic devices
6. Explain basic principles of communication waves
7. Explain significance of Logic gates and number systems
8. Explain the operation of transformers, DC and AC machines.
9. Explain principle of operation of Renewable Energy systems
10. Explain the elements in electric circuits and electronic devices
11. Apply appropriate techniques in the analysis of electric circuits
12. Analyse the principles of capacitors and inductors as energy storage elements and their first order circuits
13. Explain the operation of transformers, DC and AC machines
14. Outline the key principles involved in the operation of Renewable Energy systems
15. Use appropriate equipment in conducting experiments in a safe manner.

## Subject Content

Introduction to basic electrical quantities

Kirchhoff's current and voltage laws

Series and parallel resistors, current and the voltage divider rules

Nodal and Loop analysis, The principle of superposition and Thevenin and Norton equivalent circuits  
Energy storage elements, capacitors and inductors. Transient  
Response of first-order circuits  
An introduction to Electronics  
An introduction to communication waves  
Logic gates and number systems  
An introduction to Transformers, Electrical Machines  
An introduction to Renewable Energy 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
Quiz	4 x Inclass tests 15 minutes per test.	10	N	Individual
Intra-session Exam	1 hour and 30 minutes	20	N	Individual
Practical	6 x Laboratories 3 hours per practical	20	N	Individual
Final Exam	2 hours	50	N	Individual

## 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
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 1 (2024)

### Sydney City

**On-site**

**Subject Contact** Jamal Rizk (<https://directory.westernsydney.edu.au/search/name/Jamal Rizk/>)

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=ELEC1003\\_24-SC1\\_SC1#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ELEC1003_24-SC1_SC1#subjects))

## **Spring (2024)**

### **Penrith (Kingswood)**

#### **On-site**

**Subject Contact** Jamal Rizk ([https://directory.westernsydney.edu.au/search/name/Jamal Rizk/](https://directory.westernsydney.edu.au/search/name/Jamal%20Rizk/))

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=ELEC1003\\_24-SPR\\_KW\\_1#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ELEC1003_24-SPR_KW_1#subjects))

### **Parramatta City - Macquarie St**

#### **On-site**

**Subject Contact** Jamal Rizk ([https://directory.westernsydney.edu.au/search/name/Jamal Rizk/](https://directory.westernsydney.edu.au/search/name/Jamal%20Rizk/))

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=ELEC1003\\_24-SPR\\_PC\\_1#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ELEC1003_24-SPR_PC_1#subjects))

## **Sydney City Campus - Term 3 (2024)**

### **Sydney City**

#### **On-site**

**Subject Contact** Jamal Rizk ([https://directory.westernsydney.edu.au/search/name/Jamal Rizk/](https://directory.westernsydney.edu.au/search/name/Jamal%20Rizk/))

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=ELEC1003\\_24-SC3\\_SC\\_1#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ELEC1003_24-SC3_SC_1#subjects))