

ELEC 1005 ELECTRICAL FUNDAMENTALS (WSTC)

Credit Points 10

Legacy Code 700024

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

Description The objective of this subject is to introduce to the student a number of concepts within electrical engineering. These include the basic definitions of charge, current, potential difference, power; electric circuits and basic laws such as Ohm's and Kirchhoff's Laws; Thevenin, Norton's and the maximum power theorems; electromagnetism and the associated fundamental laws; capacitor and resistor circuits and time constants; an introduction to Electronics; communication waves; Logic gates and number systems; and an introduction to Electrical Machines and Renewable Energy systems. Basic principles are explained and applied to a range of typical electrical circuits and devices. These foundations provide students with the basic requirements for a career in engineering where the concepts can be developed or applied to more complex engineering systems.

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

Pre-requisite(s) Students enrolled in 6033 Diploma in Engineering Bachelor of Engineering Studies or 7034 Diploma in Engineering or 7066 Diploma in Engineering Extended must pass PHYS 0003 Foundation Physics 2 before enrolling in this unit

Equivalent Subjects ELEC 1003 - Electrical Fundamentals ELEC 1004 - Electrical Fundamentals (WSTC Assoc Deg)

Restrictions

Students must be enrolled at Western Sydney University, The College. Students enrolled in Extended Diplomas must pass 40 credit points from the preparatory subjects listed in the program structure prior to enrolling in this University level subject. Students enrolled in the combined Diploma/Bachelor programs listed below must pass all College Preparatory subjects listed in the program structure before progressing to the Year 2 subjects.

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

Subject Content

1. Introduction to basic electrical quantities
2. Kirchhoffs 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. Transient Response of first-order circuits
6. An introduction to Electronics
7. An introduction to communication waves
8. Logic gates and number systems
9. An introduction to Transformers, Electrical Machines
10. 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	In-class test x4 (2.5% each) 10 - 15 minutes during tutorial class	10	N	Individual
Intra-session Exam	1 hour	20	N	Individual
Practical	Practicals x5 (4% each) (2 hours each)	20	N	Both (Individual & Group)
Final Exam	2 hours	50	N	Individual

Prescribed Texts

- Alexander, CK & Sadiku, MNO 2017, Fundamentals of electric circuits, 6th edn, McGraw-Hill Education, New York

Teaching Periods

Term 1 (2024) Penrith (Kingswood)

On-site

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

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ELEC1005_24-T1_KW_1#subjects)

Term 3 (2024) Penrith (Kingswood)

On-site

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

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