

# ELEC 2002 CIRCUIT THEORY (WSTC ASSOCD)

**Credit Points** 10

**Legacy Code** 700243

**Coordinator** Abbas Ranjbar (<https://directory.westernsydney.edu.au/search/name/Abbas%20Ranjbar/>)

**Description** This subject aims to equip the student with the tools needed for the design and analysis of electrical and electronic circuits. It also introduces various techniques of circuit analysis, convolution, mutual coupling, frequency response and two-ports loops. Offerings of alternate subjects are dependent on there being sufficient student enrolment numbers. If enrolments are low, the College may cancel delivery of the alternate subject.

**School** Eng, Design & Built Env

**Discipline** Electrical Engineering

**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 2 subject

**Pre-requisite(s)** ELEC 1004 and MATH 1020

## Learning Outcomes

1. Apply the basic principles of analysing an electric circuit
2. Apply Kirchhoff's Voltage and Current laws and demonstrate their use in a number of electric circuit configurations
3. Apply nodal analysis, mesh analysis and linear circuit theorems to electric circuits
4. Apply the Laplace Transform to electric circuits
5. Draw conclusions from frequency responses
6. Mathematically analyse frequency-selective filters
7. Describe and utilise magnetically coupled circuit
8. Describe and utilise two-port networks

## Subject Content

1. Phasors relationships for Circuit Elements.
2. Kirchoff's Laws in frequency domain
3. Impedance combinations
4. Sinusoidal Steady state analysis (Nodal Analysis, Mesh Analysis, Superposition Theorem and Thevenin equivalent Circuits)
5. Alternating Current (AC) Power Analysis (Instantaneous and Average Power, RMS value, Maximum Power and Power factor correction)
6. Magnetically coupled circuits (Mutual Inductance, Energy in a coupled Circuit)
7. Frequency response
8. Laplace Transform and its applications in circuits analysis
9. Two port network

## 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
Practical	2 hours each	20	N	Individual	N
Quiz	30 minutes each	10	N	Individual	N
Intra-session Exam	1.5 hour	20	N	Individual	N
Final Exam	2 hours	50	N	Individual	N

Teaching Periods

## Quarter 4 (2025)

**Penrith (Kingswood)**

**Hybrid**

**Subject Contact** Abbas Ranjbar (<https://directory.westernsydney.edu.au/search/name/Abbas%20Ranjbar/>)

View timetable ([https://classregistration.westernsydney.edu.au/odd/timetable/?subject\\_code=ELEC2002\\_25-Q4\\_KW\\_3#subjects](https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ELEC2002_25-Q4_KW_3#subjects))