

# ELEC 2004 ELECTRONICS

**Credit Points** 10

**Legacy Code** 300025

**Coordinator** Ali Hellany ([https://directory.westernsydney.edu.au/search/name/Ali Hellany/](https://directory.westernsydney.edu.au/search/name/Ali%20Hellany/))

**Description** This unit further develops skills in the analysis, design, practical implementation and testing of the main analogue electronic circuits. Topics covered are: semiconductor diodes and their applications, Bipolar Junction Transistors (BJT), Field Effect Transistors (FET), analysis of BJT and FET, design of discrete operational amplifiers, and operational amplifier characteristics and circuit configurations.

**School** Eng, Design & Built Env

**Discipline** Electrical And Electronic Engineering And Technology

**Student Contribution Band** HECS Band 2 10cp

Check your HECS Band contribution amount 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 1003 OR ELEC 1009

**Equivalent Subjects** ELEC 2005 - Electronics (WSTC AssocD)

## Assumed Knowledge

The prior knowledge on Vibrations and wave phenomena; Photoelectric effect, atomic structure and periodic table; Electricity and magnetism are required. Students should have a sound understanding on: basic principles of analysing an electric circuit; Kirchhoff's Voltage and Current laws and their use in electric circuits; Nodal analysis, mesh analysis and superposition analysis in DC electric circuits; Thevenin and Norton equivalent and their use in electric circuits; The storage elements capacitor and inductor and understand their performance in first and second order circuits.

## Learning Outcomes

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

1. Explain the basic structure and mode of operation of pn junction diode.
2. Conduct an AC and DC analysis of a circuit with pn junction diode.
3. Explain the basic structure and mode of operations of BJT, MOSFET transistors and operational amplifiers.
4. Conduct an AC and DC analysis of single-stage amplifying circuits using BJT, MOSFET transistors and operational amplifiers.
5. Design simple electronic circuits for a given specification and application.
6. Use Electronics Workbench as a tool to simulate and understand electronic circuits

## Subject Content

1. Semiconductors Diodes.
2. Diode applications.
3. Bipolar Junction Transistor (BJTs).
4. DC Biasing (BJTs).
5. Field Effect Transistors (FETs).
6. DC biasing of FET.

7. AC Analysis of FET Operational Amplifiers .

## 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.

| Item               | Length                                   | Percent | Threshold | Individual/Group Task     |
|--------------------|--|---------|-----------|---------------------------|
| Practical          | 3 hours and 5 pages (per Practical)      | 20      | Y         | Both (Individual & Group) |
| Quiz               | 10-15 minutes (per Quiz) - Max 6 Quizzes | 10      | N         | Individual                |
| Intra-session Exam | 1.5 hours                                | 20      | N         | Individual                |
| Final Exam         | 2 hours                                  | 50      | Y         | Individual                |

Teaching Periods

## Autumn Penrith (Kingswood)

### Day

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

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=ELEC2004\\_22-AUT\\_KW\\_D#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ELEC2004_22-AUT_KW_D#subjects))

## Parramatta - Victoria Rd

### Day

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

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=ELEC2004\\_22-AUT\\_PS\\_D#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ELEC2004_22-AUT_PS_D#subjects))

## Sydney City Campus - Term 2

### Sydney City

### Day

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

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=ELEC2004\\_22-SC2\\_SC\\_D#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ELEC2004_22-SC2_SC_D#subjects))