ELEC 2004 ELECTRONICS

Credit Points 10

Legacy Code 300025

Coordinator Ali Hellany (https://directory.westernsydney.edu.au/search/name/Ali Hellany/)

Description This subject 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 Electronic Engineering

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 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.

Type	Length	Percent	Threshold	Individual/ Group Task	Mandatory
Practical	3 hours and 5 pages (per Practical)	20	Y	Group/ Individual	Y
Quiz	10-15 minutes (per Quiz) - Max 6 Quizzes	10	N	Individual	N
Numerical Problem Solving	1.5 hours	20	N	Individual	N
Final Exam	2 hours	50	N	Individual	N

Teaching Periods

Autumn (2025)
Penrith (Kingswood)
On-site
Subject Contact Ali Hellany (https://directory.westernsydney.edu.au/search/name/Ali Hellany/)

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ELEC2004_25-AUT_KW_1#subjects)

Parramatta City - Macquarie St
On-site
Subject Contact Ali Hellany (https://directory.westernsydney.edu.au/search/name/Ali Hellany/)

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ELEC2004_25-AUT_PC_1#subjects)

Sydney City Campus - Term 1 (2025)
Sydney City
On-site
Subject Contact Ehsan Gatavi (https://directory.westernsydney.edu.au/search/name/Ehsan Gatavi/)

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ELEC2004_25-SC1_SC_1#subjects)

Sydney City Campus - Term 3 (2025)
Sydney City
On-site
Subject Contact Ehsan Gatavi (https://directory.westernsydney.edu.au/search/name/Ehsan Gatavi/)

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ELEC2004_25-SC3_SC_1#subjects)