ELEC 2013 CIRCUITS AND SIGNALS

Credit Points 10

Legacy Code 301352

Coordinator Leigh Sheppard (https://directory.westernsydney.edu.au/search/name/Leigh Sheppard/)

Description This subject will be offered at Engineering Innovation Hub - Hassall St, Parramatta campus. This subject covers the fundamentals of circuit, system and signal analysis on which most other courses in the electrical engineering curriculum are built. The subject provides a foundation in frequency domain analysis and in transform methods, as well as significantly extending alternate current analysis, transient analysis and other fundamental circuit analysis tools. Although there is a practical program in the laboratory, the theory aspects of this course are the primary focus.

School Eng, Design & Built Env

Discipline Electrical Engineering

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/) page.

Level Undergraduate Level 2 subject

Pre-requisite(s) ELEC 1009

Restrictions

Must be enrolled in 3771 Bachelor of Engineering Advanced (Honours)

Learning Outcomes

After successful completion of this subject, students will be able to:

1. Apply transform methods in the analysis of continuous-time linear systems.
2. Explain the functions involved in the interaction between signals and linear systems.
3. Analyse simple and complex electric and magnetic circuits in the time and frequency domains.
4. Describe concepts related to AC power analysis.

Subject Content

- Transform Methods: Periodic signals and Fourier series, aperiodic signals and Fourier transform, Laplace transforms and their application to signals and circuits.
- Circuit Analysis: AC circuits with sinusoidal inputs in steady state, use of phasors and complex impedance in AC circuit analysis, AC power (real, reactive, apparent), power factor, leading/lagging, series and parallel resonance, transformers and coupled coils, application of network theorems in AC circuit analysis, two-port network analysis.
- System Analysis: Linear systems and convolution, impulse response, frequency response and transfer functions, steady-state analysis of linear systems, transient analysis of the 1st and 2nd order systems, circuit analysis using transform methods.

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
Practical	9 x weekly supervised in-class lab session activities and 5-page log book.	20	Y	Individual
Intra-session Exam	1.5 hours	30	N	Individual
Final Exam	2 hours	30	Y	Individual

Prescribed Texts

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

Teaching Periods

Autumn (2023)

Parramatta City - Macquarie St

On-site

Subject Contact Leigh Sheppard (https://directory.westernsydney.edu.au/search/name/Leigh Sheppard/)

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ELEC2013_23-AUT_PC_1#subjects)