ELEC3301: Unit Outline

Unit Coordinator
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Other pages about this Unit

Supplementary assessment is not available in this unit except in the case of a bachelor's pass degree student who has obtained a mark of 45 to 49 and is currently enrolled in this unit, and it is the only remaining unit that the student must pass in order to complete their course.

Objectives
Students gain an understanding of fundamental aspects of distributed circuits and electronic circuits. They gain practical experience in both distributed and electronic circuit problem solving and in project reporting.

Outcomes
Students gain an understanding of fundamental aspects of distributed circuits and electronic circuits. They gain practical experience in both distributed and electronic circuit problem solving and in project reporting.

Content
This unit comprises three parts: (1) distributed electric circuits—transmission line equations, time and frequency domain analysis, reflections and terminations, signal integrity; (2) bipolar transistor and MOSFET models—basic models for MOSFET, charge storage in electronic devices, large signal charge control models for the MOSFET and bipolar transistor; and (3) electronic switching circuits—large signal transient and power characteristics of bipolar and MOSFET circuits, building blocks of logic families, metastability in switching circuits.

Pre-requisites:
ELEC2300 Circuits and Electronic Systems 2 (formerly 620.229 Circuits and Electronic Systems 229/ENGT2300 Circuits and Electronic Systems 2)
Advisable prior study:
ELEC2305 Signals and Systems 2 (formerly 620.228 Signals and Systems 228/ENGT2305 Signals and Systems 2)

Unit Structure
This delivery of the unit will be divided in the following two parts:
Distributed electric circuits—transmission line equations, time and frequency domain analysis, reflections and terminations, signal integrity, etc...;
Electronic circuits—Review on Bipolar transistor; MOSFET operation and models, Electronic switching circuits, Building blocks of Digital logic families, metastability in switching circuits, etc...

Recommended Reading
Microelectronic Circuits, Sedra & Smith, Oxford University Press.
Electric transmission Lines, Skilling, Mc Graw Hill.
Elements of Electromagnetics, Sadiku, Oxford University Press.