Faculty of Engineering and the Built Environment

Department of Electrical Engineering

2019 Course Handout: EEE2047S

Course Name:	EEE2047S SIGNALS AND SYSTEMS 1
SAQA Credits:	16
Pre-requisites:	MAM1021F/S
Co-requisites:	None

Course convenor:	A/Prof. Fred Nicolls
Email address:	fred.nicolls@uct.ac.za
Office location:	Menzies 611
Consultation hours:	By arrangement
Course lecturer:	Fred Nicolls, Paul Amayo
Teaching assistant:	Stacey Shield

Lecture venue:	Menzies 9
Lecture days and time:	Mon-Thu, 4th period
Laboratory venue	Menzies 9
Laboratory days and times	Fri, 4th period

Course objectives

The course provides students with the basic tools required for understanding linear systems, and the effect that such systems have on deterministic signals.

Learning outcomes

Students successfully completing this course will have the following:	Exit level	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9	LO10	LO11
A. Knowledge (Information plus Understanding)												
1 The representation and manipulation of continuous-time signals and systems			6									
2 The role of the convolution operation for linear time invariant systems			6									
3 The Fourier series and Fourier transform of a signal and its interpretation			6									
4 The use of linear systems or filtering signals						6						
5 Sampling signals and reconstructing signals from samples						6						
B. Skills (Application of Knowledge)												
1 Know how to characterise and understand linear systems in terms of input-output relations, and apply associated methods to some actual problems						6						
2 Understand what is meant by frequency of a signal and frequency response of a system						6						
3 Become accustomed to using alternative domains for solving problems						6						
4 Use computer packages like MATLAB to plot and manipulate signals according to mathematical formulae						6						
C. Values and Attitudes												
1 Confidence in the use of MATLAB and equivalent computer packages						6						
2 An appreciation for mathematics as the language of science						6						

Detailed course content

This course provides students with the basic tools required for understanding linear systems, and the effect that such systems have on determistic signals. Upon completion, students will be able to characterise and manipulate linear time-invariant systems in terms of input-output relationships, using both time and frequency domain methods. The course includes concepts related to signal representation, linear convolution, Fourier analysis, sampling of continuous-time signals, and Laplace transforms.

TEST DATES: 14 August 2019 and 25 September 2019

Knowledge areas

Maths Sciences	Natural Sciences	Eng Sciences	Design & Synthesis	Complm Studies
	10	90		

Learning environment

Material is presented in lectures, with enough examples for the students to have an idea of applications. Homework assignments are given out every 2-3 weeks, and some questions have to be handed back to be marked. Computer assignments consolidate the concepts at each stage, and also have to be submitted by the students.

Suggested time allocation

Learning Activity	No./ week	Time in hours	Contact time Multiplier	Total no of hours
Number of lectures *per week*	4	0.75	2	72
Number of tutorials *per week*	1	0.75	2	18
Total practical/lab periods			2.5	18.8
Total other contact periods				
Total assignment non-contact *hours*	---		---	35
Assessment hours (Tests, Exam)	---		4	16
Number of weeks the course lasts	12	---	---	---
Total hours	---	---	---	159.8

General assessment strategy

Assessment Task	%	The following DP rules apply:
Assignments		100% practical and tutorial submission
Tutorials	10	
Labs	10	
Project		
Tests	20	
Exam	60	
Total	**100**	

Books/Reading Materials/Notes

B. P. Lathi, Signal Processing and Linear Systems, Oxford University Press, 2010.

Absence: The continuous assessment marks will be adjusted to allow for absence only on the following grounds:
- A medical certificate for absence of 3 or more consecutive days or any day with a class test or exam
- Death of an immediate family member (parent or sibling)
- Pre-arranged absence to represent a University, provincial or national team.

Academic dishonesty: Plagiarism is a very serious offence and usually leads to disciplinary action that could include expulsion from the university. Therefore, recognise the work of others in any submission. Details of referencing methods are widely available on the Web. A non-plagiarism declaration must be submitted with all work submitted for marking.