

Course Name : Signals & Networks
Course Code : BEE2143
Pre Requisite : BUM2133 & BEE1133
Course Type : Core Faculty
Program Offered : BEE
 : BEP
 : BEC

Credit Hour : 3
Lecture Hours : 3
Tutorial Hours : -
Lab Hours : 2

Synopsis This course introduces the students to various signals transformation techniques and its application to electrical circuits. This includes Fourier Series, Fourier Transforms and Laplace Transform. The concept of frequency response is introduced in filter.

Course Outcomes At the end of this course student should be able to:
CO 01: Distinguish the different type of signals and its operations.(C2)
CO 02: Apply Fourier and Laplace techniques in solving electrical problems. (C3)
CO 03: Analyze and differentiate several types of passive filters. (C4)
CO 04: Evaluate various signals and systems using engineering software. (P4)
CO 05: Conduct independent readings and research in designing Graphical User Interface (GUI) for any transformation technique (FS/FT/LT). (A3, LLL2)

CO/PO Mapping

	PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 11	PO 12
CO 01	X											
CO 02	X											
CO 03	X											
CO 04					X							
CO 05											X	

Key Indices:

X: assessed outcomes

Syllabus

- 1.0 Introduction to Signals and Systems (6 Hours)**
- 1.1 Classification of signals and systems
 - 1.2 Signal Characteristic
 - 1.3 Time and Frequency domains
 - 1.4 Elementary signals
 - 1.5 Signals Operations
 - 1.6 Convolution
- (BT Level 2: Understanding)*
- 2.0 Fourier Series (10 Hours)**
- 2.1 Trigonometric Fourier Series
 - 2.2 Exponential Fourier Series
 - 2.3 Symmetry considerations in Fourier Series
 - 2.4 Amplitude and phase spectra in Fourier Series
 - 2.5 Applications
- (BT Level 3: Applying)*
- 3.0 Fourier Transform (10 Hours)**
- 3.1 Definition and Properties of Fourier Transform
 - 3.2 Fourier Transform using derivative technique
 - 3.3 Inverse Fourier Transform
 - 3.4 Applications
- (BT Level 3: Applying)*
- 4.0 Laplace Transform (10 Hours)**
- 4.1 Definition and Properties of Laplace Transform
 - 4.2 Inverse Laplace Transform
 - 4.3 Applications
- (BT Level 3: Applying)*
- 5.0 Filters and frequency response (6 Hours)**
- 5.1 Type of filters
 - 5.2 Transfer function of filter circuits
 - 5.3 Frequency response of filters
- (BT Level 4: Analyzing)*

References

1. Alexander, Sadiku, "Fundamentals of Electric Circuits", 3rd Edition. McGraw-Hill, 2007.
2. M.J. Roberts, "Signals and Systems : Analysis Using Transform Methods and MATLAB", McGraw-Hill, 2003.
3. Simon Haykin, Barry Van Veen, "Signals and Systems", 2nd Ed., Wiley, 2003.

Assessment

Quizzes	10%
Laboratory	10%
Assignments	10%
Test	30%
Final Examination	40%
Total	100%

Assessment Methods

- 1: Assessment on Knowledge Domain (shorter duration)
 - Final Examination, Test, Quiz
- 2: Assessment on Knowledge Domain (longer duration)
 - Assignment, Project
- 3: Assessment on Skills and Affective Domains
 - Presentation, Laboratory Assessment, Demonstration, Self/Peer/Group Evaluation.
- 4: Assessment on Report as Final Product
 - Thesis/Dissertation/Industrial Training Report

Teaching Approach Lecture, Active Learning, Group Assignment

Course Homepage <http://notes.ump.edu.my/fkee/BEE2143>