DIGITAL SIGNAL PROCESSING

Course Description

This course introduces the student to the field of digital signal processing. The areas covered include: description of discrete time signals and systems, input-output relations, the use of transform methods to simplify input-output relations, sampling theory and digital filters.

Course Objectives

Upon completion of this course, the student will be able to:

1. Identify the difference between continuous-time and discrete-time signals.
2. Approximate continuous-time processes by discrete models.
3. Represent LTI systems by difference equations and system diagrams.
4. Express system input-output relation by discrete convolution.
5. Find out the frequency response of an LTI system.
6. Define the difference frequency responses of ideal filters.
7. Identify recursive and non-recursive digital filters.
8. Identify the z-transform pairs of some right-handed sequences.
9. Implement convolution using z-transform.
10. Express transfer functions in z-domain.
11. Recognize the connections between time domain and z-domain.
12. Find the discrete Fourier series of a periodic sequence.
13. Find the discrete Fourier transform of finite duration sequences.