1. Course Code: CT203

2. Title: Signals and Systems

3. Instructors: Rajib Lochan Das (rajib_das@daiict.ac.in) 
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4. Credit Structure (L-T-P-Cr): 3-1-0-4

5. Slot: Semester III (BTech)

6. Category: Core

7. Objective:
   Signals and systems course is a pre-requisite for several important topics such as digital signal processing, analog and digital communication, image processing, speech processing etc. The course aims to introduce the concept of signals and systems. Both continuous time and discrete time signals will be covered along with their analysis in frequency domain. Further, characteristics of systems and their response to different signals will be discussed.

8. Suggested books:

9. Evaluation:
   Mid Semester Exam 40%, End Semester Exam 50% and Tutorial 10%.

10. Course outline:
    (i) Signals: Continuous time and discrete time; Periodic and aperiodic; Even and odd signals; Signal energy and power (3 L)
    (ii) Basic signals (unit step, unit impulse, ramp, exponential, sinusoids), transformations of the independent variable (shifting, scaling, reversal) (3 L)
    (iii) Systems and properties: Linearity, time invariance, causality, memory, stability (3 L)
    (iv) Linear and time invariant system, impulse response, convolution integral (3 L)
    (v) Fourier Series representation of periodic signals; Parseval’s relation (5 L)
    (vi) Continuous time Fourier transform (5 L)
    (vii) Sampling theorem (2 L)
    (viii) Discrete time Fourier transform (5 L)
    (ix) Frequency sampling, Circular convolution, Discrete Fourier transform (3 L)
    (x) Laplace transform (2 L)
    (xi) Z transform (2 L)
    (xii) Introduction to filters: LPF, HPF, BPF (4 L)