PROF. KUSHAL K. SHAH
Department of Electrical and Electronics Engineering
IISER Bhopal

TYPE OF COURSE : New | Core | UG
COURSE DURATION : 12 weeks (27 Jan' 20 - 17 Apr' 20)
EXAM DATE : 26 Apr 2020

PRE-REQUISITES : Mathematics at 10+2 level
INTENDED AUDIENCE : 2nd year undergraduate students
INDUSTRIES APPLICABLE TO : All companies dealing with signal processing

NOTE: In this course, the explanation will be in Hindi, but the scientific terms, assignments and exams will be in English.

COURSE OUTLINE:
This course will introduce the students to basics of signal processing and systems analysis. We will focus on continuous-time signals and systems, but also give an introduction to discrete-time signals and systems towards the end of the course. This is a very important course for all engineers working in the electronics and communications domain.

ABOUT INSTRUCTOR:
Prof. Kushal K. Shah completed his BTech in 2005 and PhD in 2009, both from the Electrical Engineering Department of IIT Madras. In 2009-10, he went to Weizmann Institute of Science in Israel for a post-doctoral fellowship. He joined Jawaharlal Nehru University (New Delhi) as an Assistant Professor in 2010 and in 2012, he was conferred with the GN Ramachandran fellowship by the university. In May 2012, he joined IIT Delhi as an Assistant Professor in the Electrical Engineering Department and moved to IISER Bhopal in August 2017 as an Associate Professor in the Department of Electrical Engineering & Computer Science. He was awarded the INAE Young Engineer Award in 2014. His primary research interests include Plasma Physics, Nonlinear Dynamics and Genomic Signal Processing.

COURSE PLAN:
Week 1 : Mathematical Preliminaries
Week 2 : Types of Signals and Transformations
Week 3 : Fourier Transform of Continuous-Time Signals
Week 4 : Properties of Fourier Transforms
Week 5 : LTI Systems
Week 6 : Convolution and LTI System Properties
Week 7 : Laplace Transform
Week 8 : Laplace Transform Properties
Week 9 : Fourier Series of Continuous-Time Periodic Signals and Properties
Week 10 : Discrete-Time LTI Systems and Sampling
Week 11 : Discrete-Time Fourier Transform (DTFT)
Week 12 : Z-Transform