



# SIGNALS AND SYSTEMS

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IISER Bhopal

**TYPE OF COURSE** : Rerun | Core | UG**COURSE DURATION** : 12 weeks (24 Jan' 22 - 15 Apr' 22)**EXAM DATE** : 24 Apr 2022**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 :**

Dr. 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 Dynamical Systems, Signal Processing and Artificial Intelligence.

**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