SIGNAL PROCESSING TECHNIQUES AND ITS APPLICATIONS

PROF. SHYAMAL KUMAR DAS MANDAL

Department of Advanced Technology Development Centre
IIT Kharagpur

INTENDED AUDIENCE : UG and PG student of Electronics and Electrical Communication Engg, Electrical Engineering and Computer Science and Engineering along with Industry working in the area of Image and speech processing

COURSE OUTLINE :

Digital Signal Processing (DSP) is concerned with the representation, transformation and manipulation of signals on a computer. After half a century advances, DSP has become an important field, and has penetrated a wide range of application systems, such as consumer electronics, digital communications, medical imaging and so on. With the dramatic increase of the processing capability of signal processing microprocessors, it is the expectation that the importance and role of DSP is to accelerate and expand.

ABOUT INSTRUCTOR :

Prof. S K. Das Mandal was born on October 1975; He received the B.E degree in Electronics and Telecommunication engineering in 1998 and Ph.D degree in 2007 from Jadavpur University, India and currently working in Indian institute of Technology Kharagpur as an Assistant Professor. His current research interests include automatic speech recognition, speech synthesis, and computer assisted spoken language acquisition.

COURSE PLAN :

Week 1**:** Concept of frequency in continuous-time and Discrete-time signal

Week 2**:** Concept of frequency in continuous-time and Discrete-time signal

Week 3**:** Discrete time system

Week 4**:** Linear Time-Invariant Systems

Week 5**:** Recursive and Non-recursive discrete time system and its application

Week 6**:** Realization of Linear Time-Invariant Systems

Week 7**:** Discrete Time Fourier Transform(DTFT)

Week 8**:** Discrete Fourier Transform(DFT) and Fast Fourier Transform(FFT)

Week 9**:** Short Time Fourier Transform(STFT) and Its Application

Week 10**:** Use of FFT in Linear Filtering and correlation, Discrete cosine transform (DCT) and its Application

Week 11**:** Introduction to Digital Filter design (FIR and IIR)

Week 12**:** Homomorphic Signal Processing and Multirate digital signal processing