EE301A
Digital Signal Processing

1. Instructor: K Vasudevan (email: vasu@iitk.ac.in).

2. Aim: This course deals with the processing of discrete-time signals. The main advantage of discrete-time processing is that it can be implemented in software. Software implementation is much more flexible and reliable compared to hardware implementation. Sophisticated signal processing techniques (algorithms) can be implemented in software, which is not possible in a hardware implementation.

3. Lectures: Tue, Thu, Fri, 8 am, L17.

4. Office hours: Mon-Fri, 4-5 pm, ACES 303B. Kindly send me an email before coming.

5. Marks distribution (out of 100):

   (a) Two assignments: $5 + 5$. Computer assignments.

   (b) Two quizzes: $10 + 10$

   (c) Mid Sem: 30

   (d) End Sem: 40

   All exams are closed book.

6. Dates of quizzes:

   (a) Quiz 1: 1st Feb

   (b) Quiz 2: 3rd April

7. Syllabus: The sampling theorem revisited, discrete-time Fourier transform (DTFT), the z-transform, discrete Fourier transform (DFT), the fast Fourier transform (FFT), finite impulse response (FIR) and infinite impluse response (IIR) filters, linear phase FIR filters, discrete-time differentiators and Hilbert transformers, DSP applications in digital communications – equalizers – symbol-spaced, fractionally-spaced and decision-feedback equalizers. Linear prediction.

8. Course policies: Attendance, Honesty practices, Withdrawal etc – as per UG manual.

9. Books:

   (a) Digital Signal Processing: Principles, Algorithms and Applications by JG Proakis and DG Manolakis.

   (b) Digital Communications and Signal Processing by K Vasudevan, 2nd ed, 3rd ed. [3rd ed available online.]