



**E9 201 Aug. 3:0**

## **Digital Signal Processing**

### **Instructor**

Prasanta Kumar Ghosh, Soma Biswas

Email: [prasantg@iisc.ac.in](mailto:prasantg@iisc.ac.in), [somabiswas@iisc.ac.in](mailto:somabiswas@iisc.ac.in)

### **Teaching Assistant**

Pokala Praveen Kumar

Email: [pokalapraveen@ee.iisc.ernet.in](mailto:pokalapraveen@ee.iisc.ernet.in)

### **Department: Electrical Engineering**

Course Time: 3:30pm - 5:00pm

Lecture venue: EE B 308

Detailed Course Page: [http://www.ee.iisc.ac.in/people/faculty/prasantg/e9201\\_dsp\\_aug2017.html](http://www.ee.iisc.ac.in/people/faculty/prasantg/e9201_dsp_aug2017.html)

## **Announcements**

### **Brief description of the course**

The genesis of the Digital Signal Processing course is at the high demand of processing signals of different types including speech, earthquake, image, video, biomedical signal in a variety of curriculum and programs.

If one is interested in learning different techniques for processing and interpreting signals of different forms, the Digital Signal Processing course is ideal for him/her. This course cover fundamental topics as well as applications that requires those fundamental concepts through hands-on programming session.

### **Prerequisites**

none

### **Syllabus**

Discrete time signals and systems

Z -transform

Sampling

Discrete Fourier transform, FFT

Fourier analysis of signal using DFT

Structures of DT system, Quantization effect on DT system structure

Bandpass sampling, Multi-rate signal processing

Transform analysis

Filter design

Parametric Signal model

Discrete hilbert transform

## **Course outcomes**

- 1) How one can sample a continuous-time signal to obtain discrete-time signal without losing any information and reconstruct back the continuous-time signal.
- 2) Various transforms to mathematically analyze discrete-time signals for frequency domain interpretation.
- 3) different discrete-time structures for implementing discrete-time algorithms
- 4) how computer approximation affects the discrete-time system structure
- 5) How to sample a discrete-time signal at different rates and conditions on signal for efficient reconstruction
- 6) design and implementation of different filters that can run on discrete-time signals based on the specification for continuous-time signal.

## **Grading policy**

20% Assignment

20% Midterm

10% Project

50% Final Exam

## **Assignments**

## **Resources**