



**E9 261 Jan. 3:1**

## **Speech Information Processing**

### **Instructor**

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### **Teaching Assistant**

Email:

**Department: Electrical Engineering**

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

Lecture venue: EE B 303

Detailed Course Page: [http://www.ee.iisc.ac.in/people/faculty/prasantg/e9261\\_speech\\_jan2018.html](http://www.ee.iisc.ac.in/people/faculty/prasantg/e9261_speech_jan2018.html)

### **Announcements**

First lecture will be held in EE B 303 on January 3, 2018 (Wednesday) at 3:30pm.

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

The course is aimed for students who are interested to work in the area of speech processing as well as those who are interested in doing research in speech. The course covers techniques for analysis and modeling of speech both from signal processing and machine learning aspects covering a number of applications including speech recognition, enhancement and coding.

### **Prerequisites**

Digital Signal Processing, Probability and Random Processes

### **Syllabus**

Speech communication and overview

Time varying signals/sys

Spectrograms and applications

Speech parameterization/representation

AM-FM, sinusoidal models for speech

AR, ARMA, time-varying AR models for speech

Deep learning for speech

Speech applications - recognition, enhancement and coding

## **Course outcomes**

- 1) Understanding of human speech communication system
- 2) Time varying signals and system for modeling speech
- 3) Short-time analysis for speech signal
- 4) Various types of parameterizations and representations for speech including homomorphic filtering, cepstrum, pole-zero modeling
- 5) Deep learning, choices of cost function, non-linearities, initialization,
- 6) Convolutional architecture, restricted Boltzmann machine
- 7) Applications of various techniques for speech coding, enhancement and recognition.

## **Grading policy**

5% Surprise Exam

5% Assignment

20% Midterm

20% Project

50% Final Exam

## **Assignments**

## **Resources**