**Lesson Plan**

**Name of Faculty :** POONAM, Assistant Professor

**Discipline :**  ECE

**Semester:**  7th

**Subject :**  DSP(PCC-ECE401-T)

**Lesson Plan Duration:** 15 weeks

Work Load (Lectutre/Practical) per week (in hours):Lectures-03

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| **Week** | **Theory** | | **Actual Covered** |
| **Lecture Day** | **Topic (Including Assignment/Test)** |  |
| 1st | 1 | Frequency Domain Sampling and reconstruction of discrete time signal, |  |
| 2 | Discrete Fourier Transform |  |
| 3 | DFT as a linear Transformation |  |
| 2nd | 4 | Properties of DFT |  |
| 5 | Linear filtering methods |  |
| 6 | Use of DFT in linear filtering |  |
| 3rd | 7 | Filtering of long data sequence |  |
| 8 | FFT |  |
| 9 | Radix-2 and Radix-4 algorithm |  |
| 4th | 10 | Application of FFT algorithm |  |
| 11 | Efficient computation of the DFT of two real sequence |  |
| 12 | Efficient computation of the DFT of two N point real sequence |  |
| 5th | 13 | Use of FFT in Linear Filtering System |  |
| 14 | Use of FFT in Correlation |  |
| 15 | Direct Form structures, Cascade form structure |  |
| 6th | 16 | Frequency sampling structures, lattice structure |  |
| 17 | Direct Form structures of IIR systems,signal flow graphs |  |
| 18 | Cascade and parallel form structure |  |
| 7th |  | ----------------------------**Ist Minor Test**--------------------------- |  |
| 8th | 19 | Lattice and ladder form structure of IIR Systems. |  |
| 20 | FIR and IIR filters properties |  |
| 21 | Design of FIR filters: importance  of Linear Phase response |  |
| 9th | 22 | Assignment questions |  |
| 23 | Design of linear phase FIR filters using Windows, Desirable Window,function properties for FIR filter design |  |
| 24 | Frequency Sampling method for Linear Phase FIR Filter  Design. Design steps for IIR Filter design |  |
| 10th | 25 | Design of IIR low pass analog filters: Butterworth |  |
| 26 | Chebyshew, Elliptic |  |
| 27 | Conversion of analog system to digital system by: Approximation of Derivatives |  |
| 11th | 28 | Impulse Invariance, |  |
| 29 | Bilinear Transformation |  |
| 30 | Frequency Transformations |  |
| 12th | 31 | Problems solving |  |
| 32 | Introduction to Multirate digital signal processing, interpolation and decimation |  |
| 33 | interpolation and decimation, sampling rate conversion by rational factor |  |
| 13th | 34 | sampling rate conversion by rational factor |  |
| 35 | Filter design and implementation for sampling rate conversion, |  |
| 36 | interpolators, |  |
| 14th |  | ----------------------------**2nd Minor Test**--------------------------- |  |
| 15th | 37 | Multistage decimator . |  |
| 38 | Applications of Multirate Signal Processing |  |
| 39 | Problems Solving |  |