**Lesson Plan**

Name of faculty : Er. Sita Devi

Discipline : Electrical Engineering

Semester : 6th

Subject : Digital Signal Processing (ET-306E)

Lesson plan duration : 15 weeks

|  |  |  |
| --- | --- | --- |
| Week | Theory | |
|  | Lecture  Day | Topic (Including assignment / Test) |
| 1st | 1 | Introduction to Z-transform |
| 2 | Properties of Z-transform & its proof |
| 3 | Inversion of Z-transform |
| 4 | One sided Z-transform &solution of differential equations |
| 2nd | 5 | Analysis of LTI system in Z-domain |
| 6 | Introduction to causality  Stability: schur-cohn stability test |
| 7 | Numericals based on stability test. |
| 8 | Introduction to fourier transform  Relationship between Z-transform and fourier transform |
| 3rd | 9 | Frequency selective filters; all pass filters, minimum-phase, maximum- phase and mixed-phase systems |
| 10 | Introduction to DFT &properties of DFT |
| 11 | Linear filtering using DFT |
| 12 | Frequency analysis of signals using DFT, radix-2, radix-4, goertzel algorithm |
| 4th | 13 | Direct form, cascade form for FIR systems |
| 14 | Frequency sampling for FIR system |
| 15 | lattice structure for FIR system |
| 16 | Direct form for IIR systems |
| 5th | 17 | cascade form for IIR systems |
| 18 | Transposed form for IIR systems |
| 19 | Parallel form for IIR systems |
| 20 | Lattice structure for IIR systems |
| 6th | 21 | lattice ladder structure for IIR systems |
| 22 | Comparision between FIR &IIR systems |
| 23 | State space structure |
| 24 | Ouantization of filter co-efficent structures for all pass filters |
| **7th** | **1st minor test** | |
| 8th | 25 | Discussion on 1st minor test question |
| 26 | Characteristics of practical frequency selective filters |
| 27 | Filter design specifications |
| 28 | peak pass band ripple |
| 9th | 29 | Minimum stop band attenuation |
| 30 | Types of filters |
| 31 | Design of FIR filter using windows |
| 32 | Numerical on FIR filter using windows |
| 10th | 33 | Kaiser window method |
| 34 | Numerical on Kaiser window method |
| 35 | Comparison of design methods for FIR filter |
| 36 | Gibbs phenomenon |
| 11th | 37 | Design of IIR filters from analog filters |
| 38 | Design by approximation of derivatives |
| 39 | Impulse invariance method |
| 40 | Bilinear transformation method |
| 12th | 41 | Numerical on Bilinear transformation method |
| 42 | Introduction to Butterworth filter |
| 43 | Numerical on butterworth filter |
| 44 | Characteristics of butterworth filter |
| 13th | 45 | Introduction to Chebyshev filter |
| 46 | Numerical on Chebyshev filter |
| 47 | Characteristics of Chebyshev filter |
| 48 | Introduction to Elliptical analog filter |
| **14th** | **2nd minor test** | |
| 15th | 49 | Discussion on 2nd minor test question |
|  | 50 | Characteristics of Elliptical analog filter |
|  | 51 | Design of IIR filter |
|  | 52 | Numerical based on IIR system |

Sita Devi

Guest Faculty in Electrical Engg.