Lesson Plan

Discipline: Electrical Engineering Semester : 5th Subject : Control System

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| **Week** | **Lecture**  | **Topic (Including Assignment / Test) : Planned** | **Actually covered on** **(date)** | **Teacher’s** **Sign** | **HOD’s Sign** | **DP’s****Sign** |
| 1st | 1 | **Introduction to Control Systems:** Open & Closed loop |  |  |  |  |
| 2 | Control System classification, |  |  |  |  |
| 3 | Transfer function analysis |  |  |  |  |
| 2nd | 4 | concept of poles and zeros |  |  |  |  |
| 5 | Mathematical modelling of electrical systems, |  |  |  |  |
| 6 | Error detectors, gears |  |  |  |  |
| 3rd | 7 | gyroscope, DC motors |  |  |  |  |
| 8 | servomotors, techo-generators |  |  |  |  |
| 9 | servo amplifiers, synchros |  |  |  |  |
| 4th | 10 | block diagram techniques |  |  |  |  |
| 11 | block diagram reduction techniques |  |  |  |  |
| 12 | signal flow graphs |  |  |  |  |
| 5th | 13 | mason’s gain formulae |  |  |  |  |
| 14 | performance of feedback Systems |  |  |  |  |
| 15 | Standard test signals |  |  |  |  |
| 6th | 16 | time response of first order systems |  |  |  |  |
| 17 | characteristic equation of feedback control systems |  |  |  |  |
| 18 | transient response of second order systems, |  |  |  |  |
| **7th** |  | **1stSessionals** |  |  |  |  |
| 8th | 19 | time domain specifications, |  |  |  |  |
| 20 | steady state response |  |  |  |  |
| 21 | steady state errors and error constants |  |  |  |  |
| 9th | 22 | Proportional, Integral,. Proportional Derivative systems. |  |  |  |  |
| 23 | Development of root loci |  |  |  |  |
| 24 | root motions under close-looping |  |  |  |  |
| 10th | 25 | Case study- Speed Control of DC Motor using PID. |  |  |  |  |
| 26 | Stbility, Routh-Hurwitz stability criterion, |  |  |  |  |
| 27 | relative stability |  |  |  |  |
| 11th | 28 | frequency-domain specifications analysis using Bode plots |  |  |  |  |
| 29 | Gain margin and phase margin |  |  |  |  |
| 30 | Nyquist plot (Polar Plot), Use of Nyquist stability criterion for stability analysis, |  |  |  |  |
| 12th | 31 | Feedback compensation –Lead, Lag compensation |  |  |  |  |
| 32 | Compensator design using Root locus, |  |  |  |  |
| 33 | Compensator design using Bode Plot |  |  |  |  |
| 13th | 34 | Specifications of time-domain and frequency domain |  |  |  |  |
| 35 | design of P, PD, PI, PID error control strategies |  |  |  |  |
| 36 | impact on transient response and steady-state response. |  |  |  |  |
|  **14th** |  | **2ndSessionals** |  |  |  |  |
| 15th | 37 | Case study- DC Motor Control. |  |  |  |  |
| 38 | Revision  |  |  |  |  |
| 39 | Revision |  |  |  |  |