**Lesson Plan**

Name of faculty : HANUMAN

Discipline : Electrical Engineering

Semester : 4th

Subject : CONTROL SYSTEM/EE-208L

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Week | Theory | | **Date of Actual covered** | **Signatures** | | | | | |
| Lecture  Day | Topic (Including assignment / Test) | **Concerned teacher** | | | **HOD** | **DP** | |
| **Unit-I** | | | | | | | | | |
| 1st | 1 | Open loop control system |  | |  |  | | |  |
| 2 | Closed loop control system |
| 3 | Servomechanism |
| 4 | Differential equation of physical systems |
| 2nd | 5 | Transfer function |  | |  |  | | |  |
| 6 | Block diagram algebra |
| 7 | Signal flow- graphs |
| 8 | Masons formula and its applications |
| 3rd | 9 | Feedback and non-feedback systems |  | |  |  | | |  |
| 10 | Effect of feedback on sensitivity |
| 11 | Stability |
| 12 | Overall gain |
| **Unit-II** | | | | | | | | | |
| 4th | 13 | Standard test signals |  | |  |  | | |  |
| 14 | Time response of first order and second order system |
| 15 | Steady- state errors and error constants |
| 16 | Design specification of second-order systems |
| 5th | 17 | Concept of stability |  | |  |  | | |  |
| 18 | Necessary conditions for stability |
| 19 | Hurwitz stability criterion& Routh stability criterion |
| 20 | Assignment on time response of first order and second order systems |
| 6th | 21 | Relative stability analysis |  | |  |  | | |  |
| 22 | Root locus concept |
| 23 | Construction / development of root loci for various systems |
| 24 | Stability considerations |
| **7th** | **1st Minor Test** | | | | | | | | |
| **Unit-III** | | | | | | | | | |
| 8th | 25 | Correlation b/w time & frequency response |  | |  |  | | |  |
| 26 | Polar plots |
| 27 | Nyquist plots |
| 28 | Bode plots |
| 9th | 29 |  |  | |  |  | | |  |
| 30 | Stability |
| 31 | Nyquist stability criterion |
| 32 | Gain margin |
| 10th | 33 | Phase margin |  | |  |  | | |  |
| 34 | Relative stability |
| 35 | Realtive stability using by Nyquist criterion |
| 36 | Frequency response |
| **Unit-IV** | | | | | | | | | |
| 11th | 37 | Necessity of compensation |  | |  |  | | |  |
| 38 | Phase lag compensation |
| 39 | Phase lead compensation |
| 40 | Feed back compensation |
| 12th | 41 | Concept of state |  | |  |  | | |  |
| 42 | State variable & state model |
| 43 | State model for linear continuous time systems |
| 44 | Diagonalisation solution of state equations |
| 13th | 45 | Concept of controllability & observability |  | |  |  | | |  |
| 46 | Assignment on Correlation between time and frequency response |
| 47 | Concept of Synchros |
| 48 | Working principle of synchros |
| **14th** | **2nd Minor test** | | | | | | | | |
| 15th | 49 | AC & DC techo-generators |  | |  |  | | |  |
|  | 50 | Servo motors |
|  | 51 | Magnetic amplifier |
|  | 52 | Stepper motor |

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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Week** | **Practical** | | | | **Date of Actual covered** | **Signature** | | |
|  |  |  | **Practical**  **Day** | **Topic** | **Concerned teacher** | **HOD** | **DP** |
| 1st | 1 |  | 1 | Experiment to study DC position control system |  |  |  |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 2nd | 5 |  | 2 | Experiment to study linear system simulator |  |  |  |  |
| 6 |  |
| 7 |  |
| 8 |  |
| 3rd | 9 |  | 3 | Experiment to study light intensity control using P & PI controller with provision for disturbance and transient speed control |  |  |  |  |
| 10 |  |
| 11 |  |
| 12 |  |
| 4th | 13 |  | 4 | Experiment to study D.C. motor speed control |  |  |  |  |
| 14 |  |
| 15 |  |
| 16 |  |
| 5th | 17 |  | 5 | Experiment to study the stepper motor characteristics & its control through microprocessor kit |  |  |  |  |
| 18 |  |
| 19 |  |
| 20 |  |
| 6th | 21 |  | 6 | Experiment to study temperature control system |  |  |  |  |
| 22 |  |
| 23 |  |
| 24 |  |
| **7th** | **1st Minor Test** | | | |  |  |  |  |
| 8th | 25 |  | 7 | Experiment to study compensation design |  |  |  |  |
| 26 |  |
| 27 |  |
| 28 |  |
| 9th | 29 |  | 8 | Experiment to study relay control system |  |  |  |  |
| 30 |  |
| 31 |  |
| 32 |  |
| 10th | 33 |  | 9 | Experiment to study potentials metric error detector |  |  |  |  |
| 34 |  |
| 35 |  |
| 36 |  |
| 11th | 37 |  | 10 | Experiment to study SC position control system |  |  |  |  |
| 38 |  |
| 39 |  |
| 40 |  |
| 12th | 41 |  | 11 | Experiment to study SC position control system |  |  |  |  |
| 42 |  |
| 43 |  |
| 44 |  |
| 13th | 45 |  | 12 | Experiment to study synchros |  |  |  |  |
| 46 |  |
| 47 |  |
| 48 |  |
| **14th** | **2nd Minor test** | | | |  |  |  |  |
| 15th | 49 |  | 13 | Experiment to study synchros |  |  |  |  |
|  | 50 |  |
|  | 51 |  |
|  | 52 |  |