

# **DR. D. N. CHARYA**

**KHENTAWAS, FARRUKHNAGAR, GURGAON, HR**

**Department: ELECTRONICS & COMMUNICATION ENGINEERING**

**Academic Session: 2017-18 (Jan-June 2018)**

**Lesson Plan for the Semester started w.e.f 08.01.2018**

**Subject with code: Control System Engineering (EE-304-F)**

**Semester VI**

**Name of Faculty with designation : Mrs. Dimple Sapru (Associate Professor)**

| Month   | Date & Day             | Sem-Class | Unit | Topic/Chapter covered   | Academic activity | Test / assignment  |
|---------|------------------------|-----------|------|---|-------------------|--------------------|
| January | 08.01.2018<br>Monday   | VI ECE    | A    | System/Plant model, types of models, illustrative examples of plants and their inputs and outputs, controller, , regulating system, linear time-invariant (LTI) system, time-varying system, causal system, open loop control system, closed loop control system, illustrative examples of open-loop and feedback control systems, continuous time and sampled data control systems | .....             |                    |
| January | 09.01.2018<br>Tuesday  | VI ECE    | A    | Servomechanism, Field Control & Armature Control  |                   |                    |
| January | 11.01.2018<br>Thursday | VI ECE    | B    | Block diagram algebra   |                   | Assignment 1 given |
| January | 15.01.2018<br>Monday   | VI ECE    | B    | Block diagram algebra, Numerical  |                   |                    |
| January | 16.01.2018<br>Tuesday  | VI ECE    | B    | Mason's gain formula & its application,   |                   |                    |
| January | 18.01.2018<br>Thursday | VI ECE    | B    | Mason's gain formula, Numericals  |                   | Assignment 2 given |
| January | 23.01.2018<br>Tuesday  | VI ECE    |      | Test / Discussion on Questions of Assignment 1 & 2  |                   | Test               |

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| January  | 25.01.2018<br>Thursday | VI ECE    | B    | Characteristic equation, Derivation of transfer functions of electrical and electromechanical systems  |                   |                    |
| January  | 29.01.2018<br>Monday   | VI ECE    | B    | Transfer functions of cascaded and non-loading cascaded elements. Introduction to state variable analysis and design   |                   | Assignment 3 given |
| January  | 30.01.2018<br>Tuesday  | VI ECE    | C    | Typical test signals, time response of first order systems Step I/P  |                   |                    |
| February | 01.02.2018<br>Thursday | VI ECE    | C    | Time response of 2nd order system to step input,   |                   |                    |
| February | 05.02.2018<br>Monday   | VI ECE    | C    | Time response of 2nd order system to step input, relationship between location of roots of characteristic equation, $\omega$ and $\omega_n$ , time domain specifications of a general and an under-damped 2nd Steady state error and error constants, Hurwitz stability criterion order system |                   | Assignment 4 given |
| February | 06.02.2018<br>Tuesday  | VI ECE    | A    | Effects of feedback on sensitivity (to parameter variations), stability, external disturbance (noise), overall gain etc. Introductory remarks about non-linear control systems.  |                   |                    |
| February | 08.02.2018<br>Thursday | VI ECE    | C    | Root locus concept,  |                   |                    |
| February | 19.02.2018<br>Monday   | VI ECE    | C    | Development of root loci for various systems, stability considerations   |                   | Assignment 5 given |
| February | 20.02.2018<br>Tuesday  | VI ECE    | C    | Numericals of Root Locus,  |                   |                    |
| February | 22.02.2018<br>Thursday | VI ECE    |      | Test / Discussion on Questions of Assignment 3&4   |                   | Test               |
| March    | 26.02.2018<br>Monday   | VI ECE    | D    | Dominant closed loop poles, concept of stability, pole zero configuration and stability, Bode plots  |                   |                    |
| March    | 27.02.2018<br>Tuesday  | VI ECE    | D    | Bode plots, stability, Gain-margin and Phase Margin, relative stability, frequency response specifications.  |                   |                    |
| March    | 05.03.2018<br>Monday   | VI ECE    | D    | Numericals of Bode Plot  |                   | Assignment 6 given |
| March    | 06.03.2018<br>Tuesday  | VI ECE    | D    | Numericals of Bode Plot  |                   |                    |
| March    | 08.03.2018<br>Thursday | VI ECE    | D    | Nyquist  |                   |                    |

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| March | 12.03.2018<br>Monday   | VI ECE    | D    | Nyquist  |                   | Assignment 7 given |
| March | 13.03.2018<br>Tuesday  | VI ECE    | D    | Discussion on Questions of Assignment 5&6  |                   |                    |
| March | 15.03.2018<br>Thursday | VI ECE    | D    | Relationship between frequency response and time-response for 2nd order system, polar, Nyquist             |                   |                    |
| March | 26.03.2018<br>Monday   | VI ECE    | D    | Necessity of compensation, compensation networks, application of lag and lead compensation                 |                   | Assignment 8 given |
| March | 27.03.2018<br>Tuesday  | VI ECE    | D    | basic modes of feedback control, proportional, integral and derivative controllers, illustrative examples. |                   |                    |
| April | 02.04.2018<br>Monday   | VI ECE    | D    | Synchros, AC and DC techs-generators, servomotors, stepper motors, & their applications,                   |                   | Assignment 9 given |
| April | 03.04.2018<br>Tuesday  | VI ECE    |      | Stepper motors, & their applications, magnetic amplifier.  |                   |                    |
| April | 05.04.2018<br>Thursday | VI ECE    |      | Revision   |                   |                    |
| April | 09.04.2018<br>Monday   | VI ECE    |      | Revision   |                   |                    |