

**UNIT I**

**Introduction** - Basic elements of control system, Open loop and closed loop systems, Differential equations and transfer function, Modelling of electric systems, Translational and rotational mechanical systems, Block diagram reduction techniques, Signal flow graph.

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**UNIT II**

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Frequency response and frequency domain specifications, correlation between time domain and frequency domain specifications, Polar plot, Nyquist stability criterion and construction of Nyquist plots, Bode plot, Determination of frequency domain specifications and stability analysis using Nyquist plot and Bode plot.

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### UNIT VI

Concept of Controller, Basic ON-OFF Controller, Concept of Dead Zone, Introduction to P, I, D, PI, PD and PID controller, OFFSET of Controller, Integral Reset, PID Characteristics. Concept of Zeigler-Nicholas method. Concept of Industrial Automation, Need of IoT based Industrial Automation.

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