

	GURGAON INSTITUTE OF TECHNOLOGY & MANAGEMENT	
	Department : Electronics & Communication Engineering	Session : Jan-May 2018
Branch/Sem : ECE / EE 6 th Semester		Subject Name & Code : Control System Engineering & EE-304-F
Lesson Plan		TEACHER: Ms. Vimal

Books Referred:

- A. Control System Engineering : I.J.Nagrath & M.Gopal; New Age .
- B. Control Systems : B.S Manke.
- C. Control Systems - Principles & Design : Madan Gopal; Tata Mc Graw Hill

Lecture No.	Topics to be Covered
1.	Section-A:Introductory Concept Linear time-invariant (LTI) system, time-varying system, Continuous time and sampled data control systems.
2.	Open loop control system, closed loop control system, illustrative examples of open-loop and feedback control systems .
3.	Section-B:Mathematical Modeling Concept of transfer function, block diagram algebra.
4.	Numerical on Block diagrams
5.	Signal flow graphs : Mason's gain formula & its application
6.	Numerical on signal Flow
7.	Derivation of transfer function of electrical & electromechanical system, regulating system
8.	Numerical on electrical & electromechanical system
9.	Effects of feedback on sensitivity (to parameter variations), stability, external disturbance (noise), overall gain etc. Introductory remarks about non-linear control systems
10.	Relationship between transfer function and impulse response, Order of system.
11.	Section-C:Time Domain Analysis Typical test signals, time response of first order systems to various standard inputs time response of 2nd order system to step input .
12.	Relationship between location of roots of characteristics equation,
13.	ω and ω_n , time domain specifications of a general and an under-damped 2nd order system,

14.	Steady state error and error constants, dominant closed loop poles,
15.	Concept of stability, pole zero configuration and stability, necessary and sufficient conditions for stability.
16.	Hurwitz stability criterion, Routh stability criterion and relative stability
17.	Root locus concept
18.	Section-D: Frequency Domain Analysis : Relationship between frequency response and time-response for 2nd order system
19.	Polar, Nyquist, Bode plots, stability.
20.	Gain-margin and Phase Margin
21.	Relative stability
22.	Frequency response specifications
23.	Introduction to state variable analysis and design
24.	Necessity of compensation, compensation networks
25.	Application of lag and lead compensation
26.	Synchros, AC and DC Techo-generators, servomotors, stepper motors, & their applications, magnetic amplifier
27.	Servomotors
28.	Stepper motors, & their applications
29.	Magnetic amplifier
30.	Revision of previous question papers.
31.	Revision of previous question papers.
32.	Revision of previous question papers.