EVEN SEM LESSSON PLAN (SEM4, SEM6)

Faculty Name: Deepika Panda
Sem: 6
Subject: CONTROL SYSTEM AND COMPONENT (TH2)
Academic Year: 2023-24
Duration: 2nd Jan 2024 to 23rd April 2024

CONTROL SYSTEM AND COMPONENT (TH2) - 6TH SEMESTER ETC		
Week	**No of Periods Alloted (60)**	**Syllabus To be Covered**
1ST	**1.Fundamental of Control System - 5P**	
	1st	1.1 Classification of Control system
	2nd	1.2 Open loop system & Closed loop system and its comparison
	3rd	1.3 Effects of Feed back
	4th	1.4 Standard test Signals(Step, Ramp, Parabolic, Impulse Functions)
2ND	**1st**	1.5 Servomechanism
	2. Transfer Functions - 8P	
	2nd	2.1 Transfer Function of a system & Impulse response,
	3rd	2.2 Properties,Advantages& Disadvantages of Transfer Function
	4th	2.3 Poles & Zeroes of transfer Function
3RD	**1st**	2.4 Poles & Zeroes of transfer Function
	2nd	2.5 Representation of poles & Zero on the s-plane
	3rd	2.6 Simple problems of transfer function of network
	4th	2.6 Simple problems of transfer function of network
4TH	**1st**	2.6 Simple problems of transfer function of network
	3. Control system Components & mathematical modelling of physical System - 5P	
	2nd	3.1 Components of Control System
	3rd	3.2 Potentiometer, Synchros, Diode modulator & demodulator
	4th	3.2 Potentiometer, Synchros, Diode modulator & demodulator
5TH	**1st**	3.3 DC motors, AC Servomotors
	2nd	3.4 Modelling of Electrical Systems(R, L, C, Analogous systems)
	4. Block Diagram & Signal Flow Graphs(SFG) - 8P	
	3rd	4.1 Definition of Basic Elements of a Block Diagram
	4th	4.2 Canonical Form of Closed loop Systems
6TH	**1st**	4.3 Rules for Block diagram Reduction 4.4 Procedure for of Reduction of Block Diagram
	2nd	4.5 Simple Problem for equivalent transfer function
	3rd	4.6 Basic Definition in SFG & properties
	4th	4.7 Mason's Gain formula
7TH	**1st**	4.8 Steps foe solving Signal flow Graph
	2nd	4.9 Simple problems in Signal flow graph for network
	5. Time Domain Analysis of Control Systems - 8P	
	3rd	5.1 Definition of Time, Stability, steady-state response, accuracy, transient accuracy, In-sensitivity and robustness.
	4th	5.2 System Time Response
8TH	**1st**	5.3 Analysis of Steady State Error
	2nd	5.4 Types of Input & Steady state Error(Step ,Ramp, Parabolic)
	3rd	5.5 Parameters of first order system & second-order systems

	4th	5.6 Derivation of time response Specification (Delay time, Rise time, Peak time,Setting time,Peak over shoot)
9TH	1st	5.6 Derivation of time response Specification (Delay time, Rise time, Peak time,Setting time,Peak over shoot)
	2nd	5.6 Derivation of time response Specification (Delay time, Rise time, Peak time,Setting time,Peak over shoot)
	6. FeedbackCharacteristics of Control Systems - 6P	
	3rd	6.1 Effect of parameter variation in Open loop System & Closed loop Systems
	4th	6.2 Introduction to Basic control Action& Basic modes of feedback control: proportional, integral and derivative
10TH	1st	6.3 Effect of feedback on overall gain, Stability
	2nd	6.3Effect of feedback on overall gain, Stability
	3rd	6.4 Realisation of Controllers(P, PI,PD,PID) with OPAMP
	4th	6.4 Realisation of Controllers(P, PI,PD,PID) with OPAMP
11TH	**7. Stability concept& Root locus Method - 8P**	
	1st	7.1 Effect of location of poles on stability
	2nd	7.2 RouthHurwitz stability criterion.
	3rd	7.3 RouthHurwitz stability criterion.
	4th	7.3 RouthHurwitz stability criterion.
12TH	1st	7.4 Steps for Root locus method
	2nd	7.5 Root locus method of design(Simple problem)
	3rd	7.5 Root locus method of design(Simple problem)
	4th	7.5 Root locus method of design(Simple problem)
13TH	**8. Frequency-response analysis&Bode Plot -7P**	
	1st	8.1 Frequencyresponse,Relationship between time & frequency response
	2nd	8.2 Methods of Frequency response
	3rd	8.3 Polar plots & steps for polar plot
	4th	8.4 Bodes plot & steps for Bode plots
14TH	1st	8.5 Stability in frequency domain, Gain Margin& Phase margin
	2nd	8.6 Nyquist plots. Nyquiststability criterion.
	3rd	8.7 Simple problems as above
	9. State variable Analysis - 5P	
	4th	9.1 Concepts of state, state variable, state model,
15TH	1st	9.1 Concepts of state, state variable, state model,
	2nd	9.2 state modelsfor linear continuous time functions(Simple)
	3rd	9.2 state modelsfor linear continuous time functions(Simple)
	4th	9.2 state modelsfor linear continuous time functions(Simple)

Faculty Name: Deepika Panda
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S.No	Topic	Contents To be covered:	Recourse	Class No in the week	Week
Unit-1: Network& Protocol (8P)					
1	1.1 Data Communication	• Introduction • Components of Communication • Data Representation	1.Lecture Note 2.CCNA Module 1	1	**1ST**
2	1.2 Networks	Network Criteria: • Performance • Reliability • Security	1.Lecture Note 2.CCNA Module 1	2	
3	1.2 Networks	Types of Networks: • LAN • MAN • WAN • PAN	1.Lecture Note 2.CCNA Module 1	3	
4	1.3 OSI layer model(Application, Presentation Session layer)	• Define: ○ Protocol ○ Standards • Explain the necessity of Layered Tasks at sender and receiver • Inro to OSI model • Application and Session layer working	1.Lecture Note 2.CCNA Module 1 3. Animation: https://www.youtube.com/watch?v=-6Uoku-M6oY	4	
5	1.3 OSI layer model(Transport, Network layer)	Functionality of: • Transport layer • Network layer	1.Lecture Note 2.CCNA Module 1	1	**2ND**
6	1.3 OSI layer model(Datalink, Physical layer)	Functionality of: • Datalink layer • Physical layer	1.Lecture Note 2.CCNA Module 1	2	
7	1.3 TCP/IP	• Intro to TCP/IP • Comparison between TCP/IP and OSI architecture	1.Lecture Note 2.CCNA Module 1	3	
8	1.3 Protocol & Architecture, Standards	• Protocol & Architecture, Standards • Recap of 1st chapter	1.Lecture Note 2.CCNA Module 1	4	
Unit-7: TCP/IP (8P)					
9	7.1 TCP/IP Protocol Suite	In detail explanation of different layers of TCP/IP architecture	1.Lecture Note	1	
10	7.2 Basic Protocol functions	Explain the protocols of Application layer: HTTP,HTTPS,DNS,Telnet,SSH,FTP etc	1.Lecture Note	2	
11	7.2 Basic Protocol	Expain the protocols of Transport layer:	1.Lecture Note 2.animation:	3	

	functions	• TCP • UDP • TCP vs UDP	https://www.youtube.com/watch?v=A3zId8jOfV4 3. CCNA Module 1		**3RD**
12	7.4 Internet Protocol operations	Expain the prototcols of Internet layer: • IPv4: Classification and exapin different classes of IPv4	1.Lecture Note 2. Nptel: https://www.youtube.com/watch?v=5vbPS-KnhvI 3. CCNA Module 1	4	
13	7.4 Internet Protocol operations	• Classess addressing • Subnet Mask	1.Lecture Note 3. CCNA Module 1	1	**4TH**
14	7.3 Internet Protocol operations	• IPv4 header	1.Lecture Note	2	
15	7.4 Internet Protocol	Explain the prototcols of Internet layer: • IPv6 representation • Ipv6 header and applications • IPv4 vs Ipv6	1.Lecture Note 2. CCNA Module 1	3	
16	7.3 Principles of Internetworking	• Extranet • Intranet • Internet • Revision of entire chapter	1.Lecture Note 2. video link: https://www.youtube.com/watch?v=YMP5-Zynuw4 2. CCNA Module 1	4	
UNIT - 2. DATA TRANSMISSION & MEDIA (8P)					
17	2.1 Data transmission Concepts and Terminology	• Modes of transmission: Simplex, Half Duplex, Full Duplex • Types of Connection: Point-to-Point, Multipoint	1.Lecture Note 2. animation: https://www.youtube.com/watch?v=LMRSS7ZYM50	1	**5TH**
18	2.1 Data transmission Concepts and Terminology	Breif explanation on: • Channel(Analog/digital) • Data transfer rate • Throughput • Bandwidth	1.Lecture Note	2	
19	2.2 Analog and Digital Data transmission	• Analog Signal • Digital Signal • Analog Transmission	1.Lecture Note	3	
20	2.2 Analog and Digital Data transmission	• Digital Transmission • Comparison between Analog and Digital Transmission	1.Lecture Note 2. Video: https://www.youtube.com/w	4	

			atch?v=33kbebX5fkk		
21	2.3 Transmission impairments, Channel capacity	Explain: • Attenualtion, • Distortion, • Types of noise(Thernal noise, internmodal noise, impulse noise) • crosstalk	1.Lecture Note 2.video: https://www.youtube.com/watch?v=Ey75NVQ6qYE 3. video: https://www.youtube.com/watch?v=FCk_pDCc-x4	1	**6TH**
22	2.3 Transmission impairments, Channel capacity	• Channel Capacity • Shannon channel capacity formula	1.Lecture Note	2	
23	2.4 Transmission media, Guided Transmission, Wireless Transmission	• Classify media • Explain the guided media (twisted pair and coaxial cable)	1.Lecture Note 2.video: https://www.youtube.com/watch?v=fgOkvIHKgXQ 3.CCNA MODULE 1	3	
24	2.4 Transmission media, Guided Transmission, Wireless Transmission	• Explain the guided media-optical fiber cable • Explain the unguided media	1.Lecture Note 2.CCNA Module 1	4	
Unit-3. Data Encoding (8P)					
25	3.1 Data encoding,	Define: • Encoding, • Data Encoding Types of Data Encoding	1.Lecture Note	1	**7TH**
26	3.2 Digital data digital signals	• Different techniques used for Digiatal data digital signal encoding • Unipolar encoding • Polar:NRZ encoding	1.Lecture Note	2	
27	3.2 Digital data digital signals	• RZ encoding • Manchester encoding • Biphase encoding	1.Lecture Note	3	
28	3.3 Digital data analog signals	• Digital Analog conversion • ASK	1.Lecture Note 2. video: https://www.youtube.com/watch?v=mHvV_Tv8HDQ	4	
29	3.3 Digital data analog signals	• FSK • PSK	1.Lecture Note 2. video: https://www.youtube.com/watch?v=mHvV_	1	**8TH**

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30	3.4 Analog data digital signals	Pulse code modulation and its block diagram	1.Lecture Note 2. video: https://www.youtube.com/watch?v=mHvV_Tv8HDQ	2	
31	3.5 Analog data analog signals	• Analog data anlog signal • AM	1.Lecture Note 2. video: https://www.youtube.com/watch?v=mHvV_Tv8HDQ	3	
32	3.5 Analog data analog signals	• FM • PM	1.Lecture Note 2. video: https://www.youtube.com/watch?v=mHvV_Tv8HDQ	4	
Unit-4. Data Communication & Data link control (8P)					
33	4.1 Asynchronous and Synchronous Transmission	• Asynchronous Transmission • Synchronous Transmission	1.Lecture Note	1	
34	4.2 Error Detection	• Parit check • Checksum • Cyclic redundancy check	1.Lecture Note	2	**9TH**
35	4.3 Line configuration	• Point to point configuration • Multipoint configuration	1.Lecture Note	3	
36	4.4 Flow Control	• Stop and wait protocol • Sliding widnow protocol	1.Lecture Note	4	
37	4.5 Error Control	• Single bit error vs burst error • Stop and wait arq • Go back n • Selective reject	1.Lecture Note Video: https://www.youtube.com/watch?v=kSgtZnffCog	1	**10TH**
38	4.6 Multiplexing	• Reasons for multiplexing • Typs of multiplexing • Advantages		2	
39	4.7 FDM synchronous TDM	• FDM • TDM(Synchronous)	1.Lecture Note 2.video: https://www.youtube.com/watch?v=f52bwNbuMDA 3.video: https://www.youtube.com/watch?v=aeJ55Iy	3	

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40	4.8 Statistical TDM	Statistical TDM	1.Lecture Note	4	
Unit-6: LAN Technology (10P)					
41	6.1. Topology	• Define topology • Explain different types of topology(Contd…)	1.Lecture Note 2. CCNA Module 1 3. video: https://www.youtube.com/watch?v=zbqrNg4C98U	1	**11TH**
42	6.1 Topology	Explain different types of topology	1.Lecture Note	2	
43	6.2 LAN protocol architecture	• Features of LAN • Logic link layer	1.Lecture Note	3	
44	6.3. Medium Access control	• Channel allocation and types • Pure Aloha • Slotted Aloha	1.Lecture Note 2. video: https://www.youtube.com/watch?v=j4-r0e7DjqY	4	
45	6.3. Medium Access control	• CSMA/CD • CSMA/CA	1.Lecture Note 2. Video: https://www.youtube.com/watch?v=KDHbP81SAmA	1	**12TH**
46	6.4 Bridges, Hub, Switch	• Repeater • Hub	1.Lecture Note 2. animation: https://www.youtube.com/watch?v=1z0ULvg_pW8	2	
47	6.4 Bridges, Hub, Switch	• Switch • Router • Gateway	1.Lecture Note 2. animation: https://www.youtube.com/watch?v=1z0ULvg_pW8	3	
48	6.5 Ethernet (CSMA/CD)	Explain the concept of Ethernet	1.Lecture Note 2. video: https://www.youtube.com/watch?v=i2qiNAVfQRw	4	
49	6.5 Fiber Channel	Explain the fiber channel	1.Lecture Note	1	**13TH**
50	6.6 Wireless LAN	Wireless LAN Technology	1.Lecture Note	2	

	Technology		2.video: https://www.youtube.com/watch?v=METB1o4UAT8		
Unit-5: Switching & Routing (10P)					
51	5.1 Circuit Switching networks	• Concept of Routing and switching • Circuit switching • Advantages and disadvantages	1.Lecture Note 2. Video: https://www.youtube.com/watch?v=-HlJ4psu5aU&t=77s	3	**13TH**
52	5.2 Packet Switching principles	• Packet switching • Advantages and disadvantages • Differences between circuit and packet switching	1.Lecture Note 2. https://www.youtube.com/watch?v=-HlJ4psu5aU&t=77s	4	
53	5.3 X.25	X.25	1.Lecture Note 2. nptel: https://www.youtube.com/watch?v=DU7IZMciHJE	1	**14TH**
54	5.4 Routing in Packet switching	• Centralized vs Distributed Routing • Static vs Dynamic Routing • Virtual Circuit Based Packet Switching • Datagram Circuit Based Packet Switching	1.Lecture Note	2	
55	5.5 Congestion	• Causes of Congestion • Congestion correction	1.Lecture Note 2.video: https://www.youtube.com/watch?v=txctUWFirt8	3	
56	5.6 Effects of congestion, congestion control	Congestion Control:Open loop Congestion control	1.Lecture Note 2. https://www.youtube.com/watch?v=txctUWFirt8	4	
57	5.6 Effects of congestion, congestion control	Congestion Control:Close loop Congestion control	1.Lecture Note 2. video: https://www.youtube.com/watch?v=ZYIdYIt	1	**15TH**

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58	5.7 Traffic Management	• Types of network traffic • Traffic management techniques	1.Lecture Note	2	
59	5.8 Congestion Control in Packet Switching Network.	Congestion Control in Packet Switching Network.	1.Lecture Note	3	
60	5.8 Congestion Control in Packet Switching Network.	Revision of chapter 5	1.Lecture Note	4	