B.Tech IV Sem (Electronics Engineering/ Electronics & Telecommunication Engineering)

Code	Category Code	Subject Name	Theory Slot				Practical Slot			Total Marks	Contact Hr/week			Total Credits
			End Sem Marks	Proficiency	Mid Sem Marks	Quiz/ Assignment Marks	End Sem Mark	Lab work & Sessional Mark	Skill based mini proj		L	T	P	
140416/ 200416	DC	Digital Communication	50	10	20	20	60	20	20	200	2	1	2	4

Digital Communication (140416/200416)

Course Objectives: The main objective of this course is to understand the basic concepts of digital modulations and digital transmission techniques.

Unit I Sampling: Sampling theorem for Low pass signal, Ideal sampling, Natural sampling and Flat top sampling, Time division Multiplexing, Generation and detection of PAM, PPM and PWM.

Unit II Digital Modulation Systems: Pulse Code Modulation, Quantization, Quantization noise, Companding, Eye pattern, Delta modulation, Adaptive delta modulation and DPCM.

Unit III Band Pass Data Transmission:ASK, Binary phase shift keying (BPSK), QPSK, DPSK, Coherent and Non coherent BFSK.

UNIT IV Information Theory Concept of information theory, Entropy and Information rate, Channel capacity, Shannon's theorem, Shannon Hartley theorem.

Unit V Coding Techniques: Coding Efficiency, Shannon Fano coding, Huffman coding.

Text Books:

1. Singh, R.P. & Sapre, S.D, "Communication Systems: Analog & Digital", Tata McGraw-Hill, 5th reprint, 2000.
2. John G. Proakis, "Digital Communication", McGraw Hill Inc, 5th Edition, 2008.

Reference Books:

1. Simon Haykin, "Communication Systems", John Wiley & Sons, 4th Edition, 2000.
2. Taub & Schilling, "Principle of Communication Systems", 2nd Edition, 2003.

Course Outcomes:

After successful completion of the course, students will be able to:

CO1: Explain the process of sampling and pulse modulation.
CO2: Analyze digital modulation systems
CO3: Describe the different band pass data transmission techniques.
CO4: Illustrate the concepts of information theory and source coding.
CO5: Apply error correcting codes in digital communication.

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140417/ 200417	DC	Linear Control Theory	50	10	20	20	-	-	-	100	3	-	-	3

Linear Control Theory (140417/200417)

Course Objectives: learning of control system theory and its implementation in practical systems using electronic devices.

UNIT I: Introduction to Control Systems: Basic control system terminology, Open loop and Closed loop system, Feedback control, Different modeling of physical systems, Linear approximation of physical systems. Transfer function of linear systems, Block diagram algebra and Signal flow graphs, Effects of negative feedback.

UNIT II: **Time Domain Analysis:** Test input signals, First order systems, Second order systems, Effects of addition of poles and zeros to open and closed loop transfer functions, Steady state error, Constant and error coefficients for type 0, 1, and 2 systems.

UNIT III: Stability Analysis: Concept of stability of linear systems, Relation between the closed loop poles and stability, Relative stability, Absolute stability, Routh Hurwitz criteria and its applications, Root locus plot.

UNIT IV: Frequency Domain Analysis: Performance specifications in frequency domain, Co-relation between frequency domain and time domain, Polar plots and Bode plots of transfer function, Nyquist stability criterion, Assessment of relative stability.

Unit V: Introduction to Controllers: Introduction to Proportional, Integral, and Derivative controller, PD controller, PI controller, PID controller, Design of various controllers and their limitations.

Text Books:

1. Control System Engineering- I. J. Nagrath & M. Gopal, New Age International.
2. Modern Control Engineering –K. Ogata, Prentice Hall.
3. Control System- A. Anand Kumar, PHI
4. Control System Engineering – B.S. Manke, Khanna publications.

Reference Books:

1. Automatic Control System— B. C. Kuo,Wiley.
2. Control System Engineering- Norman Nise, John Wiley & Sons.

Course Outcomes:

After successful completion of the course, students will be able to:

CO1. **Determine** the transfer function of linear control system.
CO2. **Evaluate** the time domain response of control system for different standard inputs.
CO3. **Compute** the steady state error for type 0,1,2 systems.
CO4. **Analyze** the stability of control system using time and frequency domain methods.
CO5. **Design** proportional, integral, and derivative controller, PD, PI, PID controllers.

B.Tech IV Sem (Electronics Engineering/ Electronics & Telecommunication Engineering)

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			End Sem Marks	Proficiency	Mid Sem Marks	Quiz/ Assignment Marks	End Sem Mark	Lab work & Sessional Mark	Skill based mini proj		L	T	P	
140418/ 200418	DC	Analog Integrated Circuits	50	10	20	20	60	20	20	200	2	1	2	4

Analog Integrated Circuits (140418/200418)

Course objective: Students will be able to learn the concepts of power, multistage and operational amplifiers. Further, they will learn to design multivibrators using IC 555 and active filter design using Opamp.

Unit I Power Amplifiers: Introduction, Difference between voltage and power amplifier, Terms used in power amplifier, Class A power amplifier, Transformer coupled class A power amplifier, Harmonic distortion in amplifier, Class A push-pull amplifier, Class B power amplifier, Class B push-pull and complementary-symmetry power amplifier, Class AB and Class C amplifiers.

Unit II : **Operational Amplifier**: Introduction of op-amp, Block diagram, characteristics and equivalent circuits of an op-amp, Power supply rejection ratio for op-amp(PSRR), common-mode rejection ratio (CMRR), Slew rate and its Effect, Input and output offset voltages. Open and Closed loop configuration of Op-amp.

Unit III Application of Operational Amplifier: Inverting and non-inverting amplifier configurations, Summing amplifier, Integrators and differentiators, Schmitt Trigger, Logarithmic and anti-logarithmic amplifier etc.

Unit IV: Active Filter Design: Characteristics of filters, Classification of filters, Magnitude and frequency response, 1st and 2nd order Low pass and High pass ,Band pass filters and Band reject filters.

Unit V Multivibrator Design using 555 IC: The 555 IC Circuit, 555 IC block diagram, Using the 555 IC as Astable , Monostable and Bistable Multivibrator Circuits and its applications.

Text Books:

1. Electronics Devices and Circuits: Boylested& Nashelsky,11thEdition**,** Pearson Education India
2. Op-Amp and Linear Integrated Circuit: R.A.Gayakwad, 4th Edition, Prentice Hall of India.

Reference Books:

1. Integrated Electronics: Millman&Halkias, 2nd Edition,McGraw Hill Education
2. Electronics Devices and Circuits: Shalivanan, 2nd Edition, Tata Mcgraw Hill Education.
3. Microelectronic Circuits- Theory and Application: Sedra& Smith,7th Edition**,** Oxford Press.

Course Outcomes

After the completion of this course students will be able to:

- **CO1.** Compare the efficiency of various power amplifiers.
- **CO2.** Analyze the parameters of Operational amplifiers.
- **CO3.** Design the applications using Operational amplifier IC.
- **CO4.** Implement the active filters based on given specifications.
- **CO5.** Design Multivibrator circuits using IC 555.

B.Tech IV Sem (Electronics Engineering/ Electronics & Telecommunication Engineering)

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100004	MC	Cyber Security	50	10	20	20	-	-	-	100	3	-	-	3

TOPIC-WISE MOOC LINKS FOR CYBER SECURITY (100004)

UNIT - 1:
Topic of the lecture: Overview of Cyber Security
Topic of the lecture: Introduction to Cyber Security, Cyber-crime
Topic of the lecture: Types of Cyber Attacks
Topic of the lecture: Cyber Vandalism (Hacking), Cyber Stalking, Internet Frauds and Software Piracy

UNIT - 2:
Topic of the lecture: Basics of Internet and Networking
Topic of the lecture: Network Topologies
Topic of the lecture: Wired and Wireless networks, E-commerce
Topic of the lecture: OSI Model:
Topic of the lecture: Internetworking Devices:
Topic of the lecture: Firewall:

UNIT - 3:
Topic of the lecture: Security Principles and Attacks
Topic of the lecture: Cryptography:
Topic of the lecture: Symmetric key Cryptography
Topic of the lecture: Symmetric key Ciphers
Topic of the lecture: Public key cryptography
Topic of the lecture: SSL

UNIT - 4:
Topic of the lecture: Hacker, Types of Hacker
Topic of the lecture: Malicious Softwares (Part 1)
Topic of the lecture: Malicious Softwares (Part 2)

UNIT - 5:
Topic of the lecture: Introduction of Intellectual Property and patent
Topic of the lecture: More About Patent
Topic of the lecture: All about Trademark
Topic of the lecture: Industrial Design
Topic of the lecture: Geographical Indication
Topic of the lecture: All about copyright
Topic of the lecture: IT act 2000
Topic of the lecture: Digital Crime Investigation