SARDAR PATEL UNIVERSITY
Programme & Subject: M.Sc (Electronics & Communication)
Semester: II
Syllabus with Effect from: June - 2022 - 23

Paper Code: PS02CELC51	**Total Credit: 4**
Title Of Paper: Analog & Digital Communication	

Unit	Description in Detail	Weightage (%)
I	Fourier series, Power Spectral Density, Convolution, Correlation between waveforms, Auto and Cross correlation, Sampling Theorem.	25%
II	Amplitude Modulation: Equation for AM, modulation index, spectrum of AM, DSB and SSB transmission with and without carriers, VSB transmission, DSB,C amplitude modulators, Envelope detectors, Balanced Modulator, SSB signal generation and Demodulation schemes. ASK, FSK, QAM, BPSK, QPSK, Transmitter and receiver block diagrams.	25%
III	Equations for FM, modulation Index, spectrum calculation for sinusoidal waveform and Bessel's function table, phase modulation, relationship between FM and PM, NBFM and WBFM, frequency modulators and demodulators (Armstrong method) Types of noise : Noise in AM and FM systems.	25%
IV	Various pulse modulation methods, Pulse code modulation PCM, Delta modulation DM. Comparison between PCM and DM, Companding method, Noise in digital systems.	25%

Basic Text & Reference Books:-

- Modern digital and analog communication systems: B.P.Lathi, Holt,Sounders (HRW Series) Publication. 1987.
- Electronic communications: Dennis Roddy and John Coolen, PHI 1995.
- Principles of communication. Systems: Taub and Schilling, McGraw Hill Publication, 1992.
- Communication systems: Haykin, John Wiley, 1994.

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Paper Code: PS02CELC52	**Total Credit: 4**
Title Of Paper: 16-Bit Microprocessor & Its Application	

Unit	Description in Detail	Weightage (%)
I	Introduction to 16 bit Microprocessor family, stored program computers, computer instruction and bus cycles, computer codes, 8086/8088 Architecture, Segmented memory, Machine language instructions, Internal execution and timing.	25%
II	Data transfer instructions, Arithmetic instructions, Logical, shift and rotate instructions, Branch instructions, Loop instructions, NOP, HLT and flag manipulation instructions, Assembler directives.	25%
III	8086 System Connections And Timings: 8086 Hardware overview, Basic signal flow on 8086 buses, Analyzing a minimum mode system, 8086 addressing and address decoding, 8086 timing parameters.	25%
IV	8086 interrupts and interrupt responses, 8086 Interrupt types, Hardware and software considerations for using interrupts.	25%

Basic Text & Reference Books:-

- Microprocessors and Interfacing, Programming and Hardware: Hall Douglas V, Tata McGraw Hill.
- Microcomputer Systems: The 8086/8088 Family, Architecture, Programming and Design: Gibson Glenn A. and Liu Yu Cheng, Prentice Hall India.
- MCS,86 User's Manual : Santa Clara, Intel Corporation.
- The 8086 Premier: An Introduction to It's Architecture, System Design and Programming: Morse, Stephen P, Hayden Book Company.

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Paper Code: PS02CELC53	**Total Credit: 4**
Title Of Paper: Digital Electronics	

Unit	Description in Detail	Weightage (%)
I	Digital computer and digital systems, Binary Number, Number base conversion Octal and Hexadecimal Number, complements, Binary Codes, Binary Storage and register, Binary Logic, Integrated Circuit.	25%
II	Basic Theorem and Properties of Boolean Algebra, Minterms And Maxterms, Logic Operations, Digital Logic Gates. Different types Map method, Product of sum Simplification, NAND or NOR implementation, Don't Care condition, Tabulation method.	25%
III	Introduction to Combinational Logic, Design Procedure, adder, subtractor, Code Conversion, Universal Gate, Binary Parallel Adder, Decimal Adder, Magnitude Comparator, Decoder, Multiplexer, ROM, Programmable Logic Array.	25%
IV	Introduction to Sequential Logic, Flip-Flops, Triggering of Flip-Flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, Flip-Flop Excitation Tables, Design Procedure, Design of Counters, Design with State Equations.	25%

Basic Text & Reference Books:-

- Digital Logic and Computer Design: M Morris Mano, Prentice-Hall of India, 1992.
- Digital Computer Fundamentals: Bartee Thomas, McGraw- Hill, 1995.
- Digital Integrated Electronics: Taub and Schilling, McGraw- Hill, 1985.
- Modern Digital Design: Richard Sandige, McGraw-Hill, 1990.

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Paper Code: PS02CELC54	**Total Credit: 4**
Title Of Paper: Practical - I	

	Description in Detail	Weightage (%)
1	Practical based on Microprocessor 8086.	
2	Practical based on Microprocessor 8086.	
3	Practical based on Microprocessor 8086.	
4	Practical based on Microprocessor 8086.	
5	Practical based on Microprocessor 8086.	
6	Practical based on Microprocessor 8086.	
7	Practical based on Microprocessor 8086.	
8	Practical based on Microprocessor 8086.	
9	Practical based on Microprocessor 8086.	
10	Practical based on Microprocessor 8086.	
11	Practical based on Microprocessor 8086.	
And other practicals based on syllabus.		

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Paper Code: PS02CELC55	**Total Credit: 4**
Title Of Paper: Practical - II	

	Description in Detail	Weightage (%)
1	Amplitude Shift Keying (ASK)	
2	Phase Shift Keying (PSK)	
3	Frequency Shift Keying (FSK)	
4	Sampling Theorem	
5	Pulae Code Modulation (PCM)	
6	Pulse Amplitude Modulation (PAM)	
7	Pulse Width Modulation (PWM)	
8	Line Coding Techniques NZ, NRZ & Unipolar NRZ	
9	Manchester Coding	
10	Amplitude Modulation	
11	Frequency Modulation	
12	Delta Modulation	
And other practicals based on syllabus.		

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Paper Code: PS02EELC51	**Total Credit: 4**
Title Of Paper: Computational Technique Using C	

Unit	Description in Detail	Weightage (%)
I	Introduction to Solution of Non Linear Equations, error, accuracy, properties of polynomial equations, transcendental equations, approximate value of roots, evaluations of polynomial, solutions of quadratic equations. Bisection method; Method of False position; Newton-Raphson method; Secant method.	25%
II	Newton-Gregory formula; Lagrange interpolation formula; Interpolation through central differences; Formulation of polynomials; Cubic spline interpolation; Interpolation in two or more dimensions. Periodic functions, trigonometric series, Fourier series, even and odd functions, half range expansions, Fourier integrals, Fourier cosine and sine transform, Fourier transforms.	25%
III	Classical integration formula for equally spaced abscissa; Trapezoidal formula a single interval; Solution of linear systems; Numerical derivatives.	25%
IV	Gauss-Jordan Elimination; Row v/s Column Elimination Strategies; LU decomposition; Matrix inversion; Determinant of a matrix; Complex system of equations; Singular value decomposition; Vander Monde matrices and Toeplitz matrices; Eigenvalue and eigenvectors; Applications in problem of Electrical Network Theory.	25%

Basic Text & Reference Books:-

- Introductory Methods of Numerical Analysis: Sastry S. S., Prentice-Hall India, Edition 1994.
- Advanced Engineering Mathematics: Erwin Kreyszing, John Wiley & Sons.
- Programming with C: Gottfried, Tata McGraw-Hill.

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Paper Code: PS02EELC52	**Total Credit: 4**
Title Of Paper: Computer Networks	

Unit	Description in Detail	Weightage (%)
I	Network, network classification, protocol & standards, topology, OSI reference model, TCP/IP model, digital data transmission, DTE-DCE Interface, MODEMS,56k modems, transmission media: guided media, unguided media, performance.	25%
II	Framing, error control, flow control, error detection & correction, stop & wait protocol, automatic repeat request (ARQ), sliding window protocol: 1 bit S W, go back n, selective repeat, channel allocation, multiple access protocol, ALOHA, carrier sense multiple access protocol, collision free protocol, IEEE standard 802 for LANs, Ethernet (802.3), token bus (802.4), token ring (802.5), logical link control.	25%
III	Services provided to transport layer, circuit switching & packet switching, routing algorithms, congestion prevention policies, leaky bucket & token bucket algorithm, internetworking devices: repeater, bridges, switches, gateways, connectionless internet, tunneling, fragmentation, firewall.	25%
IV	Transport services, elements of transport protocol: addressing, establishing & releasing a connection, flow control & buffering, multiplexing, crash recovery. Transmission control protocol, user datagram protocol.	25%

Basic Text & Reference Books:-

- Computer Networks: A. S. Tanenbaum, Prentice Hall India.
- Data & Computer Communication: William Stallings, Prentice Hall India.
- Data communication and networking: B. A. Forouzan, Tata McGraw Hill.