

SARDAR PATEL UNIVERSITY
Syllabus Structure B.Sc. Semester: IV
With Effect from: June – 2024
Bachelor of Science
B.Sc. Electronics and Communication Semester IV

Course Code	US04MAELC01	Title of the Course	Signals and Systems
Total Credits of the Course	04	Hours per Week	04

Course Objectives:	<p>1. In this course, students will be introduced to fundamental basic electronics with application.</p> <p>2. To understand the basics of semiconductor components like transistor and their applications.</p>
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Course Content		
Unit	Description	Weightage* (%)
1.	Objective and overview, signal and system types and classifications, LTI system: Causality, stability, step response, impulse response and convolution integral; Periodic signal analysis: Fourier series and properties;	25%
2.	Aperiodic signal analysis : Fourier Transform - its properties and sinusoidal steady state analysis of systems; Discrete-time Fourier transform; Fourier transform for periodic signals; Time and frequency characterization of signals and systems: magnitude-phase representation of Fourier transforms	25%
3.	Unilateral and Bilateral Laplace Transforms and properties: Analysis and characterization of LTI systems using Laplace transform; System function and block diagram representation, Bode plot; Discrete signals: Sampling, digitization and reconstruction of analog signals	25%
4	Fourier transform of discrete signals: DFT, z-transforms; Discrete systems, transfer functions and convolution; Analog filter design: Butterworth, Sallen Key, frequency transformation and scaling.	25%

Teaching-Learning Methodology	<p>Direct Teaching through Chalk-Walk and Talk</p> <p>ICT enabled teaching</p> <p>Question-Answer</p> <p>Class discussion led by teacher/students</p> <p>Case Studies</p> <p>Literature review</p> <p>Problem solving activities</p>
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	Debate Collaborative and Co-operative Learning Think Pair Share Jigsaw Inquiry Based Learning Panel Discussion Project Based Learning Flipped Classroom Blended Learning designs Concept Mapping
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	50%
2.	University Examination	50%

Suggested References:	
Sr.	References
1.	A. V. Oppenheim, A. S. Willsky and S. H. Nawab, "Signals and Systems," 2nd Ed., Pearson Prentice Hall, 2015.
2.	S. Haykin and B. V. Veen, "Signals and Systems," 2nd Ed., Wiley India, 2007.
3.	H. P. Hsu, "Signals and Systems – Schaum's Outline Series," McGraw Hill, 1995.

On-line resources to be used if available as reference material
On-line Resources:
https://www.electronics-tutorials.ws/ https://www.electronicshub.org/tutorials/ www.allaboutcircuits.com



SARDAR PATEL UNIVERSITY
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Course Code	US04MAELC02	Title of the Course	Digital Electronic Circuits
Total Credits of the Course	04	Hours per Week	04

Course Objectives:	<p>1. In this course, students will be introduced to fundamental basic electronics with application.</p> <p>2. To understand the basics of semiconductor components like transistor and their applications.</p>
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Course Content		
Unit	Description	Weightage* (%)
1.	Boolean Algebra and Logic Simplification BCD, Octal, Hexadecimal Number systems, Conversions from one to other type, De Morgan's Theorem, Code converters, Logic Gates. Reduction of logic function using Boolean algebra, SOP & POS forms, canonical forms of SOP and POS equation. Karnaugh map up to 4 variables.	25%
2.	Combinational Logic Design Code conversion, Half, Full Adders and subtractor circuits, Digital Comparator, Multiplexer, Demultiplexer, Encoder, Decoder, Study of ALU	25%
3.	Sequential Logic Design S-R, clocked S-R, J-K and Master-Slave J-K flip-flops, excitation table of flip-flop, flip flop Conversions, shift registers their types and applications, Counters, Design of ripple and synchronous counters	25%
4	Logic Families, Interfacing: TTL NAND gate, specifications, tri-state TTL, ECL, MOS, CMOS families and their interfacing. Introduction to ADC and DAC	25%

Teaching-Learning Methodology	<p>Direct Teaching through Chalk-Walk and Talk</p> <p>ICT enabled teaching</p> <p>Question-Answer</p> <p>Class discussion led by teacher/students</p> <p>Case Studies</p> <p>Literature review</p> <p>Problem solving activities</p>
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	50%
2.	University Examination	50%

Suggested References:	
Sr.	References
1.	S. Lee, "Digital Circuits and Logic Design," 1st Ed., Prentice Hall India, 2008
2.	D. P. Leach, A. P. Malvino and G. Saha, "Digital Principles and Applications," 8th Ed., McGraw Hill Education, 2014
3.	M. Morris Mano, "Digital Logic and Computer Design," 1st Ed., Prentice Hall, 1979, 15th Reprint 2013.

On-line resources to be used if available as reference material
On-line Resources:
https://www.electronics-tutorials.ws/ https://www.electronicshub.org/tutorials/ www.allaboutcircuits.com
https://www.allaboutcircuits.com/textbook/direct-current/chpt-10/what-is-network-analysis/



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With Effect from: June – 2024
Bachelor of Science
B.Sc. Electronics and Communication Semester IV
(Major subject- Minor subject - Interdisciplinary subject)

Course Code	US04MAELC03	Title of the Course	Practical
Total Credits of the Course	04	Hours per Week	08

Course Content		
Sr. No.	List of Experiments	Weightage* (%)
1.	Half Adder	
2.	Binary – Grey and Grey – Binary converter	
3	Full Adder	
4	<u>Flip flop</u>	
5	<u>Shift Counter</u>	
6	<u>Encoder</u>	
7	Decoder	
8	<u>Subtractor</u>	
9	Shift Register	
10	Comparator	



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Course Code	US04MIELC01	Title of the Course	Digital Electronic Circuits
Total Credits of the Course	02	Hours per Week	02

Course Objectives:	1. In this course, students will be introduced to fundamental basic electronics with application. 2. To understand the basics of semiconductor components like transistor and their applications.
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Course Content		
Unit	Description	Weightage* (%)
1.	Boolean Algebra and Logic Simplification BCD, Octal, Hexadecimal Number systems, Conversions from one to other type, De Morgan's Theorem, Code converters, Logic Gates. Reduction of logic function using Boolean algebra, SOP & POS forms, canonical forms of SOP and POS equation. Karnaugh map up to 4 variables.	25%
2.	Combinational Logic Design Code conversion, Half, Full Adders and subtractor circuits, Digital Comparator, Multiplexer, Demultiplexer, Encoder, Decoder, Study of ALU	25%

Teaching-Learning Methodology	Direct Teaching through Chalk-Walk and Talk ICT enabled teaching Question-Answer Class discussion led by teacher/students Case Studies Literature review Problem solving activities Debate Collaborative and Co-operative Learning Think Pair Share Jigsaw Inquiry Based Learning Panel Discussion Project Based Learning Flipped Classroom Blended Learning designs Concept Mapping
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Course Code	US04MIELC02	Title of the Course	Practical
Total Credits of the Course	02	Hours per Week	04

Course Content		
Sr. No.	List of Experiments	Weightage* (%)
1.	Half Adder	
2.	Binary – Grey and Grey – Binary converter	
3	Full Adder	
4	Subtractor	
5	Shift Register	
6	Comparator	

