(Bachelor of Science) (B.Sc. (Electronics & Communication)
(B.Sc.) (Electronics & Communication) Semester (III[rd])

Course Code	US03CELC51	Title of the Course	SIGNAL PROCESSING
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	The course helps the students to understand analog and digital signals and their communication process.

Course Content		
Unit	Description	Weightage* (%)
1.	**Signals and their Terminology:** Introduction of signals, Classification of Signals: Continuous and District time signals, Periodic and non-periodic signals, Deterministic and random signals, Symmetrical and Anti-symmetrical signals, Energy and power signals, Pulse characteristics and pulse terminology, Examples related to signals.	25%
2.	**Signal Generation:** Introduction, Sine wave generator, Hartley oscillator, Colpitts oscillator, Attenuator: Pi-attenuator, Piston type attenuator, Frequency synthesized signal generator, Function generator.	25%
3.	**Fourier Series:** Periodic function, Fourier series, Euler's formula, Formulae for determining Fourier co-efficient, Fourier series of discontinuous functions, change of interval, expansions of odd & even periodic function, half range Fourier series	25%
4.	**Laplace Transform:** Definition of Laplace transform, properties of Laplace transform, Laplace transform of derivatives and integral, multiplication by T^n	25%

Teaching-	Online and Board work

Learning Methodology	

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Gives the basic knowledge of Analog signal and Digital signal.
2.	Helps to understand the use of random –process models to represent non-deterministic signals and noise, and extract from these models the time - domain and frequency – domain structure of the signals and noise.
3.	Analyze the response of linear, time –invariant dynamic systems to random input signals or Noise, and understand how the resulting output reflects input system characteristics
4.	Use probabilistic characterization of random signal and noise measurement derided from these signals, to make optimal interface about related systems.

Suggested References:	
Sr. No.	References
1.	Higher Engineering Mathematics: B.S.Grewal.
2.	Advanced Engineering Mathematics: E. Kreyzig.
3.	Applied Engineering Mathematics (VOL 1): Stroud.

On-line resources to be used if available as reference material

On-line Resources

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(Bachelor of Science) (B.Sc. (Electronics & Communication)
(B.Sc.) (Electronics & Communication) Semester (III[rd])

Course Code	US03CELC53	Title of the Course	PRACTICAL
Total Credits of the Course	4	Hours per Week	8

Course Objectives:	The objective of the course is to make the students solve the different Mathematical numerical by applying the laws studied in the theory paper.

Course Content		
Unit	Description	Weightage* (%)
1.	Astable multivibrator using transistor	10%
2.	Colpitts oscillator	10%
3.	Hartley oscillator.	10%
4.	Phase shift oscillator.	10%
5.	Examples related to Euler's formulae.	10%
6.	Examples related to Fourier series for odd and even function,	10%
7.	Examples related to Half range sine series and cosine series,	10%
8.	Examples related to elementary function of Laplace Transform.	10%
9.	Example related to First shifting theorem of Laplace Transform.	10%
10.	Example related to Laplace of Integration.	10%

Teaching-Learning Methodology	Online and Board work

Evaluation Pattern

2

Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	It helps the students to understand different physical laws and also helps there to understand the communication system.

Suggested References:	
Sr. No.	References
1.	
2.	
3.	

On-line resources to be used if available as reference material
On-line Resources

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(Bachelor of Science) (B.Sc. (Electronics & Communication)
(B.Sc.) (Electronics & Communication) Semester (III[rd])

Course Code	US03CELC52	Title of the Course	ANALOG COMMUNICATION
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	The course is to make the students understand the communication system and various methods and components involved in the communication system.

Course Content		
Unit	Description	Weightage* (%)
1.	**Principles of Communication system:** General communication system, Basic constituents of the communication system, Information source, transmitter, channel, receiver, Need for using high carrier frequency, classification of RF spectrum, Band width requirement, Classification of Noise, Types of Noise, Signal to Noise Ratio, Noise figure. Expression and Wave forms of Amplitude modulated Voltage, Definition, Expression and Wave forms of Frequency modulated Voltage, Definition, Expression and Wave forms of Phase modulated Voltage, Side bands of AM and FM wave.	25%
2.	**Method of Amplitude modulation and Demodulation:** Classification of Amplitude modulation methods, Collector modulation, Square law diode modulation, Classification of Amplitude demodulation methods, Square law diode detector, Linear diode Detector, Choice of time constant RC in the Detector circuit.	25%
3.	**Method of Frequency modulation and Demodulation:** Classification of Frequency modulation methods, Reactance Tube frequency modulator, Reactance FET, Reactance FET Frequency modulator, Frequency modulation using Varactor diode, Classification of FM detectors, Slope detector, balanced slope detector, Ratio detector.	25%
4.	**Antennas and wave propagation:** Introduction, Antenna Action, Short electric doublet, electric doublet, Thin linear Antenna, Types of Radio wave Propagation,	25%

	Ground wave Propagation, Surface wave Propagation, Ionospheric Propagation, Space wave Propagation, Range of space wave propagation. Circuits, Balun, IF Traps, RF Amplifier, Frequency Mixer, Local Oscillator.	

Teaching-Learning Methodology	Online and Board work

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Helps to understand the concept of the analog communication system
2.	Make students understand various issue related to analog communication such as modulation, demodulation, transmitter and receiver and effect of noise in the transsimision of communication signals.

Suggested References:	
Sr. No.	References
1.	Radio Engineering .(Applied Electronics Vol -2) by G.K.Mitthal
2.	Electronics Communication by Danis Roddy and Jhon Coolen.
3.	Electronics Communication Systems by Kennedy.

On-line resources to be used if available as reference material
On-line Resources