DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING

VISION

To produce quality technocrats with human values and emphasis on the social needs and professional ethics in the domain of Electronics and Telecommunication Engineering.

MISSION

- To provide academic environment
- Exposure to modern communication processes
- Minimize the impact on environment
- To be Ethically and socially Responsible
- Inculcate self-learning capabilities and prepare for pursuing higher education

PROGRAM OUTCOMES

Engineering Graduates will be able to:

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one"s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

PEO1: Provide strong basics in the field of Telecommunication Engineering.

PEO2: Design, Develop and Analyze the solutions using suitable mathematical models and implement them using both software and hardware engineering practices.

PEO3: Instill Professional Ethics, Teamwork, Managerial skills and continuous learning capabilities to generate new knowledge.

PEO4: Develop skills in Telecommunication related technologies and knowledge-based systems to build solutions that cater the needs of industries and the societal problems or to become entrepreneur.

PROGRAM SPECIFIC OUTCOMES (PSOS)

PSO1: Apply Science, Engineering and Mathematics (through differential and integral calculus) to solve complex Electronics and Telecommunication Engineering problems.

PSO2: Demonstrate proficiency in the use of software and hardware required to practice Electronics and Telecommunication Engineering profession.

Scheme of teaching and Examination-2024 (160 credits, NEP) Outcome-Based Education (OBE) and Choice Based Credit System (CBCS) (Effective from the academic year 2024-25)

III Semester — Academic year 2024-25

Sl No.	Course Code		Course Title	Teaching dept.	L	T	P	Credits	CI E	SEE	Total Marks	Exam Hours
01	BS	22ES301	Integral Transform and Numerical Techniques	MA	3	-	-	3	50	50	100	3
02	PC	22ET302	Signals and Systems	ET	3	-	-	3	50	50	100	3
03	PC	22ET303	Analog Electronic Circuits	ET	3	-	2	4	50	50	100	3
04	PC	22ET304	Digital Electronic Circuits Design using Verilog	ET	3	-	2	4	50	50	100	3
05	PC	22ET305	Network Analysis	ET	3	-	-	3	50	50	100	3
06	PC	22ET306	Skill Lab-1	ET	-	-	4	2	50	50	100	3
07	HS	22SK307	Skill Development-1	T&P	2	-	-	1	50		50	-
08	HS	22CI308	Constitution of India	HS	2	-	-	1	50	-	50	-
Total						-	8	21	400	300	700	-

CIE-Continuous Internal Evaluation, SEE-Semester End Examination

Syllabus for the Academic Year – 2024-2025

Department: Electronics and Telecommunication Engineering			Semester:	III
Subject: Integral Transforms and Numerical Techniques (Common to EC, EE, ET, & BM)				
Subject Code:	22ES301		L – T – P - C:	3–0–0–3

Sl. No	Course Objectives
1	Introduce the concept of Numerical methods.
2	Introduce the concept of Fourier series and Fourier transforms to study behavior of periodic functions arising in Engineering field.
3	Describe the concept of Curve fitting and Regression lines.
4	Illustrate the applications of Laplace Transform and Inverse Laplace transform in control Theory.

Unit	Description	Hrs
I	**Numerical solution of Ordinary differential equations of first order and first degree**: Taylor"s series method, Modified Euler"s method, Runge-Kutta method of fourth order, Milne"s and Adams-Bashforth Predictor and Corrector methods (only formulae) - problems. **Numerical Integration:** Simpson"s 1 3^{rd},3 8^{th} rule, Weddle"s rule, (without proof) - problems.	**07**
II	**Laplace Transforms:** Basic definition, Laplace transforms of elementary functions, Properties of Laplace transforms, Laplace transforms of Periodic function, Unit step function (All results without proof)-Problems only. **Inverse Laplace transforms**: Basic definition, Evaluation of inverse Laplace transforms by standard methods. Convolution theorem - Problems only. Solutions of second order linear differential equations using Laplace transforms method.	**09**
III	**Statistical Methods:** Definition of Correlation-Karl Pearson's coefficient of correlation–problems. Regression lines (All results without proof)–Problems. **Curve fitting:** Curve fitting by the method of least squares-Fitting of the straight line, second degree parabola and exponential form of the curve □ =□b□ (All results without proof) – Problems.	**07**

IV	**Fourier Series:** Periodic function, Dirichlet‟s conditions. Fourier series of even and odd functions. Fourier series of periodic functions with period 2□ and 2l -problems only. Applications to Engineering problems: Fourier series for Periodic square wave, Full wave rectified form, Saw-tooth wave with graphical representation. Half range Fourier series- problems. Practical harmonic analysis - problems.	**09**
V	**Fourier Transforms:** Infinite Fourier transforms, Fourier Sine and Cosine transforms. Inverse Fourier transforms and simple problems. **Z-Transforms:** Basic definitions of Z-transform, Standard Z-transforms, Damping rule, Shifting rule, Initial value and Final value theorems(without proof)-problems. Inverse Z-transform-problems. Application to difference equations using Z-transforms.	**08**

Course Outcomes:

Course outcome	Descriptions
CO1	Understand the basic concepts of Numerical and Statistical methods, Laplace transforms, Inverse Laplace transforms, Fourier series, Fourier transforms and Z- transforms.
CO2	Apply the concepts of Laplace transform, Inverse Laplace transform, Fourier series to solve problems in Engineering fields.
CO3	Demonstrate Fourier series and Fourier transforms to study behavior of periodic functions problems arising in Engineering fields.
CO4	Analyze and apply Z- transforms, Numerical and Statistical methods in Engineering fields

Course Articulation Matrix

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2												
CO2	3	2	1											
CO3	3	3	2	1								1		
CO4	3	3	2	1								1		

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Higher Engineering Mathematics	B.S. Grewal	43rd Edition Khanna Publications, 2015. ISBN:9788174091956
2	Higher Engineering Mathematics	B.V. Ramana	1st Edition, Tata McGraw-Hill, 2006. ISBN:9780070634190

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Advanced Engineering Mathematics	E. Kreyszig	10th Edition JonWiley& Sons, 2015. ISBN:9780470913611
2	Higher Engineering Mathematics	H.K. Das Er. Rajnish Verma	1st Edition, Chand publishing, 2011. ISBN:9788121938907

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Syllabus for the Academic Year – 2024-2025

Department: Electronics and Telecommunication Engineering			Semester:	III
Subject: Signals and Systems				
Subject Code:	22ET302		L – T – P - C:	3 – 0 – 0 –3

Sl. No	Course Objectives
1	Acquire the knowledge about basic signal and system modeling concept and definitions.
2	Learn about representations of Linear Time Invariant system using Differential and Difference equations.
3	Apply the knowledge about the application and use of mathematical transforms to solve electrical engineering problems.
4	Understand the different transform techniques to solve the continuous and discrete Linear Time Invariant Systems.

Unit	Description	Hrs
I	**Introduction to Signals:** Definition of signal and system, Classification of signals, Basic Operations on signals, Elementary signals. **(Section : 1.1, 1.2, 1.4, 1.5, &1.6)**	7
II	**Introduction to Systems:** Definitions of a system, properties of systems, systems viewed as Interconnections of operations, Differential and difference equation representations and block diagram representations of LTI systems. **(Section : 1.7, 1.8, 2.4 & 2.5)**	8
III	**Representation of LTI Systems:** Introduction to impulse response representation, Convolution sum, Convolution Integral. **Fourier representations of Aperiodic Signals:** Introduction, Fourier representation of Continuous time signals (FT), Fourier representation of Discrete time signals (DTFT), Properties and Significance of FT and DTFT.**(Section 2.1, 2.2, 3.1, 3.4, 3.5)**	8
IV	**Sampling:** Sampling of Continuous time signals and reconstruction of Continuous time signals from samples. **Applications of Fourier Transform Representations**: Introduction, Frequency Response of LTI systems, Fourier Transform Representation for discrete time signals, frequency domain analysis of simple circuit. **(Section 4.1 to 4.4)**	8
V	**Z-Transform and its applications:** Introduction, Z-transform, properties of ROC, Properties of Z- transforms, Inverse of Z-transforms. Transform function, Unilateral Z-transform and its application to solve difference equations. **(Section7.1to7.6, 7.9 to7.10)**	8

Course Outcomes:

Course outcome	Descriptions
CO1	Define, understand and explain the concepts of Signals, Systems and properties of Fourier and Z-Transform.
CO2	Analyze different signals in time and frequency domain.
CO3	Apply the properties of Systems and Transform suitably.
CO4	Evaluate the response of the system in time and frequency domain.

Course Articulation Matrix

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1			1							2		
CO2	3	2		2	1					1				
CO3				2	2							1		
CO4	3	1		1	2							1		

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Signals and Systems	Simon Haykin and Barry Van Veen	2nd Edition, 2007

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Signals and Systems	Alan V Oppenheim, Alan S, Willsky and A Hamid Nawab	2002
2	Fundamentals of Signals & Systems	Michael Roberts	Vol-6 and 2010
3	Linear Systems and Signals	B. P. Lathi	Vol-2 and 2005

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Syllabus for the Academic Year – 2024-2025

Department: Electronics and Telecommunication Engineering			Semester:	III
Subject: Analog Electronic Circuits				
Subject Code:	22ET303		L – T – P - C:	3 – 0 – 2 – 4

Sl. No	Course Objectives
1	Understand the basics of semiconductor physics and electronic devices.
2	Study the mathematical models of BJTs, MOSFETs.
3	Learn the design concepts and demonstrate the diode circuits and Amplifiers.
4	Communicate and discuss effectively the applications of analog electronic circuits.

unit	Description	Hrs
I	**Design of Diode Applications:** Introduction, applications of diode, Full wave rectifier with C Filter, Clippers and Clampers. Problems and Solutions. **MOS Field-Effect Transistor (MOSFETs):** Introduction, Device Structure & Physical Operation, Derivation of iD –VDS Relationship, Symbol, iD –VDS characteristics, Operation as a switch, Operation as a Linear Amplifier. Problems and Solutions. (**Text1: 2.5.2,2.6.1, 2.6.2, 4.1.1 to 4.1.3, 4.1.6, 4.2.1 to 4.4.4)**	8
II	**MOS Field-Effect Transistor (MOSFETs) amplifier:** Small-Signal Operation and Models and MOSFET Amplifiers: MOSFETs- Small Signal Analysis, Trans-conductance gm, The T-equivalent Circuit model. Common Source amplifier, Common Source amplifier with Source Resistance, Common Drain Amplifier. Problems and Solutions Frequency response of CS amplifier. **MOS Differential Pair:** Operation with a Common-Mode Input Voltage and Differential Input voltage. Small-Signal Operation of the MOS **Differential Pair:** Differential Gain and Common Mode Rejection Ratio.(CMRR). **(Text1:4.6.4 to 4.6.6, 4.7.3,4.7.4,4.7.6,8.1.1,8.1.2,8.2.1,8.2.2)**	8
III	**Feedback Amplifier and oscillators:** Introduction, Feedback Amplifiers: General feedback structure, Properties of negative feedback. Basic four feedback topologies. Concept of Positive feedback, LC Oscillators, and Crystal Oscillator (Qualitative). **(Text1:7.1.1, 7.2.1 to 7.2.4, 7.3.1 to 7.3.4, 7.3.8)** **Operational Amplifier applications:** Comparator, zero crossing detectors, Inverting Schmitt trigger, Non inverting Schmitt trigger circuit. ,small signal rectifiers (Precision half wave rectifiers, precision full wave rectifiers)	9

IV	**Oscillators & Filters:** RC-phase shift oscillator, Wien bridge oscillator, Active filters First and Second order Low Pass Filters, High Pass Filters, Band Pass Filters. Problems and Solutions. **(Text 2: 8.2 to 8.10, 8.12, 8.13,9.1 to 9.4, 9.12.2)**	7
V	**Waveform generators and power amplifier:** Classification of power amplifiers, Transformer coupled Class A amplifier & Class B Push- pull amplifier, Class C Amplifier. Problems Basic 555 timers: Timer used as A stable Multi vibrator circuits and derivation and Monostable Multi vibrator and derivation. **(Text1:12.1, 12.2.5,12.2.6, Text -2:, 10.4, 10.4.1, 10.4.3, 10.4.4)**	7

LAB CONTENT

Sl. No	Experiment Description
1	Diode applications i) Series clipper Circuits ii) shunt clipper Circuits iii) Two ended clipper Circuits iv) positive Clamper Circuits v) Negative clamper Circuits
2	Voltage regulator.
3	Op-Amp applications: i) Schmitt Trigger. ii) Half wave and full wave Precision Rectifiers
4	Astable and Monostable using 555 Timer.
5	RF amplifiers: a) Hartley oscillator b) Colpitts oscillator c) RC phase shift oscillator
6	DAC Circuits.
7	ADC Circuits.

Course Outcomes:

Course outcome	Descriptions
CO1	Outline the principles associated in designing rectifiers, amplifiers, oscillators (L2)
CO2	Analyze the discrete analog circuits based on BJT, MOSFET and OP-Amp (L3)
CO3	Evaluate the performance parameters of discrete analog circuits based on standard specifications (L4)
CO4	Develop discrete analog circuits based on BJT, MOSFET and OP- Amp (L3)

Course Articulation Matrix

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	1	2	2						2			
CO2	2	2	2	3	2									
CO3		1	3	1	2				1					
CO4	3			1	2									

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Microelectronic Circuits, Theory and Applications	Adels sedra kenneth c. smith	5th Edition,
2	Op-Amp and linear integrated circuits.	Ramakanth A Gayakawad	3rd Edition,1998

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Fundamentals of Microelectronics	Behz d razavi	2nd Edition 2006

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Syllabus for the Academic Year – 2024-2025

Department: Electronics and Telecommunication Engg			Semester:	III
Subject: Digital Electronic Circuits Design using Verilog				
Subject Code:	22ET304		L – T – P - C:	3 – 0 – 2 – 4

Sl. No	Course Objectives
1	Understand the basic concepts of the algebraic simplification tools and Hardware description language using Verilog used to design the digital systems.
2	Analyze and implement logical operations using combinational and sequential circuits and build Verilog models for digital circuit.
3	Learn concepts of sequential circuits in terms of state machines
4	Acquire knowledge of the characteristics, classification of Memory devices and Programmable logic devices (PAL and PLA).

Unit	Description	Hrs
I	**Introduction to Digital Systems:** Canonical formulas, Gates and combinational networks, Incomplete Boolean functions and don"t care conditions. Compliments of canonical formulas, Karnaugh Maps, Using K- Maps (one, two, three and four variable k-Map) to obtain Minimal Expressions for complete and incomplete Boolean Functions. **Contd..,** **(Text 1- chapter 3-3.5,3.6.7,3.7,3.8 chapter 4-4.4 to 4.6)** **Introduction to HDL:** Typical design flow, verilog data types, Modules and ports, Gate types, Gate delays, Verilog operators. Different types of modeling (Data flow, Behavioral & Structural in brief) **(Text 2: 1.3, 3.2, 4.1, 4.2, 5.1,5.2, 6.4)**	**9**
II	**Combinational Circuits:** Binary adder and subtractor -Parallel adder and subtractor, Carry look ahead adder, Decimal adder, Comparator, Decoder, Encoder, Multiplexer and De-multiplexer. (Text 1-.5.1 to 5.6) HDL Concepts: Verilog Models (Structural & Data flow model) for Combinational Circuits. **(Text 2:5.1, 5.1.3, 5.1.4, 6.1, 6.5)**	**8**
III	**Sequential Circuits:** The basic bistable element, latches, Clocked S-R flip flop, clocked JK flip flop, Master-Slave J-K flip flop, D and T Flip flop, characteristic equations, shift registers, Counters, Asynchronous and synchronous counter, Design of synchronous counter. **(Text 1- 6.1,6.2,6.3,6.4,6.6,6.7,6.8,6.9)**	**8**

	HDL Concepts: Verilog statements (if-else, case loops, always). Verilog Models for Sequential Circuits (Behavioral). **(Text 2: 7.1, 7.2, 7.4, 7.5, 7.6,7.9)**	
IV	**Synchronous Sequential Design**: Introduction, Mealy and Moore Model analysis, Analysis of Clocked Synchronous Sequential Network: Excitation and Output Expressions, Transition Equations, Transition Tables, Excitation Tables, State Tables, State Diagrams. **(Text 1- chapter 7-7.1,7.2,7.3)** HDL Concepts: Verilog Models for Synchronous sequential circuits- serial binary adder. **(Text 2: 14.7).**	**8**
V	**Programmable logic Devices:** Memory-ROM, PROM and EPROM, Programmable logic devices (PLD's): PLD Notation, PLA and PAL.PLD realization of Combinational logic. Implementation of Real Time Clock. **(Text1: chapter 5-5.7 to 5.10).**	**6**

LAB CONTENT

Sl. No	Experiment Description
1	Realization of parallel Adders/Subtractors using 7483 IC.
2	Realization of adders and subtractors using MUX using 74153 IC.
3	SR- Flip-Flop, Master and Slave JK flip-flop, T- Flip-Flop, D- Flip-Flop
4	Realization of 3-bit counters as a sequential circuit and design of MOD N counters using ICs 7476.
5	Study of Shifting operations: Shift Left, Shift Right, SIPO, SISO, PISO, PIPO using 7495S IC.
6	Design and Testing Ring Counter and Johnson Counter using7495S IC.
7	Write Verilog code for full adder using (i) Dataflow description (ii) Gate-level description.
8	Realization of code converters: BCD to Excess -3 and Vice versa, Binary to Gray code and vice versa
9	Realization of One, Two-bit comparator and magnitude comparator.
10	Design and Simulate the up/down counters.

Course Outcomes:

Course outcome	Descriptions
CO1	Acquire the knowledge of digital circuits - the algebraic simplification tools, combinational circuits, sequential circuits and Programmable Logic Devices.
CO2	Analyze the digital circuits -the combinational circuits and sequential circuits
CO3	Design digital systems - the combinational circuits, sequential circuits, Finite State Machine and Programmable logical devices
CO4	Realize digital systems - the algebraic simplification tools, combinational circuits and sequential circuits using Verilog

Course Articulation Matrix

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2									2				
CO2	2									2				
CO3	2								2	2		2		2
CO4		3							2	2		2		2

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Digital Principles and Design, McGraw-Hill	Donald D. Givone	I edition,2008
2	Verilog HDL	Samir Palnitkar	Pearson Education, II Edition, 2003

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Digital Logic Applications and Design	John M Yarbrough	Thomson learning,2006
2	Digital Systems Design using Verilog	Charles H. Roth. Jr	Thomson Learning , Inc, I edition,2015

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Syllabus for the Academic Year – 2024-2025

Department: Electronics and Telecommunication Engg.			Semester:	III
Subject: Network Analysis				
Subject Code:	22ET305		L – T – P - C:	3 – 0 – 0 –3

Sl. No	Course Objectives
1	Study the Basic Laws of electric circuits and Network Theorems.
2	Learn the network reduction techniques and Laplace transforms.
3	Understand the concepts of Resonance and Network Topology applied to circuits.
4	Study the two port network parameters.

Unit	Description	Hrs
I	**Fundamental Concepts of Networks**: Introduction to Voltage and current sources, Kirchhoff"s Laws, source Transformation and shifting, Loop Variable Analysis, Node Variable Analysis, Network reduction using star to delta conversion. **Text1: 3.1 to 3.6.**	**9**
II	**Network Theorems:** Introduction, Superposition theorem, reciprocity theorem, Thevenin"s theorem, Norton's theorem, Millman"s Theorem, Maximum power transfer theorem. **Text2: 7.1 to 7.7**	**8**
III	**Network Topology and Resonance in Circuits**: Introduction, Graph of a network, Concept of tree and links, Incidence matrix, tie-set and cut set schedules, Duality, **Series resonance-** Variation of Current and Voltage with Frequency, Selectivity and Bandwidth-factor, Circuit magnification factor, **Parallel Resonance**-Selectivity and Bandwidth, Maximum Impedance Conditions with C, L and f variable, Current in Anti-Resonant Circuit, The General Case-Resistance present in both branches. **Text2: 3.1 to 3.6,3.10,8.1 to 8.3**	**8**
IV	**Initial Conditions and Laplace Transformation:** Introduction to initial conditions in elements, Transients, Initial value and final value theorem, Wave form synthesis of periodic & non periodic Signals. **Text1: 5.2,7.3,7.4**	**7**
V	**Two Port Network:** Introduction to single & two port Networks, Relationship between Two-port variables, open circuit impedance parameters, short circuit admittance parameters, Hybrid parameters and Transmission parameters, Relationships between parameter sets. **Text1:11.0 to 11.6**	**7**

Course Outcomes:

Course outcome	Descriptions
CO1	Apply network reduction for Solving the currents and voltages using basic laws (L2)
CO2	Identify the resonance and two port network parameters.(L2)
CO3	Synthesize the Periodic and non-Periodic waveforms using Laplace transform.(L3)
CO4	Apply the initial conditions and Network theorems for the given network.(L3)

Course Articulation Matrix

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1											
CO2			2	2	1	1								
CO3				2	3	1								
CO4				2	1	1								

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Network Analysis	M. E. Van Valkenburg	PHI, Third edition, 2007, 978-81-203-0156-6
2	Networks and systems	Roy Choudhury	New Age International Publishers, 2nd edition, 2006, 81-224- 0002-7

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Engineering Circuit Analysis	Hayt, Kemmerl y and Durbin	TMH, 6th Edition, 2002,13- 978-007-1122276
2	Network Analysis and Synthesis	Franklin F. Kuo	Wiley, Second edition (2006), 10: 97881265100 16
3	Electrical Networks	Ravish R singh	McGraw Hill, Tenth reprint 2013, 978-0-07-026096-2
4	Network Theory Analysis and Synthesis	Smarajit Ghosh	PHI Learning Pvt. Ltd, Sixth printing, June 2010, 978-81-203-2638-5

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Syllabus for the Academic Year – 2024-2025

Department: Electronics and Telecommunication Engg.	Semester:	III

Subject: Skill Lab-1				
Subject Code:	22ET306		L –T –P - C:	0 –0 –4 –2

Sl. No	Course Objectives
1	Describe the fundamental commands of MATLAB.
2	Write the basic MATLAB programs.
3	Create and work with functions.
4	Design a GUI.

LAB CONTENT

Sl. No	Experiment Description
1	Introduction to MATLAB.
2	Working with Matrices
3	Working with MATLAB Expressions
4	Working with Relational and Logical Operations
5	Working with Plotting Functions
6	Working with Complex and Statistical Functions
7	Working with input and output variables
8	Working with flow control
9	Creation of a GUI
10	Simple Projects

Course Outcomes:

Course outcome	Descriptions
CO1	Understand the MATLAB programming syntax.
CO2	Analyse the given basic MATLAB program.
CO3	Apply the syntax of MATLAB programming to perform a given logic.
CO4	Design and implement a GUI for a basic application using MATLAB.

Course Articulation Matrix

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	2		1	2				1	2		2		
CO2	1	2		1	1					1		1		
CO3	1	1										1		
CO4	1				1					1		1		

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Syllabus for the Academic Year – 2024-2025

Department: Electronics and Telecommunication Engineering			Semester:	III
Subject: SKILL DEVELOPMENT-I (HUMANITY SCIENCE Course)				
Subject Code:	22SK307		L – T – P - C:	2-0-0-1

Sl. No	Course Objectives
1	Improve Communication Skills: Enhance students' ability to express ideas clearly, listen actively and adapt communication style to different contexts and audiences.
2	Foster Effective Teamwork: Develop students' teamwork skills, including cooperation, active participation, conflict resolution, and leveraging diverse strengths for collaborative success.
3	Enhance Leadership Abilities: Cultivate leadership qualities by helping students develop self-awareness, problem-solving skills, and decision-making abilities
4	Promote Professional Etiquette: Instill a sense of professionalism in students, emphasizing appropriate workplace behavior, business etiquette, and ethical conduct.

Unit	Description	Hrs
I	**Communication Skills**: Basics, Method, Means, Process and Purpose, Basics of Business Communication, Written & Oral Communication, Listening .Communication with Confidence & Clarity-Interaction with people, the need the uses and the methods, Getting phonetically correct, using politically correct language, Debate & Extempore.	6 hrs
II	**Assertive Communication-**Concept of Assertive communication, Importance and applicability of Assertive communication, Assertive Words, being assertive. **Presentation Skills-**Discussing the basic concepts of presentation skills, Articulation Skills, IQ & GK, How to make effective presentations, body language & Dress code in presentation, media of presentation	5 hrs
III	**Team Work**: Team Work and its important elements Clarifying the advantages and challenges of team work Understanding bargains in team building Defining behavior to sync with team work Stages of Team Building Features of successful teams. **Body Language & Proxemics**: Rapport Building - Gestures, postures, facial expression and body movements in different situations, Importance of Proxemics, Right personal space to maintain with different people.	5 hrs

IV	**Group discussion, Motivation and Stress Management** a. Theory & Evaluation: Understanding why and how the group discussion is conducted. b. Techniques of group discussion c. Discussion on FAQs of group discussion d. Body language during group discussion Self-motivation, group motivation, leadership abilities, Stress clauses and stress busters to handle stress and de-stress; Understanding stress - Concept of sound body and mind, Dealing with anxiety, tension, and Relaxation techniques. Individual Counseling & Guidance, Career Orientation. Balancing Personal & Professional Life	6 hrs
V	**Interview Skills, Professional Practice** a. Personal and Group Interviews b. Mock Interviews - Questions asked & how to handle them c. Body language in interview d. Etiquette, Dress code in interview e. Behavioral and technical interviews f. Practice on stress interviews, technical interviews, General HR interviews **Professional Practice**: Professional Dress Code, Time Sense, Respecting	6 hrs

Course Outcomes:

COs	Descriptions
CO1	Improved Communication Skills: Students will demonstrate enhanced verbal and written communication abilities, effectively expressing ideas, actively listening, and adapting their communication style to different situations.
CO2	Effective Teamwork and Collaboration: Students will exhibit improved teamwork skills, actively contributing to group projects, resolving conflicts constructively, and leveraging the strengths of team members to achieve shared goals.
CO3	Professional Etiquette and Conduct: Students will display professional behavior, adhering to workplace etiquette, demonstrating appropriate appearance, punctuality, and practicing ethical conduct in professional settings.
CO4	Strengthened Aptitude Skills: Students will demonstrate improved aptitude skills, including logical reasoning, analytical thinking, and problem-solving abilities, enabling them to excel in competitive exams, interviews, and real-life problem-solving scenarios

Course Articulation Matrix

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1					2		3	3	3				
CO2	1					2		3	3	3				
CO3	1					2		3	3	3				
CO4	1					2		3	3	3				

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	--	--	--
2	--	--	--

Reference Books:

Sl No	Reference book title	Author	Volume and Year of Edition
1	Technical Communication Principles and Practices	Meenakshi Raman and Sangeeta	Oxford Publishers, 2004
2	Tools for Talking When Stakes are High,	Kerry Patterson, Joseph Grenny,	McGraw-Hill Publication, ISBN: 9780071772204

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Syllabus for the Academic Year – 2024-2025

Department: Electronics and Telecommunication Engineering			Semester:	III
Subject: CONSTITUTION OF INDIA (HUMANITY SCIENCE Course)				
Subject Code:	22CI308		L – T – P - C:	2-0-0-1

Sl. No	Course Objectives
1	To be familiar with salient features and preamble of the constitution of India. Including fundamental rights of the citizen of India and types of Fundamental rights.
2	To understand the relevance of directive principles under part-IV and the responsibilities of the individuals towards society.
3	To understand the powers and functions of the Legislature, Executive, and judicial bodies.
4	To provide the information of FDs, Electoral Process, emergencies and amending procedures.

Unit	Description	Hrs
I	Introduction, Meaning and definitions. Salient features, Sources, Constituent Assembly, Drafting Committee. Preamble to the constitution of India.	6 hrs
II	Fundamental rights under part III – details of exercise of rights, Scopes & Limitations and, important cases	6 hrs
III	Relevance of directive principles of state policy under part-IV Fundamental duties and their significance-part-IV A	4 hrs
IV	Union Executive- President, Prime minister, Parliament and Supreme Court of India. State Executive – Governors, Chief Ministers, State legislature and High Courts.	6 hrs
V	Constitutional Special Provisions for Scheduled Castes and Tribes, Women, Children and backward classes. Emergency provisions under Part XVIII. Electoral process, Amendment procedure, 42nd, 44th, 74th, 76th, and 91stConstitutional amendments.	6 hrs

Course Outcomes:

COs	Descriptions
CO1	Have general knowledge and legal literacy and thereby to take up competitive examinations
CO2	Understand the freedom, rights and restrictions including directives, through fundamental duties
CO3	Understand the importance of the three main organs of the constitution, Viz-the legislature, the executive and the judiciary.
CO4	Understand the power and functions of political institutions established throughout the country

Course Articulation Matrix:

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1						2	1	3	3	2				
CO2						2	2	3	3	2				
CO3						2	3	3	2	2				
CO4						2	2	3	3	2				

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Introduction to the Constitution of India" (student edition)	DurgaDas Basu,	EEE, 19th/20th Edn.,2001
2	An Introduction to Constitution of India	MV Pylee.	Volume-1 Vikas Publishing, 2002

Reference Books:

Sl No	Reference book title	Author	Volume and Year of Edition
1	An Introduction to Constitution of India	Brij kishore Sharma	Prentice-Hall of India, Volume-12002
2	Constitution of India	V. Rajaram	Second Edition New Age

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4TH SEM

Scheme of teaching and Examination-2024 (160 credits, NEP) Outcome-Based Education (OBE) and Choice Based Credit System (CBCS) (Effective from the academic year 2024-25)

IV Semester — Academic year 2024-25

Sl No.	Course Code		Course Title	Teaching dept.	L	T	P	Credits	CIE	SEE	Total Marks	Exam Hours
01	BS	22ES401	Probability and Advanced Linear Algebra	MA	3	-	-	3	50	50	100	3
02	PC	22ET402	Sensors and Applications	ET	3	-	-	3	50	50	100	3
03	PC	22ET403	Analog and Digital Communication	ET	3	-	2	4	50	50	100	3
04	PC	22ET404	Microcontroller and Embedded Systems	ET	3	-	2	4	50	50	100	3
05	PC	22ET405	Python Programming	ET	3	-	-	3	50	50	100	3
06	PC	22ET406	Skill Lab-2	ET	-	-	4	2	50	50	100	3
07	HS	22HV407	Universal Human Values	XX	2	-	-	1	50		50	-
08	HS	22EN408	Environmental Studies	HS	2	-	-	1	50	-	50	-
Total						-	8	21	400	300	700	-

CIE-Continuous Internal Evaluation, SEE-Semester End Examination

Syllabus for the Academic year 2024-25

Department: Electronics and Telecommunication Engineering			Semester:	IV
Subject: Probability and Advanced Linear Algebra (Common to BM, EC, EE and ET)				
Subject Code:	22ES401		L – T – P - C:	3–0–0–3

Sl. No	Course Objectives
1	Introduce the concept of vector space, linear transformations, probability and joint probability distributions and complex analysis.
2	Apply discrete and continuous probability distributions for single and two variables in analyzing the probability models arising in engineering field.
3	Study the concept of joint probability distribution and Markov chain.
4	Apply the vector space and linear transformation problems in engineering fields.

Unit	Description	Hrs
I	**Vector spaces:** Solution of system of equations by LU decomposition method. Vector space, Subspaces, Linear Combinations, Linear Spans, row space and column space of a Matrix, Linear Dependence and Independence (all statements only). **Basis and Dimensions**: Basis and Dimensions of Vector space and problems.	**08**
II	**Linear transformation:** Introduction, Linear Mappings, Kernel and Image of a linear transformations, Matrix representation of linear transformations, Range space, Null space, Nullity, Rank-Nullity Theorem, Singular and Non-singular linear transformations (all statements only), Problems.	**07**
III	**Probability Distributions**: Review of basic probability theory. Random variables (Discrete and Continuous), Probability of mass/density functions and problems. Binomial distribution, Poisson's distribution and Normal distribution (without derivations) and problems.	**09**
IV	**Joint probability distribution:** Joint probability distribution for discrete random variables, Marginal distributions, Expectation, covariance, problems. **Stochastic Process:** Probability Vector, Stochastic Matrix, Regular Stochastic Matrix, definition of Markov chain, Transition Probabilities and Transition probability Matrix, Higher Transition Probabilities, stationary distribution of regular Markov chains, problems.	**08**
V	**Complex Analysis**: Review of function of a complex variables, limits, continuity and differentiability. Analytic functions, Cauchy-Riemann equations in Cartesian and polar forms (without proof). Properties and construction of analytic functions by Milne-Thompson Method. Bilinear Transformations, problems.	**08**

Course Outcomes:

Course outcome	Descriptions
CO1	Understand the concept of vector space, Basis and Dimensions, linear Transformations, Complex analysis and Probability distributions.
CO2	Formulate and solve mathematical problems on probability distribution, Vector spaces, LU-decomposition method and linear transformations.
CO3	Make use of linear transformations, stochastic process, Linear Transformations and complex analysis to solve the Engineering problems.
CO4	Apply and analyze the concept of probability distribution, Joint probability Distribution and stochastic models in Engineering fields.

Course Articulation Matrix:

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3												
CO2	3	3	2											
CO3	3	3	2											
CO4	3	3	2	1								1		

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Higher Engineering Mathematics	B.S.Grewal	43rd Edition Khanna Publications, 2015. ISBN:9788174091956
2	Linear Algebra and its Applications	David C. Lay	3rd Edition, 2002, Pearson Education India, ISBN-13: 978-81-7758-333-5.

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Linear Algebra and its Applications	Gilbert Strang	4th Edition, 2006, Cengage Learning India Edition, ISBN: 81-315-0172-8.
2	Higher Engineering Mathematics	B.V. Ramana	1st Edition, Tata McGraw-Hill, 2006. ISBN:9780070634190

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Syllabus for the Academic Year – 2024-2025

Department: Electronics and Telecommunication Engineering			Semester:	IV
Subject: Sensors and Applications				
Subject Code:	22ET402		**L – T – P - C:**	**3–0–0–3**

Sl. No	Course Objectives
1	Study the characteristics of sensors.
2	Understand the role noise and working of signal conditioning circuits.
3	To provide the knowledge of sensor's application.
4	Understand sensors applications in various fields.

Unit	Description	Hrs
I	**Data Acquisition, Approximations, sensor characteristics:** Sensors, Signals, and Systems, Sensor Classification, Units of Measurements, Linear Piecewise Approximation, Calibration, Computation of Parameters, Computation of a Stimulus. Text: 1.2, 1.3, 2.3, 3.1.1, 3.1.2, 3.2 to 3.7	8
II	**Dynamic Characteristics, Interface Electronic Circuits:** Dynamic Characteristics, Dynamic Models of Sensor Elements, Environmental Factors, signal conditioners. Text: 3.16 to 3.20, 6.1 to 6.1.4.	7
III	**Converters and generators, Noise in Sensors and Circuits:** Charge- and Current-to-Voltage Converters, Light-to-Voltage Converters. Analog-to-Digital Converters, Inherent Noise, Transmitted Noise Mechanical Noise, Seebeck Noise. Text: 6.1.5 to 6.4.7, 6.7.1, 6.7.5, 6.7.9	8
IV	**Microphones, light detectors:** Dust and Smoke Detectors, Microphone Characteristics, Dynamic Microphones, Photodiode, Phototransistor, Photo resistor, soil moisture measurement. Text: 12.10 ,13.1 to 13.7, 14.8, 15.2 to 15.4	8
V	**Sensors applications:** occupancy detector, opto-electronic motion detector, touch screen sensor(capacitive), Optical Fingerprint Sensors, metal detector, smoke detector, Soil Moisture, blood glucose sensor, pulse oximeter. Text: 7.6, 7.8.1, 7.13.5, 7.13.7, 8.4.5, 12.10.2,14.8, 18.4.3,18.9.3	8

Course Outcomes:

Course outcome	Descriptions
CO1	Explain the concepts of Sensors, converters, generators and detectors.
CO2	Analyze Sensors characteristics and correlate the errors in Sensors, converters, generators and detectors.
CO3	Discuss environmental effects and influence of noise in sensor circuits.
CO4	Apply the concepts of Sensors and detectors to obtain the desired results.

Course Articulation Matrix:

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2									1				
CO2	1	2							1					
CO3	1													
CO4				2						1				2

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Handbook of Modern sensors Physics, designs, and Applications	Jacob Fraden	Fifth Edition

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Syllabus for the Academic Year – 2024-2025

Department: Electronics and Telecommunication Engineering	Semester:	IV

Subject: Analog and Digital Communication				
Subject Code:	22ET403		L – T – P - C:	3 – 0 – 2 – 4

Sl. No	Course Objectives
1	Analyze modulation and demodulation techniques in analog and digital communication.
2	Analyze the effect of noise in different receivers.
3	Analyze the conversion of analog signals to digital data and represent the digital data in digital formats.
4	Understand pulse shaping technique to reduce inter-symbol interference.

Unit	Description	Hrs
I	**Introduction:** Signals, elements of communication system, applications, transmission of message signals, resources of communication systems. **Amplitude Modulation:** Amplitude Modulation, generation of AM waves: switching modulator, detection of AM waves: envelope detector, virtues, limitations and modifications of amplitude modulation, DSB-SC Modulation, generation of DSB- SC waves: product modulator, detection of DSB-SC waves: coherent detection, SSB Modulation, VSB modulation, comparison of amplitude modulation techniques, FDM, application: AM radio. **Text: 1.1,1.2, 1.4,1.5, 1.6, 7.1,7.2,7.4, 7.5, 7.6, 7.8,7.9**	**8**
II	**Angle Modulation:** Basic concepts, frequency modulation, transmission bandwidth of FM waves, generation of FM waves: indirect method demodulation of FM waves: phase-locked loop, application: FM radio. **Text 7.10,7.11,7.12,7.14**	**7**
III	**Pulse modulation – Transition from analog to digital communications:** Analog pulse modulation: pulse amplitude modulation, quantization process, encoding, digital pulse modulation: pulse code modulation, differential pulse code modulation, delta modulation, TDM, baseband transmission of digital data, inter-symbol interference, base band and pulse shaping, eye-pattern, adaptive equalization. **Text: 5.1 to 5.8,5.10, 6.1 to 6.4,6.7,6.8**	**8**
IV	**Digital Band-Pass Modulation Techniques:** Binary ASK, Binary PSK, Binary FSK, generation and coherent detection of binary modulated waves, DPSK, QPSK, application: digital communications by satellite. **Text: 7.15, 7.16**	**8**

V	**Noise in analog modulation:** Signal to noise ratio, AM receiver model, noise in AM receivers using envelope detection, FM receiver model, noise in FM reception. Noise in digital modulation: Noise in coherent detection of binary modulated waves, noise in DPSK, noise in QPSK. **Text: 9.1,9.2,9.4,9.5,9.6,9.8,10.7, 10.8, 10.9, 10.10**	**8**

LAB CONTENT

Sl. No	Experiment Description
1	Amplitude Modulation using transistor/ FET
2	Frequency modulation using 8038/2206
3	Pulse Amplitude Modulation (PAM) and Verification of Sampling theorem
4	Pulse Width Modulation (PWM)
5	Pulse Position Modulation (PPM)
6	ASK generation and detection
7	FSK generation and detection
8	PSK generation and detection

Course Outcomes

Course outcome	Descriptions
CO1	Acquire the basic concepts of analog and digital communication systems.
CO2	Analyze the mathematical model of analog and digital modulation techniques.
CO3	Discuss noise models related to various analog and digital modulation techniques.
CO4	Apply the knowledge of communication.

Course Articulation Matrix

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2									1				
CO2	1	2							1					
CO3	1													
CO4				2						1				2

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	An Introduction to Analog and Digital Communications	Simon Haykin	2008

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Digital Communication	Simon Haykin	2008
2	Digital and Analog Communication Systems	Sam Shanmugam	1996
3	Communication systems	Simon Haykin	4th edition

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Syllabus for the Academic Year – 2024-2025

Department: Electronics and Telecommunication Engineering	Semester:	IV

Subject: Microcontroller and Embedded Systems				
Subject Code:	22ET404		L – T – P - C:	3 – 0 – 2 – 4

Sl. No	Course Objectives
1	Understand the difference between microprocessor, Microcontroller and Embedded Microcontroller.
2	Familiarize the basic Architectural Features of 8051 and ARM controller.
3	Learn the ALP and C programming using 8051 microcontroller.
4	Understand the operation and use of inbuilt timers / counters, I/O devices and Serial port of 8051.

Unit	Description	Hrs
I	**Microprocessor, Microcontroller and Embedded Micro Controllers:** Introduction**,** Difference between Microprocessors and Microcontrollers, RISC & CISC C P U Architectures, Harvard & Von-Neumann CPU architecture. **The 8051 Microcontroller:** Introduction, Architecture of 8051, Pin diagram of 8051, Memory organization, Stacks, Addressing Modes, I/O Ports: Input/output port structures of 8051. **Text 1: Section: 1.1, 2.4 to 2.7, 5.1 to 5.3**	**8**
II	**Instruction set:** Instruction set of 8051: Data transfer instructions, Arithmetic Instructions, Logical Instructions, and Branch control instructions, Bit manipulation instructions, simple programs. **Text 1: Section: 3.1 to 3.3, 4.1 to 4.2, 6.1 to 6.5** **Text2: Section 5.6.**	**8**
III	**8051, Timer/counter programming:** 8051 Peripherals: Programming of ports. Timer/Counter: Programming 8051 Timers, Counter Programming using C and Assembly language. **Serial communication and Interrupts Programming:** Basics of Serial Data Communication, 8051 Serial Communication, connections to RS-232, Serial Communication Programming in assembly and C. **Text1: Section: 9.1 to 9.2, 10.1 to 10.4**	**8**

IV	**8051 Interrupts:** Basics of interrupts, 8051 interrupt structure, Priority of interrupts. **8051 Interfacing to External memory, I/O Devices and RTC:** Introduction toexternal memory, External Memory interfacing (Programming memory only), DAC, Stepper motor interfacing, programming in C and Assembly language, DS12887 RTC Interfacing and programming in assembly language (Setting the Time and Date). **Text1: 10.1 to 10.3, 11.1 to 11.5, Text2: Section: 3.6** **Text1: Section: 13.2, 14.1 to 14.4, 16.1, 17.2 to 17.3**	**8**
V	**Introduction to Embedded System:** Concept of Embedded System, ARM processor, Register, current program status register, pipeline exceptions, interrupt and vector table, reset operation and addressing modes. **ARM7TDMI:** Processor block diagram, ARM7TDMI features, programmer's model, pipelined architecture, memory format and instruction length, cache and tightly coupled memory and memory management. **Text 2: Chapter- 1.1 to 1.4, 2.1 to 2.5**	**7**

LAB CONTENT

Sl. No	Experiment Description
1	**Data transfer Instructions** (a) Transfer A Block 0f Data from Source to Destination (b) Interchange Block 0f Data from Source to Destination
2	**Arithmetic Instructions** (a) Addition/Subtraction of Two Multi Byte Numbers (b) Multiplication of 16 Bit Number By 8 Bit Number (c) Find cube of a number (d) Find Average Of „N" Numbers
3	**Sorting of Numbers** (a) Sort „N" Hexadecimal Numbers in Ascending/ Descending Order (b) Find Largest / Smallest Number in A Given Array
4	**Code Conversions** (a) Conversion of Decimal to Hexadecimal and vice versa (b) Conversion of ASCII To BCD and viceversa
5	**Counters** Implementation of Decimal Up/Down Counter
6	**DAC Interfacing** Generation of Ramp/Square/Triangular/Sine Wave Using DAC Interface.
7	Stepper Motor Control
8	DC Motor Control

Course Outcomes:

Course outcome	Descriptions
CO1	Interpret the architectural features of 8051 and design Memory interfacing. (L2)
CO2	Outline Interrupt systems, operation of Timers/Counters and Serial Port of 8051 (L2)
CO3	Apply knowledge of addressing modes and instructions for writing assembly language and C programming. (L3)
CO4	Develop C language program to interface I/O devices and RTC with 8051 microcontrollers. (L3)

Course Articulation Matrix:

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3													-
CO2	1	2		1					1	1				1
CO3	1	2							1			1		1
CO4	1	2		1					1	1				-

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	"The 8051 Microcontroller and Embedded Systems – using assembly and C".	MuhammadAliM azidi and Janice Gillespie Mazidi and RollinD	2008
2	ARM system developers guide	Andrew N Sloss	3rd Edition

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Microcontrollers Architecture, programming, Interfacing and System Design	Raj Kamal	2011
2	MSP 430 Microcontroller Basics	Davies j h	2008
3	Microcontrollers	Sampath k venkatesh	2008

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Syllabus for the Academic Year – 2024-2025

Department: Electronics and Telecommunication Engineering			Semester:	IV
Subject: Python Programming				
Subject Code:	22ET405		L – T – P - C:	3-0-0-3

Sl. No	Course Objectives
1	Get acquainted with the syntax and semantics of Python programming language.
2	Understand the operational principles of lists, tuples, dictionaries and sets in structuring data.
3	Learn File handling and Exception handling
4	Demonstrate the use of NumPy, Pandas and Mat plot lib libraries.

Unit	Description	Hrs
I	**Variables, Expressions and Statements:** The first program, Comments, Values and data types, Variables, Statements, Evaluating expressions, Operators and operands, Type converter functions, Order of operations, Operations on strings, Input, Composition, The modulus operator. **Textbook 1: Chapters 1 – 2**	8
II	**Flow control:** Boolean Values, Comparison Operators, Boolean Operators, Mixing Boolean and Comparison Operators, Elements of Flow Control, Program Execution, Flow Control Statements, Importing Modules, Ending a Program Early with sys. exit(), **Functions:** def Statements with Parameters, Return Values and return Statements, The None Value, Keyword Arguments and print(), Local and Global Scope, The global Statement, Exception Handling, A Short Program: Guess the Number **Textbook 1: Chapters 3**	8
III	**Lists:** The List Data Type, Working with Lists, Augmented Assignment Operators, Methods, Example Program: Magic 8 Ball with a List, List-like Types: Strings and Tuples, References, **Dictionaries and Structuring Data:** The Dictionary Data Type, Pretty Printing, Using Data Structures to Model Real-World Things **Textbook 1: Chapters 4 – 5**	9
IV	**Manipulating Strings:** Working with Strings, Useful String Methods, Project: Password Locker, Project: Adding Bullets to Wiki Markup # **Reading and Writing Files:** Files and File Paths, The os. path Module, The File Reading/Writing Process, Saving Variables with the shelve Module, Saving Variables with the print. format() Function, Project: Generating Random Quiz Files, Project: Multiclipboard, **Textbook 1: Chapters 6 , 8**	7

V	**Extending Python Using NumPy**: What is NumPy?, Creating NumPy Arrays, Array Indexing- Boolean Indexing, Slicing Arrays, NumPy Slice Is a Reference, Reshaping Arrays, Array Math- Dot Product, Matrix, Cumulative Sum, NumPy Sorting, Array Assignment- Copying by Reference, Copying by View (Shallow Copy), Copying by Value (Deep Copy). **Textbook 2: Chapter 2**	7

Course Outcomes:

Course outcome	Descriptions
CO1	Demonstrate proficiency in handling various programming constructs of Python.
CO2	Explicate the type of operators, built-in libraries and functions.
CO3	Illustrate the process of representation and accessing of data using various data Structures.
CO4	Analyze a given problem and develop solution for the same.

Course Articulation Matrix

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2									1				
CO2	1	2							1					
CO3	1													
CO4				2						1				2

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Al Sweigart	Automate the Boring Stuff with Python	2015
2	Jeffrey Elkner, Peter Wentworth, Allen B. Downey, and Chris Meyers	How to Think Like a Computer Scientist: learning with Python 3 Documentation	Releasing 3rd Edition (Using Python 3.x), April, 2020

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Richard L. Halterman	Fundamentals of Python Programming	Southern Adventist University, 2019, Ebook, ISBN:9781539530268

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Syllabus for the Academic Year – 2024-2025

Department: Electronics & Telecommunication Engineering	Semester:	VI

Subject: Skill Lab-2				
Subject Code:	22ET406		L – T – P - C:	0-0-4-2

Sl. No	Course Objectives
1	Study the characteristics of sensors.
2	Study of touch, light & heat sensors.
3	Study of IR sensor, photodiode and thermistor.
4	Applications of sensors.

LAB CONTENT

Sl. No	Experiment Description
1	Touch sensor
2	Light sensor
3	Linear variable position transducer
4	Water level indicator
5	IR sensor and Photodiode
6	Piezo Electric sensor
7	Heat sensor
8	Thermistor
9	Mini project-1
10	Mini project-2
11	Mini project-3

Course Outcomes:

Course outcome	Descriptions
CO1	Understand basic concepts of sensors.
CO2	Analyze the characteristics of sensors.
CO3	Visualize the applications of sensors.
CO4	Design electronic circuits using sensors.

Course Articulation Matrix

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2									1				
CO2	1	2							1					
CO3	1													
Co4	2									1				

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Syllabus for the Academic Year – 2024-2025

Department: Electronics and Telecommunication Engineering			Semester:	IV
Subject: UNIVERSAL HUMAN VALUES (HUMANITY SCIENCE Course)				
Subject Code:	22HV407		L – T – P - C:	2-0-0-1

Sl. No	Course Objectives
1	This introductory course input is intended: To help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings
2	To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence. Such a holistic Perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.
3	To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and mutually enriching interaction with Nature.
4	This course is intended to provide a much needed orientation input in value education to the young enquiring minds.

Unit	Description	Hrs
I	**Introduction to Value Education:** -Understanding Value education- Need, Guidelines, content, Role of education- Sanskar - Process for Value Education- Self-exploration, the Dialogue Within. -Continuous Happiness and Prosperity – the Basic Human Aspirations. -Right Understanding, Relationship and Physical Facility. -Exploring the Meaning of Happiness and Prosperity. - Method to Fulfill the Basic Human Aspirations.	6 hrs
II	**Harmony in the Human Being:**-Understanding the Human being (As the Co- existence of the Self and Body) -Distinguishing between the Needs of the Self and the Body -The Body as an Instrument of the Self-The response of the self and the body -Understanding Harmony in the Self-State of imagination -Understanding Harmony of the Self with the Body - Programme to ensure self-regulation and Health-Nurturing the body.	6 hrs
III	**Understanding Harmony in the Family and Society:** Harmony in the Family – the Basic Unit of Human Interaction Values in Human-to-Human Relationship "Trust' – the Foundational Value in Relationship 'Respect' – as the Right Evaluation.- Other Naturally Acceptable. Feelings in Relationship-Affection, Care, Guidance, Reverence, Glory, Gratitude and Love Vision for the Universal Human Order-from family to world family.	6 hrs

IV	**Understanding Harmony in the Nature/Existence:** Understanding Harmony in the Nature-Interconnectedness, self-regulation and Mutual Fulfillment among the Four Orders of Nature-Realizing Existence as Co-existence at All Levels- The Holistic Perception of Harmony in Existence.	4 hrs
V	**Implications of the Holistic Understanding–a Look at Professional Ethics** Natural Acceptance of Human Values -Definitiveness of (Ethical) Human Conduct-A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order -Competence in Professional Ethics -Holistic Technologies, Production Systems and Management Models- Typical Case Studies - Strategies for Transition towards Value-based Life and Profession	6 hrs

Course Outcomes:

COs	Descriptions
CO1	By the end of the course, students are expected to become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
CO2	They would have better critical ability, also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
CO3	It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.
CO4	This is only an introductory foundational input. It would be desirable to follow it up by a) Faculty-student or mentor-mentee programs throughout their time with the institution b) Higher level courses on human values in every aspect of living

Course Articulation Matrix

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1				1		3	3	3	2	3				
CO2				2		3	3	3	2	3				
CO3				2		3	3	3	2	3				
CO4				2		3	3	3	2	3				

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	A Foundation Course in Human Values and Professional Ethics	R R Gaur, R Sangal, G P Bagaria,	Excel Books, New Delhi, 2010
2	The Teacher's Manual Teachers" Manual for A Foundation Course in Human Values and, Professional Ethics	R R Gaur, R Asthana, G P Bagaria	2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Jeevan Vidya: EkParichaya	A Nagaraj,	Jeevan Vidya Prakashan, Amarkantak, 1999.
2	Human Values,	A.N. Tripathi,	New Age Intl. Publishers, New Delhi, 2004
3	The Story of Stuff (Book). . i) Small is Beautiful ii) Slow is Beautiful	- E. F Schumacher	
4	The Story of My Experiments with Truth	- by Mohandas Karamchand Gandhi	

Signature of the course coordinator **Signature of the HoD** **Signature of the Dean (Academic Affairs)**

Syllabus for the Academic Year – 2024-2025

Department: COMMON TO ALL THE STREAM OF ENGG			Semester:	III / IV
Subject: ENVIRONMENTAL STUDIES (HUMANITY SCIENCE Course)				
Subject Code:	22EN408		L – T – P - C:	2-0-0-1

Sl. No	Course Objectives
1	To identify the major challenges in environmental issues and evaluate possible solutions. To analyze an overall impact of specific issues and develop environmental management plan.
2	Develop analytical skills, critical thinking and demonstrate socio-economic skills for Sustainable development.
3	To gain knowledge on different types of pollution in the environment.
4	To analyze an overall impact of specific issues and develop environmental management plan Environment.

Unit	Description	Hrs
I	**Introduction:** Environment - Components of Environment Ecosystem: Types of Ecosystem, Balanced ecosystem. Human Activities – Food, Shelter, And Economic & Social Security, Effects of human activities on environment- Agriculture, Housing, Industry, Mining & Transportation. Environmental Impact Assessment (EIA), Sustainable Development.	6 hrs
II	**Natural Resources**-Introduction, types of resources, Water resources – Availability & Quality aspects, Water borne diseases & water induced diseases, Fluoride problem in drinking water. Mineral resources**,** Forest Wealth. Material Cycles – Carbon Cycle, Nitrogen Cycle & Sulphur Cycle.	6 hrs
III	**Energy** – Different types of energy, Conventional sources & Non-conventional sources of energy Solar energy, Hydro electric energy, Wind Energy, Nuclear energy, Biomass & Biogas Fossil Fuels, Hydrogen as an alternative energy.	6 hrs
IV	**Environmental Pollution** – Air Pollution & Automobile Pollution Water Pollution, Noise pollution, Land Pollution ,Public Health Aspects. Global Environmental Issues: Population Growth, Urbanization, Land Management, Water & Waste Water Management.	4 hrs
V	Definition, Effects – Global Warming, Acid rain & Ozone layer depletion, controlling measures. Solid Waste Management, E - Waste Management & Biomedical Waste Management -Sources, Characteristics & Disposal methods. Environmental Acts & Regulations, Role of government, Legal aspects, Role of Non-governmental Organizations (NGOs) , Environmental Education	6 hrs

Course Outcomes:

COs	Descriptions
CO1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale
CO2	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment,
CO3	Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components
CO4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues

Course Articulation Matrix:

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	1	1	1	3	3	2	2	2	1	3		
CO2	2	2	1	1	1	3	3	2	2	2	1	1		
CO3	2	2	1	1	1	3	3	2	2	2	1	1		
CO4	2	2	1	1	1	3	3	2	2	2	1	1		

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Environmental Studies	Benny Joseph	Tata McGraw– Hill Publishing Company Limited (2005), Delhi.
2	Environmental Studies	R Rajagopalan	From Crisis to Cure", Oxford University Press, 2005,

Reference Books:

Sl No	Reference book title	Author	Volume and Year of Edition
1	Environmental Science and Engineering	Aloka Debi	Universities Press (India) Pvt. Ltd. 2012
2	Environmental Studies	R.J.Ranjit Daniels	Wiley India Private Ltd., New
3	Text Book of Environmental and Ecology"	Dr.Pratiba Sing, Dr.Anoop Singh and Dr.Piyush Malaviya,	Acme Learning Pvt. Ltd. New Delhi
4	Environmental Science – working with the Earth	G.Tyler Miller Jr.,	Eleventh Edition, Thomson Brooks /Cole, 2006

Signature of the course coordinator **Signature of the HoD** **Signature of the Dean (Academic Affairs)**