

COURSE OBJECTIVES:

To make the student conversant with the

Basics in probability that is relevant in applications such as random signals and linear systems in communication engineering.

Concept of two dimensional random variables.

Basic concept of random processes and control system.

Properties of vector spaces which will then be used to solve related problems.

Concept of linear transformations.

Real-world case studies on random processes and linear algebra.

UNIT - 1 RANDOM VARIABLES

10

Applications: Quality control and manufacturing, risk assessment and insurance, finance, stock market analysis, machine learning and artificial intelligence.

Axioms of probability - Conditional probability - Baye's theorem - Discrete and continuous random variables - Moments - Moment generating functions - Binomial, Poisson, Geometric, Uniform, Exponential and Normal distributions - Functions of a random variable.

UNIT - 2 TWO-DIMENSIONAL RANDOM VARIABLES

10

Applications: Correlation and dependence analysis, regression analysis, risk and reliability analysis, signal processing, medical and health studies, machine learning.

Joint distributions - Marginal and conditional distributions - Covariance - Correlation and linear regression - Transformation of random variables - Central limit theorem (statement only).

UNIT - 3 RANDOM PROCESSES

10

Applications: Image and video compression, weather and climate modelling robotics and control systems, biology and epidemiology.

Classification - Stationary process - Markov process - Poisson process - Discrete parameter Markov chain - Chapman Kolmogorov equations (Statement only) - Limiting distributions.

UNIT - 4 VECTOR SPACES

10

Applications: Portfolio optimization, linear programming, path, planning, cryptography, Discrete Cosine Transform (DCT), Finite Element Method (FEM).

Vector spaces - Subspaces - Linear combinations and linear system of equations - Linear independence and linear dependence - Theorems and Properties- Bases and dimensions.

UNIT - 5 LINEAR TRANSFORMATIONS

10

Applications: Structural engineering, matrix encryption, homogeneous transformation matrices, sensor data integration, kinematics and motion control.

Linear transformation - Null spaces and ranges - Dimension theorem - Matrix representation of linear transformations, Inner product - Norms - Gram Schmidt orthogonalization process –Adjoint of linear operations- Least square approximation.

UNIT - 6 APPLICATIONS OF RANDOM PROCESSES AND LINEAR ALGEBRA IN REAL-LIFE SCENARIO

10

Apply Markov process in optimizing the wait time at traffic intersections - Analyze the price difference in dynamic components using Poisson distribution - Signal optimization using Gram-Schmidt process - Analyze noise pattern between the two components using correlation -Apply Least squares approximation in kinematics - Encoding Signal by Quadrature Amplitude Modulation (QAM) using vector space.

TOTAL: 60 PERIODS**OUTCOMES:**

At the end of the course, the students will be able to

1. Utilize the axioms of probability, conditional probability and apply standard distributions that can describe the real life phenomena.
2. Interpret the concepts of joint distributions, correlation, linear regression of two-dimensional random variables and execute the problems by central limit theorem.
3. Classify random processes, stationary processes and analyze the discrete parameter Markov chains in terms of a transition matrix.
4. Illustrate the concepts of vector space, basic theorems and properties and solve problems related to linear systems.
5. Describe the concept of linear transformations, dimension theorem, inner product spaces in orthogonalization and Least Square Approximation.
6. Apply the concept of Random Processes and Linear Algebra in real life scenario.

TEXT BOOKS:

1. Gross, D., Shortle, J.F, Thompson, J.M and Harris. C.M., “Fundamentals of Queueing Theory”, Wiley Student 4th Edition, 2014.
2. Ibe, O.C., “Fundamentals of Applied Probability and Random Processes”, Elsevier, 1st Indian Reprint, 2007.
3. Friedberg. A.H., Insel. A.J. and Spence. L., “Linear Algebra”, Prentice Hall of India, New Delhi, 4th Edition, 2004.

REFERENCES:

1. Hsu, "Schaum's Outline of Theory and Problems of Probability, Random Variables and Random Processes", Tata McGraw Hill Edition, New Delhi, 2004.
2. Trivedi, K.S., "Probability and Statistics with Reliability, Queueing and Computer Science Applications", 2nd Edition, John Wiley and Sons, 2002.
3. Yates, R.D. and Goodman. D. J., "Probability and Stochastic Processes", 2nd Edition, Wiley India Pvt. Ltd., Bangalore, 2012.
4. Kolman. B. Hill. D.R., "Introductory Linear Algebra", Pearson Education, New Delhi, First Reprint, 2009.
5. Kumaresan. S., "Linear Algebra - A Geometric Approach", Prentice - Hall of India, New Delhi, Reprint, 2010.

CO - PO MAPPING

CO	PO												PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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4	3	3	–	–	–	–	–	–	1	–	–	1	–	–	–
5	3	3	–	–	–	–	–	–	1	–	–	1	–	–	–
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LOW (1) ; MEDIUM (2) ; HIGH (3)															

	CIRCUIT ANALYSIS	L T P C 2 1 0 3
COURSE OBJECTIVES:		
✓	To analyze AC and DC circuits using fundamental laws.	
✓	To apply the concepts of network theorems to obtain simplified circuits.	
✓	To develop series and parallel resonance circuits	
✓	To solve the RL, RC and RLC circuits using Laplace transformation to find the transient and steady state response.	
✓	To analyze the behavior of an input and output port of a two port networks.	
✓	To know the recent trends and applications of circuit analysis	
UNIT –1	BASIC CIRCUIT THEORY	8
<i>Application : Circuit Design, Troubleshooting, Analyzing complex circuits</i> Basic circuit concepts - Independent Voltage and Current sources - Ohms law - Kirchhoff's law - Series and Parallel Circuit (Resistor, Inductor, Capacitor) - Mesh current and Node voltage method of analysis for DC and AC circuits.		
UNIT –2	NETWORK THEOREMS	8
<i>Applications: Simplifying complex circuits, Optimizing power transfer</i> Network reduction: Voltage and Current division rule - Source transformation – Thevinin and Norton's theorem – Maximum power transfer theorem – Reciprocity theorem – Super position theorem – Millman's theorem - Star Delta transformation.		
UNIT – 3	RESONANCE AND COUPLED CIRCUITS	8
<i>Applications: Transformers, RF Circuits, Wireless Power transfer</i> Introduction: Resonance in series circuits – Resonance in parallel circuits – Self inductance – Mutual inductance – Coupling factor – Dot rule – Analysis of coupled circuits - Single tuned circuits – Double tuned circuits.		
UNIT –4	TRANSIENT ANALYSIS	8
<i>Application: Power system stability and protection, Designing filter circuits, Control system design</i>		

Introduction: Initial value theorem – Final value theorem – RL transients and decay of currents in RL circuits – RC transients and decay of currents in RC circuits – RLC transient circuits – over damped and under damped condition – AC transients of RLC networks – Natural frequency and damping ratio – Solving RLC transient circuits with Laplace transformations.		
UNIT –5	TWO PORT NETWORKS	8
<i>Applications: Amplifier design, Antenna design, Transmission lines, Electrical machines</i> Introduction: Z parameters - Y parameters - Transmission (ABCD) parameters - Hybrid(h)Parameters - Interconnection of two port networks - Symmetrical properties of T and π networks.		
UNIT –6	BUSINESS STATISTICS AND CURRENT TRENDS	5
International Market status: Market size and growth – Technological Innovation – Major players and competitive landscapes –Market challenges; Current trends: Simulation software – machine learning for circuit design – Energy efficiency and electromagnetic compatibility.		
TOTAL: 45 PERIODS		
OUTCOMES:		
<i>At the end of the course the students will be able to</i>		
CO 1	Analyze mesh current and node voltage at various points in a circuit using Kirchhoff laws	
CO 2	Apply the concepts of different network theorems to get the simplified circuit.	
CO 3	Design resonance circuits to calculate the resonant frequency and impedance.	
CO 4	Solve the RLC transient circuits in time domain and frequency domain by applying Laplace transformation to obtain responses.	
CO 5	Analyze the concepts of two port network and find the behavior of voltage and current at its input port and output port.	
CO 6	Understand the recent trends and various applications of Circuit analysis.	
TEXT BOOKS:		
1.	Circuits And Networks: Analysis And Synthesis, A. Sudhakar, Shyammohan S. Palli, 6 th Edition Paperback , TATA McGraw Hill Publishers – July 2022.	
2.	Electric Circuit Analysis, T. Nageswara Rao, A.R S. Publications, Tamil Nadu -2021.	

3.	Electric Circuit Theory, Dr. M. Arumugam and N. Premakumaran, ISBN: 978-81-7409-077 - Khanna Publishers, 2016.
REFERENCES:	
1.	Engineering Circuit Analysis, William H. Hayt, Jack Kemmerly and M. Urbin, 8 th Edition Paperback, TATA McGraw Hill Publishers, August 2013.
2.	Schaum's Outline of Basic Circuit Analysis, Second Edition (English, Paperback, O'Malley John) ISBN13: 9780071756433, Publisher: McGraw-Hill Education, 2011.
3.	Circuit Theory (Analysis and Synthesis), A. Chakrabarti, Dhanpat Rai & Company, 6 th edition, 2021.
4.	Fundamentals of Electric Circuits, Charles K. Alexander and Matthew N.O. Sadiku, 7 th Edition, McGraw-Hill Education, 2021.
5.	Basic Electrical Engineering, D.P. Kothari and I.J. Nagrath, 5 th Edition, McGraw-Hill Education, 2021.

CO – PO MAPPING

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3	3	3	2	2	1	-	-	-	-	-	2	3	2	1
4	3	3	2	3	1	-	-	-	-	-	2	3	2	1
5	3	2	2	2	1	-	-	-	-	-	2	3	2	1
6	1	0	0	0	0	-	-	-	-	-	2	0	0	0
LOW (1) ; MEDIUM (2) ; HIGH (3)														

	ELECTRONIC DEVICES AND CIRCUITS	L T P C 3 0 0 3
COURSE OBJECTIVES:		
✓	To describe the construction and working of semiconductors diodes.	
✓	To study the structures and working of different transistors.	
✓	To analyze the frequency response of small signal amplifiers	
✓	To design feedback amplifiers and oscillators.	
✓	To design multistage and differential amplifier circuits.	
✓	To study about recent advances in electronic devices and circuits.	
UNIT - 1	SEMICONDUCTOR DEVICES	8
<i>Applications:</i> <i>Switches, Solar panels</i>		
Semi-conductors – Charge carriers, electrons and holes in intrinsic and extrinsic semi-conductors – Recombination - Generation, Charge Transport and Continuity Equation – Hall effect - Diodes – PN junction – Current equation – Junction Capacitance – Zener diode – Breakdown characteristics of Zener diode, Tunnel diode, Schottky diode.		
UNIT - 2	TRANSISTORS	8
<i>Applications:</i> <i>Pacemakers, Hearing Aids, Cameras, Calculators, and Watches</i>		
Bipolar junction transistors – Characteristics – Configurations - Unipolar devices – FET, MOSFET, UJT and Opto- Electronic devices – theory and characteristics - Rectifiers and Switched mode power supplies – Filter circuits, applications.		
UNIT - 3	AMPLIFIERS	8
<i>Applications:</i> <i>Radio, Television</i>		
Need for biasing, AC and DC load lines, Stability factors, Various biasing methods of BJT and MOSFET, BJT small signal model – Analysis of CE, CB, CC amplifiers- Gain and frequency response –High frequency analysis, Bias compensation techniques using diode, thermistor and sensistor.		
UNIT - 4	FEEDBACK AMPLIFIERS AND OSCILLATORS	8

Applications: <i>Speakers, Headphones, ECG</i>		
Effects of negative feedback, Loop gain, four types of negative feedback- Voltage / Current, Series/ Shunt feedback Amplifiers, Barkhausen criterion, positive feedback–Condition for oscillations, Analysis of LC oscillators- Hartley, Colpitts, RC oscillators-RC phase shift, Wein bridge phase shift and Crystal oscillators.		
UNIT - 5	MULTISTAGE AMPLIFIERS AND DIFFERENTIAL AMPLIFIER	8
Applications: <i>Radio receivers, Optical traps</i>		
Cascade amplifier, Differential amplifier – Common mode and Difference mode analysis – MOSFET input stages – Single tuned and double tuned amplifiers- Effect of cascading single tuned and double tuned amplifiers on Bandwidth, Stagger tuned amplifier – Gain and frequency response – Neutralization methods.		
UNIT - 6	BUSINESS STATISTICS AND CURRENT TRENDS	5
ISM: Indian semiconductor mission, Fabrication Schemes - magnetoelectric spin-orbit logic device - GaN - 3D stacking technology - AI-ready hardware, advanced materials, and chiplet technology – The development of new materials like graphene for enhanced conductivity - Integration of 2-D materials - Compound semiconductors.		
TOTAL: 45 PERIODS		
OUTCOMES:		
At the end of the course the students would be able to		
1.	Understand the basics of semiconductor physics and various diodes.	
2.	Understand the basics structure, operation and working of different transistors.	
3.	Design various amplifiers.	
4.	Design various oscillator circuits to generate signals of desired frequency.	
5.	Design and plot the frequency response of multistage and differential amplifier circuits.	
6.	Gain knowledge about current technology developments in electronic devices and circuits.	
TEXT BOOKS:		

1.	Thomas L. Floyd, 'Electronic Devices', Pearson Education Limited, 9th Edition, 2013.
2.	Millman and Halkias 'Electronic Devices and Circuits', McGraw - Hill International Student, 2nd Edition, 2009.
3.	Suman Lata Tripathi, Sanjeet Kumar Sinha, 'Recent Advancement in Electronic Devices, Circuits and Materials', Nova Science Publishers, 1 st Edition, 2020.
REFERENCES:	
1.	Allen Mottershead, 'Electronic Devices and Circuits - An Introduction', PHI, 18th Reprint, 2010
2.	Joseph. A. Edminister, 'Electric Circuits - Schaum's Outline Series', McGraw-Hill Publications, 6th Edition, 2003.
3.	Robins & Miller, 'Circuit Analysis Theory and Practice', Delmar Publishers, 5th Edition, 2012.
4.	Hayt, W. H, Kemmerly J. E. & Durbin, 'Engineering Circuit Analysis', McGraw Hill Publications, 8th Edition, 2013.
5.	Charles K. Alexander, Matthew N.O.Sadiku, 'Fundamentals of Electric Circuits', McGraw-Hill Publications, 5th Edition, 2013.

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4	3	3	3	2	-	-	-	-	-	-	2	3	2	1
5	3	2	2	2	-	-	-	-	-	-	2	3	2	1
6	3	2	2	2	-	-	-	-	-	-	2	2	2	2

COURSE OBJECTIVES:

- ✓ To introduce basic concepts of Data types, Algorithms and linear data structures.
- ✓ To perform operations on linear data structures Stack and Queues.
- ✓ To apply suitable non-linear data structure (tree) operations to solve specific problems.
- ✓ To utilize relevant graph algorithms for various graph-based applications.
- ✓ To evaluate different searching, sorting and hashing algorithms.
- ✓ To apply the data structure concepts in different domains.

UNIT- I INTRODUCTION TO DATA STRUCTURE AND LIST**8**

Applications: *Linked list- image viewer, Music player, previous & next pages in web browser, GPS navigation, undo redo functionality.*

Introduction to analysis of algorithms - Asymptotic Notations -Recursive, Non Recursive Algorithm - Abstract Data Types (ADTs) -List ADT -Array-based implementation -Linked list implementation - Singly linked lists -Circularly linked lists -Doubly-linked lists -Applications of lists - Polynomial ADT- Polynomial Manipulation.

UNIT- II LINEAR DATA STRUCTURES–STACKS, QUEUES**8**

Applications : *Stack-back & forward buttons in a web browser, recursive programs-Queue- call centers, printer management, traffic systems, task scheduling*

Stack ADT -Stack Model - Implementations: Array and Linked list - Operations - Applications - Balancing Symbols -Evaluating arithmetic expressions- Infix to Postfix conversion -Function Calls - Queue ADT - Operations - Circular Queue - DeQueue - Applications of Queues.

UNIT- III NON LINEAR DATA STRUCTURES–TREES**8**

Applications : *BST- dictionary, phone contacts, online store system, File system. AVL trees-indexing databases-Heaps-resource allocation, directory structures in file systems.*

Tree ADT -Tree Traversals -Binary Tree ADT- Expression trees- Binary Search Tree ADT- AVL Trees - -Priority Queue (Heaps) - Binary Heap- Multi way Search Trees: B-Tree-B+ Tree.

UNIT -IV NON LINEAR DATA STRUCTURES -GRAPHS**8**

Applications : *Social Networks, Transportation, Computer networks, Web crawling, GPS Navigation, Network routing. Telecommunication Networks-route planning for postal delivery, road trips*

Graph Definition-Representation of Graphs-Types of Graph- Breadth-first traversal -Depth-first traversal -Bi-connectivity-Euler circuits-Topological Sort-Shortest Path Algorithm: Dijkstra's algorithm- Minimum Spanning Tree: Prim's algorithm, Kruskal's Algorithm.

Applications: *E-commerce Applications, Social Media, Search Engines, Text Editors and IDE ,Accident Detection, Online shopping- **Hashing** : Bloom Filtering, Data base indexing, Password storage.*

Searching: Linear Search-Binary Search. Sorting: Bubble sort -Selection sort -Insertion sort -Quick sort. Hashing: Hash Functions -Collision Resolution Strategies: Separate Chaining -Open Addressing - Rehashing.

UNIT- VI RECENT TRENDS AND APPLICATIONS IN DIFFERENT DOMAIN 5

Introduction - Cache-Oblivious Data Structures, Sketch Data Structures, Geometric Data Structures, Self-Organizing Data Structures. Applications- AI & ML- Decision Trees for Predictions, Graphs in Neural Networks-Block chain Technology-Merkle trees, Hash tables. Healthcare and Bioinformatics-suffix trees, hash tables and Graphs. IoT- Circular buffer, Graphs & BST.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

At the end of this course, the students will be able to:

- CO1:** Understand basic concepts in algorithms and data structures.
- CO2:** Implement linear data structure operations.
- CO3:** Use appropriate linear/non-linear data structure operations for solving a given problem.
- CO4:** Apply appropriate graph algorithms for graph applications.
- CO5:** Analyze the various searching, sorting and hashing algorithms.
- CO6:** Apply the data structure concepts in different domains.

TEXT BOOKS

1. Mark Allen Weiss, “Data Structures and Algorithm Analysis in C”, 2nd Edition, Pearson Education, 2005.
2. Kamthane, “Introduction to Data Structures in C”, 1st Edition, Pearson Education, 2007
3. SartajSahni, “Data Structures, Algorithms and Applications in C++”, Silicon paper publications,2004.

REFERENCES

1. “SCHAM’S outlines Data Structures With C”, Seymour Lipschutz, Adopted in India by Arrangement with The Tata McGraw-Hill companies, Lnc., New York.
2. Langsam, Augenstein and Tanenbaum, “Data Structures Using C and C++”, 2nd Edition, Pearson Education,2015.
3. Thomas H. Cormen, Charles E. Leiserson, Ronald L.Rivest, Clifford Stein, “Introduction to Algorithms”, Fourth Edition, Mcgraw Hill/ MIT Press,2022.
4. Alfred V. Aho, Jeffrey D. Ullman,John E. Hopcroft ,”Data Structures and Algorithms”, 1st edition, Pearson, 2002.
5. Kruse, “Data Structures and Program Design in C”, 2nd Edition, Pearson Education, 2006.
6. RajeshK.Shukla,“Data Structures using C and C++”,Wiley India Publications,2009.

LIST OF EXPERIMENTS:**30 PERIODS**

1. Array implementation of List, Stack and Queue ADTs
2. Implementation of Singly Linked List
3. Write a program to simulate the working of stack using an array with the following:
 - i. Push
 - ii. Pop
 - iii. DisplayThe program should print appropriate messages for stack overflow, stack underflow
4. Linked list implementation of Linear Queue ADTs
5. Implementation of Polynomial addition and multiplication using Linked list
6. Implementation of Tree traversal Techniques
7. Implementation of Binary Search Trees
8. Implementation of Linear Search and Binary Search
9. Implementation of Insertion Sort and Selection Sort

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4	3	3	2	2	2	-	-	-	-	-	2	2	2	2
5	3	3	2	2	2	-	-	-	-	-	3	2	2	2
6	3	3	3	2	2	-	-	-	-	-	3	1	-	-

(XXXXX)
Subject
Code

LIFE SKILL III – BASIC CONVERSATION SKILLS

L T P C
2 0 0 1

COURSE OBJECTIVES:

- ✓ To develop effective professional communication skills, including greetings, polite conversations, and intervening in dialogues.
- ✓ To introduce and practice framing questions using model auxiliaries (can, could, would) and WH questions in a technical environment.
- ✓ To apply tone, intonation, and voice modulation effectively in two-way conversations to enhance communication clarity and impact.
- ✓ To practice essential one-on-one conversation techniques to communicate effectively in interview settings.
- ✓ To practice various discussion activities.
- ✓ To understand the do's and don'ts of group discussions and perform group discussions.

UNIT – I PROFESSIONAL COMMUNICATION

2

Creating conversation - Professional greetings and courtesies - Introduction to polite conversation techniques – Intervening when two people are conversing - Polite disagreement

Practice: Initial greeting, Transitioning between conversations, Practicing professional greetings using conversation and Courtesy vocabularies in different scenarios (C 17)

Role-play: Conducting professional conversations

UNIT – II FRAMING QUESTIONS

2

Basics of framing questions using model auxiliaries (can, could, would, etc.) - WH questions and Yes/No questions in technical environment

Practice: Role - play exercises in question framing, Conducting Q&A sessions based on conversations, Effective questioning techniques in various settings

UNIT – III LISTENING TWO-WAY CONVERSATION

2

Understanding tone and intonation in conversations - Responding appropriately in two - way conversations, practicing real - life two - way conversations

Practices: Practicing two - way conversation with tone and intonation - Voice modulation

UNIT – IV TWO -WAY CONVERSATION – BASICS

2

“Basic one and one techniques in interview”

Practice: Conversation tips for effective two-way dialogue - Common conversation pit falls (how to avoid monotones, Long sentences and Breath control during conversation).

UNIT – V DISCUSSION

2

Techniques of discussion – Brainstorming questions, debate and argumentation, panel discussion

Practice: Asking brainstorming questions

UNIT – VI BASICS OF GROUP DISCUSSION

2

Dos and Don'ts of group discussion – Evaluation process

Practice: Three group discussions

TOTAL: 12 PERIODS

OUTCOMES:

At the end of the course the students will be able to

1. Initiate and manage professional conversations with correct greetings and courtesies.
2. Demonstrate proficiency in asking clear and appropriate questions in professional and technical conversations.
3. Adjust their tone and intonation based on the context of the conversation.
4. Confidently navigate one-on-one interviews and other personal conversations.
5. Formulate and ask open-ended brainstorming questions.
6. Understand the importance and purpose of group discussions in professional and academic settings.

REFERENCES:

1. “Advanced Communication Skills” by Mathew Richardson, Charlie Creative Lab, 2020.
2. Andy Gillett, Using English for Academic purposes for students in higher Education.
<https://www.uefap.org/reading/>
3. R. K. Agnihotri and A. L. Khanna. *English for Academic and Professional Purposes*. Macmillan India, 2008
4. **Swales, John M., and Christine B. Feak.** *Academic Writing for Graduate Students: Essential Tasks and Skills*. University of Michigan Press, 2012

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4	-	-	-	-	-	-	-	-	3	3	-	3	-	-	-
5	-	-	-	-	-	-	-	-	3	3	-	3	-	-	-
6	-	-	-	-	-	-	-	-	3	3	-	3	-	-	-
LOW (1); MEDIUM (2); HIGH (3)															

(XXXXX)	HOLISTIC PERSONALITY DEVELOPMENT AND	L T P C
Subject	BEHAVIORAL SKILLS	2 0 0 1
Code		

COURSE OBJECTIVES:

- ✓ To enable students to gain a comprehensive understanding of the self and its key components, including self-identity, self-image, self-concept, and self-confidence.
- ✓ To provide insights into the nature and types of fear, emphasizing its impact on both personal and academic spheres.
- ✓ To equip students with effective tools and strategies to assess and enhance self-esteem, while fostering a growth mindset and cultivating a positive attitude.
- ✓ To introduce the concept and dimensions of Emotional Intelligence (EQ) and differentiate it from Intelligence Quotient (IQ) and Spiritual Quotient (SQ).
- ✓ To develop students' communication proficiency and impression management skills for fostering healthy interpersonal relationships.
- ✓ To strengthen students' interpersonal competence for success in both social and professional environments.

UNIT –I SELF AWARENESS 2

Understanding Self (Self-Identity, Self-Concept, Self-Confidence, Self-Image) Techniques of Self Awareness (Johari Window, Self-Characteristics, Stages of Self Awareness)

UNIT –II FEAR MANAGEMENT 2

Understanding Fear (e.g., fear of failure, public speaking, exams, job interviews) - The science behind fear (Fight or Flight response) - Changing negative thoughts into positive ones - Facing fears step by step

UNIT –III SELF ESTEEM 2

Self Esteem & Effectiveness (Importance, High & Low Self-Esteem, Measurement, Steps to Improve) Adopting a growth mindset for continuous improvement. Building Positive Attitude (Types & Importance of Attitude)

UNIT –IV EMOTIONAL INTELLIGENCE 2

Emotional Intelligence (Difference Between IQ, EQ, and SQ) Managing Emotions & Building Emotional Competence - Power of Now

UNIT –V RELATIONSHIP MANAGEMENT 2

Understanding Relationships (Roles, Healthy Relationships) - Bridging Individual Differences (TA & Communication Styles) - Impression Management

UNIT –VI INTERPERSONAL RELATIONSHIP 2

Interpersonal Relationship Development (Skills & Types) - Theories of Interpersonal

TOTAL: 12 PERIODS

COURSE OUTCOMES:

1. Students will be able to identify and analyze their self-concept, self-image, and self-confidence, while recognizing their individual strengths and areas for improvement.
2. Students will demonstrate an understanding of the biological and psychological foundations of fear and apply techniques to transform negative thought patterns into positive affirmations.
3. Students will implement evidence-based strategies to enhance self-esteem and adopt a growth-oriented approach to personal and professional development.
4. Students will effectively regulate and manage emotions by applying practical Emotional Intelligence (EQ) frameworks.
5. Students will articulate various roles within relationships, identify traits of healthy relationships, and utilize communication skills to foster meaningful connections.
6. Students will examine the development, theoretical foundations, and essential skills required for cultivating effective interpersonal relationships.

TEXT BOOKS:

1. “Emotional Intelligence: Why It Can Matter More Than IQ” by Goleman and Daniel, 10th Anniversary Edition 2006, Bantam Books.
2. “The 7 Habits of Highly Effective People” by Covey and Stephen R, 30th Anniversary Edition 2020, Simon & Schuster Publisher.
3. “Personality Development and Soft Skills” by Mitra, Barun K, 2nd Edition 2011, Oxford University Press.
4. “You Can Win: A Step by Step Tool for Top Achievers” by Khera, Shiv, Revised and Updated Edition 2014, Bloomsbury India Publisher.

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1. “You Can Win: A Step by Step Tool for Top Achievers” by Khera, Shiv, Revised and Updated Edition 2018, Bloomsbury India Publisher.
2. “Personality Development and Soft Skills” by Mitra, Barun K, 2nd Edition 2016, Oxford University Press.
3. “The 7 Habits of Highly Effective People: Powerful Lessons in Personal Change” by Covey and Stephen R, 30th Anniversary Edition 2020.
4. “Emotional Intelligence: Why It Can Matter More Than IQ” by Goleman, Daniel, 10th Anniversary Edition 2006.

	ELECTRIC CIRCUITS AND ELECTRON DEVICES LAB	L T P C 0 0 3 1.5
COURSE OBJECTIVES:		
✓	To learn various parameters of ac and dc circuits with various laws and theorems	
✓	To study different performance characteristic curves of various amplifier circuits with different configuration.	
✓	To generate sinusoidal waveforms with different LC and RC oscillator tank circuits.	
LIST OF EXPERIMENTS:		
1.	Verification of Kirchhoff’s voltage and current law	
2.	Verification of Thevinin’s and Norton’s theorem	
3.	Verification of Super position theorem and Maximum power transfer theorem	
4.	Plot the frequency response and 3db curve of series and parallel resonance circuits	
5.	Plot V-I Characteristics curve of PN junction diode and Zener diode	
6.	Plot the input and output characteristic curves of CE, CB and CC configuration of BJT transistor circuits.	
7.	Plot the drain and transfer characteristic curves of JFET CS transistor configuration circuit.	
8.	Obtain the frequency response and 3db curve of a single stage CE and CS transistor amplifier	
9.	Construct Colpitts and Hartley oscillator and generate stable sinusoidal frequency with LC tank circuit	
10.	Construct RC phase shift oscillator and generate stable sinusoidal frequency with RC circuits	
11.	Plot the V-I characteristics of a Uni Junction Transistor and find its peak and valley point.	
	CONTENT BEYOND SYLLABUS	
12	Construct a single stage common emitter amplifier circuit and measure various parameters like Vc, Vb, Ve, Vcb, Vbe, Ic, Ie and Vce with the help of DMM	
TOTAL: 30 PERIODS		
COURSE OUTCOMES:		
At the end of the course the students are able to		
1.	Apply the concepts of Kirchhoff’s law to find voltages and current at various nodes of electric circuits.	

2.	Apply different biasing techniques to plot frequency response curves of various amplifier circuits with different configuration.
3.	Analyze different oscillator tank circuit to produce a stable sinusoidal wave forms with positive feedback

CO – PO MAPPING

CO	PO											PSO		
	1	2	3	4	5	6	7	8	9	10	11	1	2	3
1	3	3	2	2	-	-	-	3	-	-	2	1	1	1
2	3	2	3	2	-	-	-	3	-	-	2	1	1	1
3	3	3	2	2	-	-	-	3	-	-	2	1	1	1

LABORATORY REQUIREMENTS:

TOTAL 30 STUDENTS

Major Equipments:

Regulated Power Supply Single (0-30V)/2A – 10

Regulated power supply Dual (0 – 30V) / 2A – 10

Various ranges of Voltmeters – 15 Nos

Various ranges of Ammeters – 15 Nos

Digital Multimeters – 15

LCR Meter 02 Nos

Bread Board – 15 Nos

Cathode Ray Oscilloscope – 15 Nos

Function generators – 15 Nos

Consumables:

Carbon Resistors – 100 Nos (All values)

Capacitors – 100 Nos

Inductors – all values 50 nos

DRB

DIB

DCB

PN Diode – 1N4007 – 25

Zener diode – 10 Nos

BJT Transistors BC147, BC157, BC107 – Each 10

JFET – BFW 10 -10 Nos

JFET – BFW 11 – 10 Nos

UJT–2N2646 (metal)–10Nos

LED - 25 Nos

SCR – 2P4M – 25 Nos

Hook up wires 02 coils

	ADVANCED PYTHON PROGRAMMING	L T P C 3 0 0 3
COURSE OBJECTIVES:		
✓	To learn how to design object oriented programs with Python classes.	
✓	To understand threading concept and multithreading on Python.	
✓	To learn about lambda function and regular expression.	
✓	To develop GUI based applications and Graphics using python.	
✓	To use Numpy, Pandas and Matplotlib packages.	
✓	To know about real time applications of python.	
UNIT - 1	OBJECT ORIENTED PROGRAMMING IN PYTHON	8
Applications: OOPs concepts in Client Server Systems, OO Databases, Simulation and modeling.		
OOPs in python: Features of Object Oriented Programming system (OOPs) - classes and objects - Creating a class - the self variable, types of variables, namespaces – inheritance in python, types of inheritance – polymorphism – overloading – overriding – data hiding.		
UNIT - 2	THREADS AND ADVANCED FILE OPERATIONS	8
Applications: Multiprocessing, better resource utilization, rendering graphics.		
Threads in python: Difference between process and thread - types of threads - benefits of threads - creating threads – multithreading – starting a thread - thread synchronization. File operations – modes of opening a file – seek() and tell() - working with text file , binary file and CSV file – preparing a pdf file after data processing.		
UNIT - 3	LAMBDA FUNCTION AND REGULAR EXPRESSION	8
Applications: Quick data manipulation, less number of lines in coding, flexibility, pattern matching, word (or) character searching.		
Lambda function – syntax - advantages over normal function – difference between lambda and def - Regular expression - sequence characters in regular expressions - quantifiers in regular expressions - special characters in regular expressions - using regular expression on files - retrieving information from a file.		
UNIT - 4	GRAPHICAL USER INTERFACE & GRAPHICS IN PYTHON	8

Applications: Self ticket booking system, Video games, Designing Web pages.		
Graphical user interface: Creating a GUI in python - widget classes - working with Fonts and Colors, working with Frames, Layout manager, Event handling – Graphics in python - Turtle Graphics – turtle attributes and methods - Creating drawings and animations – simple shapes – working with colors and pen size – Using loops and functions – creating designs.		
UNIT - 5	PACKAGES IN PYTHON	8
Applications: Data Analysis and Visualization, real time numerical calculations, image processing, AIML model predictions.		
Introduction to Numpy -Creation of vectors and matrices - Matrix manipulation - Pandas - Pandas data structures – Series and Data Frame - Data wrangling using pandas – Matplotlib - Scatter plot - Line plot - Bar chart.		
UNIT - 6	REAL TIME APPLICATIONS	5
Python in Web Development, Data Science , Artificial Intelligence and Machine Learning, Deep Learning, 3D game development, Web Scrap applications, Search Engine optimization. Familiar companies uses python – Netflix, Facebook, Spotify, Google, AWS uses Django and Flask.		
TOTAL: 45 PERIODS		
OUTCOMES:		
At the end of the course the students would be able to		
1	Understand OOP concepts in Python including inheritance and polymorphism.	
2	Work with files and perform operations on it using Python	
3	Implement regular expression and concept of threads for developing efficient program	
4	Design GUI based applications using Python	
5	Gain knowledge of using Numpy, Pandas and Matplotlib packages.	
6	Know the real time applications and familiar companies using python	
TEXT BOOKS:		
1.	Paul Gries , Jennifer Campbell, Jason Montojo, Practical Programming: An Introduction to Computer Science Using Python 3, Pragmatic Bookshelf, 3rd Edition, 2018.	
2.	Programming through Python, M. T Savaliya, R. K. Maurya, G M Magar, Revised Edition, Sybgen Learning India, 2020.	
REFERENCES:		
1	Advanced Python Programming, Dr. Gabriele Lanaro, Quan Nguyen, Sakis Kasampalis, Packet Publishing, 2019.	

2	Programming in Python 3, Mark Summerfield, Pearson Education, 2nd Ed, 2018.
3	Python: The Complete Reference, Martin C. Brown, McGraw Hill, 2018.
4	Beginning Python: From Novice to Professional, Magnus Lie Hetland, Apress, 2017.
5	Programming in Python 3, Mark Summerfield, Pearson Education, 2nd Ed, 2018.