VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

ACCREDITED BY NAAC WITH 'A++' GRADE

Ibrahimbagh, Hyderabad-31

Approved by A.I.C.T.E., New Delhi and

Affiliated to Osmania University, Hyderabad-07

Sponsored

by

VASAVI ACADEMY OF EDUCATION

Hyderabad

SCHEME OF INSTRUCTION AND SYLLABI UNDER CBCS FOR

B.E. (CSE) I and II Semesters

With effect from 2025-26

(For the batch admitted in 2025-26)

(R-25)

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Phones: +91-40-23146020, 23146021

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Institute Vision

Striving for a symbiosis of technological excellence and human values

Institute Mission

To arm young brains with competitive technology and nurture holistic development of the individuals for a better tomorrow

Department Vision

To be a center for academic excellence in the field of Computer Science and Engineering education to enable graduates to be ethical and competent professionals

Department Mission

To enable students to develop logic and problem solving approach that will help build their careers in the innovative field of computing and provide creative solutions for the benefit of society.

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B.E (CSE) Program Educational Objectives (PEO's)	
Graduates should be able to utilize the knowledge gained from their academic program to:	
PEO I	Solve problems in a modern technological society as valuable and productive engineers.
PEO II	Function and communicate effectively, both individually and within multidisciplinary teams.
PEO III	Be sensitive to the consequences of their work, both ethically and professionally, for productive professional careers.
PEO IV	Continue the process of life-long learning.

B.E. (CSE) PROGRAM OUTCOMES (PO's) 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.
P1O	**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.
P11	**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.
P12	**Lifelong learning:** Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

B.E (CSE) PROGRAM SPECIFIC OUTCOMES (PSO's)	
PSO I	Graduates will have knowledge of programming and designing to develop solutions for engineering problems.
PSO II	Graduates will be able to demonstrate an understanding of system architecture, information management and networking.
PSO III	Graduates will possess knowledge of computer science and engineering in the areas of Cloud Computing & Data Analytics and apply them in appropriate domains.

With effect from the Academic Year 2025-26

SCHEME OF INSTRUCTION AND EXAMINATION(R-25)
FOR B.E 2025-26 ADMITTED BATCH I SEMESTER (A.Y 2025-26)

B.E (CSE) I Semester								
Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			
		Hours per Week			Duration in Hrs	Maximum Marks		Credits
		L	T	P/D		SEE	CIE	
THEORY								
U25BS120MA	Calculus & Linear Algebra	3	-	-	3	60	40	3
U25BS110PH	Physics of Semiconductors	2	-	-	3	60	40	2
UI25ES120CS	Programming for Problem Solving	3	-	-	3	60	40	3
U25ES130EC	Introduction to Electronics Engineering	2	-	-	3	60	40	2
U25ES010CE	Basic Engineering Mechanics	2	-	-	3	60	40	2
U25ES030CE	Basic Engineering Drawing	1	-	2	3	60	40	2
U25HS020EH	Human Values and Professional Ethics-I	1	-	-	2	40	30	1
U25HS040EH	Learning to Learn	1	-	-	2	40	30	1
UI25PE110CS	Skill Development Course-I (Technical Skills-I)	1	-	-	2	40	30	1
PRACTICALS								
U25BS111PH	Semiconductor and Optoelectronics Lab	-	-	2	3	50	30	1
UI25ES121CS	Programming for Problem Solving Lab	-	-	2	3	50	30	1
U25ES131EC	Introduction to Electronics Engineering Lab	-	-	2	3	50	30	1
Sports / Library / Mentor Interaction/CC		-	-	-	-	-	-	-
	TOTAL	**16**	**-**	**8**	-	**630**	**420**	**20**
	GRAND TOTAL	**24**			-	**1050**		
Student should acquire one NPTEL course certification of 8 weeks duration (2 credits) during I Sem to VI Sem								

VASAVI COLLEGE OF ENGINEERING (Autonomous)

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IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF MATHEMATICS

CALCULUS & LINEAR ALGEBRA

SYLLABUS FOR B.E. I-SEMESTER

(Common to CSE, CSE-AI & ML and IT)

L:T:P (Hrs./week):3:0:0	SEE Marks : 60	Course Code : **U25BS120MA**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** **On completion of the course, students will be able to**
1. Develop a deep understanding of **the** concepts of Improper integrals Beta, Gamma functions and their properties. **2. Learn** the concepts of limits, continuity, partial derivatives of functions of several variables and derivative of composite functions, Taylor's series for functions of two variables, and maxima and minima of functions of several variables. **3. Study** the fundamental concepts of vector spaces, vector subspaces, linear dependence and independence of vectors, span, basis of a vector space, dimension of a vector space, and coordinates. **4**. **Understand** the fundamental concepts of Linear transformation and their properties. **5. Understand** of linear algebra concepts, including the rank of a matrix, characteristic equation, eigen values and eigenvectors, Diagonalization using Similarity Transformation.	**1. Evaluate** Improper integrals using Beta, Gamma functions. **2. Find** partial derivatives of functions of several variables and apply Taylor's series for functions of two variables and to find maxima and minima of a function of several variables. **3. Analyze** vector spaces and their subspaces, determine linear dependence and independence of vectors, determine basis of a vector space and compute the dimension of a vector space. **4. Determine** Linear transformations, their Null space and Range Space, calculating the dimension of these spaces, understanding the Rank and Nullity of a linear transformation, and representing a Linear transformation using a matrix. **5. Find** the rank of a matrix, eigen values and eigen vectors and to Diagonalize a matrix using similarity transformation to real-world problems.

CO-PO mapping												
CO	**PO**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3	2										1
CO2	3	2										1
CO3	3	2										1
CO4	3	2										1
CO5	3	2										1

UNIT- I (08 classes)

SPECIAL FUNCTIONS

Definition of Improper Integrals- Beta function - Gamma function - Relations between Beta & Gamma function - Properties of Beta and Gamma functions.

UNIT –II (08 classes)

MULTIVARIABLE CALCULUS

Limits- Continuity (Concepts) - Partial Derivatives - Higher Order Partial Derivatives - Total

Derivatives - Derivatives of Composite and implicit functions - Taylor's series of functions of two variables - Maxima and Minima of functions of two variables - Lagrange's Method of multipliers.

UNIT-III: (08 classes)

VECTOR SPACES

Definition of Vector Space - Vector Subspaces – Linear Dependence and Independence of vectors - Span of a set of vectors - Basis of Vector Space – Dimension of a Vector Space –Co-ordinates.

UNIT-IV (08 classes)

LINEAR TRANSFORMATIONS

Introduction to Linear Transformations- The null space and range of a linear map – Dimension of Null space and Range space - Rank - Nullity theorem (without proof)-Matrix of a Linear Transformation.

UNIT-V (08 classes)

MATRICES

Rank of a Matrix - Characteristic equation - Eigen values and Eigenvectors – Diagonalization using Orthogonal Transformation - Quadratic form - Reduction of Quadratic form to Canonical form.

Text Books:

1. Advanced Engineering Mathematics, Third Edition, R. K. Jain and S. R. K. Iyengar, Narosa Publishing House.
2. Higher Engineering Mathematics, B. S. Grewal $40^{th.}$ Edition, Khanna Publishers.
3. Introduction to Linear algebra with applications, Jim DeFranza, Daniel Gagliardi, Tata McGraw-Hill

Reference Books:

1. Advanced Engineering Mathematics 8^{th} Edition by Erwin Kreyszig, John Wiley & Sons.
2. Differential Calculus by Shanti Narayan, S. Chand & Co
3. Elementary Linear algebra, Anton and Rorres, Wiley India Edition

4. An introduction to Linear Algebra, V.P Mainra, J.L Arora, Affiliated to East-West Press Pvt Ltd

Online Resources:

1. https://onlinecourses.swayam2.ac.in/cec24_ma10/preview
2. https://onlinecourses.nptel.ac.in/noc24_ma31/preview

The break-up of CIE : Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests : 90 Minutes

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IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF PHYSICS

PHYSICS OF SEMICONDUCTORS (POS)

SYLLABUS FOR B.E. I-SEMESTER

(Common to CSE, AI&ML and IT)

L:T:P(Hrs/week):2:0:0	SEE Marks:60	Course Code: **U25BS110PH**
Credits :02	CIE Marks:40	Duration of SEE: 3 Hours

Course Objectives	Course Outcomes
1. To appreciate the merits of quantum mechanics over classical mechanics.	1. To apply quantum mechanical laws and interpret quantum tunnelling phenomenon.
2. To arrive at the expression for carrier concentration in semiconductors and analyze various semiconductor devices	2. To estimate required carrier concentration and elucidate working of optoelectronic devices
3. To comprehend lasing action and relate the use of lasers in optical fiber communication	3. To compare different types of lasers and summarize merits and demerits of optical fibers.
4. To introduce basics of quantum computing	4. To interpret various types of qubits and their probable advantages

CO-PO mapping												
CO	PO											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3	3	-	-	-	-	-	-	-	-	-	1
CO2	3	3	-	-	-	-	-	-	-	-	-	1
CO3	3	3	-	-	-	-	-	-	-	-	-	1
CO4	3	3	-	-	-	-	-	-	-	-	-	1
CO5	3	3	-	-	-	-	-	-	-	-	-	1

UNIT-I: FUNDAMENTALS OF QUANTUM MECHANICS (08 hours)

de Broglie waves and their properties, wave packet, wave function and its significance, Schrodinger time dependent and independent wave equations. Eigen values and Eigen functions of one-dimensional infinite square-well potential (particle in a box). Potential barrier problem and tunnelling phenomenon.

UNIT-II: PHYSICS OF SEMICONDUCTORS AND DEVICES (10 hours)

Kronig-Penny model, effective mass of an electron, Fermi energy level and variation of Fermi energy level with temperature, density of states, expression for intrinsic equilibrium carrier concentration, conductivity of intrinsic and extrinsic semiconductors, Hall effect and its applications.

Optoelectronic Devices: Principle, construction and working of LED, photodiode, solar cell and applications.

UNIT-III: LASERS AND OPTICAL FIBERS (10 hours)

Lasers: Stimulated emissions, characteristics of lasers, population inversion, meta-stable states, pumping mechanisms, components of laser, types of lasers, construction and working of semiconductor laser, advantages, and applications of lasers.

Optical Fibers: principle of optical fiber, propagation of light in optical fiber, numerical aperture, acceptance angle, types of optical fibers, signal losses in optical fibers: Attenuation-absorption, scattering, bending and alignment losses, signal distortion, block diagram of optical communication system, advantages, and application of optical fibers.

UNIT-IV: BASICS OF QUANTUM COMPUTING (12hours)

Introduction to Ket and Bra vectors, Qubits, superposition, entanglement, interference, decoherence of qubits, difference between quantum and classical computers, basics of quantum gates: Pauli's X-gate, CNOT gate and Hadamard gate.

Physical implementation of qubits (very qualitative description)
Solid State Qubits: Semiconducting Qubits- quantum dots, spins
Superconducting Qubits: Josephson's junctions, SQUIDS, Charge, Flux and Phase
Applications of quantum computers.

Learning Resources:

1. Donald A Neamen, Semiconductor Physics and Devices, 3rd edition, Tata McGraw 2008.
2. S O Pillai, Solid State Physics, 8th edition, New Age International Publishers, 2018
3. S.O. Kasap, Optoelectronic and Photonics: Principles and Practices, Pearson, 2001
4. M.N. Avadhanulu and P.G. Kshirsagar and TVS Arun, Murthy A Textbook Engineering Physics, 11th edition, S. Chand, 2019.
5. Quantum Mechanics: Theory and Applications**"** by Ajoy Ghatak and S. Lokanathan, Springer-Verlag New York Inc., 2004.
6. Quantum Computation and Quantum Information Michael A. Nielsen & Isaac L. Chuang, 10th Anniversary Edition, Cambridge University Press
7. "Quantum Computing for Computer Scientists" by Noson S. Yanofsky and Mirco A. Mannucci Cambridge University Press, 2008.

The break-up of CIE : Internal Test + Assignments + Quizzes

1	No. of Internal Test:	02	Max. Marks for each Internal Test:	30
2	No. of Assignments:	03	Max. Marks for each Assignment:	5
3	No. of Quizzes:	03	Max. Marks for each Quiz Test:	5

Duration of Internal Test: 90 Minutes

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IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

PROGRAMMING FOR PROBLEM SOLVING

SYLLABUS FOR B.E. I-SEMESTER

L:T:P (Hrs./week):3:0:0	SEE Marks : 60	Course Code :**UI25ES120CS**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
1 Acquire problem solving skills. 2 Develop flow charts. 3 Understand structured programming concepts. 4 Write programs in C Language.	1 Design flowcharts and algorithms for solving a given problem using the fundamentals of programming. 2 Apply decision making, looping constructs and functions to develop programs for a given problem. 3 Store data using arrays and perform searching and sorting operations on the data. 4 Design programs on string handling and operations on arrays using dynamic memory management techniques. 5 Develop programs to store data and perform operations using structures and files.

CO-PO and CO-PSO mapping

CO	PO												PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	3	2	1									2		
CO2	3	2	2	2	1							1	3		
CO3	2	1	1	1								2	3	1	1
CO4	3	1	1	1								1	2	1	
CO5	3	2	2	2	1							1	3	1	1

UNIT-I:

Introduction to Computers: Computer Systems, Computing Environments, Computer Languages, Creating and Running Programs, Software Development, Flowcharts. Number Systems (Binary, Octal, Decimal and Hexadecimal), Representation of Numbers (Fixed and Floating Point).

Introduction to C Language: Background, C Programs, Identifiers, Types, Variables, Constants, Input/Output, Expressions, Precedence and Associativity, Side Effects, Evaluating Expressions, Type Conversion, Statements, Bitwise Operators.

UNIT-II:

Selection: Logical Data and Operators, if... else, switch Statements, Standard Functions.

Repetition: Loops, while, for, do-while Statements, Loop Examples, break, continue, goto.

Functions: Designing Structured Programs, Functions Basics, User Defined Functions, Inter-Function Communication, Standard Functions, Scope, Storage Classes-Auto, Register, Static, Extern, Scope Rules and Type Qualifiers.

UNIT-III:

Recursion: Recursive Functions, Preprocessor Commands.

Arrays: Concepts, Using Arrays in C, Inter-Function Communication, Array Applications, Two-Dimensional Arrays, Multidimensional Arrays, Linear Search and Binary Search, Selection Sort and Bubble Sort.

UNIT-IV:

Pointers: Introduction, Pointers for Inter-Function Communication, Pointers to Pointers, Compatibility, LValue and RValue, Arrays and Pointers, Pointer Arithmetic and Arrays, Passing on Array to a Function, Memory Allocation Functions, Array of Pointers, Programming Applications, Pointers to void, Pointers to Functions, Command Line Arguments.

Strings: Concepts, C Strings, String Input/Output, Functions, Arrays of Strings, String Manipulation Functions.

UNIT-V: Type Definition (typedef), Enumerated Types.

Structure: Definition and Initialization of Structures, Accessing Structures, Nested Structures, Arrays of Structures, Structures and Functions, Pointers to Structures, Self Referential Structures, Unions.

Input and Output: Files, Streams, Standard Library Input/Output Functions, Character Input/Output Functions.

Learning Resources:

1. Forouzan B.A & Richard F. Gilberg, A Structured Programming Approach using C,3rd Edition(2013), Cengage Learning.
2. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, 2nd Edition (2006), Prentice-Hall.
3. Rajaraman V, The Fundamentals of Computer, 4th Edition(2006), Prentice-Hall of India
4. Steve Oualline, Practical CProgramming,3rd Edition(2006),O'Reilly Press.
5. Jeri R. Hanly, Elliot B. Koffman, Problem Solving and Program Design in C, 5thEdition (2007), Pearson Education.
6. Balagurusamy E, Programming in ANSI C, 4th Edition(2008), TMG.
7. Gottfried, Programming with C, 3rd Edition(2010), TMH.
8. R G Dromey, How to Solve it byComputer,1st Edition(2006), Pearson Education.

The break-up of CIE : Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests : 90 Minutes

Duration of Internal Test : 1 Hour 30 Minutes

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

INTRODUCTION TO ELECTRONICS ENGINEERING

SYLLABUS FOR B.E. I – SEMESTER

L:T:P (Hrs/week): 2:0:0	SEE Marks : 60	Course Code: **U25ES130EC**
Credits : 2	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** **On completion of the course, students will be able to**
1. To understand the characteristics and operation of different electronic devices. 2. To understand the importance of feedback in amplifiers and oscillators 3. To study the working of rectifiers, transistor amplifiers, operational amplifiers and oscillators. 4. To study the working principle of different types of transducers and sensors	1. Describe the input and output characteristics of Diode, BJT and MOSFET. 2. Appreciate the advantages of negative feedback in amplifiers and to design simple RC type, LC type oscillators using BJT. 3. Demonstrate the working of operational amplifier as Differentiator, Integrator etc. 4. Demonstrate the ability to select and apply appropriate transducer and sensor to convert real world physical parameters into electrical signals for IOT applications.

CO-PO Mapping

CO	PO												PSO
	1	2	3	4	5	6	7	8	9	10	11	12	1
CO1	3	2	-	-	-	-	-	-	-	-	-	-	3
CO2	3	1	2	-	-	-	-	-	-	-	-	-	3
CO3	3	2	-	-	-	-	-	-	-	-	-	-	3
CO4	3	1	-	-	-	2	-	-	-	-	-	-	3

UNIT-I: Semiconductor Devices

P-N Junction diode Rectifiers: Half Wave and Full Wave Rectifiers (Bridge and Centre tapped), Ripple factor and Efficiency, Zener Voltage Regulator, Bipolar Junction Transistor (BJT), Working principle, Configurations, Transistor parameters, Problems, Transistor as an amplifier, Metal Oxide Semiconductor Field Effect Transistor (MOSFET), Types (Depletion and Enhancement), MOSFET characteristics.

UNIT-II: Feedback Concepts

Basic concept of feedback, Types of feedback, Advantages of Negative feedback in amplifiers; Oscillators: Classification, LC Type and RC Type Oscillators and Crystal Oscillators (Qualitative treatment only)

UNIT-III: Operational Amplifiers

Introduction, Characteristics of Ideal Operational amplifier, Parameters, Open loop and closed loop configurations, Applications (Adder, Subtractor, Comparator, Voltage follower, Integrator, Differentiator)

UNIT-IV: Data Acquisition Systems

Introduction, Classification of transducers, Temperature transducers (Thermocouple), Piezoelectric transducer, Photoelectric transducer; Ultrasonic Sensors, PIR Sensors, Gas Sensors and Humidity Sensors.

Learning Resources:

1. S.Shalivahan, N. Suresh Kumar, A Vallavea Raj Electronic Devices and Circuits Tata McGraw Hill, 2003.
2. Boylestad and Nashelsky, “Electronic Devices and Circuits”, Eleventh Edition, Pearson.
3. Jacob Milman & C., Halkias, Electronic devices Eighth Edition, Reprinted, Mc Graw Hill,1985.
4. Ramakanth A. Gayakwad, Op-AMPS and Linear Integrated Circuits, 3rdedition, Prentice Hall of India,1985.
5. https://nptel.ac.in/courses/117103063/

The break-up of CIE : Internal Tests + Assignments + Quizzes

1.	No. of Internal Tests	: 2	Max. Marks for each Internal Tests	:	30
2.	No. of Assignments	: 3	Max. Marks for each Assignment	:	5
3.	No. of Quizzes	: 3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests: 90 Minutes

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IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

BASIC ENGINEERING MECHANICS

(Common to CSE, AI&ML, ECE, EEE & Mechanical Engineering)

SYLLABUS FOR B.E. I SEMESTER

L : T : P(Hrs./week):2:0:0	SEE Marks:60	Course Code: **U25ES010CE**
Credits: 2	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	At the end of the course, students will be able to:
1. Explain the resolution of a system of forces (coplanar, spatial, concurrent, non-concurrent) and compute their resultant. 2. Solve particle equilibrium problem using equation of equilibrium 3. Determine forces in the members of a truss 4. Perform analysis of bodies lying on rough surfaces. 5. Locate the centroid of a body and also compute the area moment of inertia of standard sections.	1. Determine resultant of forces acting on a body. 2. Analyse equilibrium of a body subjected to a system of forces. 3. Perform analysis of trusses using method of joints and method of sections. 4. Solve problem of bodies subjected to friction. 5. Find the location of centroid and calculate moment of inertia.

CO-PO mapping												
CO	PO											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3	2	1						1	3		
CO2	3	2	1						1	3		
CO3	3	2	1						1	3		
CO4	3	2	1						1	3		
CO5	3	2	1						1	3		

UNIT-I: Force Systems: Rectangular components, moment, couple and resultant of two dimensional force systems.

UNIT-II: Equilibrium of Force Systems: Free body diagram, Equations of equilibrium, Equilibrium of two dimensional force systems.

UNIT-III: Determinate Trusses: Analysis of plane trusses like Warren girder, Pratt truss, Fink truss etc using method of joints and method of sections.

UNIT-IV: Friction: Laws of friction. Application to simple systems, Connected systems Wedge friction.

UNIT-V: Centroid and Moment of Inertia: Centroids of lines, areas, Moment of inertia of areas for regular bodies (T, I & C-Sections)

Learning Resources:

1. Singer F.L "Engineering Mechanics", Harper & Collins, Singapore, 3rd Edition 2023.
2. Timoshenko S.P and Young D.H "Engineering Mechanics", McGraw Hill International Edition, 2017
3. Andrew Pytel., JaanKiusalaas., "Engineering Mechanics", 4th edition, Cengage Learning, 2015.
4. Beer F.P & Johnston E.R Jr. "VectorMechanics for Engineers", TMH, 2019.
5. Hibbeler R.C, "Engineering Mechanics", 4th edition, Pearson Education, 2017.
6. Tayal A.K., "Engineering Mechanics – Statics & Dynamics", 4th Edition, Umesh Publications, 2011.
7. Basudeb Bhattacharyya., "Engineering Mechanics", Oxford University Press, 2014, 2nd Edition
8. Meriam. J. L. and Kraige L.G., "Engineering Mechanics", Volume-I Statics, John Wiley & Sons, 2017.
9. NPTEL Course (www.nptel.ac.in)
10. Virtual labs (www.vlab.co.in)

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests : 90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)

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IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

BASIC ENGINEERING DRAWING

(Common to CSE, AIML & IT)

SYLLABUS FOR B.E. I-SEMESTER

L:T:P (Hrs./week): 1:0:2	SEE Marks: 60	Course Code: **U25ES030CE**
Credits: 2	CIE Marks: 40	Duration of SEE: 3Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	**At the end of the course, students will be able to:**
1. Impart skills in using drawing instruments to convey exact and complete information of the object. 2. Construct conic sections and regular polygons. 3. Construct the orthographic projections of points, lines, planes and solids.	1. Understand the fundamentals of drawing, Draw polygons and Conics. 2. Draw the orthographic projections of points and straight lines. 3. Draw the orthographic projections of planes inclined to both reference planes. 4. Draw the orthographic projections of solids inclined to one reference plane.

CO-PO mapping												
CO	PO											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3	2	2						2	3		
CO2	3	2	2						2	3		
CO3	3	2	2						2	3		
CO4	3	2	1						2	3		
CO5	3	2	2						2	3		

UNIT-I: Introduction to Engineering Drawing: Necessity of Engineering Drawing for engineers, Use of Drawing Instruments, Types of Lines, Lettering practice, Dimensioning and its methods, Conic sections by eccentricity method, Regular polygons given the length of side.

UNIT-II: Orthographic Projections: Principles of orthographic projections, conventions, projections of points placed in different quadrants.
Projections of straight lines inclined to one and two reference planes placed infirst quadrant – Determination of final projections given true length and inclinations; Determination of true length and inclinations given projections ($\theta+\phi<90°$Only)

UNIT-III: Projections of Planes: Projections of perpendicular planes, oblique planes- cases of an element of plane in HP or VP only.

UNIT-IV: Projections of Regular Solids: Projections of prism, cylinder, pyramid and cone in simple positions and axis inclined to one reference plane.

Learning Resource:

1. Bhatt N.D. "Elementary Engineering Drawing", Charotar Publishers,54th Edition, 2023.
2. Basanth Agrawal, Agrawal C.M " Engineering Drawing" Second Edition, Tata McGraw Hill,2019
3. Thomas E French, Charles J Vierck, Robert J. Foster,"Engineering Drawing and Graphic Technology",Mc Graw Hill Education, 1993.
4. GillP.S."Engineering Drawing: Geometrical Drawing",S K Kataria & sons,13th Edition, 2021.
5. Venugopal.K"Engineering Drawing and Graphics Plus Autocad",New Age International (P) Ltd., New Delhi,2011.
6. Siddiquee A.N" Engineering Drawing with a Primer on Autocad",Prentice hall of India Ltd., New Delhi,2004.
7. BVR Gupta, M RajaRoy, "Engineering Drawing with AutoCad",IK Int Pvt Ltd,2020.
8. NPTELCourse(www.nptel.ac.in)
9. Virtuallabs(www.vlab.co.in)

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests : 90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)

ACCREDITED BY NAAC WITH 'A++' GRADE

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Humanities & Social Sciences

Human Values and Professional Ethics-I

SYLLABUS FOR B.E- I SEMESTER (COMMON FOR ALL BRANCHES)

L:T:P(Hrs/Week):1:0:0	SEE Marks: 40	Course Code: **U25HS020EH**
Credits: 1	CIE Marks: 30	Duration of SEE: 02 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES**
The course will enable the students to: -	On completion of this course the student will be able to :
1. Get a holistic perspective of value- based education. 2. Grasp the meaning of basic human aspirations vis-a-vis the professional aspirations 3. Understand professionalism in harmony with self and society. 4. Develop ethical human conduct and professional competence. 5. Enrich their interactions with the world around, both professional and personal.	1. Understand the significance of value inputs in a classroom and start applying them in their life and profession 2. Distinguish between Personal and Professional life goals–constantly evolving into better human beings and professionals. 3. Work out the strategy to actualize a harmonious environment wherever they work. 4. Distinguish between ethical and unethical practices, and start implementing ethical practices 5. Apply ethics and values in their personal and professional interactions.

CO-PO mapping												
CO/PO	**PO**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1						3						
CO2							3					
CO3								3				
CO4												3
CO5												

UNIT-1 HARMONY WITH SELF AND FAMILY

Understanding and living in harmony at various levels-with self, family, society and nature and the Ethical and moral values**:** which include self-sufficiency, self-determination, self-advocacy, self-competence, self-direction, self-efficacies, self-regulation, self-reliance, and self-responsibility. This also includes Family values involving all the ideas of how you want to live your family life, and they are often passed down from previous generations.

1.1 Self-Values and Ethics
1.2 Family – Values and Ethics
1.3 Self-Care Practices

UNIT-2 PROFESSIONAL VALUES AND BEHAVIOUR

At the level of individuals: as socially and ecologically responsible engineers and technologists. Team Work: Developing Credibility and building trust by having open and truthful communication. This includes recognizing the value of time and respecting time of self and others.

2.1 Professional Ethics – Individual
2.2 Professional Behaviour - Body Language and Etiquette
2.3 Professional Ethics – Team

UNIT-3 SOCIAL VALUES

Values of service, social justice, dignity and worth of the person Importance of human relationships, integrity, and competence.

3.1 Understanding Social Values
3.2 Importance of relationship
3.3 Diversity and Inclusion

UNIT -4 SPIRITUAL VALUES

Developing individual practice has to do with having a sense of peace and purpose. Spiritual values, namely, benevolence, charity, dignity, forbearance, hope, humility, kindness, love, modesty, peace, perseverance, piety, repentance, righteous, sacredness, sincerity, steadfastness, striving, trusting, truthfulness, unity, and wisdom.

4.1 Exploring Different Traditions
4.2 Values in Action
4.3 Spirituality in Everyday Life

MODE of DELIVERY

● Questionnaires ● Quizzes ● Case-studies ● Observations and practice ● Home and classroom assignments	● Discussions ● Skits ● Short Movies/documentaries ● Team tasks and individual tasks ● Research based tasks ● Viva

Relevant Websites, CD's and Documentaries

- https://plato.stanford.edu/

Learning Resources:

learn.talentsprint.com

1. Sapiens: A Brief History of Humankind By Yuval Noah Harari
2. How to Think About What You Don't Know: The Art of Counterfactual Thinking by Judith Lichtenberg
3. Ethics in the Professions by Charles E. W. Tessera
4. Thinking in Ethics: A Practical Guide to Right and Wrong by Jeanne Halifax

Additional Reading

1. Akash Singh Rathore - On Constitution

The break-up of marks for CIE:

Internal Tests + Quiz Tests + Assignments

1. No. of Internal Tests: 1 Max. Marks for each Internal Tests: 20
2. No. of Assignments : 2 Max. Marks for each Assignments : 5
3. No. of Quizzes : 2 Max. Marks for each Quiz Tests :5

Duration of Internal Tests : 90 minutes

VASAVI COLLEGE OF ENGINEERING(Autonomous)

ACCREDITED BY NAAC WITH 'A++' GRADE

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Humanities and Social Sciences

LEARNING TO LEARN

SYLLABUS FOR B.E.I-SEMESTER

L:T:P(Hrs/Week):2:0:0	SEE Marks: 40	Course Code: **U25OE040EH**
Credits: 1	CIE Marks: 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the learners to:	**At the end of the course the learners will be able to:**
1. Understand the importance of a growth mindset and personal learning styles. 2. Learn techniques to improve memory retention and focus for effective learning. 3. Develop practical time management skills to prioritize tasks effectively. 4. Help students understand questions, structure answers effectively, and manage time for improved exam performance.	1. Students will be able to adopt a growth mindset and customize learning strategies based on their strengths. 2. Students will apply mnemonic devices, active recall, and focus strategies to enhance their learning process. 3. Students will implement time-blocking and prioritization techniques for better productivity. 4. Students will apply strategies to interpret questions and write clear, effective answers within time limits.

CO-PO mapping												
CO/PO	PO											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1					3							
CO2					3							
CO3												3
CO4					3							

Overview:

In an era shaped by rapid change and evolving technologies, the ability to learn continuously is a core skill for personal and professional success. This course is designed to help engineering students become self-directed, adaptable learners. By exploring mindset, memory techniques, focus strategies, time management, and reflection, students will develop learning habits that support lifelong growth and workplace readiness.

UNIT 1: Foundations of Learning
Builds a strong base for lifelong learning through mindset, self-awareness, and personal learning styles.

1.1 Growth Mindset
1.2 Understanding Learning Styles
1.3 Overcoming Procrastination

Learning Outcomes:

- Cultivate a growth mindset to embrace challenges and persist in learning
- Identify personal learning preferences and adapt strategies accordingly
- Recognize and overcome common learning barriers like procrastination

UNIT 2: Memory and Focus
Equips students with practical strategies to improve attention and information retention.

2.1 Techniques for Focus and Attention
2.2 Spaced Repetition and Active Recall
2.3 Mind Mapping for Retention

Learning Outcomes:

- Practice focused learning using tools like Pomodoro and distraction management
- Enhance memory with scientifically supported methods like spaced repetition and recall
- Use visual techniques such as mind maps to organize and retain complex content

UNIT 3: Managing Time Effectively
Enables students to manage academic and personal responsibilities through smart scheduling and prioritization.
3.1 Prioritization (Eisenhower Matrix)
3.2 Time Management Tools
3.3 Balancing Academics and Personal Goals

Learning Outcomes:

- Prioritize tasks using structured models for better academic planning
- Use digital or physical tools to track goals, deadlines, and productivity
- Design a sustainable routine that aligns academic success with well-being

UNIT 4: Strategic Exam Skills Decoded
Focuses on building strategic approaches to tackle exams effectively, with emphasis on comprehension, answer structuring, and time-bound performance.
4.1 Understanding the Question
4.2 Structuring the Answer

4.3 Customizing Answers for Impact

Learning Outcomes:

- Interpret exam questions accurately and identify the expected response type and depth.
- Construct well-structured, relevant answers tailored to the marks and keywords in the question.
- Recognize and eliminate common answer-writing errors like digression and unnecessary detail.

Suggested Books

1. Mindset: The New Psychology of Success by Carol S. Dweck
2. Make It Stick: The Science of Successful Learning by Peter C. Brown, Henry L. Roediger III, and Mark A. McDaniel
3. Eat That Frog! by Brian Tracy
4. How to Write Better Essays by Bryan Greetham

LEARNING RESOURCES

learn.talentsprint.com

The break-up of marks for CIE :
Internal Tests + Quiz Tests + Assignments

1. No. of Internal Tests: 1 Max. Marks for each Internal Tests: 20
2. No. of Assignments: 1 Max. Marks for each Assignments: 5
3. No. of Quizzes: 1 Max. Marks for each Quiz Tests: 5

Duration of Internal Tests : 90 minutes

VASAVI COLLEGE OF ENGINEERING(Autonomous)

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IBRAHIMBAGH, HYDERABAD – 500 031

Department of Computer Science & Engineering

Skill Development Course-I (Technical Skills-I)
Problem Solving through C Programming

SYLLABUS FOR B.E. I-SEMESTER

L:T:P (Hrs./week):1:0:0	SEE Marks : 40	Course Code:**UI25PE110CS**
Credits : 1	CIE Marks : 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
1. Understand the significance of Competitive Coding 2. Prepare the students for the contests relative to the concepts learnt 3. Build confidence in coding using Fundamental C Programming Concepts 4. Learn essential concepts for Competitive Coding	1. Solve scenario-based problems on Expression Evaluation, Iteration, Number Theory and Arrays. 2. Learn usage of matrices and functions in various applications with scenario-based problem solving through coding.

CO-PO mapping												
CO/ PO	**PO**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3	2	2	-	-	-	-	-	-	-	-	1
CO2	3	2	2	-	-	-	-	-	-	-	-	1

1. Problem Solving through Computing and Expression Evaluation

Introduction to coding, datatypes and I/O Statements, Expression Evaluation, Arithmetic Operations, Assignment Operations, Relational Operations, Logical Operations, Bitwise Operations, Ternary Operations, Increment Operations, Decrement Operations, Special Operators usage, Conditional Statements, Company Specific Examples & Competitive Programming Practice Problems

Contextual implementation using Competitive Coding using global coding platforms: Code chef/ Leet code / Codeforces / Hackerrank etc

2. Problem Solving using Iterative Statements and Number Theory Problems

Problem solving using Branching & Control Statements, Pattern Display problems, Number Theory problems, Company Specific Examples & Competitive Programming Practice Problems.

Contextual implementation using Competitive Coding using global coding platforms: Code chef/ Leet code / Codeforces / Hackerrank etc

3. Problem Solving using Linear List data: Arrays

Problem Solving using Linear data structures, Subscripts, Array problems, Company Specific Examples & Competitive Programming Practice Problems.

Contextual implementation using Competitive Coding using global coding platforms: Code chef/ Leet code / Codeforces / Hackerrank etc

4. Problem Solving using Linear List data: Matrix

Problem Solving using Matrix data, 2D Array Subscript, Row Major Order & Column Major Order Representation, Matrix Problems, Company Specific Examples & Competitive Programming Practice Problems.

Contextual implementation using Competitive Coding using global coding platforms: Code chef/ Leet code / Codeforces / Hackerrank etc

5. Problem Solving through Coding - Functions

Introduction to Modular Programming, Problem solving implementing functions, Inter Function communication, Problem solving on parameter passing and return values, Coding on various scopes of data in a program, Company Specific Examples & Competitive Programming Practice Problems.

Contextual implementation using Competitive Coding using global coding platforms: Code chef/ Leet code / Codeforces / Hackerrank etc

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	1	Max. Marks for each Internal Test	:	20
1	No. of Quizzes	:	1	Max. Marks for each Quiz	:	10

Duration of Internal Tests : 1 Hour 30 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)

ACCREDITED BY NAAC WITH 'A++' GRADE

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF PHYSICS

SEMICONDUCTOR AND OPTOELECTRONICS LAB

SYLLABUS FOR B.E. I SEMESTER

(Common to CSE, AI&ML and IT)

L:T:P(Hrs./week):0:0:2	SEE Marks:50	Course Code: **U25BS111PH**
Credits :01	CIE Marks:30	Duration of SEE: 3 Hours

Course Objectives	**Course Outcomes** On completion of the course, students will be able to
• to study and discuss the characteristics of a given device • to identify probable errors and take in the readings and known possible precautions • to compare the experimental and theoretical values and draw possible conclusions. • To interpret the results from the graphs drawn using experimental values. • To write the record independently with appropriate results.	1. to conduct experiment independently and in team to record the measurements 2. To outline the precautions required to be taken in each experiment 3. To compare the experimental results with standard values and estimate error percentage 4. To draw graphs and interpret the results with respect theoretical results. 5. To effectively write summary of the experiment and draw appropriate conclusions

CO-PO mapping												
CO	**PO**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3	1	-	-	-	-	-	-	2	-	-	1
CO2	3	1	-	-	-	-	-	-	-	-	-	1
CO3	3	2	-	-	-	-	-	-	-	-	-	1
CO4	3	1	-	-	-	-	-	-	-	-	-	1
CO5	3	1	-	-	-	-	-	2	-	-	-	1

Experiments:

1. Study of I-V characteristics of P-N Junction diode.
2. Study of I-V characteristics of Zener Diode
3. Study of I-V characteristics of LED
4. Study of characteristics of Photodiode
5. Study of I-V characteristics of solar cell and to calculate fill factor and efficiency
6. Determination of wavelength of laser light.
7. Determination of energy gap of a given semiconductor by four probe method
8. Hall's effect- Determination of Hall's coefficient, carrier concentration of given semiconductor
9. Calculation of numerical aperture, acceptance angle and power loss due to bending of an optical fiber.
10. Determination of Planck's constant using Photocell
11. Determination of e/m of an electron by Thomson's method
12. Determination of Seebeck coefficient

VASAVI COLLEGE OF ENGINEERING (Autonomous)

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IBRAHIMBAGH, HYDERABAD – 500 031

Department of Computer Science & Engineering

PROGRAMMING FOR PROBLEM SOLVING LAB

SYLLABUS FOR B.E. I-SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code :**UI25ES121CS**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
1. Understand the fundamentals of programming in C Language 2. Write, compile and debug programs in C. 3. Formulate solution to problems and implement in C. 4. Effectively choose programming components to solve computing problems.	1. Choose appropriate data type for implementing programs in C language. 2. Design and implement modular programs involving input output operations, decision making and looping constructs. 3. Implement search and sort operations on arrays. 4. Apply the concept of pointers for implementing programs on dynamic memory management and string handling. 5. Design and implement programs to store data in structures and files.

CO-PO and CO-PSO mapping															
CO	**PO**												**PSO**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
CO1	3	2	2	2	1									1	
CO2	3	2	2	2	2									3	
CO3	3	3	2	2	2	1								3	
CO4	3	3	2	2	2	1								2	2
CO5	3	3	2	2	2	1								3	2

Programming Exercise:

1. Programs to illustrate operators
2. Programs to illustrate selection control statements

3. Programs to illustrate loop control statements
4. Programs to illustrate nested loop control statements.
5. Programs to illustrate functions and recursion
6. Programs to illustrate one dimensional arrays, searching and sorting.
7. Programs to illustrate two dimensional arrays
8. Programs on pointers: pointer to arrays, pointer to functions.
9. Functions for string manipulations.
10. Programs on structures and unions.
11. Finding the number of characters, words and lines of given text file.
12. File handling programs.

Learning Resources:

1. Forouzan B.A & Richard F. Gilberg, A Structured Programming Approach using C, 3rd Edition(2013), Cengage Learning.
2. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, 2nd Edition (2006), Prentice-Hall.
3. Steve Oualline, Practical CProgramming,3rd Edition(2006),O'Reilly Press.
4. Balagurusamy E, Programming in ANSI C, 4th Edition(2008), TMG.

No. of Internal Test:	01	Max. Marks for Internal Test:	12
Marks for day-to-day laboratory class work			18
Duration of Internal Test: 120 Minutes			

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

INTRODUCTION TO ELECTRONICS ENGINEERING LAB

SYLLABUS FOR B.E. I – SEMESTER

L:T:P (Hrs/week): 0:0:2	SEE Marks : 50	Course Code: **U25ES131EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES **On completion of the course, students will be able to**
1. Verify the characteristics of various electronic devices. 2. Understand the functioning of voltage regulator, rectifiers and oscillators. 3. Perform different arithmetic operations using operational amplifier.	1. Plot the characteristics of active devices and to compute their parameters. 2. Analyse the functioning of voltage regulators, rectifiers and oscillators. 3. Perform addition, subtraction and comparison operations using operational amplifier.

CO-PO Mapping													
CO	PO												PSO
	1	2	3	4	5	6	7	8	9	10	11	12	1
CO1	3	3	-	-	-	-	-	-	-	-	-	-	3
CO2	3	3	2	-	-	-	-	-	-	-	-	-	3
CO3	3	3	-	-	-	-	-	-	-	-	-	-	3

List of Experiments:

1. Study of Electronic components and Resistor Color Coding
2. Zener Voltage Regulator (Line and Load Regulations)
3. Centre tapped Full Wave Rectifier
4. Characteristics of BJT (CE Configuration)
5. Characteristics of MOSFET (Drain and Transfer characteristics)
6. RC Phase shift oscillator
7. Hartley oscillator

8. Colpitt's Oscillator
9. Applications of Operational Amplifier: Adder, Subtractor
10. Applications of Operational Amplifier: Comparator, Voltage Follower

New / Additional experiments planned

1. Operational amplifier as a Differentiator
2. Operational amplifier as an Integrator

Learning Resources:

1. Paul B. Zbar, Albert P. Malvino , Michael A. Miller, Basic Electronics, A Text-Lab Manual, 7th Edition, TMH, 1994.
2. Paul B. Zbar, Industrial Electronics, A Text – Lab Manual, 3rd Edition, TMH,1983.
3. https://nptel.ac.in/courses/122106025/

The break-up of CIE :

1.	No. of Internal Tests	:	1
2.	Max. Marks for internal tests	:	12
3.	Marks for day-to-day laboratory class work	:	18

Duration of Internal Test : 180 Minutes

With effect from the Academic Year 2025-26

SCHEME OF INSTRUCTION AND EXAMINATION(R-25)
FOR B.E 2025-26 ADMITTED BATCH II SEMESTER (A.Y 2025-26)

B.E (CSE) II Semester								
Course Code	Name of the Course	Scheme of Instruction Hours per Week			Duration in Hrs	Scheme of Examination Maximum Marks		Credits
		L	T	P/D		SEE	CIE	
THEORY								
U25HS010EH	English Language and Communication	2	-	-	3	60	40	2
U25BS220MA	Advanced Calculus	3	-	-	3	60	40	3
U25BS210CH	Material Chemistry	2	-	-	3	60	40	2
U25ES010EE	Basic Electrical Engineering	2	-	-	3	60	40	2
UI25ES220CS	Logic and Switching Theory	3	-	-	3	60	40	3
UI25ES230CS	Python Programming	3	-	-	3	60	40	3
U25MC010CE	Environmental Science	1	-	-	2	40	30	0
UI25PE210CS	Skill Development Course-II (Technical Skills-II)	1	-	-	3	40	30	1
PRACTICALS								
U25HS011EH	English Language and Communication Skills Lab	-	-	2	3	50	30	1
U25BS011CH	Chemistry Lab	-	-	2	3	50	30	1
U25ES011EE	Basic Electrical Engineering Lab	-	-	2	3	50	30	1
UI25ES231CS	Python Programming Lab	-	-	2	3	50	30	1
Sports / Library / Mentor Interaction/CC		-	-	-	-	-	-	-
TOTAL		**17**	**-**	**8**	-	**640**	**410**	**20**
GRAND TOTAL		**25**			-	**1050**		-
Student should acquire one NPTEL course certification of 8 weeks duration (2 credits) during I Sem to VI Sem								

VASAVI COLLEGE OF ENGINEERING (Autonomous)

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IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

ENGLISH LANGUAGE AND COMMUNICATION

SYLLABUS FOR B.E.II-SEMESTER (Common to all branches)

L:T:P(Hrs./week): 2:0:0	SEE Marks :60	Course Code : **U25HS010EH**
Credits :2	CIE Marks :40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to :	**At the end of the course students should be able to:**
1. Build greater confidence and proficiency in oral and written communication. 2. Equip themselves with essential language skills to analyze and articulate their point of views. 3. Develop the ability to engage in reading for reflection and enquiry. 4. Construct grammatically correct and contextually appropriate correct sentences. 5. Learn how project reports are written in their related field of study.	1. Demonstrate effective verbal and non-verbal communication skills and apply emotional intelligence and team-building concepts to real-life scenarios. 2. Listen actively and speak clearly and confidently in academic and professional contexts, including delivering structured presentations. 3. Employ reading techniques and write coherent, well-organized paragraphs, emails, and letters for different purposes and audiences. 4. Apply a broadened vocabulary and correct grammatical structures to construct meaningful and grammatically accurate sentences. 5. Analyse and appreciate literary texts, identifying themes, tone, and stylistic devices, and relate them to personal or societal contexts.

CO-PO mapping

CO/PO	PO											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1								1	2	3		3
CO2								1	2	3		3
CO3								1	2	3		3
CO4								1	1	3		3
CO5								1	1	3		3

UNIT-1

1.0 Effective communication and Interpersonal skills (8hrs)

1.1 Role and Importance of Communication – Types of Communication (Verbal-non-verbal, formal- informal, oral, written, visual, intrapersonal, interpersonal and extra personal communication); styles, channels and barriers of communication.

1.2 Emotional Intelligence: Self-awareness, Self- regulation, Motivation, Empathy and Social skills

1.3 Johari Window.

1.4 Persuasion techniques.

1.5 Stages of Team Building by Bruce Tuckman; Qualities of a team player/leader.

UNIT-2 2.0 Listening and Speaking skills (4hrs)

2.1 Importance of listening-- Types of listening; Note taking.

2.2 Speaking skills: Presentation Skills (on Projects/ Topics related to the branch).

UNIT-3 3.0 Reading and Writing skills (5hr)

3.1 Reading strategies- SQ3R (Survey, Question, Read, Recite &Review); Types of Comprehension - Global, Factual and Inferential.

3.2 Features of Writing-Principles of writing paragraphs (Coherence, Cohesion& Unity); Use of appropriate linkers/connectives; Focus on cause, effects, comparison, definition, classification problem/ solution, process, argument.

3.3 Email-Etiquette.

3.4 Letter Writing.

UNIT-4 4.0 Vocabulary Building and Grammar (3hrs)

4.1**Vocabulary Building:** Synonyms, Antonyms, One-word substitutes; Words often Confused; Idioms.

4.2 **Functional Grammar**: Tense and Aspect; Subject-Verb agreement

UNIT-5 5.0 Reading for appreciation of literary texts (8hrs)

5.1 **Prose text**- Yesterday was Beautiful by Roald Dahl

5.2 **Poem**- Defeat by Kahlil Gibran

Prescribed textbook for theory:

Technical communication - Principles and Practice (2nd Edition 2014) - Meenakshi Raman and Sangeeta Sharma- Oxford University Press.

Additional reading:-

1. Abraham Lincolns letter to his son's school master
2. On His Blindness by John Milton
3. Road not taken by Robert Frost
4. Mike Markel - Technical communication

5. The Soldier **by Rupert Brooke.**
6. Upheavals of Thought: The Intelligence of Emotions**-**Martha C. Nussbaum
7. **Emotional intelligence – Daniel Goleman.**
8. **Experience & Education-John Dewey**
9. **Academic writing-Stephen Bailey**
10. **Biographies for vocabulary and grammar- Salim Ali & Charles Barbage.**
11. **Bruce Tuckman – Team Building**

Suggested Reading

Paul V. Anderson – Technical Communication
E.Suresh Kumar, P. Sreehari and J. Savithri - Essential English
Reading comprehension - Nuttal.J.C - Orient Blackswan
Sunitha Mishra, C. Murali Krishna-Communication Skills for Engineers, Pearson, 2004.
M. Ashraf Rizvi. Effective Technical Communication. Tata McGraw Hill, 2005.
Allen and Waters. How English Works.
Willis Jane., English through English.

Mode of delivery: - Case-studies, Presentations-Power and Poster, Group Discussions, Research based projects, worksheets, Handouts, Lectures, Student presentations, Videos, Audio clips of Speeches, Team tasks etc.

The break-up of marks for CIE:

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests : 90 Minutes

VASAVI COLLEGE OF ENGINEERING(Autonomous)

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IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF MATHEMATICS

ADVANCED CALCULUS

SYLLABUS FOR B.E.II-SEMESTER

(Common to CSE, CSE-AIML & IT)

L:T:P(Hrs./week): 3:0:0	SEE Marks :60	Course Code :**U25BS220MA**
Credits :3	CIE Marks :40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to :	**At the end of the course students should be able to:**
1. Understand the fundamental concepts and solution of first-order Differential Equations, as well as their applications in modeling real-world phenomena. **2. Develop** the ability to solve homogeneous and non-homogeneous Linear differential equations with constant coefficients, and their applications to LCR circuits. **3. Learn** the concepts of evaluation of double integrals and changing the order of integration. **4. Study** the concepts of vector differentiation, Directional derivative, Divergence and Curl of a vector point function. **5. Understand** the fundamental concepts of infinite series and various tests for convergence.	**1. Solve** various types of first-order Differential Equations, model and analyze physical systems such as LR circuit and find orthogonal trajectories of Cartesian curves. **2. Solve** homogeneous and non-homogeneous Linear differential equations with constant coefficients, including those arising in LCR circuits. **3. Evaluate** the double integrals and also evaluate the double integrals by changing the order of integration and by change of variables. **4. Find** the gradient of a scalar point function, divergence and curl of vector field and its applications. **5. Identify** an appropriate test and determine nature of a series.

CO-PO mapping

CO	PO											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3	2										1
CO2	3	2										1
CO3	3	2										1
CO4	3	2										1
CO5	3	2										1

UNIT – I (08 classes)

ORDINARY DIFFERENTIAL EQUATIONS OF FIRST ORDER

Exact differential equations - Integrating factors- Clairaut's equation - Applications of First Order Differential Equations - Orthogonal trajectories (Cartesian families) – LR Circuit.

UNIT – II (08 classes)

HIGHER ORDER LINEAR DIFFERENTIAL EQUATIONS

Solutions of Homogeneous and Non-Homogeneous linear equations of the form f(D)y = r(x) with constant coefficients [Where $r(x) = e^{ax}$, $\sin(ax+b)(or)\cos(ax+b)$, x^k, $e^{ax}V(x)$] - Method of Variation of Parameters – Applications of Linear Differential Equations to LCR circuits.

UNIT – III (08classes)

DOUBLE INTEGRALS

Double integrals (Cartesian) - Change of order of integration (Cartesian Coordinates) - Change of the Variables (Cartesian to polar Coordinates in two dimensions).

UNIT – IV (08 classes)

DIFFERENTIAL CALCULUS

Scalar and Vector point functions - Vector Differentiation - Level Surfaces - Gradient of a scalar point function - Normal to a level surface - Directional Derivative – Divergence and Curl of a Vector Field - Solenoidal and Irrotational vectors- Conservative vector field .

UNIT – V (08 classes)

INFINITE SERIES

Introduction to Infinite Series – Nature of the Series- Series of positive terms- Geometric series- p-series test - Comparison tests – Limit form of comparison test- D'Alembert's Ratio Test – Cauchy's n^{th} root test - Alternating Series – Leibnitz test-Absolute Convergence.

Text Books:

1. Advanced Engineering Mathematics 3rd Edition, R.K. Jain & S.R.K.Iyengar, Narosa Publishing House.
2. Higher Engineering Mathematics 40thEdition Dr. B.S Grewal, Khanna Publishers.
3. A Text book of Engineering Mathematics, N.P. Bali& Manish Goyal, Laxmi Publications.

Reference Books:

1. Advanced Engineering Mathematics, by Wylie & Barrett, Tata Mc Graw Hill, New Delhi.
2. Advanced Engineering Mathematics, 8th Edition by Erwin Kreyszig, John Wiley & Sons, Inc.

Online Resources:

1. https://onlinecourses.swayam2.ac.in/cec24_ma09/preview
2. https://onlinecourses.nptel.ac.in/noc24_ma03/preview

The break-up of CIE : Internal Test + Assignments + Quizzes

1	No. of Internal Test	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Test : 90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)

ACCREDITED BY NAAC WITH 'A++' GRADE

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CHEMISTRY

MATERIAL CHEMISTRY

SYLLABUS FOR B.E.II SEMESTER

(For CSE, AI & ML and IT branches)

L :T:P (Hrs./week):2:0:0	SEE Marks :60	Course Code **: U25BS210CH**
Credits :2	CIE Marks :40	Duration of SEE :3 Hours

COURSE OBJECTIVES: The course will enable the students to:	**COURSE OUTCOMES** At the end of the course, students should be able to:
1. Study types of conductance, variation of electrode potential and EMF and to acquaint with applications of Galvanic Cell. 2. Classify and compare various types of batteries and fuel cells. 3. Get acquainted with polymers, liquid crystals and their applications 4. To introduce the concepts, synthesis and characterization techniques of nanomaterials along with their applications.	1. Construct a galvanic cell and calculate its EMF and pH wherever applicable. 2. Describe the construction, chemistry and applications of the selected primary, secondary batteries and fuel cells. 3. Differentiate various types of polymers, liquid crystals and explain their fundamental properties and applications. 4. Explain synthesis methods, Properties of nanomaterials and their characterization techniques.

CO-PO mapping												
CO	**PO**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3	2	-	-	-	-	-	-	-	-	-	1
CO2	3	1	-	-	-	-	2	-	-	-	-	2
CO3	3	1	-	-	-	-	2	-	-	-	-	2
CO4	3	1	-	-	-	-	1	-	-	-	-	1

UNIT-I: ELECTRODICS AND ITS APPLICATIONS (10)

Introduction, conductance, types of conductance – specific, equivalent, molar conductance and their interrelationship - numericals. Principle and applications of conductometric titrations – strong acid *vs* strong base, weak acid *vs* strong base and mixture of acids *vs* strong base.

Concept of electrode potential, electro motive force (EMF). Nernst equation – derivation, applications and numericals.

Types of electrodes- construction and working of calomel electrode (CE), quinhydrone electrode and glass electrode (GE). Determination of pH using glass electrode and quinhydrone electrode. Applications of potentiometry – acid base titrations.

UNIT-II: CHEMISTRY OF BATTERIES (9)

Introduction – definition of cell and battery – Types of cells (reversible and irreversible cells). Battery characteristics: free energy change, electromotive force of battery, power density, energy density – numericals.

Primary batteries: Types-acidic, alkaline and reserve batteries. Construction and electrochemistry of Ag_2O-Zn battery and lithium-V_2O_5 battery.

Secondary batteries: Construction and working of lead-acid and lithium ion battery – advantages, limitations and applications.

Fuel cells: Concept, types of fuel cells and merits. Construction, working and applications of methanol – oxygen(AFC) and phosphoric acid fuel cells.

UNIT-III: MACRO MOLECULES AND LIQUID CRYSTALS (11)

Introduction, degree of polymerization, functionality of monomers and its effect on the structure of polymers. Classification of polymers – i) homo and co-polymers; ii) homo chain and hetero chain polymers; iii) plastics, elastomers, fibers and resins.

Molecular weight- number average and weight average molecular weight, numericals.

Glass transition temperature (T_g) and factors affecting T_g.

Elastomers: Natural rubber- chemistry of Vulcanization

Biodegradable polymers: Concept, preparation and uses of polylactic acid and polyvinyl alcohol.

Conducting polymers: Definition- classification, mechanism of conduction in polyacetylene(doping and undoping) and applications.

Liquid Crystals:

Introduction, classification of liquid crystals – Thermotropic and Lyotropic liquid crystals – Chemical constitution and liquid crystalline behavior. Molecular ordering in liquid crystals – Nematic, Smectic and Cholesteric liquid crystals – Applications.

UNIT-IV: NANOMATERIALS (09)

Introduction – Concept of nanomaterials – quantum confinement and surface volume ratio.

Properties of nanomaterials: Catalytic and Optical - properties. Applications of Nanomaterials.

Types of Nanomaterials**:** Zero dimensional (0-D), One dimensional (1-D), Two dimensional (2-D), Three Dimensional(3-D).

Characterization of nanomaterials- Principle and block diagram of Scanning Electron Microscope (SEM), Atomic Force Microscope (AFM).

Synthesis of nanomaterials: Top down and bottom-up approaches – mechanical grinding by ball milling and sol-gel method.

Carbon Nanotubes**:** Classification – single walled carbon nanotubes (SWCNTs – armchair, zig-zag, chiral) and Multi walled carbon nanotubes (MWCNTs- Russian doll and parchment model).

Synthesis of CNTs – Arc discharge and laser ablation methods.

Text Books:

1. P. C. Jain, M Jain Engineering Chemistry, Dhanapathi Rai publishing company (17^{th} edition), New Delhi.
2. O. G. PALANNA, Engineering Chemistry, TMH Edition.

Learning Resources:

1. B. H. Mahan, University Chemistry.
2. B. L. Tembe, Kamaluddin and M. S. Krishnan, Engineering Chemistry (NPTEL Web-book).
3. P. W. Atkins, Physical Chemistry.
4. S. S. Dara, S Chand and sons, Engineering Chemistry, New Delhi.
5. Puri, Sharma and Pathania, Principles of Physical Chemistry, Vishal Publishing Co.
6. D. Dhara, IIT Kharagpur, NPTEL Polymer Chemistry Course.
7. Gowarikar V R, Polymer chemistry, V Edition.
8. S M Lindsay, Introduction to Nanoscience, Oxford University press.
9. Sashi Chawla, Text book of Engineering Chemistry, Dhanapathi Rai & Co, New Delhi.
10. J.C. Kuriacose and Rajaram, Chemistry in Engineering and Technology
11. Wiley Engineering Chemistry, Wiley India pvt Ltd, II edition.
12. Peter Grundler, Chemical sensors, An introduction for scientists and engineers, Springers
13. Chemistry of Nanomaterials by CNN Rao.

The break-up of CIE : Internal Test + Assignments + Quizzes

1	No. of Internal Test	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Test : 90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)

ACCREDITED BY NAAC WITH 'A++' GRADE

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Electrical & Electronics Engineering

BASIC ELECTRICAL ENGINEERING

SYLLABUS FOR B.E II – SEMESTER

(Common to CSE & AIML, IT and ECE Branches)

L:T:P(Hrs/week):2:0:0	SEE Marks:60	Course Code: **U25ES010EE**
Credits : 2	CIE Marks:40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
1. To explain the concepts and principles governing Direct Current (DC) electrical circuits. 2. To explain the essential principles of Alternating Current (AC) electrical circuits. 3. To explain the operational mechanisms and principles of DC electrical machines. 4. To explain the core working principles and applications of AC electrical machines.	1. Analyze Electrical Dc circuits using different analyzing methods and theorems. 2. Analyze Electrical single phase circuits and power factor improvement. 3. Comprehend the working principles of DC machines. 4. 4. Comprehend the working of single phase transformer & AC machines.

CO-PO mapping												
CO	**PO**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3	3	2	2	2							1
CO2	3	3	2	2	2							1
CO3	3	2	2	1	2							1
CO4	3	2	2	1	2							1

Unit-I

D.C. Circuits:

Electrical circuit elements (R, L and C), independent voltage and current sources, Kirchhoff current and voltage laws, Source transformation, Mesh Analysis, Nodal analysis, Superposition theorem, Thevenin's and Norton's

Theorem, Maximum power transfer theorem.

Unit II

A.C. Circuits:

Representation of sinusoidal waveform - peak and rms values, form factor, phasor representation, real power, reactive power, apparent power, power Factor. Analysis of single-phase ac series combinations of R-L-C circuits, power factor improvement.

Unit III

DC Machines:

Construction, Working principle of DC Generator and DC motor , EMF equation, Types of DC Generators & motors, Torque in a DC motor, Torque – speed characteristic of DC Shunt motor, Speed control of DC shunt motor.

Unit IV

Single Phase Transformer, Three phase induction Motor:

Principle of operation, Ideal and practical transformer on No-load and Load, Equivalent circuit, losses in transformers, efficiency.

Generation of rotating magnetic fields, Construction and working of a three- phase induction motor, torque derivation,torque-slip characteristics.

Applications: General construction, working of Stepper motor and BLDC motor.

Learning Resources:

1. D. P. Kothari and I. J. Nagrath, “Basic Electrical Engineering”, 4th edition Tata McGraw Hill, 2019.
2. D. C. Kulshreshtha, “Basic Electrical Engineering”, McGraw Hill, 2019.
3. L. S. Bobrow, “Fundamentals of Electrical Engineering”, Oxford University Press, 2011.
4. E. Hughes, “Electrical and Electronics Technology”, Pearson, 2010.
5. V.K Mehta, Rohit Mehta, “Principles of Electrical Engineering and Electronics”, S Chand & Company Ltd, 2006.
6. J.B. Guptha, A course in electrical installation estimating and costing, reprint 2013, published by S.K. Kataria & Sons.
7. V. D. Toro, “Electrical Engineering Fundamentals”, Prentice Hall India, 1989.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	: 2	Max. Marks for each Internal Test	: 30
2	No. of Assignments	: 3	Max. Marks for each Assignment	: 5
3	No. of Quizzes	: 3	Max. Marks for each Quiz Test	: 5

Duration of Internal Tests : 90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)

ACCREDITED BY NAAC WITH 'A++' GRADE

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Computer Science & Engineering

LOGIC AND SWITCHING THEORY

SYLLABUS FOR B.E. II-SEMESTER

L:T:P (Hrs./week):3:0:0	SEE Marks:60	Course Code:**UI25ES220CS**
Credits :3	CIE Marks:40	Duration of SEE : 3Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** *On completion of the course, students will be able to*
1 Understand the use of logic minimization methods and to solve the Boolean logic expressions. 2 Design combinational and sequential circuits.	1 Apply Boolean logic postulates and Karnaugh-Map to simplify Boolean expressions. 2 Apply tabulation method to minimize Boolean expressions. 3 Design combinational circuits such as adders, encoders and multiplexers. 4 Design sequential circuits like counters and registers. 5 Design a circuit using programmable logic devices.

CO-PO and CO-PSO mapping															
CO	**PO**												**PSO**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
CO1	2	1	1										2		
CO2	2	1	1	1									2	1	
CO3	3	2	2	1									3	1	
CO4	2	2	2	1									3	1	
CO5	3	2	2	1									3	1	

UNIT-I:

Boolean Algebra: Axiomatic definition of Boolean Algebra, Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, The Map Method, Four Variable K-Map , Product of Sums Simplification, Don't Care Conditions.

UNIT-II:

Minimization of Switching Functions: Determination of Prime Implicants and Essential Prime Implicants, Quine-McCluskey Tabular Method.

Implementation of Boolean Functions: Single-Output and Multiple-Output Combinational Circuit Design, AND-OR, OR-AND and NAND &NOR Realizations, Exclusive-OR and Equivalence functions.

UNIT-III:

Combinational Logic: Introduction, Combinational Circuits, Analysis of Combinational Circuits, Design of Combinational Circuits , Binary Adder—Subtractor, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers

UNIT-IV:

Sequential Logic: Introduction, Sequential Circuits, Storage Elements: Latches, Storage Elements: Flip Flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, Design Procedure.

Registers and Counters: Registers, Shift Registers, Ripple Counters, Synchronous Counters, Ring Counter, Johnson Counter.

UNIT-V:

Memory and Programmable Logic: Random Access Memory (RAM), Read Only Memory (ROM), Programmable Logic Array (PLA), Programmable Array Logic (PAL).

Learning Resources:

1. M. Morris Mano and Michael D. Ciletti, Digital Design, 6th Edition (2018), Pearson, India.
2. ZviKohavi, Switching and Finite Automata Theory, 2nd Edition(1978), Tata McGraw Hill.
3. Charles H. Roth, Jr., Larry L. Kenny, Fundamentals of Logic Design, 7th Edition(2013), Cengage Learning.
4. Anand Kumar A, Switching Theory and Logic Design, 2nd Edition(2014), PHI Publishers.
5. CH Roth , Fundamentals of Logic Design, 4th Edition(2006), Jaico Publishers.
6. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-111-introductory-digital-systems-laboratory-fall-2002
7. http://www.facweb.iitkgp.ernet.in/~isg/SWITCHING/
8. Digital System design URL:https://nptel.ac.in/courses/108106177

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests : 1 Hour 30 Minutes

With effect from the Academic Year 2025-26

VASAVI COLLEGE OF ENGINEERING(Autonomous)

ACCREDITED BY NAAC WITH 'A++' GRADE

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

PYTHON PROGRAMMING

SYLLABUS FOR B.E. II-SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code : **UI25ES230CS**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
1 Acquire problem solving skills 2 Write programs using Python language	1 Develop Python programs with conditionals, loops and functions 2 Write programs using strings,lists and Numpy 3 Construct Python data structures programs using tuples sets and dictionaries 4 Write programs using files and exception handling. 5 Design Programs on OOPS concept, inheritance and Modules.

CO-PO and CO-PSO mapping															
CO	**PO**												**PSO**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
CO1	3	3	3	1	1									2	
CO2	3	2	3	1	2									2	
CO3	3	2	2	1	2									2	
CO4	3	1	2	1	2									2	1
CO5	3	2	2	1	2				1		1			2	2

UNIT-I:

Basics of Python Programming: Features of Python**,** Literal Constants, Variables and Identifiers, Data Types, operators and expressions, Type Conversions.

Decision control Statements: Selection/Conditional branching statements, basic loop structures/iterative Statements, nested loops, break, continue, and pass Statements.

Functions: function definition, function call, Variable Scope and Lifetime, more on defining functions, Recursive functions.

UNIT-II:

Data Structures: **Strings**: Introduction, built-in string methods and functions, slice operation, String Module, **Regular Expressions**, Meta-character in Regular Expression.

Lists: Introduction, nested list, cloning lists, basic list operations, list methods, List Comprehensions, Looping in Lists.

Functional programming-filter(),map(),reduce() function.

Numpy: Numpy Fundamentals, creating arrays, array indexing, Basic Array Operations, one dimensional and n dimensional array, Creating Matrices using Numpy arrays, Matrix multiplication.

UNIT –III:

Tuples: Introduction, basic tuple operations, tuple assignment, tuples for returning multiple values, nested tuples, tuple methods and functions, Variable length Argument Tuples, Advantages of Tuple Over List.

Set: Introduction, Set operations.

Dictionaries: Basic operations, sorting items, looping over dictionary, nested dictionaries, built-in dictionary functions, String Formatting with Dictionaries.

UNIT-IV:

Files Handling: Introduction, File Path, Types of files, Opening and closing Files, reading and writing files, File Positions, Renaming and Deleting Files, Directory Methods, Pickling and JSON.

Exception Handling: Introduction to Errors and Exceptions, Handling Exceptions, Multiple Except Blocks, The Else Clause, Raising Exceptions, Handling the Exceptions in invoked functions, Built-in and user-defined exceptions, The Finally Block, Re raising Exception, Assertions

Unit-V:

OOPS Concepts: Introduction, classes and object, class method and self argument, the__init__()method, class variables and object variables, public and private data members, Private Methods, Calling a Class method from another class Method, Built-in Class Attributes, Garbage Collection, Inheritance, Operator Overloading.

Modules: Modules, Package, Standard Library Modules, Math, Random, date and time, Matplotlib, Turtle, Pandas-Introduction, Pandas Series, Data Frames.

Learning Resources:

1. Reema Thareja ,"Python programming using problem solving approach ", Oxford university press.
2. Allen Downey," Think Python: How to Think Like a Computer Scientist",O'Reilly publications,2nd Edition.
3. Albert Lukaszewski, "Mysql for python ", PACKT publishers
4. Mark Lutz , "Learning Python",O'Reilly Publications.
5. Stewart Venit and Elizabeth Drake, Prelude to Programming: Concepts and Design, 6th Edition(2015), Pearson India
6. Mark J Guzdial, Introduction to Computing and programming in Python, 3rdEdition(2013), Pearson India

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests : 1 Hour 30 Minutes

With effect from the Academic Year 2025-26

VASAVI COLLEGE OF ENGINEERING (Autonomous)

ACCREDITED BY NAAC WITH 'A++' GRADE

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

ENVIRONMENTAL SCIENCE

SYLLABUS FOR B.E. II-SEMESTER

(Common to CSE & IT)

L:T:P(Hrs./week): 1 : 0 : 0	SEE Marks:40	Course Code:**U25MC010CE**
Credits : - - -	CIE Marks:30	Duration of SEE: 2 Hrs

COURSE OBJECTIVES	**COURSE OUTCOMES**
In this subject the students will	*Upon the completion of this course students will be able to*
1. **Explain** the scope and fundamental principles of environmental science, including key concepts such as ecosystem structure, function, and biodiversity. 2. **Characterize** genetic, species, and ecosystem diversity, and articulate the various values of biodiversity. 3. **Analyze** the causes, effects, and control measures for air, water, and land pollution—and **apply** major regulatory frameworks 4. **Evaluate** the environmental impacts of food-related practices and **propose** sustainable, health-oriented alternatives. 5. **Assess** renewable energy resources and **design** integrated, engineering-based solutions that meet environmental, legal, and societal requirements.	1. **Define and illustrate** core environmental science concepts—ecosystem structure, energy flow and levels of biodiversity. 2. **Apply** key legislative frameworks to real-world scenarios involving air, water, and land resource management. 3. **Analyze** the environmental fate and impacts of agricultural inputs on food systems, recommending sustainable practices. 4. **Compare and evaluate** major renewable energy technologies in terms of availability, efficiency, cost, and environmental footprint. 2. 5. **Integrate** scientific data, legal requirements, and engineering principles to design a mini-project addressing a local environmental challenge.

CO-PO and CO-PSO mapping															
CO	**PO**												**PSO**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
CO1	2	-	-	-	-	2	3	-							
CO2	-	-	-	-	-	3	3	-							
CO3	-	-	-	-	-	-	3	1							
CO4	2	-	-	-	-	3	3	-							
CO5	3	-	-	-	-	-	3	-							

UNIT 1: Environmental Science Fundamentals and Ecosystem Diversity (5)

Definition and importance of Environmental Science, Ecosystem: classification, structure, and function, Diversity: genetic, species, and ecosystem level. Biodiversity values: productive, consumptive, ethical, social, cultural, optional, Biodiversity Acts and Laws: The Biological Diversity Act-2002, Environment (Protection) Act- 1986.

UNIT 2: Air, Water, and Land Resources (4)

Air Pollution: The Air (Prevention and Control of Pollution) Act- 1981, Water Resource: Freshwater availability on Earth, Drinking water quality standards | IS 10500:1991, Water pollution: effects and control measures, Case studies. Land Resource: Desertification, Land degradation: causes, effects, and control, Case studies

UNIT 3: Food Resources and Environmental Issues (2)

Food Resource: Fertilizer and pesticide problems, Eutrophication, Biomagnification, Balanced diet, Effects of processed food, Case studies

UNIT 4: Renewable Energy Resources (3)

Importance of renewable energy sources: Solar, Wind, Tidal, Ocean thermal, Geothermal, Biomass, Biofuel, Biogas, Hydrogen energy, Case studies

Learning Resources:

1. Deswal S. and Deswal A., A Basic Course on Environmental studies, Dhanpat Rai & Co Pvt. Ltd. 2013.
2. Benny Joseph, Environmental Studies, Tata McGraw-Hill, 2006.
3. Suresh K. Dhameja, Environmental Studies, S.K. Kataria & Sons, 2010.
4. De A.K., Environmental Chemistry, New Age International, 2003.
5. Odum E.P., Fundamentals of Ecology, W.B. Sunders Co., USA, 2004.
6. Sharma V.K., Disaster Management, National Centre for Disaster Management, IIPE, Delhi, 2013.
7. Rajagopalan R., Environmental Studies, Second Edition, Oxford University Press, 2013.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	:	2	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	2	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests : 90 Minutes

With effect from the Academic Year 2025-26

VASAVI COLLEGE OF ENGINEERING(Autonomous)

ACCREDITED BY NAAC WITH 'A++' GRADE

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Computer Science & Engineering

Skill Development Course-II (Technical Skills-II)

Problem Solving through Python

SYLLABUS FOR B.E. II-SEMESTER

L:T:P (Hrs./week):1:0:0	SEE Marks : 40	Course Code:**UI25PE210CS**
Credits : 1	CIE Marks : 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
1. Build confidence in coding using Python Programming Concepts 2. Prepare students for the contests relative to the concepts learnt 3. Learn essential concepts for Competitive Coding	1. Solve scenario-based problems using Python Control Statements, Strings and Lists 2. Learn usage of Dictionaries, Methods and Exception in Python in various applications with scenario-based problem solving through coding.

CO-PO mapping												
CO/ PO	**PO**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3	2	2	-	-	-	-	-	-	-	-	1
CO2	3	2	2	-	-	-	-	-	-	-	-	1

- **Problem Solving using Python – Data Operations**

  Problem solving through Coding, Introduction to Python, Syntax of the language, datatypes and variables, Input-Output statements, Operators and precedence, Expressions, Keywords, Company Specific Examples & Competitive Programming Practice Problems.

  Contextual implementation using Competitive Coding using global coding platforms: Code chef/ Leet code / Codeforces / Hackerrank etc.

- **Problem Solving using Python – Control Statements**
  Introduction to conditional branching, if statement, for statement, range function, break and continue statements, usage of else clause in loops, pass statements, match statements, Company Specific Examples & Competitive Programming Practice Problems.
  Contextual implementation using Competitive Coding using global coding platforms: Code chef/ Leet code / Codeforces / Hackerrank etc.

- **Problem Solving using Python –String and Lists**
  Problem solving on accessing strings, string operations, string slices, functions and methods, Introduction to lists, accessing list, working on Lists, Matrix data, Company Specific Examples & Competitive Programming Practice Problems.

  Contextual implementation using Competitive Coding using global coding platforms: Code chef/ Leet code / Codeforces / Hackerrank etc.

- **Problem Solving using Python –Methods and Dictionaries**
  Introduction to tuple, accessing tuples, tuple operations, introduction to dictionaries, accessing values in dictionaries, properties and functions, importing modules, math module, random module, packages and composition, Company Specific Examples & Competitive Programming Practice Problems.

  Contextual implementation using Competitive Coding using global coding platforms: Code chef/ Leet code / Codeforces / Hackerrank etc
- **Problem Solving using Python –Eception handling**
  Problem solving through user defined functions and methods, implementing exception handling, except clause, try? finally clause, user defined exceptions, Advanced data types, Company Specific Examples & Competitive Programming Practice Problems.

  Contextual implementation using Competitive Coding using global coding platforms: Code chef/ Leet code / Codeforces / Hackerrank etc

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	1	Max. Marks for each Internal Test	:	20
1	No. of Quizzes	:	1	Max. Marks for each Quiz	:	10

Duration of Internal Tests : 1 Hour 30 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)

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IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

ENGLISH LANGUAGE AND COMMUNICATION SKILLS LABORATORY

SYLLABUS FOR B.E. - II SEMESTER (Common to all branches)

L: T: P(Hrs/Week): 0:0:2	SEE Marks : 50	Course Code:**U25HS011EH**
Credits: 1	CIE Marks: 30	Duration of SEE:3 Hours

COURSE OBJECTIVES The course will enable the learners to:	**COURSE OUTCOMES** On completion of the course, students will be able to
1. Understand the fundamentals of English phonetics, including sound classification and pronunciation of commonly mispronounced and foreign words. 2. Enhance listening comprehension and ear training through stress, intonation, and exposure to historical speeches and pronunciation patterns. 3. Develop effective public speaking and presentation skills by analysing model speeches and practicing structured delivery techniques. 4. Build collaborative communication abilities through group discussions, focusing on initiation, continuation, and closure strategies. 5. Strengthen reading comprehension and analytical skills, including paraphrasing and summarizing, using diverse reading strategies and text types.	1. Accurately identify and pronounce English consonant and vowel sounds, including words with silent letters and foreign-origin terms used in English. They will also demonstrate improved listening and speech recognition skills through analysis of famous speeches and application of intonation and stress patterns. 2. Deliver structured public speeches and group presentations confidently, adhering to best practices for content and visual aid usage. They will engage effectively in group discussions, displaying clarity of thought, respect for others' opinions, and logical progression. 3. Apply advanced reading techniques (e.g., SQ3R, scanning, skimming) to comprehend, paraphrase, and summarize content from diverse sources including technical and journalistic texts.

CO-PO mapping

CO/PO	PO											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1								1	3	3		3
CO2								1	3	3		3
CO3								1	3	3		3

1.0 PHONETICS LAB- TOPICS (8hrs)

1.1 **Introduction to English Phonetics:**
Classification of consonants and vowel sounds and related symbols. Pronunciation of commonly mispronounced words. Pronunciation of Foreign words in English.

1.2 **Aspects of language learning and ear training activities-** Word stress and intonation, Pronunciation of silent letters and Foreign words used in English Longman Dictionary of contemporary English- 6th Edition, 2020. Listening to famous speeches from history followed by while listening and post listening exercises.

2.0 INTERACTIVE COMMUNICATION SKILLS LAB-TOPICS (8hrs)

2.1 **Public speaking:**
Dos and don'ts of public speaking. Listening and analysing speeches of great personalities in history, TED talks, Documentaries and Movies.

2.2 **Presentation Skills:**
Dos and Don'ts of power point presentations, group presentations (branch specific topics)

2.3 **Group discussion:**
Objectives of GD, Types of GDs; Initiating, Continuing, and concluding a GD.

3.0 READING SKILLS LAB – TOPICS (8hrs)

3.1 Sub-skills of reading - SQ3R – skimming, scanning, extensive and intensive reading.

3.2 Teaching different types of texts for comprehension-short stories and technical articles.

3.3 Newspaper reading and paraphrasing/summarising.

3.4 Interview skills: For Practical examinations and general HR interviews.

Prescribed textbook for laboratory:

1. Speak Well: Jayshree Mohanraj, KandulaNirupa Rani and Indira Babbellapati - Orient Black Swan
2. Longman Dictionary of Contemporary English – 6th Edition, 2020.(The students will be given the PDF format)

Learning Resources:

1. Balasubramanian: A textbook of English phonetics for Indian students, Macmillan, 2008.
2. Priyadarshini Patnaik: Group discussion and interviews, Cambridge University Press India private limited 2011.
3. Daniel Jones: Cambridge English Pronouncing Dictionary - A Definitive guide to contemporary English Pronunciation.
4. Reading Cards (Eng400): Orient Black Swan. Reading Squabble - Hadfield.

The break-up of marks for CIE & SEE:

1. No. of Internal Tests-2 : Max. Marks for Internal Test : 30
   Duration of Internal Test : 120 Minutes
2. SEE : 50 Marks
   Duration : 180 Minutes

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IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CHEMISTRY

CHEMISTRY LAB

SYLLABUS FOR B.E. II SEMESTER

L:T:P(Hrs./week):0:0:2	SEE Marks : 50	Course Code: **U25BS011CH**
Credits :01	CIE Marks : 30	Duration of SEE: 3 Hours

COURSE OBJECTIVES:	COURSE OUTCOMES:
The course will enable the students to:	**At the end of the course, students should be able to:**
1. Describe the quantitative analytical techniques 2. Learn the skills to handle the instruments 3. Apply the theoretical principles in experiments	1. Estimate the amount of metals in the given solutions. 2. Analyze the hardness, alkalinity and chloride content of a given water sample. 3. Determine the concentration a given solution by conductometry, potentiometry and pH metry. 4. Use the principle of colorimetry in the estimation of Permanganate/ Copper (II) in a given solution.

CO-PO mapping												
CO	**PO**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3	2	-	-	-	-	-	-	2	-	-	1
CO2	3	2	-	-	-	-	-	-	2	-	-	1
CO3	3	2	-	-	-	-	-	-	2	-	-	1
CO4	3	2	-	-	-	-	-	-	2	-	-	1

Note: Minimum of Ten experiments of the following.

1. Preparation of standard FAS or oxalic acid solution and standardization of $KMnO_4$ or NaOH solution.
2. Estimation of ferrous iron in the given solution by permanganometry.
3. Estimation of chromium (VI) in the given solution by standardized FAS.
4. Estimation of copper (II) in given solution by hypo.

5. Estimation of total hardness of given water sample.
6. Estimation of alkalinity of a given sample.
7. Conductometric acid-base titrations -Determination of strength of given acids (HCl *Vs* NaOH and CH_3COOH *Vs* NaOH).
8. Conductometric acid-base titrations- Determination of strength of acids in a given mixture of acids (HCl and CH_3COOH *Vs* NaOH)
9. Determination of strength of a given acid by Potentiometry.
10. Determination of concentration of a given $FeSO_4$ using redox titration by Potentiometry.
11. Determination of strength of a given acid by pH metry.
12. Determination of strength of permanganate or copper in brass solution by Colorimetry.

Text Books:

1. G H Jeffery, J Bassett, J Mendham, R C Denney, Vogel's text book of quantitative chemical analysis, Fifth Edition.2
2. M S Kaurav, Engineering chemistry with laboratory experiments, PHI learning (P) ltd, New Delhi.
3. Sunita rattan, Experiments in applied chemistry, S K Kataria & Sons (2010)
4. A text book on experiments and calculation Engg. S.S. Dara.

No. of Internal Tests:	01	Max. Marks for Internal Test:	12
Marks for assessment of each experiment			18
Duration of Internal Test: 3 Hours			

With effect from the Academic Year 2025-26

VASAVI COLLEGE OF ENGINEERING (Autonomous)

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IBRAHIMBAGH, HYDERABAD – 500 031

Department of Electrical & Electronics Engineering

BASIC ELECTRICAL ENGINEERING LAB

SYLLABUS FOR B.E II – SEMESTER (CSE & AIML, IT and ECE Branches)

L:T:P(Hrs./week):0:0:2	SEE Marks:50	Course Code: **U25ES011EE**
Credits :1	CIE Marks:30	Duration of SEE: 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** **On completion of the course, students will be able to**
1. To familiarize students with the operation and safe handling of basic electrical equipment 2. To enable students to perform experimental testing and analyze the performance characteristics of AC and DC machines 3. To provide practical experience in applying and verifying electrical network theorems 4. To develop competency in measuring electrical energy consumption 5. To instill the importance of power factor in electrical systems	1. Handle basic electrical equipment and apprehend safety precautions 2. Test the performance of various AC and DC machines 3. Apply and Verify various Network theorems 4. Comprehend Measurement of Electrical Energy consumption 5. Comprehend the importance of Power Factor improvement.

CO-PO mapping												
CO	**PO**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3	2	2	1	3							1
CO2	3	3	2	2	3							1
CO3	3	3	2	2	2							1
CO4	3	2	2	2	3							1
CO5	3	2	2	1	2							1

List of Experiments

1. Basic safety precautions. Introduction and use of measuring instruments – voltmeter, ammeter, multi-meter, oscilloscope. Real- life resistors, capacitors and inductors.
2. Verification of Kirchoff's Voltage Law & Kirchoff's Current Law.

3. Verification of Superposition theorem.
4. Verification of Maximum Power transfer theorem.
5. Verification of Thevenin's theorem.
6. Sinusoidal steady state response of R-L and R-C circuits, Measurement of phase angle.
7. Demonstration of cut-out sections of machines: dc machine (commutator-brush arrangement), induction machine (squirrel cage rotor), synchronous machine (field winging - slip ring arrangement) and single-phase induction machine.
8. Torque Speed Characteristic of dc shunt motor.
9. Speed control of dc shunt motor.
10. Loading of a transformer: measurement of primary and secondary voltages and currents and power.
11. Torque-Slip Characteristic of a three phase induction motor.
12. Measurement of electrical energy consumption.
13. Improvement of Power factor in R-L-C Circuits.

From the above experiments, each student should perform at least 10 (Ten) experiments.

No. of Internal Tests:	01	Max. Marks for Internal Test:	12
Marks for assessment of each experiment			18
Duration of Internal Test: **3 Hours**			

With effect from the Academic Year 2025-26

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

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IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

PYTHON PROGRAMMING LAB

SYLLABUS FOR B.E. II-SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code: **UI25ES231CS**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** *On completion of the course, students will be able to*
1 Acquire problem solving skills	1 Develop Python programs with conditional statements and loops.
2 Write programs using Python language	2 Write programs using functions, strings and lists. 3 Construct Python data structures programs using tuples, dictionaries and set. 4 Implement programs using files and exception handling. 5 Develop programs using Object oriented programming.

CO-PO and CO-PSO mapping															
CO	**PO**												**PSO**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
CO1	3	3	2	1	1									2	1
CO2	3	3	2	1	1									2	1
CO3	3	3	2	1	1									2	1
CO4	3	3	2	2	2									2	1
CO5	3	3	2	2	2				2					2	2

Programming Exercise:

1. Implementation of decision making, branching and looping
2. Implementation of functions and function calls
3. Implementation of recursive functions

4. Implementation of string traversal, searching and other string methods
5. Implementation of list and list operations
6. Implementation of tuples
7. Implementation of dictionary and its operations
8. Implementation of set operations
9. Implementation of basic operations in NumPy
10. Implementation of files and pickling in files
11. Implementation of classes
12. Implementation of OOPS concepts in Python

Learning Resources:

1. Reema Thareja ,"Python programming using problem solving approach ", Oxford university press.
2. Allen Downey," Think Python: How to Think Like a Computer Scientist", O'Reilly publications,2nd Edition.
3. Albert Lukaszewski, "Mysql for python ", PACKT publishers
4. Mark Lutz , "Learning Python",O'Reilly Publications.
5. Stewart Venit and Elizabeth Drake, Prelude to Programming: Concepts and Design, 6th Edition(2015), Pearson India
6. Mark J Guzdial, Introduction to Computing and programming in Python, 3rd Edition(2013), Pearson India

No. of Internal Tests:	01	Max. Marks for Internal Test:	12
Marks for day-to-day laboratory class work			18
Duration of Internal Test: 2 Hours			