VASAVI COLLEGE OF ENGINEERING(AUTONOMOUS)
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. (EEE) I & II Semesters
With effect from 2024-25
(For the batch admitted in 2024-25)
(R-24)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
Phones: +91-40-23146030, 23146031
Fax: +91-40-23146090

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

Empowering Future Engineers in Electrical & Electronics Engineering with Technological Excellence and Human Values.

DEPARTMENT MISSION

To Arm Aspiring Engineers with Cutting-Edge Technology and Cultivate Holistic Development, Fostering a Synergy of Knowledge and Values for a Brighter Future.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO 1: Graduates will acquire technical competence to analyze, design and solve engineering problems in the field of Electrical and Electronics Engineering and use modern engineering tools, techniques and software.

PEO 2: Graduates will be able to acquire necessary skills and obtain employment and will be productive in the professional practice of Electrical and Electronics Engineering and related fields.

PEO 3: Graduates will be sensitive to professional and social contexts, committed to ethical action and engaged in lifelong learning skills.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO 1: EEE students will be able to design, analyze Power Systems & Electrical Machines to solve complex engineering problems.

PSO 2: EEE students will be able to design and analyze Electrical and Power Electronic Circuits.

PSO 3: EEE students will be able to use and apply modern software tools and techniques related to Electrical Engineering.

B.E. (EEE) PROGRAM OUTCOMES (PO's)	
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.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS):: IBRAHIMBAGH, HYDERABAD – 500 031.
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION (R-24)::B.E. - EEE : FIRST SEMESTER(2024-25)

Course Code	Name of the Course	Scheme of Instruction Hours per Week L	T	P/D	Scheme of Examination Duration in Hrs	Maximum Marks SEE	CIE	Credits
B.E (EEE) I Semester								
THEORY								
U24BS110MA	Matrices & Calculus	3	-	-	3	60	40	3
U24HS010EH	English Language and Communication	2	-	-	3	60	40	2
U24BS110CH	Engineering Chemistry	3	-	-	3	60	40	3
U24ES110EE	Programming and Problem Solving for EEE	3	-	-	3	60	40	3
U24ES010CE	Basic Engineering Mechanics	3	-	-	3	60	40	3
U24PC110EE	Circuit Theory	3	-	-	3	60	40	3
U24MC010ME	Introduction to Entrepreneurship	1	-	-	2	40	30	-
U24MC010CE	Environmental Science	2	-	-	3	60	40	-
PRACTICALS								
U24HS011EH	English Language and Communication Skills Lab	-	-	2	3	50	30	1
U24BS011CH	Chemistry Lab	-	-	2	3	50	30	1
U24ES111EE	Programming and Problem Solving for EEE Lab	-	-	2	3	50	30	1
	Library/Sports/Mentor- Mentee Interaction	-	-	-	-	-	-	-
	PDC/CC/TC/RC	-	-	-	-	-	-	-
TOTAL		**20**	**-**	**6**	**-**	**610**	**400**	**20**
GRAND TOTAL			**26**			**1010**		**20**

B.E students shall complete one NPTEL Certificate equivalent Course of 8 weeks equivalent to 2 Credits by the end of VI semester

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF MATHEMATICS

MATRICES & CALCULUS

SYLLABUS FOR B.E. I SEMESTER

(Common to Civil, EEE, ECE and Mech)

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U24BS110MA**
Credits: 3	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 the concepts of rank of a matrix, System of linear equations and LU-Decomposition method.	**1. Find** the rank of a given matrix and solution of a system by LU-Decomposition method.
2. Learn the concepts of eigenvalues, eigenvectors, diagonalization, and canonical forms.	**2. Compute** the characteristic equation, eigenvalues, eigenvectors and diagonalize a square matrix using similarity transformation.
3. Develop a deep understanding of the concepts and applications of Taylor's series, Maclaurin's series, curvature, radius of curvature, centre of curvature, and evolutes.	**3. Apply** the concepts of Taylor's series and Maclaurin's series to approximate functions and calculate the curvature, radius, centre of curvature of curves, and evolutes.
4. Learn the techniques for finding partial derivatives of functions of several variables and Taylor's series for functions of two variables, methods for finding maxima and minima of functions of several variables.	**4. Calculate** partial derivatives of functions of several variables and apply Taylor's series for functions of two variables, analyze functions to find maxima and minima.
5. Understand the fundamental concepts of sequences and series, including convergence criteria.	**5. Identify** an appropriate test and determine convergence of the series.

UNIT- I
MATRICES-I
Rank of a Matrix- Echelon form- Normal Form-Linearly Dependence and Independence of Vectors–Consistency and Inconsistency of Homogeneous and Non-Homogenous system of linear equations –LU-Decomposition method.

UNIT –II
MATRICES-II
Characteristic equation- Cayley - Hamilton Theorem (without proof)-Eigen values and Eigenvectors - Diagonalization using Similarity Transformation-Reduction of Quadratic from to Canonical form.

UNIT – III
DIFFERENTIAL CALCULUS
Taylor's Series – Maclaurin's Series- Curvature- Radius of Curvature – Centre of Curvature –Evolutes(Cartesian and Parametric forms of the curves).

UNIT – IV
MULTIVARIBLE CALCULUS
Limits- Continuity (Concepts) -Partial Derivatives-Higher Order Partial Derivatives-Total Derivates - Derivatives of Composite and implicit functions - Taylor's series of functions of two variables – Jacobian - Maxima and Minima of functions of two variables - Lagrange's Method of multipliers.

UNIT-V
INFINITE SERIES
Definition of Sequence, Convergence of sequence. Series – Convergence and Divergence- Series of positive terms-Geometric series- P-series test - Comparison tests – Limit comparison test-D'Alembert's Ratio Test – Cauchy's n^{th}root test - Alternating Series – Leibnitz test – Absolute and Conditional convergence.

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.

Reference Books:
1. Advanced Engineering Mathematics   8th Edition by Erwin Kreyszig, John Wiley & Sons.
2. Differential Calculus by Shanti Narayan, S. Chand & Co
3. Vector Calculus – Schaum's outline series.

Online Resources:

1. https://onlinecourses.nptel.ac.in/noc24_ma03/preview

2. https://onlinecourses.nptel.ac.in/noc24_ma31/preview

3. https://onlinecourses.swayam2.ac.in/cec24_ma10/preview

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

ENGLISH LANGUAGE AND COMMUNICATION

SYLLABUS FOR B.E. I SEMESTER

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code: **U24HS010EH**
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The objectives of the course are:	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. Communicate effectively, appropriately and ethically in both professional & personal spheres. 2. Listen to different types of spoken discourses and take notes for future reference. 3. Research, collect data and make effective presentations using, graphs, charts, statistical information and text. 4. Construct grammatically correct sentences using adequate vocabulary to compose written and spoken discourses. 5. Read, comprehend and appreciate various text types using the various techniques.

UNIT-1   1.0 Effective communication and Interpersonal skills

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

1.2 Johari Window.

1.3 Persuasion techniques.

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

UNIT-2   2.0 Listening and Speaking skills

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

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.

UNIT-4   4.0Vocabulary BuildingandGrammar

4.1**Vocabulary Building:**Synonyms,Antonyms,One-wordsubstitutes;Words often

Confused; Idioms.

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

     (Declarative sentence, Interrogative sentence, Exclamatorysentence and

     Imperative sentence)

UNIT-5   5.0 Reading for appreciation of literary texts

5.1   **Prose text**- The Knowledge Society by APJ Abdul Kalam.

5.2   **Poem**-'What Life should be' by Patricia A Fleming.

Prescribed textbook for theory:

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

Suggested Reading

Paul V. Anderson – Technical Communication

E.Suresh Kumar, P. Sreehari and J. Savithri - Essential English

Reading comprehension - Nuttal.J.C - Orient Blackswan

SunithaMishra,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.
Brown, Penelope and Stephen C. Levinson. 1978. Universals in language usage: politeness phenomena: Cambridge University Press.

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF CHEMISTRY

ENGINEERING CHEMISTRY

SYLLABUS FOR B.E. I SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U24BS110CH**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The objectives of the course are:	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.	1. Construct a galvanic cell and calculate its EMF and pH wherever applicable.
2. Classify and compare various types of batteries and fuel cells.	2. Describe the construction, functioning and applications of the selected primary, secondary batteries and fuel cells.
3. Get acquainted with different types of polymers and their applications.	3. Classify the polymers and discuss the synthesis and applications of few polymers.
4. Explain the concepts of engineering materials like nano materials and liquid crystals.	4. Get expose to the classification, properties and applications of nano materials and liquid crystals.
5. Know the principles of few analytical techniques.	5. Familiarize with the basic concepts of few analytical techniques.

UNIT-I: ELECTRO CHEMISTRY
Introduction, conductance, types of conductance – specific, equivalent, molar conductance and their interrelationship – numericals. Principle and applications of conductometric titrations- strong acid *vs* strong base, week acid *vs* strong base and mixture of acids *vs* strong base.

Cells – electrolytic and electrochemical cells. IUPAC convention of cell notation, cell reaction, concept of electrode potential, electromotive force (EMF). Electrochemical series – applications, 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.

UNIT-II: BATTERY TECHNOLOGY
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, Memory effect, flat discharge rate.
Primary batteries: Construction and electrochemistry of Zn-C battery – acidic and alkaline 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 fuel cell and phosphoric acid fuel cell.

UNIT-III: POLYMER CHEMISTRY

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. Types of Polymerizations – Addition and condensation polymerization. Molecular weight – number average and weight average molecular weight, numericals. Glass transition temperature and factors affecting glass transition temperature.
Plastics: thermo plastics and Thermo sets.
Biodegradable polymers: Concept, preparation and uses of poly lactic acid.
Conducting polymers: Definition – classification, mechanism of conduction in (p-doped and n-doped) polyacetylene and applications.
Polymer composites: Introduction, advantages of composites over conventional materials, Classification of composites. Manufacturing methods-Hand lay up and RTM method.

UNIT-IV: ENGINEERING MATERIALS

Nanomaterials
Introduction – concept of nanomaterials – quantum confinement and surface volume ratio. Applications of Nanomaterials.
Types of Nanomaterials**:** carbon nanotubes, quantum dots, nanowires, nanocrystals.
Synthesis of nanomaterials: Top down and bottom-up approaches – Mechanical grinding by ball milling, sol gel method.
Carbon Nanotubes**:** Single walled carbon nanotubes (SWCNTs). Multi walled carbon nanotubes (MWCNTs), synthesis of CNTs – arc discharge and laser ablation methods.
Liquid Crystals
Introduction, classification of liquid crystals – Thermotropic and Lyotropic liquid crystals – Chemical constitution & liquid crystalline behavior. Molecular ordering in liquid crystals – Nematic, Smectic and Cholestric liquid crystals – Applications.

UNIT-V: INSTRUMENTAL METHODS OF ANALYSIS

Spectroscopy: Principle of Beer-Lamberts law, numericals. Principle, block diagram and Applications of Atomic Absorption Spectroscopy (AAS).

Microscopic techniques: Introduction, Limitations of optical microscopy. Significance of de Broglie's equation, Principle and block diagram of Scanning Electron Microscope (SEM), Atomic Force Microscope (AFM).

Thermo Gravimetric Analysis: Principle, block diagram of Thermogravimetric Analysis (TGA) and analysis of calcium oxalate and copper sulphate.

Text Books:

1. P. C. Jain, M Jain Engineering Chemistry, Dhanapathi Rai publishing company (17th edition), New Delhi.
2. Sashi Chawla, Text book of Engineering Chemistry, Dhanapathi Rai & Co, New Delhi.
3. O. G. PALANNA, Engineering Chemistry, TMH Edition.
4. J.C. Kuriacose and Rajaram, Chemistry in Engineering and Technology
5. Wiley Engineering Chemistry, Wiley India pvt Ltd, II 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.

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

Department of Electrical & Electronics Engineering

PROGRAMMING AND PROBLEM SOLVING FOR EEE

SYLLABUS FOR B.E. I SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U24ES110EE**
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.

UNIT-I
Introduction to Computers: Computer Systems, Computing Environments, Computer Languages, Creating and Running Programs, SoftwareDevelopment, Flowcharts. Number Systems (Binary, Octal, Decimal andHexadecimal), 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, Bitwise Operators.

UNIT-II:

Selection: Logical Data and Operators, if… else, switch Statements, StandardFunctions.

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

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

UNIT-III:

Recursion: Recursive Functions.

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, Insertion sort.

UNIT-IV:

Pointers: Introduction, Pointers for Inter-Function Communication, Pointers to Pointers, Compatibility, Arrays and Pointers, Pointer Arithmeticand Arrays, Passing on Array to a Function, Memory Allocation Functions, Array of Pointers, Programming Applications.

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, NestedStructures, Arrays of 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 usingC,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 inC, 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),
   PearsonEducation.

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
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Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF CIVIL ENGINEERING

BASIC ENGINEERING MECHANICS
(Common to Civil, CSE, ECE, EEE & Mechanical Engineering)

SYLLABUS FOR B.E. I SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U24ES010CE**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

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 and composite 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 and polar moment of inertia of a given section.

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

UNIT-II: Equilibrium of Force Systems: Free body diagram, Equations of equilibrium, Equilibrium of planar and spatial system.

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, Connectedsystems and belt friction, Wedge friction.

UNIT-V: Centroid and Moment of Inertia: Centroids of lines, areas and volumes, Moment of inertia of areas, Composite areas, Polar moment of inertia, Radius of gyration.

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

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Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

CIRCUIT THEORY

SYLLABUS FOR B.E. I SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U24PC110EE**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES**
	On completion of the course, students will be able to
The objective of Circuit theory is to provide a thorough understanding of the fundamentals of electric circuits such that the student would develop an in depth know ledge of circuit elements (active and passive), their characteristics and their functioning to analyze and apply to many engineering problems.	1. Describe the elements of electrical circuits and apply basic laws and principles to determine desired values. 2. Apply basic Electrical concepts to analyze dc electrical circuits. 3. Apply basic Electrical concepts to analyze ac electrical circuits. 4. Apply network theorems to analyze Electrical circuits 5. Apply concepts of three phase circuits to analyze them.

UNIT-I: Electric Circuit fundamentals:
Charge and Current, Voltage, Power and energy, Passive sign convention, Passive circuit elements R, L and C and their V-I relationships, Description of independent and dependent sources, Ohm's law, KCL, KVL, Series and parallel circuits, Current and voltage division principles, Source transformation, Wye – Delta transformation, Delta-Wye transformation.

UNIT-II: DC Circuit Analysis:
Nodal and mesh analyses containing independent and dependent sources.
AC Circuit Fundamentals: Definition and computation of average value, RMS value of periodic signals, form factor and peak factor, Definition of phasor, Phasor domain conversions.

UNIT-III: AC Circuit Analysis:
Network analysis techniques in phasor domain, Steady state response of RLC circuits subjected to sinusoidal excitation. Definition of instantaneous power, complex power and Power factor. Power in single phase ac circuits.

Unit IV: Network Theorems:
Linearity, Superposition, Thevenin's, Norton's, Maximum Power Transfer and Tellegen's Theorem with DC and AC excitation.

Unit V: Three phase circuits:
Balanced three phase voltages, three phase power, Wye and Delta Connected systems, Calculations of voltage, current and power in three phase circuits for balanced and unbalanced loads. Three phase power measurement using two wattmeters.

Learning Resources:
1. Charles K.Alexander& Matthew N.O.Sadiku, Fundamentals of ElectricCircuits,Tata McGraw-Hili, 6th Edition, 2019.
2. W.H.Hayt, J.E.Kimmerly, Engineering Circuit Analysis, McGraw Hill, 8thEdition, 2013
3. M.E. Van Valkenburg, Network Analysis, Prentice Hall of India, 3rd Edition,2019
4. David A.Bell, Electric Circuits ,Oxford university Press, SeventhEdition,2015

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF MECHANICAL ENGINEERING

INTRODUCTION TO ENTREPRENEURSHIP
SYLLABUS FOR B.E.I-SEMESTER

L:T:P(Hrs/week):1:0:0	SEE Marks:40	Course Code: **U24MC010ME**
Credits : 0	CIE Marks:30	Duration of SEE: 2 Hours

COURSE OBJECTIVE	COURSE OUTCOMES	
The objective of the course is to	*On completion of the course, students will be able to*	
inspire students develop an entrepreneurial mind-set, educate about the resources and schemes available to start enterprises in India.	1	Get awareness about entrepreneurship and potentially become an entrepreneur.
	2	Discern the characteristics required to be a successful entrepreneur
	3	Know the importance of effective communication.
	4	Demonstrate effective sales skills.

Unit-I: Sources of new ideas, techniques for generating ideas.
Team formation, how entrepreneurship has changed the country and world, entrepreneurial myths, E-cells and their significance, success story of entrepreneurs, eg: Practo, global entrepreneurs, entrepreneurial journeys, challenges, and successes, characteristics of a successful entrepreneur, entrepreneurial styles, introduction to business model.

Unit-II: Importance of effective communication for entrepreneurs, communication barriers, miscommunication, incorrect assumptions about people, importance of listening, design thinking, sales skills, understanding the customer-centric approach, personal selling techniques, show and tell, elevator pitch, managing risks and learning from failures, women entrepreneurs.

Learning Resources:

1. Bruce R. Barringer and R. Duane Ireland, "Entrepreneurship: successfully launching new ventures", 3rd edition, Pearson Prentice Hall, 2009.
2. P. Denning and R. Dunham, "The Innovator's Way", MIT Press: Cambridge, Massachusetts, 2010.
3. Arya Kumar, "Entrepreneurship", Pearson Education, Delhi, 2012.
4. Michael H. Morris, D.F.Kuratko, J G Covin, "Corporate Entrepreneurship and Innovation", Cengage learning, New Delhi,2010
5. Peter F. Drucker, "Innovation and Entrepreneurship", Routledge Classics, 2015.
6. Eric Ries, "The Lean Start-up", Currency, 1st edition, 2011.

Web Resources:
7. http://www.learnwise.org

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

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

Duration of Internal Test: 90 minutes

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

DEPARTMENT OF CIVIL ENGINEERING
ENVIRONMENTAL SCIENCE
(Common to Civil, ECE, EEE &Mech.)
SYLLABUS FOR B.E.I-SEMESTER

L:T:P(Hrs/week):2:0:0	SEE Marks:60	Course Code: **U24MC010CE**
Credits : -	CIE Marks:40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES**
In this subject the students will	Upon the completion of this course students will be able to
1. Describe various types of natural resources available on the earth surface. 2. Explain the concepts of an ecosystem and the biotic and abiotic components of various aquatic ecosystems. 3. Identify the values, threats of biodiversity, endangered and endemic species of India along with the conservation of biodiversity. 4. Explain the causes, effects and control measures of various types of environmental pollutions. 5. Describe the methods for water conservation, the causes, effects of global warming, climate change, acid rain, ozone layer depletion, population explosion.	1. Describe the various types of natural resources. 2. Differentiate between various biotic and abiotic components of ecosystem. 3. Examine the values, threats of biodiversity, the methods of conservation, endangered and endemic species of India. 4. Illustrate causes, effects, control measures of various types of environmental pollutions. 5. Explain the methods of water conservation, causes, effects of climate change, global warming, acid rain and ozone layer depletion, population explosion.

UNIT-I: Environmental Studies: Definition, importance of environmental studies. Natural resources: Water resources; floods,drought, conflicts over water, dams-benefits and problems. Food resources; Effects of modern agriculture, fertilizer-pesticide problems, Eutrophication, Biomagnification, water logging, salinity. Energy resources: Renewable and non-renewable energy resources. Land Resources, soil erosion and desertification.

UNIT-II: Ecosystems: Definition of ecosystem, classification of ecosystem, Structure and function of an ecosystem, producers, consumers and decomposers, food chains, food webs, ecological pyramids, aquatic ecosystem (ponds) ,Terrestrial ecosystem(Forest)

UNIT-III: Biodiversity: Definition, Genetic, species and ecosystem level diversity. Values of biodiversity, threats to biodiversity, endangered and endemic species of India, conservation of biodiversity. Biological diversity Act 2002.

UNIT-IV: Environmental Pollution: Causes, effects and control measures of air pollution, air pollution control devices (catalytic convertor) water pollution, water pollution monitoring devices, soil pollution, noise pollution, solid waste types, Municipal solid waste & e-waste recycling, Air act and water act.

UNIT-V: Social Aspects and the Environment: Water conservation, global warming, case study related to self cooling technologies, acid rain, ozone layer depletion, Kyoto protocol, Climate change, Dubai and Paris aggrements. Environmental Impact Assessment. Consumerism, Sustainable development goals (SDG-17), Environmental protection act 1986

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 Test	:	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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

SYLLABUS FOR B.E. I SEMESTER

L:T: P (Hrs/Week):0:0:2	SEE Marks: 50	Course Code: **U24HS011EH**
Credits: 1	CIE Marks: 30	Duration of SEE : 3 Hours

COURSE OBJECTIVE	COURSE OUTCOMES
The objective of the course is to	*On completion of the course, students will be able to*
1. Learn the speech sounds, parts of speech and distinguish between vowel and consonant sounds in the English language to reduce mother tongue influence when speaking English. 2. Understand and follow the rules in debates, group discussions, interviews. 3. Develop reading skills and analyse various text types.	1. Speak well using 'generally acceptable English' in terms of pronunciation and use of diction. 2. Participate effectively in group discussions, public speaking, debates (formal and informal). 3. Read, analyse, evaluate and infer meaning from different types of texts and paraphrase them.

1.0 PHONETICS LAB- TOPICS

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.

2.0 INTERACTIVE COMMUNICATION SKILLS LAB-TOPICS

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

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

2.3   **Debate:**
        Understanding the difference between a debate and a group discussion,
        essentials of debates.

3.0 READING SKILLS LAB - TOPICS

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.

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. PriyadarshiniPatnaik : 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.

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

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF CHEMISTRY

CHEMISTRY LAB
SYLLABUS FOR B.E. I SEMESTER

L:T: P (Hrs/Week):0:0:2	SEE Marks: 50	Course Code: **U24BS011CH**
Credits: 1	CIE Marks: 30	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.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.

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 available chlorine in bleaching powder.
6. Estimation of total hardness of given water sample.
7. Estimation of alkalinity of a given sample.
8. Conductometric acid-base titrations -Determination of strength of given acids (HCl *Vs* NaOH and CH_3COOH *Vs* NaOH).
9. Conductometric acid-base titrations- Determination of strength of acids in a given mixture of acids
(HCl and CH_3COOH *Vs* NaOH)
10. Determination of strength of a given acid by Potentiometry.

11. Determination of concentration of a given $FeSO_4$ using redox titration by Potentiometry.
12. Determination of strength of a given acid by pH metry.
13. Determination of strength of permanganate or copper in brass solution by Colorimetry.
14. Synthesis of Phenol formaldehyde resin / PANI.
15. Chemistry of blue printing.

Text Books:
1. G H Jeffery, J Bassett, J Mendham, R C Denney, Vogel's text book of quantitative chemical analysis, Fifth Edition.
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**			

VASAVI COLLEGE OF ENGINEERING
(AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

Department of Electrical & Electronics Engineering

Programming and Problem Solving for EEE Lab
SYLLABUS FOR B.E. I SEMESTER

L:T: P (Hrs/Week):0:0:2	SEE Marks: 50	Course Code: **U24ES111EE**
Credits: 1	CIE Marks: 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	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.

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'ReillyPress.
4. Balagurusamy E, Programming in ANSI C, 4th Edition(2008), TMG.

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**			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS) :: IBRAHIMBAGH, HYDERABAD – 500 031.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SCHEME OF INSTRUCTION AND EXAMINATION (R-24) :: B.E. - EEE : SECOND SEMESTER(2024-25)

Course Code	Name of the Course	Scheme of Instruction Hours per Week			Scheme of Examination			Credits
		L	T	P/D	Duration in Hrs	Maximum Marks		
						SEE	CIE	
B.E (EEE) II Semester								
THEORY								
U24BS210MA	Differential Equations & Vector Calculus	3	-	-	3	60	40	3
U24BS210PH	Quantum Mechanics and Material Science	3	-	-	3	60	40	3
U24ES210EE	Object Oriented Programming using C++	3	-	-	3	60	40	3
U24PC220EE	Electrical Network Analysis	3	-	-	3	60	40	3
U24ES030CE	Basic Engineering Drawing	1	-	2	3	60	40	2
U24HS020EH	Human values and Professional Ethics -I	1	-	-	2	40	30	1
PRACTICALS								
U24BS211PH	Engineering Physics Lab	-	-	2	3	50	30	1
U24ES021ME	Workshop Practice	-	-	2	3	50	30	1
U24ES211EE	Object Oriented Programming using C++ Lab	-	-	2	3	50	30	1
U24PC221EE	Electrical Network Analysis Lab	-	-	2	3	50	30	1
	Library/Sports/Mentor- Mentee Interaction	-	-	-	-	-	-	-
	PDC/CC/TC/RC	-	-	-				
TOTAL		14	-	10	-	540	350	19
GRAND TOTAL		24				890		19

B.E students shall complete one NPTEL Certificate Course of 8 weeks equivalent to 2 Credits by the end of VI semester

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF MATHEMATICS

DIFFERENTIAL EQUATIONS & VECTOR CALCULUS
(Common to Civil, EEE, ECE, Mech.)

SYLLABUS FOR B.E. II SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:**U24BS210MA**
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 techniques 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 the techniques to analyze LCR circuits. **3.Understand**the concepts of Beta, Gamma functions and their properties. **4. Learn**how to evaluate double and triple integrals and study the concepts of vector integration. **5. Study** the concepts of vector differentiation.	**1. Solve** various types of first-order differential equations, model and analyze physical systems such as LR and RC circuitsand sketch orthogonal trajectories of Cartesian families of curves. **2. Solve** homogeneous and non-homogeneous linear differential equations with constant coefficients, including those arising in LCR circuits. **3. Evaluate** Improper integrals using Beta, Gamma functions. **4. Apply** the concepts of multiple integrals to evaluate area, volume **5. Find** the gradient of a scalar point function, divergence and curl of vector field and its applications.

UNIT – I
ORDINARY DIFFERENTIAL EQUATIONS OF FIRST ORDER
Exact first order differential equations - Integrating factors - Clairaut's equation - Applications: Orthogonal trajectories (Cartesian families), LR and RC Circuits

UNIT – II
HIGHER ORDER LINEAR DIFFERENTIAL EQUATIONS
Solutions of Homogeneous and Non-Homogeneous linear equations with constant coefficients: Complimentary function & Particular Integral-Method of Variation of Parameters. LCR circuits

UNIT – III
SPECIAL FUNCTIONS
Definition of Improper Integrals. Beta function , Gamma function , Relations between Beta & Gamma function ,Properties of Beta and Gamma functions.

UNIT – IV
MULTIPLE INTEGRALS
Double integrals (Cartesian) - Change of order of integration (Cartesian Coordinates)- Change of the Variables (Cartesian to polar Coordinates in two dimensions)- Tripleintegrals (Cartesian).

UNIT – V
VECTOR CALCULUS
Scalar and Vector point functionand their derivatives-Level Surface-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 - Line integral - Green's Theorem (Without proof).

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.
3. Complex Variables and applications, J.W.Brown and R.V.Churchill, 7th Edition, Tata Mc Graw Hill,2004.

Online Resources :

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

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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)

9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF PHYSICS

Quantum Mechanics and Material Science
(Common Syllabus for ECE and EEE Branches)

SYLLABUS FOR B.E. II SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U24BS210PH**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1.Demonstrate the significance of crystal structure in device applications. 2.Appreciate the advantages of quantum mechanics over classical mechanics. 3.Arrive at the expressions for carrier concentration in semiconductors 4.Comprehend lasing action and relate the use of lasers in optical fiber communication 5.Choose appropriate dielectric, magnetic and superconducting materials for required applications	1.Classify crystals based on their structure and list appropriate uses 2.Apply Schrodinger wave equations to quantum mechanical systems. 3.Apply semiconductor physics to fabricate various devices 4.Compare different types of lasers. Summarize merits and demerits of optical fibers. 5.Select various dielectric, magnetic and superconducting materials for specific applications in engineering.

UNIT-I: FUNDAMENTALS OF CRYSTAL STRUCTURE

Introduction to crystallography-Miller Indices, inter planar spacing (d_{hkl}), Bragg's law, x- ray diffraction, Debye-Scherer (powder) method, distinction between crystalline, polycrystalline, and amorphous materials, Point Defects and their effects, expression for concentration of Schottky and Frankel defects and applications relevant to electronics and communication engineering.

UNIT-II: QUANTUM MECHANICS

De Broglie Hypothesis, wave packet, Davisson and Germer's experiment, wave function and its significance, Schrodinger time dependent and independent wave equations, Eigen values and Eigen functions of infinite square-well potential (particle in a box). Potential barrier-quantum tunneling problem. Introduction to bra and ket vector notation, representation of Qubit, applications of quantum computing.

UNIT-III: SEMICONDUCTOR PHYSICS

Classical free electron (Drude) theory and its limitations, density of states, Kronig-Penney model, formation of energy bands, E-k diagram, Fermi-Dirac statistics (Qualitative), types of semiconductors, Fermi energy level, variation of Fermi energy level with temperature and doping concentration, expression for equilibrium carrier concentration in intrinsic and extrinsic semiconductors, conductivity of intrinsic and extrinsic semiconductors, formation of P-N Junction, Hall effect and its applications, Applications of semiconductor devices in electronic engineering.

UNIT-IV: LASERS AND OPTICAL FIBRES

Lasers: Induced absorption, spontaneous and stimulated emissions, characteristics of lasers, population inversion, meta-stable states, pumping mechanisms, components of laser, Properties of laser beam, types of lasers, construction and working of He-Ne laser and 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, V- number, signal losses in optical fibers: Attenuation-absorption, scattering, bending, alignment losses, Signal distortion: intermodal and intra modal dispersions, block diagram of optical communication system, advantages and application of optical fibers.

UNIT-V: MATERIALS SCIENCE

Dielectric Materials: Polar and non-polar dielectrics, types of dielectric polarizations, Expressions for electronic polarizability and ionic polarizability, Frequency and temperature dependence of dielectric polarizations, applications of dielectric materials.

Magnetic Materials: Origin of magnetism, Ferromagnetic materials, antiferromagnetic materials and ferri-magnetic (ferrites) materials, Weiss molecular field theory of ferromagnetism, magnetic domains, hysteresis curve, soft and hard magnetic materials and their applications.

Superconductivity: Introduction to superconductivity, General properties of superconductors, Meissner effect, Type I and Type II superconductors-fundamentals of BCS Theory - Josephson's Junctions-Josephson's effects–SQUID-Applications of superconductors.

Learning Resources:

1. Charles Kittel, Introduction to Solid State Physics, 8th edition, John Wiley & Sons, 2012
2. S O Pillai, Solid State Physics, 8th edition, New Age International Publishers, 2018
3. M.N. Avadhanulu and P.G. Kshirsagar and TVS Arun Murthy, A Textbook Engineering Physics, 11th edition, S. Chand, 2019.
4. NPTEL MOOCS, Introduction to Solid State Physics, Satyajit Banerjee
5. NPTEL MOOCS, Concepts in Magnetism and Superconductivity, Prof Arghya Taraphder.
6. NPTEL MOOCS, Solid State Physics, Prof. Amal Kumar Das.

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

Object Oriented Programming using C++
SYLLABUS FOR B.E. II SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:**U24ES210EE**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	On completion of the course, students will be able to
• Understand basic notions of object oriented programming. • Acquire object-oriented problem solving skills. • Write programs in C++.	1. Explain Object Oriented Programming concepts using C++. 2. Design programs using functions, input/output operations, decision making and looping constructs. 3. Create classes using object oriented design principles. 4. Design programs to implement inheritance, polymorphism. 5. Design programs to implement exception handling.

UNIT-I

Introduction to C++: Programming paradigms, Object Oriented Programming Concepts, Advantages and Applications of OOP.
C Concepts: Variables and Assignments, Input and Output, Data Types, Expressions, SimpleFlow Control and Control Structures.

I/O Streams as an introduction to Classes and Objects.
UNIT-II
Functions: Call by Value, Call by Reference, Recursion, Testing and Debugging Functions.
Arrays: Introduction to Arrays, Arrays in Functions, Programming with Arrays and Multidimensional Arrays, Dynamic Arrays.

UNIT-III
Constructors, Destructors, CopyConstructors.

Static Polymorphism: Function and Operator Overloading, Friend Functions.

UNIT-IV
Inheritance: The Notion of Inheritance, Derived Classes, Overriding, Virtual Base Class. Runtime Polymorphism, Virtual Functions, Abstract class.

UNIT-V
Function Templates and Class Templates.
Exception Handling: Exception Handling Basics, Programming Techniques for Exception Handling

Learning Resources:

1. Walter Savitch, "Problem solving with C++", 6th Edition, Pearson Education,2009.
2. Behrouz A. Forouzan, Richard F. Gilberg, "Computer Science, A StructuredApproach using C++", 2nd Edition, Cengage Learning, 2010.
3.E. Balaguruswamy, "Object-Oriented Programming with C++", 6thEdition, Tata Mc-Graw Hill, 2013.
4.K.R.VenuGopal, Rajkumar Buyya, T.RaviShankar, "Mastering C++", 2nd Edition,McGraw Hill , 2013.
5.S.B. Lippman. J Lajoie , "C++ Primer" 3rd Edition, AW Publishing Company,2007.
6.Paul Dietel, Harvey Dietel, "C++ How to Program", 6th Edition, PHI, 2010.
7.Bjarne Stroustrup, "The C++ Programming Language", 4th Edition, Addison-Wesley, 2013.

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
Electrical Network Analysis

SYLLABUS FOR B.E. II SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks: 60	Course Code: **U24PC220EE**
Credits: 3	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:
The objective of Electrical Network Analysis is to provide the Knowledge on transient and steady state analysis of electrical circuits, Resonance, coupled circuits and two port network parameters. Also provide the Laplace approach to analyse electrical networks.	At the end of this course, students will demonstrate the ability to 1. Analyse the transient and steady-state response of first order and second order electrical circuits. 2. Apply and analyse the resonance in electrical circuits 3. Analyse the coupled circuits. 4. Analyse the two port networks. 5. Apply Laplace transforms to analyse the electrical circuits

Unit I: Solution of First order networks
Introduction, Terminology: Time constant, natural response, forced response; The source free RC circuit, Source free RL circuit, Singularity functions, Step response of an RC circuit, Step response of an RL circuit.

Unit II: Solution of Second order networks
Introduction, Finding initial and final values, The Source free series RLC circuit, Source free parallel RLC circuit, Step response of a series RLC circuit, Step response of a parallel RLC circuit, General second order circuits.

Unit III: Dual networks. Resonance and Magnetically Coupled Circuits

Duality and dual networks; series and parallel resonances; Mutual inductance, energy in a coupled circuit, Mutual coupled circuits, Dot Convention in coupled circuits, Linear transformer , Ideal Transformer.

Unit IV: Two Port Networks

Two Port Networks, terminal pairs, relationship of two port variables, impedance parameters, admittance parameters, transmission parameters and hybrid parameters, interconnections of two port networks.

Unit V: Electrical Circuit Analysis Using Laplace Transforms:

Review of Laplace Transform: Definition, properties; Inverse Laplace Transform; Analysis of electrical circuits using Laplace Transform for standard inputs, convolution integral, Circuit element models, Analysis of transformed network with initial conditions. Transfer function representation, Poles and Zeros.

Learning Resources:

1.   C. K. Alexander and M. N. O. Sadiku, "Fundamentals of Electric Circuits", Tata McGraw Hill Education, 2013.
2.   W. H. Hayt and J. E. Kemmerly, "Engineering Circuit Analysis", Tata McGraw Hill Education, 2013.
3.   D. Roy Choudhury, "Networks and Systems", New Age International Publications, 1998.
4. M. E. Van Valkenburg, "Network Analysis", Prentice Hall, 2006.
5.   K. V. V. Murthy and M. S. Kamath, "Basic Circuit Analysis", Jaico Publishers, 1999.

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF CIVIL ENGINEERING

Basic Engineering Drawing
(Common to EEE & ECE)

SYLLABUS FOR B.E. II SEMESTER

L:T:P (Hrs./week): 1:0:2	SEE Marks: 60	Course Code: **U24ES030CE**
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. 4. Visualize and construct isometric projections.	1. Understand the fundamentals of drawing. 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. 5. Draw the isometric projections of lines, planes and solids.

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 in first quadrant only. Traces (By conventional methods only).

UNIT-III: Projections of Planes: Projections of perpendicular planes, oblique planes and their traces.

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

UNIT-V: Isometric Projections: Principles of isometric projections – Isometric scale, Isometric axes, Isometric planes, Isometric view. Isometric views of lines, planes, regular solids, and combination of two solids.

Learning Resource:

1. Bhatt N.D. "Elementary Engineering Drawing",Charotar Publishers,2014.
2. Thomas E French, Charles J Vierck, Robert J. Foster,"Engineering Drawing and Graphic Technology",Mc Graw Hill Education, 1993.
3. Gill P.S."Engineering Drawing: Geometrical Drawing",S K Kataria &sons, 2012.
4. Venu gopal. K" EngineeringDrawingand Graphics Plus Autocad",New Age International (P) Ltd., New Delhi,2011.
5. Siddiquee A.N" Engineering Drawing with a Primer on Autocad", Prentice hall of India Ltd., New Delhi,2004.
6. Basanth Agrawal, Agrawal C.M " Engineering Drawing" Second Edition, Tata McGraw Hill,2013
7. BVR Gupta, MRajaRoy, "Engineering Drawing with AutoCad", IKInt Pvt Ltd, 2009.
8. NPTEL Course (www.nptel.ac.in)
9. 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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

HUMAN VALUES AND PROFESSIONAL ETHICS-1
(Common to all branches) SYLLABUS FOR B.E. II SEMESTERS

L:T: P (Hrs/Week):1:0:0	SEE Marks: 40	Course Code: **U24HS020EH**
Credits: 1	CIE Marks: 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES students able to:	COURSE OUTCOMES The students acquire the ability 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.

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

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

1. No. of Internal Tests : 1 Max. Marks for each Internal Test : 20
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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF PHYSICS

ENGINEERING PHYSICS LAB
SYLLABUS FOR B.E. II SEMESTER
(Common to ECE and EEE)

L:T: P (Hrs/Week):0:0:2	SEE Marks: 50	Course Code: **U24BS211PH**
Credits: 1	CIE Marks: 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES students able to:	**COURSE OUTCOMES** The students acquire the ability 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. Conduct experiment independently and in team to record the measurements 2. Outline the precautions required to be taken for each experiment 3. Compare the experimental results with standard values and estimate errors 4. Draw graphs and interpret the results with respect to graphical and theoretical values 5. Write the summary of the experiment and draw appropriate conclusions

1.   Determination of wavelength of Laser light.
2. Calculation of NA, acceptance angle and power loss due to bending of an optical fibre.
3. Determination of energy gap of a given semiconductor by four probe method
4. Study of I-V characteristics of solar cell and to calculate fill factor and efficiency.
5. Determination of Hall coefficient using Hall effect.
6. Determination of e/m of an electron by Thomson's method
7. Study of resonance in LCR series circuits and estimation of band width & Q- factor
8. Study of resonance in LCR parallel circuits
9. Determination of wavelength of a light source by Michelson interferometer

10. Determination of Seebeck coefficient
11. Determination of Dielectric constant.
12. Helmholtz coil –calculation of magnetic field along the axis of a solenoid
13. B-H curve-estimation of Hysteresis loss of a ferromagnetic sample
14. Study of I-V characteristics of P-N Junction diode.
15. Study of I-V characteristics of Zener Diode

Each student should perform at least 10 (Ten) experiments.

No. of Internal Tests:	01	Max. Marks for Internal Test:	12
Marks for day-to-day laboratory class work			18
Duration of Internal Test: **3 Hours**			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF MECHANICAL ENGINEERING

WORKSHOP PRACTICE
SYLLABUS FOR B.E. I-SEMESTER (AY 2024-25)
(Common to Civil & EEE branches)

SYLLABUS FOR B.E. II SEMESTER

L:T: P (Hrs/Week):0:0:2	SEE Marks: 50	Course Code: **U24ES021ME**
Credits: 1	CIE Marks: 30	Duration of SEE : 3 Hours

List of the Experiments:

ELECTRICAL & ELECTRONICS:
1. Two lamps in(a)series(b) parallel with 3 pin plug and switches
2. Staircase wiring and Tube light wiring
3. (a) Identification of electronic components
   (b) Soldering practice

CARPENTRY:
1. Half-lap joint
2. Dove-tail joint
3. Bridle joint

PLUMBING:
1. Introduction of tools, joints, couplings and valves etc.
2. Pipe thread cutting and making single joint with coupling and tap connection.
3. Water shower connection with reducer coupling

WELDING
1. Bead formation using arc welding
2. Butt joint & T joint using arc welding
3.Lap joint using gas welding`

ADDITIONAL EXPERIMENTS
1. Electrical & Electronics: LT Distribution with loads (Demo)
2. Carpentry: Wood turning operation (demo)
3. Demonstration of 3D printing of a component
4. Welding: Spot welding (demo)

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

OBJECT ORIENTED PROGRAMMING USING C++ LAB
SYLLABUS FOR B.E. II SEMESTER

| L:T: P (Hrs/Week):0:0:2 | SEE Marks: 50 | Course Code: **U24ES211EE** |
| Credits: 1 | CIE Marks: 30 | Duration of SEE : 3 Hours |

COURSE OBJECTIVES	COURSE OUTCOMES On completion of the course, students will be able to
• Write, compile and debug programs in C++. • Formulate problems and implement in C++. • Acquire skills to solve computing problems.	• Write and debug programs in C++ language • Choose appropriate data types, functions, decision and looping constructs to develop C++ programs. • Implement OOP functionalities such as class, overloading, dynamic memory allocation. • Develop programs using Inheritance, polymorphism. • Develop programs using Templates and Exception Handling

LIST OF EXPERIEMNTS
1. Programs on matrix and complex numbers using classes.
2. Programs on control statements.
3. Programs on loop statements.
4. Programs using constructors, destructors and copy constructors.
5. Programs on dynamic memory allocation for arrays.
6. Programs to demonstrate friend class.
7. Programs to demonstrate function overloading.
8. Programs to demonstrate operator overloading.
9. Programs to demonstrate inheritance.
10. Programs on virtual functions, dynamic polymorphism.

11. Programs on function templates, class templates.
12. Programs on exception handling

SUGESTED BOOKS:

1. Walter Savitch, "Problem solving with C++", 6th Edition, Pearson Education Publishing, 2009.
2. Behrouz A. Forouzan, Richard F. Gilberg, "Computer Science, A Structured Approach using C++", 2nd Edition, Cengage Learning, 2010.
3. Balaguruswamy, "Object-Oriented Programming with C++", 6th Edition, Tata Mc-GrawHill, 2013.

No. of Internal Tests:	01	Max. Marks for Internal Test:	12
Day-to-day laboratory class work which will be awarded based on the average of assessment for each experiment considering at the end of the course			18
Duration of Internal Test: **3 Hours**			

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

Electrical Network Analysis Lab

SYLLABUS FOR B.E. II SEMESTER

L:T: P (Hrs/Week):0:0:2	SEE Marks: 50	Course Code: **U24PC221EE**
Credits: 1	CIE Marks: 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES The course will enable the students to	**COURSE OUTCOMES** On completion of the course, students will be able to
The objective of Electrical Circuits Laboratory is to provide Under Graduate Engineer a thorough understanding on the fundamentals of electric circuits with hands-on experience, so that the student will acquire in depth knowledge on circuit elements, their characteristics and their functioning to analyze and apply to many engineering problems.	1. Apply fundamental laws and find the unknown quantity (voltage/Current) in circuits with suitable analysis. 2. Analyze the power and power factor in AC circuits. 3. Analyze the Step response of first order and second order circuits. 4. Understand and analyze the characteristics of resonance in electrical circuits. 5. Understand and analyze the Coupled circuits and two-port network parameters.

List of Experiments
1. Series and parallel circuits with DC excitation.
2. Determination of power and Power factor in single phase ac circuits.
3. Superposition theorem.
4. Thevenin's and Norton's theorems.
5. Determination of maximum power transfer in a circuit.
6. Measurement of cumulative three-phase power in a balanced three phase circuit.
7. Step response of series R-L and series R-C circuit.
8. Step response of series R-L-C circuit.

9. Characteristics of Series resonance
10. Polarity test in coupled circuits and determination of mutual inductance.
11. Determination of impedance and admittance parameters of a two-port network.
12. Determination of hybrid parameters and transmission parameters a two-port network.

Virtual Lab Experiments:
Lab title: Analog Signals, Network and Measurement Virtual Laboratory

Link: https://asnm-iitkgp.vlabs.ac.in/List%20of%20experiments.html

1. Verification of Norton Theorem
2. Verification of Thevenin Theorem
3. Verification of Tellegen's Theorem
4. Verification of Superposition Theorem
5. Verification of Millman's Theorem
6. Three Phase Power Measurement
7. R-L-C Circuit Analysis
8. Tests on Single Phase Transformer
9. Verification of Compensation Theorem
10. Verification of Reciprocity Theorem
11. Verification of Maximum Power Transfer Theorem
12. Determination of different parameters of Two-port network and verification of their interrelations
13. Frequency response of R-L-C series Circuit

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 day-to-day laboratory class work			18
Duration of Internal Test: **2 Hours**			