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. (ECE) I and II Semesters
With effect from 2023-24
(For the batch admitted in 2023-24)
(R-23)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Phones: +91-40-23146040, 23146041

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

Striving for excellence in teaching, training and research in the areas of Electronics and Communication Engineering and fostering ethical values

Department Mission

To inculcate a spirit of scientific temper and analytical thinking and train the students in contemporary technologies in Electronics and Communication Engineering to meet the needs of the industry and society with ethical values

B.E (ECE) Program Educational Objectives (PEO's)	
PEO I	Graduates will be able to identify, analyze and solve engineering problems.
PEO II	Graduates will be able to succeed in their careers, higher education, and research.
PEO III	Graduates will be able to excel individually and in multidisciplinary teams to solve industry and societal problems.
PEO IV	Graduates will be able to exhibit leadership qualities and lifelong learning skills with ethical values.

B.E. (ECE) 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.
PO10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, give and receive clear instructions.
PO11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	Lifelong learning: Recognize the need, and for have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

B.E (ECE) PROGRAM SPECIFIC OUTCOMES (PSO's)	
PSO I	ECE students will be able to analyze and offer circuit and system level solutions for complex electronics engineering problems, keeping in mind the latest technological trends.
PSO II	ECE students will be able to apply the acquired knowledge and skills in modeling and simulation of communication systems.
PSO III	ECE students will be able to implement signal and image processing techniques for real time applications.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION **(R-23)** :: B.E. – ECE : FIRST SEMESTER (2023-24)

B.E (ECE) I – SEMESTER								
Course Code	Name of the Course	Scheme of Instruction			Duration in Hrs	Scheme of Examination		Credits
		Hours per Week				Maximum Marks		
		L	T	P/D		SEE	CIE	
THEORY								
U23HS010EH	English Language and Communication	2	-	-	3	60	40	2
U23BS110MA	Matrices and Calculus	3	-	-	3	60	40	3
U23BS110CH	Engineering Chemistry	3	-	-	3	60	40	3
U23ES120EC	Programming and Problem Solving for Engineers	3	-	-	3	60	40	3
U23ES010CE	Basic Engineering Mechanics	3	-	-	3	60	40	3
U23HS020EH	Human Values and Professional Ethics – I	1	-	-	2	40	30	1
U23MC010CE	Environmental Science	2	-	-	3	60	40	-
PRACTICALS								
U23HS111EH	English Language and Communication Skills Lab	-	-	2	3	50	30	1
U23BS011CH	Chemistry Lab	-	-	2	3	50	30	1
U23ES121EC	Programming and Problem Solving for Engineers Lab	-	-	2	3	50	30	1
U23ES011ME	Engineering Workshop	-	-	2	3	50	30	1
	TOTAL	**17**	**-**	**8**		**600**	**390**	**19**
	GRAND TOTAL	**25**				**990**		
Left over hours will be allocated for : Sports / Library / Mentor - Mentee Interaction / CC / RC / TC								

Note: **1)** Every Student shall complete one NPTEL course certification of 8 weeks duration (equivalent to 2 credits weightage) by the end of VI-Semester.
2) Students willing to Opt B.E (ECE) Honours Degree in System on Chip Design shall complete one NPTEL Course Certification (equivalent to 2 Credits weightage) by the end of IV-Semester.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION **(R-23)** :: B.E. – ECE : FIRST SEMESTER (2023 - 2024)

B.E (ECE) I - SEMESTER								
COURSES OFFERED BY ECE TO CSE								
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								
U23ES110EC	Introduction to Electronics Engineering	3	-	-	3	60	40	3
PRACTICALS								
U23ES111EC	Introduction to Electronics Engineering Lab	-	-	2	3	50	30	1

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DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

English Language and Communication

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

L:T:P (Hrs/Week): 2:0:0	SEE Marks: 60	Course Code: **U23HS010EH**
Credits: 2	CIE Marks: 40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the learners 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.	At the end of the course the learners will be able to: - 1. Communicate effectively and appropriately in both professional & personal spheres. 2. Listen to different types of spoken discourses and use them in relevant contexts. 3. Construct grammatically correct sentences using adequate vocabulary to compose written and spoken discourses. 4. Read, evaluate and appreciate various text types. 5. Research, collect data and write branch -specific structured project reports in English

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1										2	3				
CO2										1	3				
CO3										1	3				
CO4										1	3				

UNIT-I: 1.0 Effective communication and Interpersonal skills

1.1 Role and Importance of Communication – styles, channels and barriers of communication.

1.2 Politeness theory – Brown & Levinson.

1.3 Johari Window

1.4 Persuasion techniques.

1.5 Stages of Team Building by Bruce Tuckman

UNIT-II: 2.0 Listening and Speaking skills

2.1 Importance of listening--Types of listening

2.2 Speaking skills: Grice's – conversational Principles

UNIT-III: 3.0 Reading and Writing skills

3.1 Reading strategies- SQ3R – Survey, Question, Read, Recite, Review.

3.2 Features of Writing---Principles of writing paragraphs-Coherence, Cohesion & Unity; Use of appropriate linkers/connectives.

3.3 Request letters

3.4 Writing structured project reports.

UNIT-IV: 4.0 Vocabulary Building and Grammar

4.1 Vocabulary Building: Synonyms, Antonyms, One-word substitutes; Collocations; Idioms.

4.2 Functional Grammar: Articles, Prepositions; Tense and Aspect; Subject- Verb agreement; Direct and Indirect Speech.

UNIT-V: 5.0 Reading for appreciation of literary texts

5.1 **Prose** - What's the language of the future? Henry the teaching.

5.2 **Poem -** What should life be – Patricia Fleming.

Learning Resources:

1. Paul V. Anderson – Technical Communication
2. E. Suresh Kumar, P. Sreehari and J. Savithri - Essential English
3. Reading comprehension – Nuttal.J.C - Orient Blackswan
4. Sunitha Mishra,C. Murali Krishna, Communication Skills for Engineers, Pearson, 2004.
5. M. Ashraf Rizvi. Effective Technical Communication. Tata Mcgraw Hill, 2005.
6. Allen and Waters., How English Works.
7. Willis Jane., English through English.
8. 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 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 Test: 90 Minutes

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DEPARTMENT OF MATHEMATICS

Matrices and Calculus

SYLLABUS FOR B.E. I – SEMESTER (Common to Civil, EEE, ECE and Mech)

L:T(Hrs./week): 3:1:0	SEE Marks : 60	Course Code : **U23BS110MA**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to: **1. Study** the concepts of rank of a matrix, System of linear equations and LU-Decomposition method. **2. Learn** the concepts of Eigen values and Eigen vectors, Diagonalization of a matrix **3. Understand** the concepts of curvature, radius of curvature, evolutes and to expand functions using Taylor's series. **4. Acquire** the knowledge of partial derivatives and expand functions of two real variables using Taylor's series and maxima - minima. **5. Identify** the nature of an infinite series using various tests.	At the end of the course students should be able to: **1. Find** the rank of a given matrix and solution of a system by LU-Decomposition method. **2. Apply** the similarity transformation to diagonalize a matrix. **3. Compute** the radius of curvature, evolute of a given curve and to expand given function using Taylor's series. **4. Expand** the given function in terms of Taylor's series and find the maxima and minima of functions of several variables also using Lagrange's method of multipliers. **5. Apply** an appropriate test to check the nature of an infinite series.

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2										1	1		
CO2	3	2										1	1		
CO3	3	2										1	1		
CO4	3	2										1	1		
CO5	3	2										1	1		

UNIT-I : (10 classes)

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 : (10 classes)

MATRICES-II

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

UNIT-III : (08 classes)
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 : (12 classes)
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 - Maxima and Minima of functions of two variables - Lagrange's Method of multipliers.

UNIT-V : (08 classes)
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'Alemberts Ratio Test – Cauchy's root test - Alternating Series – Leibnitz test – Absolute and Conditional convergence.

Learning Resources:

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 40th. 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. http://mathworld.wolfram.com/topics
2. http://www.nptel.ac.in/course.php
3. https://www.coursera.org/in

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 Test: 90 Minutes

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DEPARTMENT OF CHEMISTRY

Engineering Chemistry

SYLLABUS FOR B.E. I – SEMESTER (For ECE & EEE branches)

L:T(Hrs./week): 3:0:0	SEE Marks : 60	Course Code : **U23BS110CH**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

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

CO-PO MAPPING FOR ENGINEERING CHEMISTRY												
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	3	2	-	-	-	-	-	-	-	-	-	1
2	3	2	-	-	-	-	2	-	-	-	-	2
3	3	2	-	-	-	-	2	-	-	-	-	2
4	3	1	-	-	-	-	1	-	-	-	-	2
5	3	1	-	-	-	-	-	-	-	-	-	1

UNIT-I : ELECTROCHEMISTRY (11)

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 (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, 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 (11)

Introduction, degree of polymerization, functionality of monomers and its effect on the structure of polymers. Classification of polymers – a) homo and co-polymers, b) homo chain and hetero chain polymers. c) plastics-elastomers, fibers and resins.

Types of Polymerizations – Addition and condensation polymerization.

Glass transition temperature and factors affecting glass transition temperature.

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

Plastics: thermo plastics and thermosets,

Biodegradable polymers: Concept, preparation and uses of ploy 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 (10)

Nanomaterials

Introduction – concept of nanomaterials – quantum confinement and surface volume ratio – surface Plasmon resonance. 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 (9)

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 and sons (16th edition), New Delhi.
2. Sashi Chawla, Text book of Engineering Chemistry, Dhanapathi Rai &sons, New Delhi.
3. O. G. PALANNA, Engineering Chemistry, TMH Edition.
4. Wiley Engineering chemistry, Wiley India pvt Ltd, II edition.
5. Chemistry in engineering and technology by J.C. Kuriacose and Rajaram.

Learning Resources:

1. University chemistry, by B. H. Mahan
2. Engineering Chemistry (NPTEL Web-book), by B. L. Tembe, Kamaluddin and M. S. Krishnan
3. Physical Chemistry, by P. W. Atkins
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. NPTEL Polymer Chemistry Course, D. Dhara, IIT Kharagpur.
7. Polymer chemistry by Gowariker
8. Introduction to Nanoscience, by S m Lindsay, Oxford University press

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 Test: 90 Minutes

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Programming and Problem Solving for Engineers

SYLLABUS FOR B.E. I - SEMESTER

L:T:P(Hrs./week): 3:0:0	SEE Marks : 60	Course Code : **U23ES120EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. Acquire problem solving skills. 2. Develop flow charts. 3. Understand structured programming concepts. 4. Write programs in C Language.	On completion of the course, students will be able to 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/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	2	1									2		
CO2	3	2	2	2	1								3		
CO3	2	1	1	1									3	1	1
CO4	3	1	1	1									2	1	
CO5	3	2	2	2	1								3	1	1

UNIT-I

Introduction to Computers: Computer Systems, Computing Environments, Computer Languages, Creating and Running Programs, Flowcharts.

Number Systems (Binary, Octal, Decimal and Hexadecimal), Representation of Numbers (Fixed Point).

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

UNIT-II

Selection: introduction, simple if, if – else, nested – if, else if ladder, switch statements.

Repetition: Loops, while, for, do-while Statements, Loops Examples, break, continue, nested loops.

Functions: Designing Structured Programs, Functions Basics, User Defined Functions, Inter-Function Communication, Standard Functions, Scope.

UNIT-III

Storage Classes-Auto, Register, Static, Extern, Scope Rules and Type Qualifiers, 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, Arrays and Pointers, Pointer Arithmetic, Passing on Array to a Function, Memory Allocation Functions, Array of Pointers, Programming Applications.

Strings – Concepts, C Strings, String Input/Output functions, Array 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.

Files: Introduction, Text Streams, Standard Library Input/output Functions, Character Input, output Functions, Command Line Arguments.

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 Test: 90 Minutes

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DEPARTMENT OF CIVIL ENGINEERING

Basic Engineering Mechanics

SYLLABUS FOR B.E. I SEMESTER

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

L:T:P(Hrs./week): 3:0:0	SEE Marks:60	Course Code: **U23ES010CE**
Credits: 3	CIE Marks:40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are 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.	At the end of the course, students will be able to: 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.

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1				2		1	1	1					
CO2	3	1						1	1	1					
CO3	3	2						1	1	1					
CO4	3	1						1	1	1					
CO5	3	1				2		1	1	1					

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, Connected systems 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 2011.
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 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 Test: 90 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

Human Values and Professional Ethics - I

(Syllabus: Common for All Branches B.E. I & II - SEMESTER)

L:T:P (Hrs./week): 1:0:0	SEE Marks : 40	Course Code: **U23HS020EH**
Credits : 1	CIE Marks : 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the learners 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.	At the end of the course the learners will be able to: - 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/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1								3							
CO2								3							
CO3								3							
CO4								3							
CO5								3							

UNIT-I: 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-efficacys, 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 Flipped class room

UNIT-II: PROFESSIONAL VALUES AND BEHAVIOUR

At the level of individual: 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 Ethics – Team
2.3 Flipped class room

UNIT-III: SOCIAL VALUES

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

31. Social Values
3.2 Importance of relationship
3.3 Flipped class room

UNIT -IV: SPIRITUAL VALUES

Developing individual practice and 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 Spiritual Values
4.2 Mindful Vs Mindfull
4.3 Flipped class room

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

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)
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DEPARTMENT OF CIVIL ENGINEERING

Environmental Science

SYLLABUS FOR B.E. I-SEMESTER (Common to Civil, ECE, EEE & Mech.)

L:T:P (Hrs./week): 2:0:0	SEE Marks : 60	Course Code: **U23MC010CE**
Credits: -	CIE Marks : 40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will 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.	Upon the completion of this course students will be able to 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.

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3					2	3						2		
CO2	2						3						2		
CO3	2						3	2					2	1	
CO4	2					2	3	2					2	1	
CO5	2					2	3	2					2	1	

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 management.

UNIT-V:

Social Aspects and the Environment: Water conservation, Climate change, global warming, case study related to self cooling technologies, acid rain, ozone layer depletion, Kyoto protocol. Environmental Impact Assessment, population explosion. 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

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DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

English Language and Communication Skills Lab

SYLLABUS FOR B.E. I – SEMESTER (Common to all branches)

L:T:P (Hrs/Week) :0:0:2	SEE Marks : 50	Course Code: **U23HS111EH**
Credits: 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the learners 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.	On completion of the course, learners will be able to: 1. Speak well using 'generally acceptable English' in terms of pronunciation and 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.

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1					1				2	3					
CO2									2	3					
CO3									2	3					

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.

1.2 Aspects of language learning and ear training activities- Word stress and intonation, Pronunciation of silent letters, mispronounced words, and Foreign words used in English

2.0 INTERACTIVE COMMUNICATION SKILLS LAB-TOPICS

2.1 Formal and informal conversations—From initiating to terminating stage.

2.2 Group discussion: Objectives of GD, Types of GDs; Initiating, Sustaining, and concluding a GD—Using discourse markers.

2.3 Public speaking: Dos and don'ts of public speaking. Listening and analysing speeches of great personalities in history, Josh talks, Movies.

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

3.0 READING SKILLS LAB

3.1 Strategies of reading using SQ3R, applying it to various text types.

3.2 Teaching different types of texts for comprehension—Fromshort stories to technical articles.

3.3 Newspaper reading. Summarizing, paraphrasing, and presenting news articles.

Prescribed textbook for laboratory:

1. Speak Well: Jayshree Mohanraj, Kandula Nirupa Rani and Indira Babbellapati - Orient Black Swan
2. Longman Dictionary of Contemporary English–Latest Edition.

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 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: 2 hours

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
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DEPARTMENT OF CHEMISTRY

Chemistry Lab

SYLLABUS FOR B.E. I - SEMESTER

L:T:P(Hrs./week): 0:0:2	SEE Marks: 50	Course Code: **U23BS011CH**
Credits : 1	CIE Marks: 30	Duration of SEE: 03 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to: 1. Describe the quantitative analytical techniques. 2. Learn the skills to handle the instruments. 3. Apply the theoretical principles in experiments	At the end of the course, students should be able to: 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 FOR CHEMISTRY LAB												
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	3	2	-	-	-	-	-	-	2	-	-	1
2	3	2	-	-	-	-	-	-	2	-	-	1
3	3	2	-	-	-	-	-	-	2	-	-	1
4	3	2	-	-	-	-	-	-	2	-	-	1

List of the Experiments:

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.

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 : 3 Hours

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Programming and Problem Solving for Engineers Lab

SYLLABUS FOR B.E. I - SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code : **U23ES121EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
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.	On completion of the course, students will be able to 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/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2	1									1		
CO2	2	2	2	2									3		
CO3	3	2	2	2	1								3		1
CO4	3	2	2	2	1								2	2	
CO5	3	2	2	2	1								3	2	1

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.

New Experiments:

1. Multiplication and division of N by a number represented as 2^k, without using any athematic operators.
2. To print lower and upper triangles of a square matrix of order n×n.

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.

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 : 3 Hours

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
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DEPARTMENT OF MECHANICAL ENGINEERING

Engineering Workshop

SYLLABUS FOR B.E. I – SEMESTER (for ECE)

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code : **U23ES011ME**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to: 1. know basic workshop processes, adopt safety practices while working with various tools 2. identify, select and use various marking, measuring, holding, striking and cutting tools & equipments.	At the end of the course, students will be able to: 1. create models in carpentry, fitting, electrical & electronics and sheet metal trades by using the relevant tools. 2. measure and inspect the finished components using suitable measuring instruments. 3. apply basic electrical and electronics engineering knowledge to make simple electrical circuits and check their functionality along with practice in soldering of electronic components.

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2												
CO2	3	2	1												
CO3	3	1	2												

List of the Experiments:

FITTING:

1. Template fitting (square fit)
2. V-groove fit
3. Drilling and Tapping

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

SHEET METAL:

1. Rectangular box
2. Rectangular scoop with handle
3. Making a funnel with soldering

Additional Experiments

1. Plastic Moulding: Injection moulding of plastic spoon (demo)
2. Fitting: Assembly of pulley on a shaft with key(demo)
3. Electrical & Electronics: LT Distribution with loads (Demo)
4. Carpentry: Wood turning operation (demo)
5. Sheet Metal: Making a T-Joint (Demo).

Learning Resources:

1. Hajra Choudhury S.K., Hajra Choudhury A.K., Nirjar Roy S.K. "Elements of Workshop Technology" Vol-I 2008 & Vol-II 2010 Media Promoters & Publishers Pvt. Limited, Mumbai.
2. Kalpakjian S. and Steven S. Schmid, "Manufacturing Engineering and Technology" 4th Edition, Pearson Education India Edition, 2002.
3. Gowri P., Hariharan and Suresh Babu A., "Manufacturing Technology-I", Pearson Education 2008.
4. P. Kannaiah& K. L. Narayana "Workshop manual" 2nd Ed., Scitech publications (I) Pvt. Ltd., Hyderabad.
5. B.L. Juneja, "Workshop Practice", Cengage Learning India Pvt. Limited, 2014.
6. www.technologystudent.com

The break-up of CIE :

1.	No. of Internal Tests	:	01
2.	Max. Marks for internal tests	:	12
3.	Marks for day-to-day laboratory class work	:	18

Duration of Internal Test: 2 Hours

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Introduction to Electronics Engineering

SYLLABUS FOR B.E. I – SEMESTER (for CSE)

L:T:P (Hrs/week): 3:0:0	SEE Marks : 60	Course Code: **U23ES110EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
1. To understand the characteristics and operation of different electronic devices. 2. To study the working of rectifiers, transistor amplifiers, operational amplifiers and oscillators. 3. To study the working principle of different types of transducers.	On completion of the course, students will be ableto 1. Employ different electronic devices to build electronic circuits such as rectifiers, filters, voltage regulators. 2. Describe the input and output characteristics of BJT and MOSFET. 3. Appreciate the advantages of negative feedback in amplifiers and to design simple RC type, LC type oscillators using BJT. 4. Demonstrate the working of operational amplifier as Differentiator, Integrator etc. 5. Convert real time signals into corresponding electrical signals using different types of transducers and sensors for IOT applications.

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2										3		
CO2	3	3	2										3		
CO3	3	3	2										3		
CO4	3	3	2										3		
CO5	3	3	2										3		

UNIT - I : Semiconductor Diodes

P-N Junction diode, Biasing, Diode resistance, Transition capacitance and Diffusion capacitance, Applications, Rectifiers: Half wave and Full wave Rectifiers (Bridge, center tapped), ripple factor and efficiency, comparison of rectifiers, Filters: Types of filters, Rectifiers with and without filters, Zener Diode: Characteristics, Zener diode as a voltage regulator, Block diagram of Regulated Power Supply.

UNIT - II : Transistors

Bipolar Junction Transistor (BJT), Construction, Types, Working principle, Configurations, Transistor parameters, Transistor as an amplifier, Problems, h- parameter equivalent circuits. Field Effect Transistor(FET),

Construction and working of FET, Metal Oxide Semiconductor FET (MOSFET), Types (depletion and enhancement), MOSFET characteristics, Comparison of BJTs with MOSFET

UNIT - III : Feedback Concepts

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

UNIT - IV : Operational Amplifiers

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

UNIT - V : Data Acquisition systems

Introduction, Classification of transducers, Temperature transducers (Thermocouple), Piezoelectric transducer, Photoelectric transducer; Ultrasonic Sensors, PIR Sensors, Gas sensors and Humidity Sensors. Display Systems: Constructional details of C.R.O and Applications.

Learning Resource:

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, 3rd edition, 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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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Introduction to Electronics Engineering Lab

SYLLABUS FOR B.E. I – SEMESTER (for CSE)

L:T:P (Hrs/week): 0:0:2	SEE Marks : 50	Course Code: **U23ES111EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
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.	On completion of the course, students will beable to 1. Plot the characteristics of active devices and to compute their parameters. 2. Analyze the functioning of voltage regulators, rectifiers andoscillators. 3. Perform operations such as addition, subtraction, comparison of voltage levelsusing operational amplifier. 4. Appreciate the usage of CRO for measuring different parameters of signals.

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3										3		
CO2	3	3	3										3		
CO3	3	3	3										3		
CO4	3	3	3										3		

List of Experiments:

1. Characteristics of Semiconductor diodes (Si and Zener)
2. CRO Applications(measurement of Amplitude, Time constant and Phase)
3. Centre tapped Full wave rectifier with and without filter
4. Zener Voltage Regulator(Line and Load Regulations)
5. Characteristics of BJT (CB Configuration)
6. Characteristics of BJT (CE Configuration)
7. Characteristics of FET (Drain and Transfer characteristics)

8. RC Phase shift oscillator
9. Hartley oscillator
10. Calpitt's Oscillator
11. Applications of Operational Amplifier: Adder, Subtractor, Comparator

New / Additional experiments planned

1. Positive Diode Clipping Circuits
2. Negative Diode Clipping Circuits

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 : 3 hours

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS) :: IBRAHIMBAGH, HYDERABAD – 500 031.
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION **(R-23)** :: B.E. – ECE : SECOND SEMESTER (2023-24)

B.E (ECE) II 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								
U23BS210MA	Differential Equations and Vector Calculus	3	-	-	3	60	40	3
U23BS210PH	Quantum Mechanics and Materials Science	3	-	-	3	60	40	3
U23ES210EC	Problem Solving through Object Oriented Programming	3	-	-	3	60	40	3
U23ES030CE	Basic Engineering Drawing	1	-	2	3	60	40	2
U23PC010EC	Basic Circuit Analysis	3	-	-	3	60	40	3
U23ES220EE	Basic Electrical Engineering for ECE	2	-	-	3	60	40	2
U23MC010ME	Introduction to Entrepreneurship	1	-	-	2	40	30	-
PRACTICALS								
U23BS211PH	Engineering Physics Lab	-	-	2	3	50	30	1
U23ES221EC	Problem Solving through Object Oriented Programming Lab	-	-	2	3	50	30	1
U23PC111EC	Basic Circuit Analysis Lab	-	-	2	3	50	30	1
U23ES221EE	Basic Electrical Engineering for ECE Lab	-	-	2	3	50	30	1
	TOTAL	**16**	**-**	**10**		**600**	**390**	**20**
	GRAND TOTAL	**26**				**990**		

Left over hours will be allocated for : Sports / Library / Mentor - Mentee Interaction / CC / RC / TC

Note: 1) Every Student shall complete one NPTEL course certification of 8 weeks duration (equivalent to 2 credits weightage) by the end of VI-Semester.
2) Students willing to Opt B.E (ECE) Honours Degree in System on Chip Design shall complete one NPTEL Course Certification (equivalent to 2 Credits weightage) by the end of IV-Semester.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
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DEPARTMENT OF MATHEMATICS

Differential Equations and Vector Calculus

SYLLABUS FOR B.E. II – SEMESTER (Common to Civil, EEE, ECE, Mech)

L:T:P (Hrs./week): 3:0:0	SEE Marks :60	Course Code : **U23BS210MA**
Credits : 3	CIE Marks :40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to : **1. Study** the concepts of vector differentiation. **2. Learn** how to evaluate double and triple integrals and Study the concepts of vector integration. **3. Learn** to Solve the first order differential equations and its applications. **4. Learn** to Solve the various higher order homogeneous and non-homogeneous linear differential equations with constant coefficients and its applications. **5. Understand** the concepts of Beta, Gamma functions and Error function	On completion of the course, students will be able to **1. Find** the gradient of a scalar point function, divergence and curl of vector field and its applications. **2. Apply** the concepts of multiple integrals to evaluate area, volume and vector integral theorems **3. Solve** the first order differential equations, model the real time engineering problems viz., RC& LR Circuits into differential equations. **4. Solve** the higher order Linear Differential equations; model the real time engineering problems. **5. Evaluate** Improper integrals using Beta, Gamma functions

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2										1	1		
CO2	3	2										1	1		
CO3	3	2										1	1		
CO4	3	2										1	1		
CO5	3	2										1	1		

UNIT-I : (10 classes)

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 : (12 Classes)

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 : (10 classes)
SPECIAL FUNCTIONS

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

UNIT-IV : (10 classes)
MULTIPLE INTEGRALS

Double and Triple integrals (Cartesian) - Change of order of integration (Cartesian Coordinates)- Jacobian for two variables - Change of the Variables (Cartesian to polar Coordinates).

UNIT-V : (12 classes)
VECTOR CALCULUS

Scalar and Vector point function and 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- Line integral - Green's Theorem (Without proof) - Conservative vector field

Learning Resources:

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 I
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 http://mathworld.wolfram.com/topics
2 http://www.nptel.ac.in/course.php
3 https://www.coursera.org/in
4 http://davidbau.com

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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DEPARTMENT OF PHYSICS

Quantum Mechanics and Materials Science

SYLLABUS FOR B.E. II- SEMESTER (Common to ECE and EEE)

L:T:P(Hrs/week):3:0:0	SEE Marks:60	Course Code: **U23BS210PH**
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hours

CO code	COURSE OBJECTIVES	COURSE OUTCOMES	Highest BTL
BS210PH.1	Demonstrate the significance of crystal structure in device applications.	Classify crystals based on their structure and list appropriate uses	3
BS210PH.2	Appreciate the advantages of quantum mechanics over classical mechanics.	Apply Schrodinger wave equations to quantum mechanical systems.	4
BS210PH.3	Arrive at the expressions for carrier concentration in semiconductors	Apply semiconductor physics to fabricate various devices	3
BS210PH.4	Comprehend lasing action and relate the use of lasers in optical fiber communication	Compare different types of lasers. Summarize merits and demerits of optical fibers.	2
BS210PH.5	Choose appropriate dielectric, magnetic and superconducting materials for required applications	Select various dielectric, magnetic and superconducting materials for specific applications in engineering.	3

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3										1
CO2	2	2										1
CO3	3	2										1
CO4	3	1										1
CO5	2	1										2

UNIT-I : FUNDAMENTALS OF CRYSTAL STRUCTURE (12 hours)

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 (10hours)

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 (10 hours)

Classical free electron Drude theory and its limitations, Fermi-Dirac Statistical distribution, Density of states, Kronig-Penney model, formation of energy bands, E-k diagram, 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 (10 hours)

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 model dispersions, block diagram of optical communication system, advantages and application of optical fibers.

UNIT-V : MATERIALS SCIENCE (10 hours)

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–SQUIDS- 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 Tests: 90 Minutes

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Problem Solving through Object Oriented Programming

SYLLABUS FOR B.E. II - SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code : **U23ES210EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. Understand basic notions of object oriented programming. 2. Acquire object-oriented problem solving skills. 3. Write programs in C++.	On completion of the course, students will be able to 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 using inheritance, polymorphism and exception handling. 5. Describe basic data structures using OOP concepts

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2			1									2		
CO2	3			2									3		
CO3	3	3	2	2									3		
CO4	3	3	3	2									3		
CO5	2	3	3	1									2		

UNIT-I

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

Defining Classes: Structures, Classes, Abstract Data Types.

UNIT-II

Functions: Call by value, Call by Reference, Parameters using Procedural Abstraction; Recursion.

Arrays: Introduction to Arrays, Arrays in functions, Programming with Arrays and Multidimensional Arrays; Classes with Arrays, Array of Objects.

UNIT-III

Constructors, Destructors, Copy Constructors; Friend Functions.
Strings, Pointers and Dynamic Arrays
Static Polymorphism: Function Overloading, Operator Overloading – Unary and Binary.

UNIT-IV

Inheritance: The notion of Inheritance, Derived Classes, Overriding, Virtual Base Class, Runtime Polymorphism, Virtual Functions
Templates: Function Templates, Class Templates

UNIT-V

Exception handling: Exception handling basics, Programming techniques for Exception Handling
Linked lists: Singly Linked List**,** Nodes, operations on Linked Lists: Inserting a Node, deleting a Node, Searching for a Node, Implementation of Stacks and Queues using Arrays.

Learning Resources:

1. Walter Savitch, "Problem solving with C++", 6th Edition, Pearson Education, 2009.
2. Behrouz A.Forouzan, Richard F. Gilberg, "Computer Science, A Structured Approach using C++", 2nd Edition, Cengage Learning, 2010.
3. E. Balaguruswamy, "Object-Oriented Programming with C++", 6th Edition, Tata Mc-Graw Hill, 2013.
4. S.B. Lippman. J Lajoie, "C++ Primer" 3rd Edition, AW Publishing Company, 2007.
5. Paul Dietel, Harvey Dietel, "C How to Program", 6th Edition, PHI, 2010.
6. 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 Tests: 90 Minutes

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DEPARTMENT OF CIVIL ENGINEERING

Basic Engineering Drawing

SYLLABUS FOR B.E. II-SEMESTER (Common to EEE & ECE)

L:T:P (Hrs./week): 1:0:2	SEE Marks: 60	Course Code: **U23ES030CE**
Credits: 2	CIE Marks: 40	Duration of SEE: 3Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are 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.	At the end of the course, students will be able to: 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.

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2								1			2		1
CO2	2	1			3					1			2		1
CO3	2	1								1			2		1
CO4	3	2								1			2		1
CO5	2	2			3					1			2		1

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 "Engineering Drawingand 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, M Raja Roy, "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 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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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Basic Circuit Analysis

SYLLABUS FOR B.E. II - SEMESTER

L:T:P(Hrs/week): 3:0:0	SEE Marks:60	Course Code: **U23PC010EC**
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
Students will be able to analyze the response of the circuits and networks using various concepts such as mesh & nodal analysis, network theorems and the frequency response of the circuit.	On completion of the course, students will be able to 1. Calculate circuit parameters of any given circuit. 2. Solve the given circuits using network theorems. 3. Determine two port network parameters from given network 4. Analyze given circuit in time domain using Transient and steady state analysis. 5. Design and analyze a given circuit in frequency domain.

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2										3		
CO2	3	3	2										3		
CO3	3	3	2										3		
CO4	3	3	2										3		
CO5	3	3	2										3		

UNIT - I: Basic concepts of Electric Circuits:

Classification of Basic circuit elements, Dependent and independent voltage and current sources, Energy and power, Ohm's law, Kirchhoff's laws, network reduction techniques, nodal and super nodal analysis, mesh and super mesh analysis.

UNIT - II: Network Theorems to DC and AC circuits:

Thevenin's and Norton's theorem, maximum power transfer theorem, Super position theorem, Reciprocity theorem, Tellegen's theorem, Substitution Theorem.

UNIT - III: Two port networks:
z,y,h,g, ABCD parameters. Equivalence of two port networks, conversion between network parameters. Inter connection of two ports.

UNIT – IV: Time Domain Analysis of Circuits:
Response of circuits for Unit step and sinusoidal input: Transient and Steady state response of circuits: Zero input response (ZIR), Zero state response (ZSR), and complete response. Transient and steady state analysis of RL, RC and RLC circuits for unit step, sinusoidal inputs.

UNIT - V: Frequency Domain Analysis:
Resonance: Analysis of Series and Parallel resonance, Q-factor, Selectivity, and bandwidth.
Passive Filters: Classification and analysis of low pass and high pass filters, Response of RC and RL low pass filters and high pass filters. Filters as Integrating and differentiating circuits.

Learning Resources:

1. William H. Hayt, Jr., Jack E. Kemmerly and Steven M. Durbin, Engineering Circuit Analysis, 5th edition, McGraw Hill, 2010.
2. Van Valkenberg M.E., Network Analysis, PHI, New Delhi, 3rd edition 2002.
3. Chakrabarti, Ciruit Theory Dhanapati Rai & Co(Pvt.)Ltd., Educational & Technical Publishers.
4. Charles A. Desoer and Ernest S Kuh, Basic Circuit Theory, McGraw Hill, 2009.
5. Raymond A. DeCarlo and Penmin Lin, Linear Circuit Analysis, 2nd edition, Oxford Univ. Press, 2003.
6. Lawrence P. Huelsman, Basic Circuit Theory, 3rd edition, 2009.

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

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Basic Electrical Engineering for ECE

SYLLABUS FOR B.E. II – SEMESTER

L:T:P(Hrs/week): 2:0:0	SEE Marks:60	Course Code: **U23ES220EE**
Credits : 2	CIE Marks:40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to: 1. To provide an understanding of basics in Electrical circuits 2. To explain the working principles of Electrical Machines.	On completion of the course student will be able to 1. Analyze AC network parameters and power in single phase circuits 2. Analyze Electrical single phase and three phase AC circuits 3. Comprehend the working principles of DC machines 4. Comprehend the working of single phase transformer and various Electrical switchgear, electrical energy consumption and power factor improvement 5. Comprehend the working principles of AC machines

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1									1			
CO2	3	2	1									1			
CO3	3	2	1									1			
CO4	3	2	1									1			
CO5	3	2	1									1			

UNIT-I : A.C. Circuit fundamentals:

Electrical circuit elements (R, L and C), Kirchhoff current and voltage laws, Representation of sinusoidal waveform – peak value and RMS value, form factor, peak factor, phasor representation, real power, reactive power, apparent power, power factor.

UNIT-II : A.C. Circuits analysis:

Analysis of single-phase ac series circuits: R, L, C, R-L, R-C, R-L-C circuits, Three-phase balanced circuits, voltage and current relations in star and delta connections, analysis of three phase balanced star and delta connected loads.

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 Transformers and Electrical Installation:
Principle of operation, Ideal and practical transformer on No-load and Load, Equivalent circuit, losses in transformers, efficiency.
Components of LT Switchgear: Switch fuse unit (SFU), MCB, Earthing, elementary calculations for Energy consumption, power factor improvement.

UNIT-V : Induction Motors and Stepper Motors:
Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, torque derivation, losses and efficiency, torque-slip characteristics.
General construction, working and applications of Stepper motor and BLDC motor

Learning Resources:

1. D. P. Kothari and I. J. Nagrath, “Basic Electrical Engineering”, Tata McGraw Hill, 2010.
2. D. C. Kulshreshtha, “Basic Electrical Engineering”, McGraw Hill, 2009.
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 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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DEPARTMENT OF MECHANICAL ENGINEERING

Introduction to Entrepreneurship

SYLLABUS FOR B.E. II - SEMESTER

L:T:P(Hrs/week): 1:0:0	SEE Marks:40	Course Code: **U23MC010ME**
Credits : -	CIE Marks:30	Duration of SEE: 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The objective of the course is to Inspire students develop an entrepreneurial mind-set, educate about the resources and schemes available to start enterprises in India.	On completion of the course, students will be able to 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.

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1									3	2	3	2			
CO2		2							2	2	1			2	
CO3											3				
CO4			2					1		2	1	1			2

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.

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

1.	No. of Internal Tests	: 1	Max. Marks for each Internal Tests	:	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 Tests: 1 Hour

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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: **U23BS211PH**
Credits : 1	CIE Marks: 30	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES	BTL
• to study and discuss the characteristics of a given device	1. Conduct experiment independently and in team to record the measurements	2
• to identify probable errors and take in the readings and known possible precautions	2. Outline the precautions required to be taken for each experiment	1
• to compare the experimental and theoretical values and draw possible conclusions.	3. Compare the experimental results with standard values and estimate errors	2
• To interpret the results from the graphs drawn using experimental values.	4. Draw graphs and interpret the results with respect to graphical and theoretical values	2
• To write the record independently with appropriate results.	5. Write the summary of the experiment and draw appropriate conclusions	1

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2								2			2
CO2	3											1
CO3	2	2										1
CO4	3											1
CO5	2							1				2

List of the Experiments:

1. Determination of wavelength of Laser light.
2. Study of I-V characteristics of P-N Junction diode.
3. Study of I-V characteristics of Zener Diode.
4. Calculation of numerical aperture, acceptance angle and power loss due to bending of an optical fibre.
5. Determination of energy gap of a given semiconductor by four probe

method

6. Study of I-V characteristics of solar cell and to calculate fill factor and efficiency
7. Determination of Hall's coefficient using Hall's effect
8. Determination of e/m of an electron by Thomson's method
9. Study of resonance in LCR series circuits and estimation of band width & Q- factor
10. Study of resonance in LCR parallel circuits
11. Determination of wavelength of a light source by Michelson interferometer
12. Determination of Seebeck coefficient
13. Helmholtz coil –calculation of magnetic field along the axis of a solenoid
14. B-H curve-estimation of Hysteresis loss of a ferromagnetic sample

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

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 Tests: 3 Hours

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Problem Solving through Object Oriented Programming Lab

SYLLABUS FOR B.E. II - SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code : **U23ES221EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. Write, compile and debug programs in C++. 2. Formulate problems and implement in C++. 3. Acquire skills to solve computing problems.	On completion of the course, students will be able to 1. Write and debug programs in C++ language 2. Choose appropriate data types, functions, decision and looping constructs to develop C++ programs 3. Implement OOP functionalities such as class, overloading, dynamic memory allocation 4. Develop programs using inheritance, polymorphism, file I/O, templates and exception handling techniques. 5. Implement operations on basic data structures

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	3									3		
CO2	2	2	2	2									2		
CO3	3	3	2	3									3		
CO4	3	2	2	2	1								3		
CO5	3	2	1	2	1								2		

Programming Exercise:

1. Programs on matrix and complex numbers using classes.
2. Programs using constructors, destructors and copy constructors.
3. Programs on dynamic memory allocation for arrays.
4. Programs on static data members and string manipulations.
5. Programs on friend class.
6. Programs on function overloading and operator overloading.
7. Programs on inheritance.
8. Programs on virtual functions, dynamic polymorphism.
9. Programs on function templates, class templates and exception handling.

10. Programs on bubble sort, selection sort and insertion sort.
11. Program on operations in a singly linked list.
12. Program on implementation of stacks and queues using arrays and linked list.

New Experiments

1. Operator overloading for reading and displaying complex object using << and >>.
2. Dynamic multiplication of two matrices of orders m×n and p×q.

Learning Resources:

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

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 : 3 Hours

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Basic Circuit Analysis Lab

SYLLABUS FOR B.E. II - SEMESTER

L:T:P(Hrs./week): 0:0:2	SEE Marks: 50	Course Code: **U23PC111EC**
Credits : 1	CIE Marks: 30	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
To apply the concepts of circuit theory for a given complex circuit and verify its response using discrete components and MULTISIM.	On completion of the course, students will be able to 1. Analyze the given circuits using network theorems. 2. Study the performance of circuits in frequency domain. 3. Determine different two port network parameters for a given network. 4. Simulate and find the response of a given circuit using MULTISIM.

CO-PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3		2								3		
CO2	3	3	3		2								3		
CO3	3	3	3		2								3		
CO4	3	3	3		2								3		

List of Experiments:

1. Verification of Kirchhoff's Laws, Nodal and Mesh analysis
2. Verification of Thevenin's theorems and maximum power transfer theorem
3. Verification of superposition theorem
4. Verification of Tellegen's theorem
5. Design & verification of Series Resonance
6. Design & verification of Parallel Resonance
7. Measurement of two-port network parameters

Part –B (using MULTISIM)

1. Verification of Nodal and Mesh Analysis in the presence of dependent sources.
2. Verification of Thevenin's & maximum power transfer theorem in the presence of dependent sources.
3. Verification of Norton's theorems in the presence of dependent sources.
4. Verification of superposition & Tellegen's theorem in the presence of dependent sources.
5. Transient response of RL and RC circuits.
6. Measurement of two-port network parameters in the presence of dependent sources and ac sources

New / Additional Experiments

1. Design of Integrator using RC circuits.
2. Design of Differentiator using RC circuits.

The break-up of CIE :

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

Duration of Internal Test : 3 Hours

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Basic Electrical Engineering for ECE Lab

SYLLABUS FOR B.E II – SEMESTER

L:T:P(Hrs./week): 0:0:2	SEE Marks: 50	Course Code: **U23ES221EE**
Credits : 1	CIE Marks: 30	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to: 3. To provide the practical knowledge on operation of DC, AC machines and circuits	On completion of the course student will be able to: 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/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1		1					3			1			
CO2	3	1		1					3			1			
CO3	3	1		1					3			1			
CO4	3	1		1					3			1			
CO5	3	1		1					3			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. Measurement of real, reactive and apparent power in single phase system.
4. Measurement of voltage across various elements in series R-L-C circuit.
5. Sinusoidal steady state response of R-L and R-C circuits,

measurement of phase angle.

6. Measurement of cumulative three-phase power in balanced three phase circuits.
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.
14. Measurement of impedance using Star-Delta transformation techniques

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

The break-up of CIE :

1. No. of Internal Tests	:	1
2. Max. Marks for Internal Test	:	12
3. Marks for assessment of each experiment	:	18

Duration of Internal Test : 3 Hours