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 2021-22
(For the batch admitted in 2021-22)
(R-21)**

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 wireless communication systems.
PSO III	ECE students will be able to implement signal and image processing techniques for real time applications.

With effect from the academic year 2021-22

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS) :: IBRAHIMBAGH, HYDERABAD – 500 031.
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION **(R-21)** :: B.E. – ECE : FIRST SEMESTER (2021-22)

Course Code	Name of the Course	L	T	P/D	Duration in Hrs	SEE	CIE	Credits
B.E (ECE) I – SEMESTER								
THEORY								
U21HS110EH	English Language and Communication	2	-	-	3	60	40	2
U21BS110MA	Calculus	3	-	-	3	60	40	3
U21BS110CH	Engineering Chemistry	3	-	-	3	60	40	3
U21ES120CS	Programming for Problem Solving	3	-	-	3	60	40	3
U21ES010CE	Basic Engineering Mechanics	3	-	-	3	60	40	3
U21HS020EH	Human Values & Professional Ethics – I	1	-	-	2	40	30	1
U21MC010CE	Environmental Science	2	-	-	3	60	40	-
PRACTICALS								
U21HS111EH	English Language and Communication Skills Lab	-	-	2	3	50	30	1
U21BS011CH	Chemistry Lab	-	-	2	3	50	30	1
U21ES131CS	Programming for Problem Solving Lab	-	-	2	3	50	30	1
U21ES011ME	Engineering Workshop	-	-	2	3	50	30	1
TOTAL		17	-	8	-	600	390	19
\multicolumn{2}{r}{GRAND TOTAL}		\multicolumn{2}{c}{25}		-	\multicolumn{2}{c}{990}		-

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

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VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS) :: IBRAHIMBAGH, HYDERABAD – 500 031.
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION (R-21) :: B.E. – ECE : FIRST SEMESTER (2021 - 2022)

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								
U21ES110EC	Introduction to Electronics Engineering	3	-	-	3	60	40	3
PRACTICALS								
U21ES111EC	Introduction to Electronics Engineering Lab	-	-	2	3	50	30	1

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DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

English Language and Communication

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

L:T:P (Hrs/Week): 2:0:0	SEE Marks: 60	Course Code: **U21HS110EH**
Credits: 2	CIE Marks: 40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the learners to: 1. Understand the role and importance of communications skills. 2. Develop the habit of listening effectively to various speakers and lectures. 3. Develop reading strategies in order to understand various types of texts 4. Understand the various features and formats of writing. 5. Comprehend grammar constructs and vocabulary used in different contexts.	At the end of the course the learners will be able to: - 1. Communicate effectively, appropriately and ethically in both professional & personal spheres. 2. Listen for gist and make inferences from various speeches and converse intelligibly in various contexts. 3. Evaluate and infer various text types. 4. Compose letters and essays, coherently and cohesively using discourse marks. 5. Construct grammatically correct sentences using adequate vocabulary.

UNIT-I : 1.0 Effective communication and Interpersonal skills
1.1 Role and Importance of Language and Communication; Functions of communication; Process of Communication; Types of Communication; Styles of Communication; Channels of Communication; Barriers in Communication and how to overcome them.
1.2 Politeness theory.
1.3 Johari Window
1.4 Team building skills and team work
1.5 Persuasion techniques

UNIT-II : 2.0 Listening and Speaking skills
2.1 Importance of listening for effective communication; Elements of Active listening.
2.2 Speaking skills: -Speaking strategies; Telephone etiquette.

UNIT-III : 3.0 Reading and Writing skills

3.1 Sub-skills of Reading; Understanding the functions of different texts, Reading Comprehension-Global and Local.

3.2 Features of Writing: -

Organizing principles of writing paragraphs-Coherence, Cohesion & Unity; Use of appropriate linkers. Paraphrasing and Summarizing skills.

3.3 Written Communication:

- Email etiquette
- Request letters
- Creative writing- Pictionary, Taglines, Script Writing

UNIT-IV : 4.0 Vocabulary Building and Grammar

4.1 **Vocabulary Building**: The concept of Word Formation-Prefixes and Suffixes; Synonyms, Antonyms, and Standard abbreviations. Word origin-Etymology; One-word substitutes; Collocation; Idioms.

4.2 **Functional Grammar**: Articles, Prepositions; Tense and Aspect; Subject- Verb agreement; Connectives; Direct and Indirect Speech; Active-Passive

All these aspects will be taught as common errors.

UNIT-V : 5.0 Reading for appreciation of literary texts

5.1   Prose text- On Shaking Hands- A G Gardiner.

5.2   Poem-What life should be-Patricia A Fleming.

Prescribed textbook for theory:

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

Learning Resources:

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

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DEPARTMENT OF MATHEMATICS

Calculus

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

L:T(Hrs./week): 3:1:0	SEE Marks : 60	Course Code : **U21BS110MA**
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 concepts of curvature, radius of curvature, evolutes and to expand functions using Taylor's series.	1. **Compute** radius of curvature, evolute of a given curve and also to expand given function using Taylor's series.
2. **Acquire** knowledge of partial derivatives, and expand functions using Taylor's series functions of two real variables and, maxima-minima.	2. **Expand** the given function in terms of Taylor's series and find Maxima and minima of functions of several variables also using Lagrange's method of multipliers.
3. **Study** the concepts of vector differentiation, Gradient, Divergence and Curl.	3. **Use** gradient to evaluate directional derivatives and conservative vector field.
4. **Learn** how to evaluate double and triple integrals, using change of order of integration and apply vector integration to transformation theorems	4. **Apply** concepts of multiple integrals to evaluate area and volume and vector integration to transformation.
5. **Identify** convergence of infinite series using various tests.	5. **Apply** an appropriate test to check the nature of the infinite series.

UNIT-I : (10 classes)
DIFFERENTIAL CALCULUS
Taylor's Series – Maclaurin's Series- Curvature- Radius of Curvature – Centre of Curvature –Evolutes. (Cartesian and Parametric co-ordinates)

UNIT-II : (12 classes)
FUNCTIONS OF SEVERAL REAL VARIABLES
Limits- Continuity -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-III : (08 classes)
VECTOR DIFFERENTIAL CALCULUS
Scalar and Vector point functions -Vector Differentiation-Level Surfaces-Gradient of a scalar point function- Normal to a level surface- Directional Derivative – Divergence and Curl of a Vector field-Conservative vector field.

UNIT-IV : (12 classes)
MULTIPLE INTEGRALS: Double and Triple integrals (Cartesian) -Change of order of integration (Cartesian Coordinates).

VECTOR INTEGRATION: Line, Surface and Volume integrals- Green's Theorem – Gauss Divergence theorem - Stokes's Theorem. (all theorems without proof). Solenoidal and Irrotational vectors.

UNIT-V : (08 classes)
INFINITE SERIES
Definition of Sequences- Series – Convergence and Divergence- Series of positive terms-Geometric series- p-series test - Comparison tests - 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 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. 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 Tests: 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 : **U21BS110CH**
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. 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. Categorise the polymers and discuss the synthesis of few polymers along with their applications.
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 working principle of IR, UV and Thermal analytical techniques.

UNIT-I : ELECTROCHEMISTRY (10)

Introduction, conductance, types of conductance- specific, equivalent, molar conductance and their interrelationship- numericals. Principle and applications of conductometric titrations- strong acid *vs* strong base, 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, electro motive 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. Principle and Applications of potentiometry- acid base and redox reaction $(Fe(II)$ Vs $KMnO_4)$.

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, Zn-Ag$_2$O battery and lithium-V$_2$O$_5$ battery.
Secondary batteries: Construction and working of lead-acid, Ni-Cd 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, phosphoric acid fuel cell and Molten carbonate 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 Polymerization - Addition and condensation polymerization.
Glass transition temperature (Tg), factors affecting Tg.
Molecular weight- number average and weight average molecular weight, numericals.
Plastics: Thermo plastics and thermosets - preparation, properties and applications of a) Aramid (Kevlar) b) Poly methyl methacrylate(PMMA)
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, fibre reinforced composites Kevlar, Carbon and Glass FRCs and their applications.

UNIT-IV : ENGINEERING MATERIALS (9)
Nano Materials
Introduction - concept of nanomaterials - quantum confinement and surface volume ratio - catalytic and electrical properties.
Types of Nano materials**:** carbon nano tubes**,** quantum dots, nanowires, nano crystals.
Synthesis of nano materials: Top down and bottom up approaches**-** mechanical grinding by ball milling, sol gel method.
Carbon Nano tubes**:** Single walled carbon nanotubes (SWCNTs). Multi walled carbon nanotubes (MWCNTs), synthesis of CNTs- arc discharge and laser ablation methods, applications.

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 (8)
Spectroscopy: Principle, block diagram, applications of i) Atomic absorption spectroscopy ii) Flame photometer.
Thermal Analysis: Principle, block diagram of Thermo Gravimetric Analysis (TGA) and analysis of calcium oxalate. Principle, block diagram of Differential Scanning Calorimetry (DSC) and analysis of TG of a polymer.

Learning Resources:
Text Books:
1. PC Jain, M Jain Engineering Chemistry, Dhanapathi Rai and sons (16th edition), New Delhi.
2. O.G. PALANNA, Engineering Chemistry, TMH Edition.
Reference books:
1. Sashi Chawla, Text book of Engineering Chemistry, Dhanapathi Rai &sons, New Delhi.
2. Wiley Engineering chemistry, Wiley India pvt Ltd, II edition.
3. Chemistry in engineering and technology by J.C. Kuriacose and Rajaram.
4. University chemistry, by B. H. Mahan
5. Physical Chemistry, by P. W. Atkins
6. S. S. Dara, S Chand and sons, Engineering Chemistry, New Delhi.
7. Puri, Sharma and Pathania Principles of physical chemistry, Vishal Publishing Co.
8. Polymer chemistry by Gowariker
9. Introduction to Nanoscience, by S m Lindsay, Oxford University press.
Online Resources:
1. Engineering Chemistry (NPTEL Web-book), by B. L. Tembe, Kamaluddin and M. S. Krishnan
2. NPTEL Polymer Chemistry Course, D. Dhara, IIT Kharagpur.

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 COMPUTER SCIENCE AND ENGINEERING

Programming for Problem Solving

SYLLABUS FOR B.E. I - SEMESTER

(Common to CSE, AI&ML, IT, ECE and EEE)

L:T:P(Hrs./week): 3:0:0	SEE Marks : 60	Course Code : **U21ES120CS**
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 flow charts 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

UNIT-I
Introduction to Computers: Computer Systems, Computing Environments, Computer Languages, Creating and Running Programs, Software Development, Flowcharts. Number Systems (Binary, Octal, Decimal and Hexadecimal), Representation of Numbers (Fixed and Floating Point).
Introduction to C Language: Background, C Programs, Identifiers, Types, Variables, Constants, Input/Output, Expressions, Precedence and Associativity, Side Effects, Evaluating Expressions, Type Conversion, Statements, Bitwise Operators.
UNIT-II
Selection: Logical Data and Operators, if... else, switch Statements, Standard Functions. **Repetition:** Loops, while, for, do-while Statements, Loop Examples, break, continue, goto.
Functions: Designing Structured Programs, Functions Basics, User Defined Functions, Inter-Function Communication, Standard Functions, Scope, Storage Classes-Auto, Register, Static, Extern, Scope Rules and Type Qualifiers.

UNIT-III

Recursion: Recursive Functions, Preprocessor Commands.

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

UNIT-IV

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

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

UNIT-V

Type Definition (typedef), Enumerated Types.

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

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

<u>**Learning Resources:**</u>

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, 2ndEdition (2006), Prentice-Hall.
3. Rajaraman V, The Fundamentals of Computer, 4th Edition(2006), Prentice-Hall of India
4. Steve Oualline, Practical C Programming, 3rd Edition(2006),O'Reilly Press.
5. Jeri R.Hanly, Elliot B.Koffman, Problem Solving and Program Design in C, 5th Edition(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 by Computer,1st Edition(2006), Pearson Education.

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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 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: **U21ES010CE**
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	On completion 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.	1. Determine resultant of forces acting on a body.
2. Solve particle equilibrium problem using equation of equilibrium	2. Analyse equilibrium of a body subjected to a system of forces.
3. Determine forces in the members of a truss	3. Perform analysis of trusses using method of joints and method of sections.
4. Perform analysis of bodies lying on rough surfaces.	4. Solve problem of bodies subjected to friction.
5. Locate the centroid of a body and also compute the area moment of inertia of standard and composite sections.	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, 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", Cengage Learning, 2014.
4. Beer F.P & Johnston E.R Jr. "VectorMechanics for Engineers", TMH, 2019.
5. Hibbeler R.C, "Engineering Mechanics", Pearson Education, 2017.
6. Tayal A.K., "Engineering Mechanics – Statics & Dynamics", Umesh Publications, 2011.
7. Basudeb Bhattacharyya., "Engineering Mechanics", Oxford University Press, 2014.
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 Tests: 90 Minutes

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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: **U21HS020EH**
Credits : 1	CIE Marks : 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students 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.	On completion of this course the student 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.

UNIT-1 HARMONY WITH SELF AND FAMILY
This unit covers:

a) 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-efficacy, self-regulation, self-reliance, and self-responsibility.
b) 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.

UNIT-2   PROFESSIONAL VALUES AND BEHAVIOUR

This unit covers:

a)   At the level of individual: as socially and ecologically responsible engineers and technologists.

b)   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.

UNIT 3 - SOCIAL VALUES

This unit covers:

a) Values of service, social justice, dignity and worth of the person

b) Importance of human relationships, integrity, and competence.

UNIT 4 - SPIRITUAL VALUES

This unit covers:

a) Developing individual practice and has to do with having a sense of peace and purpose.

b) 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.

MODE OF DELIVERY

● Questionnaires	● Discussions
● Quizzes	● Skits
● Case-studies	● Short Movies/documentaries
● Observations and practice	● Team tasks and individual tasks
● Home and classroom assignments	● 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 Tests: 90 Minutes

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

DEPARTMENT OF CIVIL ENGINEERING

Environmental Science

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

L:T:P (Hrs./week): 2:0:0	SEE Marks : 60	Course Code: **U21MC010CE**
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.

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, water logging salinity. Energy resources: Renewable and non-renewable energy resources. Land Resources, soil erosion and desertification.

UNIT - II:
Ecosystems: Structure and function of an ecosystem, producers, consumers and decomposers, food chains, food webs, ecological pyramids, aquatic ecosystem (ponds, oceans, estuaries).

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

UNIT-IV
Environmental Pollution: Causes, effects and control measures of air pollution, water pollution, soil pollution, noise pollution, thermal pollution and solid waste & e-waste management.

UNIT-V:
Social Aspects and the Environment: Water conservation, Climate change, global warming, acid rain, ozone layer depletion. Environmental Impact Assesment, population explosion.

Learning Resources:
1. Deswal S. and Deswal A., A Basic Course on Environmental studies, DhanpatRai& Co Pvt. Ltd. 2016
2. Benny Joseph, Environmental Studies, Tata McGraw-Hill, 2017
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. Rajagopalan R., Environmental Studies, Second Edition, Oxford University Press, 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 : 2 Max. Marks for each Assignment : 5

3. No. of Quizzes : 2 Max. Marks for each Quiz Test : 5

Duration of Internal Tests: 90 Minutes

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

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: **U21HS111EH**
Credits: 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students 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, students will be able to: 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. Analyse, evaluate and infer meaning from different types of texts.

1.0 PHONETICS LAB- TOPICS
1.1 Introduction to English Phonetics: Introductory to auditory, acoustic and articulatory phonetics. Organs of speech: the respiratory, articulatory and phonatory systems.
1.2 Aspects of language learning and ear training activities- Homophones, homonyms. Words often confused. Parts of speech-Identification and pronunciation of nouns, adjectives, verbs and adverbs. 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 Debate: Understanding the difference between a debate and a group discussion, essentials of debates.
2.3 Public speaking: Dos and don'ts of public speaking. Listening and analysing speeches of great personalities in history, TED talks, Documentaries and Movies.

2.4 Interview Skills - Basic HR questions. Viva questions will be asked in internal and external exams.

3.0 READING SKILLS LAB - TOPICS
3.1 Teaching different types of texts for comprehension
3.2 **Poster Reading-** Analysing data, specific vocabulary items & pictorial forms and convert the same to a reading text and vice versa.
Viva questions will be asked in internal and external exams.
Longman Dictionary of Contemporary English - 6th Edition, 2020.

Prescribed textbook for laboratory:
Speak Well: Jayshree Mohanraj, Kandula Nirupa Rani and Indira Babbellapati - Orient Black Swan
Longman Dictionary of Contemporary English - 6th Edition, 2020. (The students will be given the PDF format)

Learning Resources:
1. Balasubramanian: A textbook of English phonetics for Indian students, Macmillan, 2008.
2. Priyadarshini Patnaik : Group discussion and interviews, Cambridge University Press India private limited 2011.
3. Daniel Jones: Cambridge English Pronouncing Dictionary - A Definitive guide to contemporary English Pronunciation.
4. Reading Cards (Eng400): Orient Black Swan. Reading Squabble - Hadfield.
5. Rudolph F. Verderber, Kathleen S. Verderber, Deanna D. Sellnow: The Challenge of Effective Speaking 2012

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: 120 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
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DEPARTMENT OF CHEMISTRY

Chemistry Lab

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

L:T:P(Hrs./week): 0:0:2	SEE Marks:50	Course Code: **U21BS011CH**
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 4. Examine the accuracy	At the end of the course, students should be able to: 1. Determine the amount of metals in the given solutions. 2. Analyse the hardness, alkalinity and chloride content of a given sample. 3. Estimate the amount of a substance in 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.

List of the Experiments:

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. Estimationof chromium in the given solution by standardized FAS.

4. Estimation of copper in brass or given solution by hypo.

5. Estimationof 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. Determination of concentration of a salt by ion exchange method.

15. Synthesis of Aspirin or Phenol formaldehyde resin.

Learning Resources:
Text Books:
1. Sunita rattan, Experiments in applied chemistry, S K Kataria & Sons (2010)
2. M S Kaurav, Engineering chemistry with laboratory experiments, PHI learning (P) ltd, New Delhi.

Reference Books:
1. G H Jeffery, J Bassett, J Mendham, R C Denney, Vogel's text book of quantitative chemical analysis, Fifth Edition.
2. A text book on experiments and calculation Engineering Chemistry, 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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IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Programming for Problem Solving Lab

SYLLABUS FOR B.E. I - SEMESTER

(Common to CSE, AI&ML, IT, ECE and EEE)

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code : **U21ES121CS**
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.

Programming Exercise:

1. Finding maximum and minimum of given set of numbers, finding roots of quadratic equation.
2. Sin x and Cos x values using series expansion.
3. Conversion of binary to decimal, octal, hexadecimal and vice versa.
4. Generating Pascal triangle, pyramid of numbers.
5. Recursion: factorial, Fibonacci, GCD.
6. Matrix addition and multiplication using arrays, linear search and binary search using recursive and non-recursive procedures.
7. Bubble sort and selection sort.
8. Programs on pointers: pointer to arrays, pointer to functions.

9. Functions for string manipulations.
10. Programs on structures and unions.
11. Finding the number of characters, words and lines of given text file.
12. File handling programs.

Learning Resources:

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

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 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 : **U21ES011ME**
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.

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).

<u>Learning Resources:</u>

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 Tests: 2 Hours

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

Introduction to Electronics Engineering
SYLLABUS FOR B.E. CSE I - SEMESTER

L:T:P (Hrs/week): 3:0:0	SEE Marks : 60	Course Code: **U21ES110EC**
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 able to 1. Employ different electronic devices to build electronic circuits such as rectifiers, filters, voltage regulators. 2. Describe the functioning of electronic circuits such as amplifiers and oscillators. 3. Have the knowledge of certain electronic devices such as SCR, UJT. 4. Convert real time electrical signals into corresponding signals using different types of transducers. 5. Measure waveform details from CRO.

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, IC voltage regulators, Block diagram of Regulated Power Supply

UNIT - II : Transistors

Bipolar Junction Transistor (BJT), Construction, Types, Working principle, Configurations, Transistor parameters, Transistor as an amplifier, Single stage 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, General characteristics of Negative feedback 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, Capacitive transducer, Inductive transducer, LVDT, Electrical strain gauges, Temperature transducers (Thermocouple), Piezoelectric transducer, Photoelectric transducer; Industrial Devices: SCR, UJT - Construction, Working principle and Characteristics only; 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. Jacob Milman & C., Halkias, Electronic devices Eighth Edition, Reprinted, Mc Graw Hill,1985.
3. Ramakanth A. Gayakwad, Op-AMPS and Linear Integrated Circuits, 3rd edition, Prentice Hall of India,1985.
4. Mooris Mano, Digital design, 3rd edition, Prentice Hall of India, 2002.
5. Cooper, Electronic Measurement and Instrumentations.
6. 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

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

Introduction to Electronics Engineering Lab

SYLLABUS FOR B.E. CSE I - SEMESTER

L:T:P (Hrs/week): 0:0:2	SEE Marks : 50	Course Code: **U21ES111EC**
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 and rectifiers. 3. Perform different arithmetic operations using operational amplier. 4. Understand the working of logic gates to implement adder and subtractor.	On completion of the course, students will be able to 1. Verify input/output characteristics of active devices and to compute their parameters. 2. Analyse the functioning of voltage regulators, rectifiers and oscillators. 3. Perform operations such as addition, subtraction, comparison of voltage levels using operational amplifier. 4. Implement digital adders and subtractors using logic gates.

List of Experiments:
1. Characteristics of Semiconductor diodes (Si and Zener)
2. CRO Applications
3. Full wave rectifier with and without filter
4. Zener Voltage Regulator
5. Characteristics of BJT (CB and CE)
6. Characteristics of FET
7. RC Phase shift oscillator
8. Hartley oscillator
9. Calpitt's Oscillator
10. Applications of Operational Amplifier: Adder, Subtractor, Comparator.

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

The break-up of CIE :

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

Duration of Internal Test : 180 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS) :: IBRAHIMBAGH, HYDERABAD – 500 031.
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION **(R-21)** :: B.E. – ECE : SECOND SEMESTER (2021-22)

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	
B.E (ECE) II SEMESTER								
THEORY								
U21BS210MA	Differential Equations & Complex Analysis	3	-	-	3	60	40	3
U21BS210PH	Quantum Mechanics and Materials Science	3	-	-	3	60	40	3
U21ES210CS	Problem Solving through Object Oriented Programming	3	-	-	3	60	40	3
U21ES030CE	Basic Engineering Drawing	1	-	2	3	60	40	2
U21PC010EC	Basic Circuit Analysis	3	-	-	3	60	40	3
U21ES010EE	Basic Electrical Engineering	2	-	-	3	60	40	2
U21MC010ME	Introduction to Entrepreneurship	1	-	-	2	40	30	-
PRACTICALS								
U21BS211PH	Engineering Physics Lab	-	-	2	3	50	30	1
U21ES211CS	Problem Solving through Object Oriented Programming Lab	-	-	2	3	50	30	1
U21PC111EC	Basic Circuit Analysis Lab	-	-	2	3	50	30	1
U21ES011EE	Basic Electrical Engineering 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 / PDC / Mentor – Mentee Interaction / CC / RC / TC

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DEPARTMENT OF MATHEMATICS

Differential Equations and Complex Analysis

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 : **U21BS210MA**
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 matrices, Eigen values and Eigen vectors, Diagonalization and canonical form of a quadratic form. 2. **Solve** first order differential equations using elementary techniques and learn its applications. 3. **Use** the various higher order homogeneous and non-homogeneous linear differential equations with constant coefficients to solve it and apply on electrical circuits 4. **Understand** the Analytic functions, conditions and harmonic functions. 5. **Evaluate** a line integral of a function of a complex variable using Cauchy's integral formula, and how to evaluate Taylor's and Laurent Series.	On completion of the course, students will be able to 1. **Find** the rank of a given matrix, diagonalizable a given matrix and reduce a quadratic form to canonical form and find its nature. 2. **Identify** the suitable I.F and solve differential equations, model the real time electrical engineering problems viz., RC & LR Circuits into differential equations and solve. 3. **Apply** various higher order Linear Differential equations, to solve LC and LCR circuits. 4. **Apply** the condition(s) for a complex variable function to be analytic and/or harmonic and to construct an Analytic function. 5. **Evaluate** complex integrals by Cauchy's theorem and Cauchy's Integral formula and define singularities of a function and to expand a given function as a Taylor's / Laurent's series.

UNIT-I :
MATRICES
Rank of a Matrix- Linearly independence and dependence of Vectors - Characteristic equation- -Eigen values and Eigenvectors - Cayley - Hamilton Theorem (without proof)- Diagonalization using Similarity Transformation.

UNIT-II :
ORDINARY DIFFERENTIAL EQUATIONS OF FIRST ORDER Exact first order differential equations - Integrating factors- Clairaut's equation - Applications of First Order Differential Equations -Orthogonal trajectories (Cartesian families) – LR and RC Circuits.

UNIT-III :
HIGHER ORDER LINEAR DIFFERENTIAL EQUATIONS
Solutions of Homogeneous and Non Homogeneous linear equations with constant coefficients-   Method of Variation of Parameters –Applications of linear differential equations to LCR circuits

UNIT-IV :
DIFFERENTIATION OF COMPLEX FUNCTION
Limits and Continuity of function - Differentiability and Analyticity - Necessary & Sufficient Condition for a Function to be Analytic - Milne-Thompson's method -Harmonic Functions.

UNIT-V :
INTEGRATION OF COMPLEX FUNCTION
Complex Integration- Cauchy's Theorem - Extension of Cauchy's Theorem for multiply connected regions- Cauchy's Integral Formula - Power series - Taylor's Series - Laurent's Series (without proofs) –Poles and Residues.

Learning Resources:
Text Books:
1. Advanced Engineering Mathematics 3rd Edition, R.K.Jain & S.R.K.Iyengar, Narosa, Publishing House.
2. Higher Engineering Mathematics 40th Edition 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   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

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
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DEPARTMENT OF PHYSICS

Quantum Mechanics and Material 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: **U21BS210PH**
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. Demonstrate the use of crystal structure in devices applications 2. Appreciate the advantages of quantum mechanics over classical mechanics 3. Explain classification of solids based on band theory of solids. 4. Distinguish types and uses of lasers and optical fibers 5. Choose appropriate dielectric, magnetic and superconducting materials for required applications	On completion of the course, students will be able to 1. Classify crystals based on their structure and their appropriate uses 2. Apply Schrodinger wave equations to quantum mechanical systems 3. Distinguish materials based on band theory of solids and explain energy band structure of semiconductors 4. Compare different types of lasers and illustrate use of light sources in optical fibres. 5. Select various dielectric, magnetic and super conducting materials for specific applications in engineering

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

Introduction-Space lattice, Basis, Unit cell, Bravais lattices and crystal systems, X-ray diffraction, Bragg's law, powder x- ray diffraction-derivation of lattice parameters for cubic crystals, crystalline, polycrystalline and amorphous materials, Miller Indices, inter-planar spacing. Defects in crystals: point defects, expression for concentration of Schottky and Frankel defects, NaCl, Diamond and ZnS crystal structure.

UNIT-II: INTRODUCTION TO QUANTUM MECHANICS (10 hours)
Inadequacy of classical mechanics, Wave-particle duality, de Broglie waves, Davisson and Germer's experiment, G.P. Thomson experiment, wave packet, uncertainty principle, wave function and its physical significance, bra and ket notation, basics of quantum mechanical

operators, Time-dependent and time-independent Schrodinger equations, Eigen values and eigen functions of a particle in infinite square-well potential, potential barrier: tunneling effect.

UNIT-III : BAND THEORY OF SOLIDS (8 hours)
Classical free electron Drude theory and its limitations, Somerfield theory, Fermi-Dirac Statistical distribution, Density of states, Kronig-Penney model- introduction to origin of band gaps in solids, E-k diagram, formation of energy bands, Classification of solids based on energy bands as metals, semiconductors, and insulators, intrinsic and extrinsic semiconductors, expression for carrier concentration in intrinsic and extrinsic semiconductors, variation of Fermi energy level with temperature and doping concentration

UNIT-IV : LASERS AND OPTICAL FIBRES (10 hours)
Lasers: induced absorption, spontaneous and stimulated emissions, Einstein's A and B coefficients; characteristics of lasers, population inversion, meta-stable states, pumping mechanisms, components of laser, Properties of laser beam, construction and working of Ruby laser, He-Ne (gas Laser) and semiconductor laser, advantages and applications of lasers.
Optical Fibres: Introduction, total internal reflection, propagation of light in optical fibre, numerical aperture, acceptance angle, types of optical fibres, evanescent field, light sources for optical fibers, various signal losses in optical fibers: Attenuation-Absorption, Scattering, bending, alignment losses, Signal distortion: intermodal and intra model losses. Block diagram of optical communication system, advantages and application of optical fibers.

UNIT-V : MATERIALS SCIENCE (12 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, classification of various magnetic materials, Ferro, antiferro and ferri-magnetic materials, Weiss molecular field theory of ferromagnetism- magnetic domains- hysteresis curve-Soft and hard magnetic Materials, fundamentals of Ferrites and their applications.
Superconductivity: Superconductor, General properties of super conductors – Meissner effect- Type I and Type II superconductors-fundamentals of BCS Theory - Josephson's Junction- d.c and a.c Josephson's effects–SQUIDS- Applications of superconductors

Learning Resources:

1. Charles Kittel, Introduction to Solid State Physics, 7th Edition, John Wiley & Sons, 2008.
2. S O Pillai, Solid State Physics, 8th edition, New Age International Publishers, 2018
3. R. Murugeshan and K Sivaprasath, Modern Physics, 18th Edition, S. Chand & Co, 2016
4. M.N. Avadhanulu and P.G. Kshirsagar and TVS Arun Murthy A Text Book Engineering Physics, 11th Edition, S. Chand, 2018.
5. S.O. Kasap, Optoelectronic and Photonics: Principles and Practices, Pearson, 2012
6. Arthur Beiser, Shobhit Mahajan and S Rai Choudhury, Concepts of Modern Physics, 6th Edition Tata McGraw, 2009.
7. Senior, Optical Fiber Communications: Principles and Practice, 3rd edition, Pearson, 2010
8. NPTEL MOOCS, Introduction to Solid State Physics, Satyajit Banerjee

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

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

Duration of Internal Tests: 90 Minutes

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

DEPARTMENT OF COMPUTER SCIENCE AND 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 : **U21ES210CS**
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

UNIT-I
Introduction to C++: Programming paradigms, Object Oriented Programming Concepts, Advantages and Applications of OOPs.
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, Testing and Debugging Functions.
I/O Streams as an introduction to Classes and Objects.
Arrays: Introduction to Arrays, Arrays in Functions, Programming with Arrays and Multidimensional Arrays.

UNIT-III
Strings, Pointers and Dynamic Arrays, Recursion, Constructors, Destructors, Copy Constructors.
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.
Function Templates and Class Templates.

UNIT-V

Exception Handling: Exception Handling Basics, Programming Techniques for Exception Handling
Pointers and Linked Lists: Nodes and Linked Lists, Implementation of Stacks and Queues using Arrays and Linked Lists, Operations on Linked Lists- Inserting a Node, Deleting a Node, Searching for a Node.

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

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

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: **U21ES030CE**
Credits : 2	CIE Marks : 40	Duration of SEE : 3 Hours

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. Draw sections and development of regular solids. 5. Visualize and construct isometric projections from orthographic projections of regular solids.	On completion of the course, students will be able to 1. Acquire proficiency in instrumental drawing and will be able to visualize the object, draw conic sections and regular polygons. 2. Draw the orthographic projections of points, lines and planes. 3. Draw orthographic projections of regular and right solids 4. Draw the sections and development of regular solids 5. Visualise and draw the isometric view from the orthographic views of regular solids and combinations of 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).
Projections of perpendicular planes, oblique planes and their traces.

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

UNIT-IV
Sections and Developments of Solids: Sections of solids in simple positions only for prism, pyramid, cylinder and cone and their development.

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 Resources:
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", McGraw Hill Education, 1993.
3. Gill P.S. "Engineering Drawing: Geometrical Drawing", SK Kataria & sons, 2012.
4. Venugopal.K "Engineering Drawing and Graphics Plus Autocad", New Age International (P) Ltd., New Delhi, 2010.
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 Graphics" First Edition, Tata McGraw Hill, 2012
7. BVR Gupta, M Raja Roy, "Engineering Drawing with AutoCad", IK Int 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

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

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: **U21PC010EC**
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 for given circuit. 2. Analyze given circuit in time domain using Transient and steady state analysis. 3. Analyse given circuit in frequency domain using the concept of resonance. 4. To perform transient and steady state analysis for RLC circuits. 5. Design passive filters for given specifications. 6. Determine two port network parameters from given network

UNIT - I
Basic concepts of Electric Circuits:
Lumped 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, Milliman's theorem, compensation and substitution Theorem.

UNIT - III
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 – IV
Frequency domain analysis:
Resonance:
Analysis of Series and Parallel resonance, Q-factor, Selectivity and bandwidth.
Passive Filters:
Constant K-filters – low pass, high pass, band pass, band elimination filter design, m-derived -- low pass, high pass, band pass, band elimination filter design and composite filter design.

UNIT - V
Two port networks:
 Z,Y,h,g, ABCD parameters. Equivalence of two port networks, conversion between network parameters. Star and delta network transformations, Inter connection of two ports.

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

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

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Basic Electrical Engineering

SYLLABUS FOR B.E. II - SEMESTER

(Common to CSE and ECE Branches)

L:T:P(Hrs/week): 2:0:0	SEE Marks:60	Course Code: **U21ES010EE**
Credits : 2	CIE Marks:40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. To provide an understanding of basics in Electrical circuits 2. To explain the working principles of Electrical Machines.	On completion of the course, students will be able to 1. Analyze Electrical DC circuits using different analyzing methods and theorems. 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

UNIT-I : D.C. Circuits:
Electrical circuit elements (R, L and C), independent voltage and current sources, Kirchhoff current and voltage laws, Source transformation, Mesh Analysis, Nodal analysis, Superposition theorem, Thevinin's and Norton's Theorem, Maximum power transfer theorem, Tellegen's theorem.

UNIT-II : A.C. Circuits:
Representation of sinusoidal waveform - peak and rms values, form factor, phasor representation, real power, reactive power, apparent power, power factor, Analysis of single-phase ac series combinations of R-L-C circuits, Three-phase balanced circuits, voltage and current relations in star and delta connections.

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-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

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

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: **U21MC010ME**
Credits : -	CIE Marks:30	Duration of SEE: 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The objective of the course is to 1. 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

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-a problem solving process, sales skills, understanding the customer-centric approach, personal selling techniques, show and tell, elevator pitch, managing risks and learning from failures, women entrepreneurs.

<u>Learning Resources:</u>

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 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**

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031
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: **U21BS211PH**
Credits : 1	CIE Marks: 30	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. Make precise measurements using basic physical principles and acquire skills to handle the instruments 2. Relates the theoretical Knowledge to the behavior of Practical Physical world. 3. Analyze errors in the experimental data. 4. Plot graphs between various physical parameters	The students acquire the ability to 1. Conduct experiment independently and record the measurements. 2. Outline the precautions required to be taken for each experiments 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

List of the Experiments:

1. Determination of wavelength of He-Ne lasers.

2. Determination of radius of curvature of a given Plano-convex lens by forming Newton's Rings.

3. Calculation of numerical aperture, acceptance angle and power loss due to bending of an optical fibre.

4. Study of I-V characteristics of P-N Junction diode

5. Study of I-V characteristics of LED

6. Determination of energy gap of a given semiconductor by four probe method

7. Study of I-V characteristics of solar cell and to calculate fill factor and efficiency

8. Determination of Hall's coefficient using Hall's effect

9. Determination of e/m of an electron by Thomson's method

10. Study of resonance in LCR series circuit and to find resonant frequency & Q- factor

11. Study of resonance in LCR Parallel circuit and to find resonant frequency & Q- factor

12. Estimation of Thermistor constants

13. determination of Seebeck coefficient

14. Helmholtz coil –calculation of magnetic field along the axis of a solenoid

15. B-H curve-estimation of Hysteresis loss of a ferromagnetic sample

*Each student should perform at least 12 (Twelve) 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 COMPUTER SCIENCE AND 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 : **U21ES211CS**
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

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.

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.
7. http://nptel.ac.in/courses/106105151/
8. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-096-introduction-to-c-january-iap-2011/

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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IBRAHIMBAGH, HYDERABAD – 500 031

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: **U21PC111EC**
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 circuits using nodal and mesh analysis and Identify the appropriate network theorem to analyze for a given network. 2. To study the performance of circuits in frequency domain. 3. To determine different two port network parameters for a given network and also characterize the network from the two port parameters. 4. To simulate and find the response of a given circuit using MULTISIM.

List of Experiments:

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

Part –B (using MULTISIM)
1. Verification of Kirchhoff's Laws, Nodal and Mesh analysis in the presence of dependent sources and ac sources.

2. Verification of Thevenin's & Norton's theorems and maximum power transfer theorem in the presence of dependent sources and ac sources.
3. Verification of superposition theorem in the presence of dependent sources and ac sources.
4. Verification of Tellegan's theorem in the presence of dependent sources and ac sources.
5. Transient response of RL and RC circuits.
6. Verifying the performance of Series and Parallel Resonance circuits.
7. Verifying the performance of Passive filters.
8. Measurement of two-port network parameters in the presence of dependent sources and ac sources.

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

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

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Basic Electrical Engineering Lab
SYLLABUS FOR B.E. II - SEMESTER
SYLLABUS FOR B.E I – SEMESTER (IT Branch)
SYLLABUS FOR B.E II – SEMESTER (CSE and ECE Branches)

L:T:P(Hrs./week): 0:0:2	SEE Marks: 50	Course Code: **U21ES011EE**
Credits : 1	CIE Marks: 30	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
To provide the practical knowledge on operation of DC, AC machines and circuits.	On completion of the course, students 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.

List of Experiments:

1. Basic safety precautions. Introduction and use of measuring instruments – voltmeter, ammeter, multi-meter, oscilloscope. Real-life resistors, capacitors and inductors.
2. Verification of Kirchoff's Voltage Law & Kirchoff's Current Law.
3. Verification of Superposition theorem and maximum power transfer theorems.
4. Verification of Thevenin's and Tellegen's theorems.
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.

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 day-to-day laboratory class work : 18
Duration of Internal Test : 3 Hours