VASAVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

Ibrahimbagh, Hyderabad-31
Approved by A.I.C.T.E., New Delhi and
Affiliated to Osmania University, Hyderabad-07

Sponsored

by

VASAVI ACADEMY OF EDUCATION

Hyderabad

SCHEME OF INSTRUCTION AND SYLLABI UNDER CBCS FOR
B.E. (ECE) I and II Semesters
With effect from 2020-21
(For the batch admitted in 2020-21)
(R-20)

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

Department Mission

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

B.E (ECE) Program Educational Objectives (PEO's)	
PEO I	To provide the required foundation in mathematics and engineering sciences that will enable the graduates to identify, analyze and solve engineering problems.
PEO II	To impart indepth knowledge and training in Electronics and Communication Engineering and help them succeed in their careers, higher education and research.
PEO III	To inculcate professional and ethical values in the graduates to excel individually and in multi disciplinary teams to solve engineering and societal problems.
PEO IV	To provide the graduates with an environment that is conducive for developing excellence in leadership and encourage lifelong learning.

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.
P1O	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
P11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
P12	**Lifelong learning:** Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

B.E (ECE) PROGRAM SPECIFIC OUTCOMES (PSO's)	
PSO I	ECE graduates 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 graduates will be able to apply the acquired knowledge and skills in modeling and simulation of wireless communication systems.
PSO III	ECE graduates will be able to implement signal and image processing techniques for real time applications.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS) :: IBRAHIMBAGH, HYDERABAD – 500 031.
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION (R-20) :: B.E. – ECE : FIRST SEMESTER (2020 - 21)

B.E (ECE) I - SEMESTER								
Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			
		Hours per Week			Duration in Hrs	Maximum Marks		Credits
		L	T	P/D		SEE	CIE	
THEORY								
U20HS110EH	English Language and Communication Skills - I	2	-	-	3	60	40	2
U20BS110MA	Engineering Mathematics – I	3	-	-	3	60	40	3
U20BS010CH	Engineering Chemistry	3	1	-	3	60	40	4
U20ES120CS	Programming for Problem Solving	3	-	-	3	60	40	3
U20ES010CE	Basic Engineering Mechanics	3	-	-	3	60	40	3
PRACTICALS								
U20HS111EH	English Language and Communication Skills Lab – I	-	-	2	3	50	30	1
U20BS011CH	Chemistry Lab	-	-	2	3	50	30	1
U20ES121CS	Programming for Problem Solving Lab	-	-	2	3	50	30	1
U20ES021ME	Engineering Workshop	-	-	2	3	50	30	1
	TOTAL	**14**	**1**	**8**		**500**	**320**	**19**
	GRAND TOTAL	**23**				**820**		

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION (R-20) :: B.E. – ECE : FIRST SEMESTER (2020 - 2021)

B.E (ECE) I - SEMESTER								
Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			
		Hours per Week			Duration in Hrs	Maximum Marks		Credits
		L	T	P/D		SEE	CIE	
COURSES OFFERED BY ECE TO CSE								
THEORY								
U20ES110EC	Introduction to Electronics Engineering	3	-	-	3	60	40	3
PRACTICALS								
U20ES111EC	Introduction to Electronics Engineering Lab	-	-	2	3	50	30	1

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

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

English Language and Communication Skills - I

(Common to all branches)

SYLLABUS FOR B.E. I- SEMESTER

L:T:P (Hrs/Week): 2:0:0	SEE Marks: 60	Course Code: **U20HS110EH**
Credits: 2	CIE Marks: 40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to: 1. Understand the role and importance of communication skills. 2. Realise the various features and functions of human language and communication, verbal and non-verbal. 3. Comprehend the use of words in different contexts. 4. Develop the habit of listening effectively to various speakers and lectures. 5. Develop reading strategies in order to understand various types of texts.	On completion of the course, students will be able to 1. Greet and converse with friends, teachers, and strangers appropriately. 2. Listen and respond to lectures, talks and take notes. 3. Use language functionally and participate in classroom interactions and in simulated situations replicating the real world. 4. Read, comprehend, and answer questions on different types of texts and make notes. 5. Construct grammatically correct sentences for speaking and writing.

UNIT-I : 1.0 Effective communication:

1.1 Role and Importance of language and communication; Functions of communication; Process of communication; Types of communication - formal and informal; verbal and nonverbal; Styles of communication; Channels of communication; Barriers to effective communication.

UNIT-II : 2.0 Listening and Speaking skills:

2.1 Importance of listening in effective communication; Active listening, **2.2** Speaking skills: -Speaking strategies, Functions of oral communication- introducing a person and speaking about his/her achievements, situational dialogues; telephone etiquette; poster-presentations.

UNIT-III : 3.0 Reading and Writing skills:

3.1 Sub-skills of Reading; Understanding the functions of different texts, Reading comprehension

3.2 Written Communication: Styles

- Describing events, people, places, objects.
- Defining.
- Providing examples or evidence.
- Writing introduction and conclusion.

3.2.1 Written Communication: Features of Writing: -

Importance of proper punctuation, creating coherence, organizing principles of paragraphs in documents, Techniques for writing precisely using appropriate phrases and clauses and linkers.

UNIT-IV : 4.0 Vocabulary Building and Grammar:

a. Vocabulary Building: The concept of Word Formation; Root words. Prefixes and suffixes;
   Synonyms, antonyms, and standard abbreviations. Homonyms, Homophones.
b. Remedial English: Articles, Prepositions; Tense and Aspect; Subject-Verb agreement;
   Connectives; Direct and Indirect Speech, Common errors.

UNIT-V : 5.0 Reading skills and Comprehension:

5.1 Prose text- In love with Rocket Science- India's Missile Woman.
5.2 Poem - A psalm of life by Henry Wadsworth Longfellow.

Learning Resources:

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

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)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF MATHEMATICS

Engineering Mathematics - I

SYLLABUS FOR B.E. I - SEMESTER

(Common to all branches)

L:T(Hrs./week): 3:0:0	SEE Marks : 60	Course Code : **U20BS110MA**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. Understand the Mean value theorems, concepts of curvature, radius of curvature evolutes and envelopes and to expand functions 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. 3. Study the concepts of vector differentiation, Gradient, Divergence and Curl. 4. Learn how to evaluate double and triple integrals, Change of order of integration and change of variables and vector integration and its applications. 5. Understand infinite series, nature and various tests to check the nature of infinite series .	On completion of the course, students will be able to 1. Compute radius of curvature, evolute and envelope of a given curve and also to expand given function using Taylor's series. 2. Expand a 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. Calculate the gradient and directional derivatives and Curl 4. Apply given double and triple integrals to evaluate area and volume and to use Green's theorem to evaluate line integrals, Stokes' theorem to give a physical interpretation of the curl of a vector field and the divergence theorem. 5. Identify the given series and apply an appropriate test to check its nature

UNIT-I : Differential Calculus

Introduction to Mean Value Theorems with Geometrical Interpretation(Without Proofs) - Taylor's Series – Expansion of functions on power series- Curvature- Radius of Curvature (Cartesian and Parametric co-ordinates) – Center of Curvature –Evolutes – Envelopes of one parameter family of curves.

UNIT-II : Multivariable Calculus

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 with and without constraints - Lagrange's Method of multipliers.

UNIT-III : 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 : Vector Integral Calculus

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).

UNIT-V : Infinite Series

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:

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.
3. Advanced Engineering Mathematics 8th Edition by Erwin Kreyszig , John Wiley & Sons.
4. Differential Calculus by Shanti Narayan S. Chand & Co
5. Vector Calculus – Schaum's outline series.
6. http://mathworld.wolfram.com/topics
7. http://www.nptel.ac.in/course.php

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)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CHEMISTRY

Engineering Chemistry

SYLLABUS FOR B.E. I - SEMESTER

(For CSE, ECE, EEE & IT Branches)

L:T(Hrs./week): 3:1:0	SEE Marks : 60	Course Code : **U20BS010CH**
Credits : 4	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. To study variation of conductance, electrode potential and emf with change in concentration, temperature and to acquaint with applications of galvanic cells. 2. To classify and compare various types of batteries. 3. Discuss the difference types of polymers with their applications. 4. To appraise few engineering materials.	On completion of the course, students will 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. Categorize the polymers and discuss the synthesis of a few polymers and their applications. 4. Get expose to basic concepts of engineering materials such as Composites and membranes. 5. Know the classification, properties, applications and types of liquid crystals & nano materials along with their synthesis.

UNIT-I : ELECTROCHEMISTRY

Introduction, conductance, types of conductance- specific, equivalent, molar conductance and their interrelationship- numericals. Ionic mobility and transport number- definition, determination by Hittorfs method (Non attackable electrodes) 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. Applications of potentiometry- acid base and redox titration (Fe(II) Vs $KMnO_4$).

UNIT-II : BATTERY TECHNOLOGY:

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

Primary batteries: Construction and electrochemistry of Ag_2O-Zn battery and lithium-V_2O_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 and phosphoric acid fuel cell.

UNIT-III : POLYMER CHEMISTRY

Introduction, degree of polymerization, functionality of monomers and its effect on the structure of polymers. Classification of polymers-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) Phenol-formaldehyde (Bakelite) c) PVC

Elastomers: Natural rubber- structure – chemistry of vulcanization and advantages.

Artificial rubbers: Preparation, properties and uses of Buna-S and silicone rubbers.

Biodegradable polymers: Concept, preparation and uses of ploy lactic acid.

Conducting polymers: Definition- classification, mechanism of conduction in polyacetylene and applications.

UNIT-IV : ENGINEERING MATERIALS:

a. Composite materials:

Introduction, constituents of composites, advantages over conventional materials. Applications of composites. Types of composites based on matrix and dispersed phases. Manufacturing techniques – Hand lay up method-RTM, pull trusion methods.

Fiber reinforced composites: glass, carbon and aramid reinforced composites. Layered composites-applications.

b. Membrane technology

Introduction, classification- symmetric, asymmetric, electrically charged

and liquid membranes. Working principle of membrane, advantages of membrane separation over conventional separation. Casting methods: phase inversion and solvent evaporation methods, synthesis of polyphenyleneoxide, polyethersulphone and membrane casting. Industrial applications of membranes- gas separation, pervaporation, elecetrodialysis, reverse osmosis, micro, ultra and nano filtration.

UNIT-V : ADVANCED ENGINEERING MATERIALS

a. Nano Materials

Introduction - concept of nanomaterials - quantum confinement and surface volume ratio - catalytic property and mechanical properties.

Types of Nanomaterials**: c**arbon 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 Nanotubes**:**single walled carbon nanotubes (SWCNTs). Multi walled carbon nanotubes (MWCNTs), synthesis of CNTs- arc discharge and laser ablation methods, applications.

b. 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.

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 Nano science, 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 Tests: 90 Minutes

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

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Programming for Problem Solving

SYLLABUS FOR B.E. I - SEMESTER

(Common to CSE, IT, ECE and EEE)

L:T:P(Hrs./week): 3:0:0	SEE Marks : 60	Course Code : **U20ES120CS**
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.

UNIT-I

Introduction to Computers: Components of a Computer, Operating system, Compilers, Computer Languages, Program Development Environments, Creating and Running programs, Algorithm, Flowchart. Number Systems: Binary, Decimal, Octal, Hexadecimal and Conversions.

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

UNIT-II

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

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

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

UNIT-III

Recursion: Recursive Functions, Preprocessor Commands.

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

UNIT-IV

Pointers: Introduction, Pointers for Inter-Function Communication, Pointers to Pointers, Compatibility, LValue and RValue, Arrays and Pointers, Pointer Arithmetic and Arrays, Passing on Array to a Function, Memory Allocation Functions, Array of Pointers, Programming Applications, Pointers to void, Pointers to Functions, Command Line Arguments. **Strings:** Concepts, C Strings, String Input/Output, Functions, Arrays of Strings, String Manipulation Functions.

UNIT-V

Type Definition (typedef), Enumerated Types.

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

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

Learning Resources:

1. Forouzan B.A & Richard F. Gilberg, A Structured Programming Approach using C, 3rd Edition(2013), Cengage Learning.
2. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, 2nd Edition (2006), Prentice-Hall.
3. Rajaraman V, The Fundamentals of Computer, 4th Edition(2006), Prentice-Hall of India
4. Steve Oualline, Practical CProgramming,3rd Edition(2006),O'Reilly Press.
5. Jeri R. Hanly, Elliot B. Koffman, Problem Solving and Program Design in C, 5thEdition (2007), Pearson Education.
6. Balagurusamy E, Programming in ANSI C, 4th Edition(2008), TMG.
7. Gottfried, Programming with C, 3rd Edition(2010), TMH.
8. R G Dromey, How to Solve it byComputer,1st Edition(2006), Pearson Education.
9. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-087-practical programming-in-c-january-iap-2010/syllabus/
10. http://nptel.ac.in/syllabus/syllabus.php?subjectId=106104128

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Duration of Internal Tests: 90 Minutes

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

DEPARTMENT OF CIVIL ENGINEERING

Basic Engineering Mechanics

(Common to CSE, IT, ECE and EEE)

SYLLABUS FOR B.E. I - SEMESTER

L:T: P (Hrs./week): 3:0:0	SEE Marks:60	Course Code: **U20ES010CE**
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

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.	On completion 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.

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., Jaan Kiusalaas., "Engineering Mechanics", Cengage Learning, 2014.
4. Beer F.P & Johnston E.R Jr. Vector "Mechanics for Engineers", TMH, 2004.
5. Hibbeler R.C & Ashok Gupta, "Engineering Mechanics", Pearson Education, 2010.
6. Tayal A.K., "Engineering Mechanics – Statics & Dynamics", Umesh Publications, 2011.
7. Basudeb Bhattacharyya., "Engineering Mechanics", Oxford University Press, 2008.
8. Meriam. J. L., "Engineering Mechanics", Volume-I Statics, John Wiley & Sons, 2008.
9. NPTEL Course (www.nptel.ac.in)
10. Virtual labs (www.vlab.co.in)

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

Duration of Internal Tests: 90 Minutes

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

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

English Language and Communication Skills Lab - I

SYLLABUS FOR B.E. I - SEMESTER

(Common to all branches)

L:T:P (Hrs/Week) :0:0:2	SEE Marks : 50	Course Code: **U20HS111EH**
Credits: 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to: 1. Identify and describe phonemes in English. 2. Learn the speech sounds and distinguish between vowel and consonant sounds in the English language. 3. Reduce mother tongue influence when speaking English. 4. Understand and follow the rules in debates, group discussions, interviews and role plays. 5. Develop reading skills and analyse various text types. 6. Use dictionary for pronunciation and transcription of words.	On completion of the course, students will be able to 1. Use language with appropriate pronunciation. 2. Modify language, based on the context and situations. (formal and informal). 3. Participate effectively in group discussions and debates. 4. Enact role plays. 5. Use language coherently. 6. Comprehend various text types.

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 Sound System of English: Phonetic sounds, Introduction to International Phonetic Alphabet; The Syllable: Types of syllables, Transcription.

2.0 INTERACTIVE COMMUNICATION SKILLS LAB-TOPICS

2.1 Group discussion: Objectives of GD, Types of GDs; Initiating, Continuing, and concluding a GD. (Basic Level)

2.2 Debate: Understanding the difference between a debate and a group discussion, essentials of debate, concluding a debate. (Basic Level)

2.3 Role Plays: Use of structured and semi-structured dialogues in a variety of situations and settings.

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

Viva questions will be asked in internal and external exams.

Prescribed textbook for laboratory:

Speak Well: Jayshree Mohanraj, Kandula Nirupa Rani and Indira Babbellapati - Orient Black Swan

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: 120 Minutes

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

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: **U20BS011CH**
Credits : 1	CIE Marks:30	Duration of SEE:03Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. To describe the conventional quantitative analytical techniques. 2. To Learn the working principles of instruments. 3. To familiarize preparation method of few compounds.	On completion of the course, students will be able to 1. Determine the amount of metals in the given solutions. 2. Analyse the hardness, alkalinity and chloride content of a given water 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. 5. Synthesize a polymer.

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:

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, Experimenta in applied chemistry, S K Kataria & Sons (2010)
4. A text book on experiments and calculation Engg. S.S. Dara.

From the above experiments, 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 Test : 3 Hours

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

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Programming for Problem Solving Lab

SYLLABUS FOR B.E. I - SEMESTER

(Common to CSE, IT, ECE and EEE)

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code : **U20ES121CS**
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)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF MECHANICAL ENGINEERING

Engineering Workshop

SYLLABUS FOR B.E. I - SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code : **U20ES021ME**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
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	On completion 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
4. Assembly of pulley on a shaft with key (demo)

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
4. LT Distribution with loads (Demo)

CARPENTRY

1. Half-lap joint
2. Dove-tail joint
3. Bridle joint
4. Wood turning operation (demo)

SHEET METAL

1. Rectangular Box
2. Rectangular scoop with handle
3. Making a funnel with soldering
4. Making a T-Joint (Demo).

PLASTIC MOULDING

1. Injection moulding of plastic spoon (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 r. 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)
IBRAHIMBAGH, HYDERABAD – 500 031

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: **U20ES110EC**
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)
IBRAHIMBAGH, HYDERABAD – 500 031

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: **U20ES111EC**
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 and Calpitt's Oscillator
9. Applications of Operational Amplifier: Adder, Subtractor, Comparator.
10. Measure the strain using strain Gauge
11. Verify the characteristics of UJT

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-20) :: B.E. – ECE : SECOND SEMESTER (2020 - 21)

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								
U20HS210EH	English Language and Communication Skills – II	2	-	-	3	60	40	2
U20BS210MA	Engineering Mathematics – II	3	-	-	3	60	40	3
U20BS210PH	Quantum Mechanics and Materials Science	3	1	-	3	60	40	4
U20ES220CS	Problem Solving through Object Oriented Programming	3	-	-	3	60	40	3
U20ES030CE	Engineering Drawing	1	-	2	3	60	40	2
U20ES010EE	Basic Electrical Engineering	2	-	-	3	60	40	2
PRACTICALS								
U20HS211EH	English Language and Communication Skills Lab – II	-	-	2	3	50	30	1
U20BS211PH	Engineering Physics Lab	-	-	2	3	50	30	1
U20ES221CS	Problem Solving through Object Oriented Programming Lab	-	-	2	3	50	30	1
U20ES011EE	Basic Electrical Engineering Lab	-	-	2	3	50	30	1
	TOTAL	**14**	**1**	**10**		**560**	**360**	**20**
	GRAND TOTAL	**25**				**920**		

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

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

English Language and Communication Skills - II

SYLLABUS FOR B.E. II - SEMESTER

(Common to all branches)

L:T:P (Hrs/Week): 2:0:0	SEE Marks: 60	Course Code: **U20HS210EH**
Credits: 2	CIE Marks: 40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to: 1. Identify words for use both in formal and informal contexts, to persuade and instruct and to inform. 2. Adapt and cooperate with people in varied contexts to function effectively, individually and in teams. 3. Communicate in interpersonal and intrapersonal contexts. 4. Read and write letters and essays etc. independently. 5. Write sustained piece of texts exhibiting qualities of coherence and cohesion.	On completion of the course, students will be able to 1. Participate confidently in discussions both in the classroom and outside. 2. Work in teams, share ideas, agree and disagree politely. 3. Compose coherent letters, essays and resumes for varied situations. 4. Interpret and write a piece of text with coherence and cohesion. 5. Write paragraphs on any given topic following the rules of grammar and use appropriate vocabulary.

UNIT-I : 1.0 Interpersonal Communication

1.1 Johari Window

1.2 Team building skills and teamwork

1.3 Persuasion techniques

UNIT-II : 2.0 Speaking skills

2.1 Speaking strategies: - Making Power Point Presentations (research-oriented topics)

UNIT-III : 3.0 Writing Practices

3.1 Précis Writing

3.2 Essay Writing-General and Creative

3.3 Email-etiquette

3.4 Request letters

3.5 Application letters and resume

UNIT-IV : 4.0 Advanced Remedial English and Vocabulary:-
(In context)

4.1 Grammar-Active and Passive Voice; Subject-Verb agreement

4.2 Vocabulary: - Words often confused, One-word substitutes; Collocations, Phrasal verbs; Idiomatic usage.

UNIT-V : 5.0 Reading skills and Comprehension

5.1 Getting acquainted with major type of questions

5.2 Prose text**-** Shiva Ayyadurai- The Inventor of the e-mail.

5.3 Poem by William Wordsworth - The World Is Too Much with Us

Learning Resources:

1. Essential English - E.Suresh Kumar, P. Sreehari, J. Savithri - Orient BlackSwan 2011.
2. Sunitha Mishra., C. Murali Krishna., Communication Skills for Engineers, Pearson, 2004.
3. Practical English Usage. Michael Swan. OUP. 1995.
4. Remedial English Grammar. F.T. Wood. Macmillan.2007
5. On Writing Well. William Zinsser. Harper Resource Book. 2001
6. Study Writing. Liz Hamp-Lyons and Ben Healy. Cambridge University Press. 2006.
7. Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press. 2011. (vi) Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. 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 Tests: 90 Minutes

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

DEPARTMENT OF MATHEMATICS

Engineering Mathematics - II

SYLLABUS FOR B.E. II - SEMESTER

(Common to all branches)

L:T:P (Hrs./week): 3:0:0	SEE Marks :60	Course Code : **U20BS210MA**
Credits : 3	CIE Marks :40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. **Study** the concepts of matrices, Eigen values and Eigen vectors, Diagonalization and canonical form of a quadratic form. 2. **Solve** various first order differential equations using various elementary techniques and learn its applications. 3. **Solve** various Higher order homogeneous and non-homogeneous differential equations with constant and variable coefficients and applications. 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** rank of a given matrix, diagonalize a given matrix and reduce a quadratic form to canonical form and find its nature. 2. **Identify** the differential equations and solve them, model the real time electrical engineering problems viz., RC Circuits into differential equations and solve. 3. **Solve** various higher order Linear Differential Equations, model the real time electrical engineering problems viz., LC and LCR circuits into differential equations and solve them by using the various applicable techniques learnt. 4. **Apply** the condition(s) for a complex variable function to be analytic and/or harmonic and to construct an Analytic function. 5. **Apply** Cauchy's theorem and Cauchy's Integral formula to evaluate complex integrals and define singularities of a function, know the different types of singularities 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- Physical significance 0f Eigen values - Cayley - Hamilton Theorem(without proof)- Diagonalization using Similarity Transformation.

UNIT-II : Ordinary Differential Equations of first order

Exact first order differential equations - Integrating factors- Linear first

order equations -
Clairaut's Equation- Applications of First Order Differential Equations - Orthogonal trajectories
(Cartesian families) – LR and RC Circuits.

UNIT-III : Linear Differential equations

Solutions of Homogeneous and Non Homogeneous equations with constant coefficients- Method of Variation of Parameters –Applications of linear differential equations to LCR circuits

UNIT-IV : Complex Variables (Differentiation)

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 : Complex Integration

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:

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.
4. Advanced Engineering Mathematics, by Wylie & Barrett, Tata Mc Graw Hill, New Delhi.
5. Advanced Engineering Mathematics, 8th Edition by Erwin Kreyszig , John Wiley & Sons, Inc.
6. Ordinary and Partial Differential equations, by M.D.Raisinghania, S.Chand & Company Ltd.,1997.
7. Complex Variables and applications, J.W.Brown and R.V.Churchill, 7th Edition, Tata Mc Graw Hill,2004.
8. http://tutorial.math.lamar.edu/Classes/DE/DE.aspx
9. http://mathworld.wolfram.com/topics
10. http://www.nptel.ac.in/course.php

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)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF PHYSICS

Quantum Mechanics and Material Science

SYLLABUS FOR B.E. II- SEMESTER

(Common to ECE and EEE)

L:T:P(Hrs/week):3:1:0	SEE Marks:60	Course Code: **U20BS210PH**
Credits : 4	CIE Marks:40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. Learn crystal structure and defects in solids 2. Distinguish classical and quantum mechanical principles and gain knowledge on quantum mechanics 3. Appreciate classification of different solids based on band theory. 4. Acquire knowledge on optical fiber communication system and signal losses in optical fibers. 5. Narrate properties of dielectric, magnetic materials and superconductors.	On completion of the course, students will be able to 1. Segregate crystals based on their structure and apply effects of defects on manipulating properties of solids. 2. Apply and solve wave equations for various quantum mechanical systems. 3. Distinguish materials based on band theory of solids and their applications. 4. Summarize various merits, demerits and applications of optical fibers and light sources. 5. Select various dielectric, magnetic materials and superconductors for specific applications in different fields.

UNIT-I : FUNDAMENTALS OF CRYSTAL STRUCTURE

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-Schottky, Frankel defects, compositional and substitution impurities, line defects: screw and edge dislocations, burger vector, burgers circuit, energy of a dislocation, effects of defects on properties of solids. NaCl, Diamond and ZnS crystal structure.

UNIT-II: INTRODUCTION TO QUANTUM MECHANICS

Inadequacy of classical mechanics, photo electric effect, 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, postulates of quantum mechanics.

Time-dependent and time-independent Schrodinger equations, quantum mechanical operators, Schrodinger equation for one dimensional problems: free-particle, stationary-state, particle in infinite square-well potential, potential barrier and tunneling- calculation of transmission coefficient, alpha decay.

Inadequacy of classical mechanics, photo electric effect, 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, postulates of quantum mechanics.

Time-dependent and time-independent Schrodinger equations, quantum mechanical operators, Schrodinger equation for one dimensional problems: free-particle, stationary-state, particle in infinite square-well potential, potential barrier and tunneling-calculation of transmission coefficient, alpha decay.

UNIT-III : BAND THEORY OF SOLIDS

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, Qualitative treatment of density of states for bulk material, formation of energy bands. Classification of solids based on energy bands as metals, semiconductors, and insulators. Intrinsic and extrinsic semiconductors, variation of Fermi energy level with temperature and doping, expression for carrier concentration of intrinsic and extrinsic semiconductors.

UNIT-IV : LASERS AND OPTICAL FIBRES

Lasers: induced absorption, spontaneous and stimulated emissions, Einstein's theory of matter radiation interaction- A and B coefficients; population inversion, meta-stable states, pumping mechanisms, components of laser, Properties of laser beam, construction and working of Ruby laser, Nd: YAG laser (solid state lasers), He-Ne (gas Laser) and semiconductor laser, advantages and applications of lasers.

Optical Fibres: Total internal reflection, numerical aperture, acceptance angle, propagation of light in optical fiber, types of optical fibres based on refractive index and modes of propagation, light sources for optical fibres, various signal losses in optical fibres, Block diagram of optical communication system, advantages and application of optical fibres.

UNIT-V : MATERIALS SCIENCE

Dielectric Materials: Polar and non-polar dielectrics, types of dielectric polarizations, Expressions for electronic polarizability and ionic polarizability, Frequency and temperature dependence of dielectric polarizations, internal filed in solids, Lorentz field, Clausius- Mossotti equation- applications of dielectric materials. Applications of dielectric materials.

Magnetic Materials: Origin of magnetism, classification of various magnetic materials, Ferro, antiferro and ferri-magnetic materials and their properties, 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 superconductor

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. D. J. Griffiths, "quantum mechanics", Pearson Education, 2012.
4. R. Murugeshan and K Sivaprasath, Modern Physics, 18th Edition, S. Chand & Co, 2016
5. M.N. Avadhanulu and P.G. Kshirsagar and TVS Arun Murthy, A Text Book Engineering Physics, 11th Edition, S. Chand, 2018.
6. Senior, Optical Fiber Communications: Principles and Practice, 3e: Pearson, 2010
7. G. Keiser, Optical communications, Mc Graw Hill, (2010)

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)
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 : **U20ES220CS**
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.
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 : 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)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

Engineering Drawing

SYLLABUS FOR B.E. II - SEMESTER

(Common to ECE & EEE)

L:T:P (Hrs./week): 1:0:2	SEE Marks : 60	Course Code: **U20ES030CE**
Credits : 2	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
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)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Basic Electrical Engineering

SYLLABUS FOR B.E. II - SEMESTER

(Common to I – SEM: IT Branch, II-SEM: CSE and ECE Branches)

L:T:P(Hrs/week): 2:0:0	SEE Marks:60	Course Code: **U20ES010EE**
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 circuits to compute and measure the parameters of Electrical Energy. 2. Comprehend the working principles of DC Machines. 3. Identify and test the various Electrical switchgear, single phase transformers and assess the ratings needed in given application. 4. Comprehend the working principle 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)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

English Language and Communication Skills Lab - II

SYLLABUS FOR B.E. II - SEMESTER

(Common to all branches)

L: T:P (Hrs/Week): 0:0:2	SEE Marks: 50	Course Code: **U20HS211EH**
Credits: 1	CIE Marks: 30	Duration of SEE: Hours: 3

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to: 1. Use language effectively without mother -tongue influence. 2. Converse in various situations. 3. Make poster and power point presentations. 4. Listen to audio clippings, exchange dialogues and write short texts. 5. Speak effectively using discourse markers. 6. Read and understand various forms of texts and review them.	On completion of the course, students will be able to 1. Pronounce words in isolation as well as in spoken discourse. 2. Research and sift information to make presentations. 3. Comprehend the tone and tenor of various types of speeches from media and classroom lectures. 4. Listen for gist and make inferences from various speeches. 5. Identify connectives and transitions in various speeches. 6. Use connectives and make transitions

1.0 PHONETICS LAB- TOPICS

1.1 Aspects of Connected Speech:

Passages and dialogue reading.

1.2 Word Stress:

Rules of Word stress and Sentence stress

1.3 Rhythm and Intonation:

Introduction to rhythm and intonation; Major patterns of intonation in English with their semantic implications. Transcription.

Viva questions will be asked in internal and external exams.

2.0 INTERACTIVE COMMUNICATION SKILLS LAB-TOPICS (Advanced Level)

2.1 Public Speaking:

Advantages of public speaking, essentials of an effective speech, researching, planning and delivering a speech.

2.2 Presentation Skills:

Making Effective Presentations, Expressions which can be used in Presentations, Use of Non-verbal communication, Coping with stage-fright, Handling Question and Answer Session; Use of Audio-Visual Aids, PowerPoint Presentations.

2.3 Interview skills-

Do's and Don'ts, Handling difficult questions, dress code and code of conduct. Viva questions will be asked in internal and external exams.

3.0 READING SKILLS LAB

Study Skills:

Use of Dictionary and the thesaurus for vocabulary building.
Teaching different types of texts for comprehension
Viva questions will be asked in internal and external exams.

Prescribed textbook for laboratory:

Speak Well: Jayshree Mohanraj, Kandula Nirupa Rani and Indira Babbellapati - Orient BlackSwan.

Learning Resources:

1. T. 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.

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: 120 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
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: **U20BS211PH**
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	On completion of the course, students will be able to 1. Conduct experiments, take measurements independently. 2. Write appropriate laboratory reports. 3. Compute and compare the experimental results and draw relevant conclusions and interpret the results. 4. Use the graphical representation of data and estimate results from graphs

List of the Experiments:

1. Determination of characteristics of He-Ne lasers.
2. Determination of wavelength of spectral lines of Mercury light source using diffraction grating under normal incidence.
3. Calculation of numerical aperture, acceptance angle and power loss due to bending of an optical fibre.
4. Determination of energy gap of a given semiconductor by four probe method
5. Study of I-V characteristics of P-N Junction diode, Zener diode
6. Characteristics of Photodiode and LED
7. Study of I-V characteristics of solar cell and to calculate fill factor and efficiency

8. Hall's effect- determination of Hall's coefficient
9. e/m of electron-Thomson's method
10. Study of resonance in LCR series & parallel circuits and to find resonant frequency & Q- factor
11. Temperature Characteristics of Thermistor and to find Thermistor constants
12. B-H curve-estimation of Hysteresis loss of a ferromagnetic sample
13. Helmholtz coil –calculation of magnetic field along the axis

From the above experiments, 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)
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 : **U20ES221CS**
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)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Basic Electrical Engineering Lab

SYLLABUS FOR B.E. II - SEMESTER

(Common to I – SEM: IT Branch, II-SEM: CSE and ECE Branches)

L:T:P(Hrs./week): 0:0:2	SEE Marks: 50	Course Code: **U20ES011EE**
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 the basic electrical equipments. 2. Find the various electrical parameters in DC and AC circuits. 3. Find the Efficiency of the DC and AC machines.

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 12 (Twelve) 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