Department of
INFORMATION TECHNOLGY

4 Years B.Tech Degree Programme

REGULATION & SYLLABUS 2017

Choice Based Credit System
Outcome Based Assessment

SEMESTER- I & II

AUTONOMOUS
Accredited by NBA
Accredited by NAAC with 'A' Grade (3.28 out of 4.00 CGPA)

GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY
Affiliated to UGC New Delhi &Biju Patnaik University of Technology, Odisha
GUNUPUR – 765022, Odisha, India

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1: To render best platform for adequate training and opportunities to work as teams on projects with effective communication skills and leadership qualities and understand professional ethics, social awareness and organizational context in which their engineering skills are utilized.

PEO2: To endow the students with sound knowledge in the field of mathematics, basic science and engineering fundamentals to solve and inculcate the ability to utilize their skills to prepare them for higher studies, research and analyze engineering problems.

PEO3: To extend an ability to analyze the need of the society by providing innovative solutions, leading to their personal cum professional growth as an entrepreneur.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO 1: To provide students an understanding of the expectations of industry and practical competence with a broad range of programming language and open source platforms through value added courses.

PSO 2: The ability to analyze and develop computer programs in the areas related to artificial intelligence, big data analytics and cyber security for efficient design of computer-based systems of varying complexity.

PROGRAMME OUTCOMES (POs)

PO-1. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO-2. 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.

PO-3. 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.

PO- 4. 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.

PO- 5. 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.

PO- 6. 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.

PO- 7. 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.

PO- 8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO- 9. Individual and team work: Function effectively as an individual and as a member or leader in diverse teams, and in multidisciplinary settings.

PO-10. 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.

PO-11. Project management and finance: Demonstrate knowledge and understanding of the engineering 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.

PO-12. Life-long 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.

COURSE STRUCTURE

I SEMESTER

S.No	Course Category	Course Code	Course Title	L	T	P	C	QP
			THEORY					
1.	BS	BBSBS1010	Engineering Mathematics-I	3	1		4	
2.	BS	BBSBS1021	Engineering Physics	3	0		3	
		BBSBS1022	Engineering Chemistry					
3.	ES	BBSES1031	Basics of Mechanics	3	0		3	
		BBSES1032	Basics of Thermodynamics					
4.	ES	BBSES1041	Basics of Electronics	3	0		3	
		BBSES1042	Basics Electrical Engineering					
5.	ES	BBSES1050	Programming In 'C	3	0		3	
6.	HS	BBSHS1060	Communicative English-I	2	0		2	
PRACTICAL								
1.	BS	BBSBS1121	Engineering Physics Lab			2	1	
		BBSBS1122	Engineering Chemistry Lab					
2.	ES	BBSES1141	Basics of Electronics Lab			2	1	
		BBSES1142	Basics Electrical Engineering Lab					
3.	ES	BBSES1150	Programming in 'C' Lab			2	1	
4.	HS	BBSHS1160	Communicative English-I Lab			2	1	
5.	ES	BBSES1171	Engineering Drawing			2	1	
		BBSES1172	Engineering Workshop					
6.	HS	BBSHS1180	NSS / NCC			2	1	
TOTAL				**17**	**1**	**12**	**24**	

Course Code	Course Title	L	T	P	C	QP
BBSBS 1010	**Engineering Mathematics-I**	**3**	**1**	**0**	**4**	**A**

Pre -Requisite:

Course Educational Objective
CEO1: To find critical points, and use them to locate maxima and minima
CEO2: To provide the standard methods for solving differential equations
CEO3: To study Fourier series and to express a function in Fourier series
CEO4: To use matrices, determinants and techniques for solving systems of linear equations in the different areas of Linear Algebra.

Course Outcome	
CO1	To implement the engineering problems using the concept of Partial differentiation and series and to understand its application.
CO2	To solve the initial value and boundary value problem of ODE related to SHM, Electrical circuit, Growth and Decay problem etc.
CO3	To execute the technique of Fourier series for learning advanced Engineering Mathematics.
CO4	To relate the tools of matrices and linear algebra including ineartrans formations, eigen values, diagonalization and orthogonalization in Engineering.

UNIT:1   MULTIVARIABLE CALCULUS   13 Hours

Partial differentiation, Euler's theorem, Total derivative, Taylor's theorem two variable (without proof), Maxima and Minima, Differentiation under integral sign (Leibtinz rule).

UNIT:2   DIFFERENTIAL EQUATION-I   12 Hours

Ordinary differential Equation: First order and first degree differential equations and its method of solving, Application to Electrical circuits and conduction heat and their solution.

Differential Equation-II

Linear differential equation of higher order and its different methods of finding solution (operator method). Second order liner differential equation and its solution: Euler Cauchy equation, solution by undermined coefficient method and variation of parameter. Modeling of electrical circuit with solution.

UNIT:3 Fourier series   10Hours

Fourier series, Fourier expansion of functions of any period, Even and odd functions, Half Range Expansion.

UNIT:4 LINEAR ALGEBRA   15 Hours

Matrices, Types of matrices, Rank of matrix Eigen values and Eigen vectors, Cayley – Hamilton theorem (without proof), system of liner equation, Orthogonal matrices, Complex matrices, Hermitian and skew-Hermitian matrices, Unitary matrices, similarity of matrices. Quadratic forms and Canonical forms.

Teaching Methods: Chalk& Board/ PPT/Video Lectures/Lecture by Industry Expert/MOOCS

Text Books
1. Advanced Engineering Mathematics by E. Kreyszig, Tenth Edition, Willey
2. Differential Calculus by Santi Narayan and Mittal, S.Chand Publications

Ref. Books
1. Higher Engineering Mathematics by BS Grewal : Khanna Publishers, New Delhi.
2. Higher Engineering Mathematics by B.V.Raman, McGraw Hills Education
3. Advanced Engineer methods by N. P. Daly & Manish Goel.

Course Code	Course Title	L	T	P	C	QP
BBSBS1021	**Engineering Physics**	**3**	**0**	**0**	**3**	

Pre -Requisite:

Course Educational Objective

CEO1: To provide the students about the elementary features and the basic concepts of Physics and its applications to different physical systems.

CEO2: Students will be able to communicate these concepts clearly, develop problem solving skills and critical thinking.

Course Outcome

CO1	Solve engineering problems using the concept of oscillation and wave mechanics and recocgnize the scientific application of Laser.
CO2	To analysis the structural properties of elemental solids
CO3	Determine gradient of scalar field, divergence and curl of vector fields and solve engineering problems on electromagnetism
CO4	Construct a quantum mechanical model to explain the behavior of a system at microscopic level.

UNIT:1 Interaction of Wave and Matter (12 Hours)

Introduction to Harmonic Oscillator, Waves and its Characterstics, Superposititon of Waves, Interference by division of wavefront (Biprism experiment) and division of amplitude (Newton's Ring experiment). Introduction to Diffraction, types of diffraction.

LASER, spontaneous & stimulated emission, Einstein's relation, Ruby Laser and He-Ne Gas Laser, application of Laser. Optical fiber, Acceptance angle, Numerical aperature, Step index and Graded index fibers, applications of optical fiber.

UNIT:2 Physics of Materials (12 Hours)

Crystallography, Crystal structure, crystal direction and plane, Miller indices, Interplanar spacings, Reciprocal Lattice and its characterstics, Reciprocal Lattice of SC, FCC and BCC, Brillouin Zone, Bragg's law.

Energy bands in solids (conduction band, valence band and fermi level), Classification of matter on the basis of band theory.

UNIT:3 Electromagnetic theory and wave (10 Hours)

Physical significance of grad, divergence and curl operators, Gauss divergence theorem and Stoke's theorem (no derivations), fundamental laws of electrostatics, magnetostatics and electromagnetism, displacement current and conduction current, Maxwell's relations.

Electromagnetic wave and its characteristics, electromagnetic wave equation for free space in terms of **E** and **B**, electromagnetic energy, Poynting vector and Poynting theorem.

UNIT:4 Quantum Mechanics (12 Hours)

Introduction to dual nature: Black body radiation, photoelectric effect, Compton effect (qualitative idea only), de-Broglie's hypothesis, uncertainty principle & its application to non-existence of electron inside the nucleus and one dimensional harmonic oscillator, wave function and its characteristics, probability, normalization and expectation value, Schrodinger's equation & its application to one dimensional potential well, potential step and potential barrier (qualitative idea).

Teaching Methods: Chalk& Board/ PPT/Video Lectures/Lecture by Industry Expert/MOOCS

Text Books 1. Engineering Physics by D. K. Bhattacharya and Poonam Tanden, Oxford University Press. 2. Engineering Physics, H K Malik and A K Singh, Tata McGraw Hill, MGH

Ref. Books
1. Materials Science & Engg., V. Raghvan, Prentice Hall of India.
2. Concepts of Modern Physics, A. Beiser, S. Mahajan, S.R. Choudhary, Tata McGraw Hill.
3. Lasers & Optical engineering, P Dass, Narosa Publishers, Springer Publisher.
4. Engineering Physics by B. B. Swain and P. K. Jena, Kitab Mahal,Cuttack
5. Quantum Mechanics by SatyaPrakash, Kitab Mohal, etc. Kedar Nath Ram Nath Publisher

Course Code	Course Title	L	T	P	C	QP
BBSBS1022	**Engineering Chemistry**	**3**	**0**	**0**	**3**	

Pre -Requisite:

Course Educational Objective

CEO1: To impart the knowledge of application of chemical sciences in the field of engineering

CEO2: The course aims at elucidating principles of applied chemistry in industrial systems, Water treatment and engineering materials.

CEO3: To give detailed knowledge about the reactivity of metal with environment and it's Prevention from corrosion.

CEO4: To give an idea about fuel and it's characteristics.

CEO5: To enlighten the students with the applications of advanced materials.

Course Outcome

CO1	Identify suitable water treatments techniques for domestic and industrial purposes
CO2	Differentiate various types of corrosion, and gain knowledge on control measures associated with corrosion
CO3	Classify the different types of fuel , it's analysis and gain knowledge on fractional distillation of petroleum.
CO4	Understand various types of polymers, their preparation along with applications

UNIT:1 WATER TREATMENT (12 Hours)

Types of water, Impurities in water, Types of Hardness, Determination of Hardness by EDTA method, treatment of water for Domestic use, Water softening processes Lime-soda process, Ion Exchange method, Boiler feed water, Scale and Sludge, Caustic embrittlement, Priming and Foaming ,Removal of dissolved gases, Carbonate and phosphate conditioning, colloidal conditioning, Calgon conditioning, Desallination of brackish water by Reverse osmosis

UNIT:2 CORROSION CHEMISTRY (12 Hours)

Introduction, Electrochemical cell, electrode potential E.M.F, Definition of corrosion, Types of corrosion: Dry corrosion and wet corrosion, Galvanic corrosion, Concentration cell corrosion, Factors influencing corrosion, corrosion control: Cathodic protection (Sacrificial anodic protection and Impressed current cathodic protection), Inhibitors, protective coatings: Galvanization and Tinning, Passivation.

UNIT:3 FUEL TECHNOLOGY (12 Hours)

Introduction, Classification of Fuels, Calorific Value, Charcteristics of a good fuel, Types and analyses (Proximate and ultimate analysis) of coal, Dulong's Formula, Petroleum, (Extraction, purification and refining),Cracking(thermal cracking, catalytic cracking), Knocking, Antiknocking , Octane numbers, Cetane numbers, Unleaded and synthetic petrol, LPG and CNG, Combustion Numericals.

UNIT:4 CHEMISTRY OF ENGINEERING MATERIALS (12 Hours)

Introduction, polymer, Classification of polymers, Types of polymerization and mechanism, Plastics: Thermosetting and thermo plastic, PVC, PE,PS,PMMA, PTFE, Bakelite,Nylon-6,6, Nylon-6, Fiber reinforced plastic.*ADD-ON COURSES: Conducting Polymer (Polyaniline, Polyacetylene),Polycarbonates Bio-Degradable and Non-Bio Degradable polymer, Nano composite.

Teaching Methods: Chalk& Board/ PPT/Video Lectures/Lecture by Industry Expert/MOOCS

Text Books: 1 Engineering chemistry by Jain & Jain, Dhanpat Rai publishing company (p) Ltd.

Ref. Books:
1. A Text Book of Engineering Chemistry by S.S.Dara,S Chand Publishers
2. A Text Book of Engineering Chemistry by Sashi Chawla,Dhanpat Rai Publishing house.
3.Text Book of Engineering chemistry, 2nd edition, by R.Gopalan,D.Venkapaya & Sulochana Nagarajan, Vikas Publishing House Pvt.Ltd.
4. B. Tech Chemistry-II by P. K. Kar, S. Dash, B. Mishra kalyani publishers.

Course Code	Course Title	L	T	P	C	QP
BBSES1031	**Basics of Mechanics**	**3**	**0**	**0**	**3**	

Pre -Requisite:	

Course Educational Objective

CEO1:

CEO2:

Course Outcome

CO1	Determine the resultant force and moment for a given force system
CO2	Analyze planar and spatial systems to determine the forces in members of trusses, frames and problems related to friction.
CO3	Calculate the centriod and moment of inertia of plane and composite figures.
CO4	Illustrate the motion parameters of a body subjected to Dynamic principles.

UNIT:1   STATICS OF PARTICLES   (16 Hours)

Fundamental concepts and principles of engineering mechanics. Resolution of forces - Resultant of several concurrent forces - Free body diagram. Principles of transmissibility. Moment of a force - Varignon's theorem - Equivalent system of forces -Types of supports and corresponding reactions.

UNIT:2 ANALYSIS OF TRUSSES AND FRICTION   (12 Hours)

Introduction to Truss - Analysis of Trusses - Method of joints- Method of sections.

Laws of Friction - Angle of Friction-Angle of Repose-Ladder and Wedge Friction

UNIT:3   PROPERTIES OF SURFACES   (12 Hours)

Determination of first moment area of plane figures by integration – Determination of centroid of composite figures by using standard formula.

Determination of second moment area of plane figures by integration - Parallel and perpendicular axis theorems - Determination of area moment of inertia of composite figures by using standard formula - Polar moment of inertia - Radius of gyration.

UNIT:4 DYNAMICS OF PARTICLES   (10 Hours)

Rectilinear motion: uniform velocity and uniformly accelerated motion Newton second law-D'Alembert's principle and its applications- work and energy equation- Impulse and Momentum - Impact of elastic bodies.

Teaching Methods: Chalk& Board/ PPT/Video Lectures/Lecture by Industry Expert/MOOCS

Text Books: 1. Timoshenko, and Young, "Engineering Mechanics", Tata Mc-Graw Hill Book Company.
2. S. S. Bhavikatti, "Engineering Mechanics", New Age International Publishers,

Ref. Books:

1. Dr. Bansal.R.K, & Sanjay Bansal, "A Text book of Engineering Mechanics", Lakshimi publications.
2. A.K.Tayal, "Engineering Mechanics Statics And Dynamics", Umesh Publications
3. Rajasekaran.S, & Sankarasubramanian.G, "Engineering Mechanics", Vikas Publishing House Pvt Ltd, 2011.
4. Engineering Mechanics, (3ed edition) by Statics and Dynamics K.Vijaya Kumar Reddy and J Suresh Kumar, BS Publications.

Course Code	Course Title	L	T	P	C	QP
BBSES1032	**Basics of Thermodynamics**	3	0	0	3	
Pre -Requisite:						

Course Educational Objective

CEO1:

CEO2:

Course Outcome

CO1	Explain the basic concepts of system, control volume, thermodynamic properties, thermodynamic equilibrium, temperature, work and heat energy.
CO2	Apply the laws of thermodynamics to refrigerators, heat engines, heat pumps compressors and nozzles etc.
CO3	Interpret and apply the concept of entropy to thermodynamic systems
CO4	Evaluate properties of pure substances, gases and their mixtures and to derive and apply to thermodynamic problems.
CO5	

UNIT - 1 (15 Hours)

Basic concepts & definition, scope of thermodynamics. Macroscopic & microscopic approach. Definition of fixed mass (closed) system & control volume (open) system, isolated system. Thermodynamic properties (extensive & intensive), state & its representation on a property diagram, process and its representation, cyclic process Characteristics of properties (point & path function), reversible & irreversible process, Quasistatic Process. Thermodynamic equilibrium.

Pressure, Types of pressure, Zeroth law of thermodynamics & temperature scales, calibration of thermometers. Ideal gasses & their P-V-T relation. Energy transfer; Work transfer(definition & calculation), different modes of work Displacement work for various process, Free expansion work, Heat transfer; modes of heat transfer, basic laws in conduction, convection & radiation.

UNIT - 2 (13 Hours)

First law of thermodynamics, formal statement (using cyclic process) first law for processes of fixed masses (closed system) Introduction of internal energy, enthalpy as thermodynamic properties Definition of sp.heats (C_p & C_v) and their use in calculation of internal energy & enthalpy with emphasis on ideal gas.

Application of first law to control volume (Steady Flow); nozzle, diffuser, compressor, turbine, throttling device.

UNIT - 3 (12 Hours)

Second law of thermodynamics, Kelvin Planck & Clausius statements, Carnot cycle. Reversible & irreversible engines and their efficiency (Thermal and maximum Efficiency)
Entropy concepts, Clausius inequality, Entropy Principle.

UNIT - IV (10 Hours)

Properties of pure substance, P-v, T-s, h-s diagram for steam , Steam properties, Introduction to steam table with respect to specific volume, pressure, temperature, enthalpy & entropy, Mollier Diagram. Application of thermodynamics: Steam power plant, Refrigerators and Heat Pump, I C Engines (working principle with schematic diagrams only)

Teaching Methods: Chalk& Board/ PPT/Video Lectures/Lecture by Industry Expert/MOOCS

Text Books: 1 Engineering Thermodynamics by P.K.Nag, Publisher: TMH
            2. Basic Engineering Thermodynamics by D S Kumar, Publisher: S K Kataria & Sons- New Delhi

Ref. Books: 1. Fundamental of Engineering Thermodynamics by E. Rathakrishnan, publisher. PHI

2. Thermodynamics: An Engineering Approach by Yunus A. Cengel, Michael A. Boles Publisher: Mcgraw Hill Education
3. Thermal engineering by R.K.Rajput, Laxmi Publications Pvt. Ltd.
4. Steam Tables in SI Units by K. Ramalingam, Scitech Publications (P) Ltd.

Course Code	Course Title	L	T	P	C	QP
BBSES1041	**Basics of Electronics**	**3**	**0**	**0**	**3**	

Pre -Requisite:

Course Educational Objective

CEO1:

CEO2:

Course Outcome

CO1	Recognize different components such as transistors, resistors, capacitors and diodes which fit on a small chip with each leg of the chip connecting to a point within the circuit.
CO2	Apply modern modelling software for drafting different electronic circuits.
CO3	Analyze modern electronic circuits and systems.
CO4	Formulate mathematical descriptions and procedures in designing new electronic systems and technically present

UNIT-1

Semiconductor Devices:- Classification of material, Energy band diagram, properties of semiconductors, Types of semiconductors, Semiconductor diode (no bias, forward, reverse),temperature effects, diode equivalent circuit, zener diode, LED , Half wave rectifier, full wave rectifier, clippers ,clampers.

UNIT-2

Bipolar Junction Transistors (BJTs):- Introduction, transistor operation, Simplified structure and physical operation of n-p-n and p-n-p transistors in the active region, Common–Base configuration, Common–emitter configuration, Common-collector configuration Current-voltage characteristics of BJT, BJT as an amplifier and as a switch.

Field Effect Transistors (FETs):- Introduction, construction and characteristics of JFETs, transfer characteristics, D-MOSFET, E –MOSFET.

UNIT-3

Communication systems: - Analog and digital signals, block diagram of basic communication system, need for modulation, methods of modulation,AM/FM transmitters & receivers (Block diagram description only)

Electronic Instruments:- Basic principle of Oscilloscope, Function of the sweep generator, Block diagrams of oscilloscope, Measurement of frequency and phase by Lissajous method, Application of oscilloscope for measurement of voltage, period and frequency, Block diagram of standard signal generator, AF sine and square wave generator, and Function generator.

UNIT-4

Digital systems and binary numbers:-Digital systems, Binary numbers, number system conversion, octal & hexa decimal number, 1's& 2's compliments, signed binary numbers, binary codes, binary logic.

Logic Gates and Boolean Algebra:- The inverter, The AND, OR, NAND NOR, Exclusive-OR and Exclusive-NOR gate, Boolean operations and expressions, Laws and Rules of Boolean algebra, DeMorgan's theorem, Boolean analysis of logic circuits, Standard forms of Boolean expressions, Boolean expression and truth table Combinational Logic and Their Functions: Basic combinational logic circuits, Implementation of combinational logic, The universal properties of NAND and NOR gates, Basic adders

Teaching Methods: Chalk& Board/ PPT/Video Lectures/Lecture by Industry Expert/MOOCS

Text Books:

1. Electronic Devices (Seventh Edition), Thomas L. Floyd, Pearson Education, 482 FIE, Patparganj, Delhi – 110 092 (Selected Portions).
2. Digital Fundamentals (Eighth Edition), Thomas L. Floyd and R.P. Jain, Pearson Education, 482 FIE, Patparganj, Delhi – 110 092.

3.	Electronic Instrumentation, H.S. Kalsi, Tata McGraw-Hill Publishing Company Limited, New Delhi.

Reference Books:
1. Microelectronic Circuits (Fifth Edition), Adel S. Sedra and Kenneth C. Smith, Oxford University Press, YMCA Library Building Jai Singh Road, New Delhi – 110 001.
2. Electronic Devices and Circuit Theory (Ninth Edition), Robert L. Boylestad and Louis Nashelsky, Pearson Education, 482 FIE, Patparganj, Delhi – 110 092.
3. Electronics Principles (7th Edition), Albert Malvono and David J. Bates, Tata McGraw-Hill Publishing Company Limited, New Delhi.

Course Code	Course Title	L	T	P	C	QP
BBSES1042	**Basics of Electrical Engineering**	**3**	**0**	**0**	**3**	

Pre -Requisite:

Course Educational Objective

CEO1: Impart a basic knowledge of electrical quantities such as current, voltage, power, energy and frequency to understand the impact of technology in a global and societal context.

CEO2: This course provides comprehensive idea about DC & AC circuit analysis, magnetic circuit analysis, working principles of machines and common measuring instruments.

CEO3: Emphasize the effects of electric shock and precautionary measures. Improve the ability to function on multi-disciplinary teams.

Course Outcome

CO1	Understand the basic concepts of magnetic, AC & DC circuits.
CO2	Explain the working principle, construction, applications of DC machines, AC machines & measuring instruments.
CO3	Gain knowledge about the fundamentals concepts of power generation, domestic wiring, electric shock and preventive measures
CO4	Understand Electrical power generation and transimission process in India and function on multi-disciplinary teams.

UNIT-1
DC Circuits:
Introduction to electrical terminology, Ohm's Law, Equivalent Resistance, series-parallel circuits, star-delta transformation, types of elements, ideal and practical voltage & current sources; Kirchhoff's Law, Mesh and Nodal Analysis.

Network theorems:
Superposition Theorem, Thevenin theorem, Maximum power transfer theorem excited by independent sources, Transients in RL & RC series circuits.

UNIT-II
Single phase & Three phase Ac circuits:
AC Fundamentals: RMS & Average value, form and peak factors, Complex algebra, concepts of reactance, impedance and their representation, AC through pure R, L, C, series RL, series RC, series RLC circuit, Concept of power & power factor; expression of power in complex notation.

Three-phase AC circuits:
Comparison between 1-ph & 3-ph AC circuit, Star & Delta connection, relation between line and phase quantities, Measurement of 3-phase power using 2-wattmeter method.

Magnetic circuits:
Magnetic flux, Magnetic flux density, Magnetic fields intensity, Relation between B & H, B-H curve, Analogy between Electric and Magnetic circuit, Leakage flux.

UNIT-III
DC Machines:
Introduction, working principle of DC Generator, Construction, Types, EMF equation, working principle of DC Motor Back e.m.f, Application of DC machines.

AC Machines:
Introduction, Principle of operation of AC machines, Transformers, Construction, EMF equation, Turn ratio, Ideal transformer on no load with phasor diagram, 3-phase Induction motor principle of operation, Rotating magnetic field, Types of rotors, Synchronous speed and slip, Introduction to 1-phase Induction motor, 1-phase motors types, appli cations of 3-

phase and 1-phase motors, AC generator and motors, Principle of operation, types of rotors, Synchronous motor operating principle.

UNIT-IV

Measuring Instruments:

Introduction, Classification of instruments, construction and working principles of PMMC and moving iron type Instruments.

Introduction to Power System & Domestic Wiring:

General layout of electrical power system and functions of its elements, Generation of electricity (Hydro, Thermal and Nuclear power plant), standard transmission and distribution voltages, Service main, Meter board, Fuse, MCB, Earthing (pipe & plate earthing), House wiring, Electric shock & precautions.

Teaching Methods: Chalk& Board/ PPT/Video Lectures/Lecture by Industry Expert/MOOCS

Text Books:

1. V. Del Toro, "Principles of Electrical Engineering" Prentice Hall International.
2. P.V. Prasad, S.Sivanagaraju, R.PrasadBasic Electrical and Electronics Engineering; CENGAGE Learning.
3. I.J. Nagarath, " Basic Electrical Engineering" Tata McGraw Hill
4. D.E. Fitzgerald & A. Grabel Higginbotham, " Basic Electrical Engineering Mc- Graw Hill.

Reference Books:

1. Edward Hughes, " Electrical Technology" Longman
2. T.K. Nagsarkar & M.S. Sukhija, "Basic Electrical Engineering" Oxford University Press.
3. H. Cotton, " Advanced Electrical Technology" Wheeler Publishing
4. W.H. Hayt & J.E. Kennely, "Engineering Circuit Analysis" Mc Graw Hill.
5. Theory and Problems of Basic Electrical Engineering by D.P.Kothari & I.J. Nagrath PHI.
6. Fundamentals of Electrical Engineering and Electronics by B. L. Theraja, S. Chand & Company Ltd, Reprint Edition 2013.

Course Code	Course Title	L	T	P	C	QP
BBSES1050	**Programming in 'C'**	**3**	**0**	**0**	**3**	

Pre -Requisite:

Course Educational Objective

CEO1: To develop programming for solving problems using decision structures and loops, applications using arrays, solving scientific problems using functions.

CEO2: To design applications using pointer and structures.

Course Outcome

CO1	Develop the algorithms, apply them using C by compiling, debug and analyzing programs for solving problems and to understand the basic concepts and decision structures required to design programs.
CO2	Design programs on loops for solving problems and develop applications using array data structure.
CO3	Develop applications using string operations and solve scientific problems using functions.
CO4	Make use of pointers to design applications and projects, dynamic memory allocation for efficient use of memory and design programs in projects involving structure.

UNIT- I (11 Hours)

Introduction to Programming Language, Structured Programming Approach, Basic structure of C program, C compilers, Compilation and Execution Process, Error debugging.
Tokens in C: keywords, identifiers, data types, constants, variables, standard I/O statements, **Operators:** arithmetic operators, assignment operators, increment and decrement operators, relational operators, logical operators, conditional operator, bit-wise operators, Operator precedence and associativity, **Type casting**: Implicit and Explicit type casting.
Control Flow Statements: **Selection Logic**: if, if..else, else if ladder, nested if, switch case,
Course Outcome:
- ➔ Learn basic knowledge on C programming and 'C' Compilers.
- ➔ Understand different outputs given by C compiler for small programs.
- ➔ Understand the usage of selection controls.

UNIT- II (11 Hours)

Iteration Logic: while, do-while and for loop, break, continue, nested loop, goto statement.
Arrays:
Types of Arrays, 1-D Array: declaration, initialization, array operations, 2-D Array: declaration, Initialization, 2-D array operations,
Course Outcome:
- ➔ Understand the usage of loop controls for program development.
- ➔ Learn programming techniques on arrays.

UNIT- III (13 Hours)

1-D character array: String handling and string handling library functions. 2–Dcharacter array.
Functions:
User Defined Function: function prototype, function definition, function call, return statement, types of parameters, Function categories. Recursive functions, function with 1-D and 2-D array, nesting of functions, **Storage classes**: auto, register, static, extern.

Course Outcome:

➔ Learn programming techniques on string manipulations.
➔ Understand the user defined function and its advantages.

UNIT- IV (13 Hours)

Pointers: Declaration and initialization of pointers, Pointer arithmetic, Pointer and Arrays, Advantages of character pointer , Array of Pointers, **Pointers and Functions:** call by value and call by address, Function returning pointer, pointer to function, Pointer to Pointer, Dynamic memory allocation.

User Defined Data Types: typedef, enumeration , structures : Declaration and initialization of structures, accessing structure elements , nested structures, structures and arrays, structures and functions, structure and pointers, self- referential structures, structures with bit fields, Union: Declaration and initialization of Union, accessing union elements, structure with union.

Course Outcome:

➔ Understand the concept of pointer, its usage and dynamic memory allocation.
➔ Learn the concept of structure, union along with their usage in programming.

Teaching Methods: Chalk& Board/ PPT/Video Lectures/Lecture by Industry Expert/MOOCS

Text Books:

1. C Programming By E. Balagurusamy, Tata McGraw Hill Publications
2. Let us C by Yashavant P. Kanetkar, BPB Publications
3. Programming with C : Schaum's Outline Series by Byron Gottfried and Jitender Chhabra, Tata McGraw Hill Publications

References:

1. Exploring C by Yashavant P. Kanetkar, BPB Publications
2. C: The Complete Reference : By Herbert Schildt, Tata McGraw Hill Publications

Course Code	Course Title	L	T	P	C	QP
BBSHS 1060	**Communicative English-I**	**2**	**0**	**0**	**2**	

Pre -Requisite:

Course Educational Objective

CEO1: To develop the communication skills and soft skills of the students

CEO2: To enhance the ability of the students to develop employability and entrepreneurial skills

CEO3: To enable students to develop intrapersonal and interpersonal communication skills

CEO4: To enable students to participate in group discussions without stage dear

CEO5: To make students understand corporate communication

Course Outcome

CO1	Understand the importance of effective communication for personal and professional development
CO2	Use correct vocabulary and grammar for effective communication in English
CO3	Apply ICT for professional communication
CO4	Develop a positive attitude towards people, organization, and life.

UNIT -1 Importance of English for Communication in the 21st Century   (10 hours)

1.1 Role of English in enhancing employability and entrepreneurial skills 1

1.2 The Nature and Scope of Communication 1

1. 3 Objectives of Communication: Information, advice, suggestion, order, motivation, persuasion, warning, negotiation, decision-making, etc. through English Language skills, i.e., LSRW skills 1 + 1

1.4 The process of communication and factors that influence communication: Sender, receiver, channel, code, topic, message, context, feedback, noise, filters and barriers (steps such as Ideation, Encoding, Transmission, Decoding, etc. need to be dealt with); Audience and purpose 1 + 1+ 1.

1.5 Types of Communication: General and Professional Communication; Formal and Informal Communication; Verbal and Non-verbal communication; Intrapersonal and Interpersonal communication; Written communication and Spoken communication. 1 + 1+ 1.

UNIT -2. English Vocabulary, Grammar & Usage   (16 hours)

2.1 Synonyms and Antonyms   1 + 1

2.2 Words often confused   1

2.3 Technical terms and one word substitutes   1 + 1

2.4 Idioms and Phrasal Verbs   1 + 1

2.5 Correct Usage of Nouns, Pronouns, Verbs, Adverbs, Adjectives 1+1+1+1+1

2.6 Communicative use of the Passive Voice   1 + 1

2.7 Communicative use of Punctuation marks   1 + 1

UNIT-3. Introduction to Corporate Communication   (15 hours)

1. Communication and Corporate structure: Organigraph; Communication network: Formal Communication network and Informal Communication network / Grapevine   1 + 1+ 1

2. Corporate Communication – Direction of Communication: Downward Communication, Upward Communication, Horizontal/Lateral Communication, Diagonal Communication 1 + 1+ 1

3. Communication challenges in today's work place: Advances in technology; culturally diverse workforce; Team-based organizational Settings; how to overcome these challenges 1 + 1+ 1

4. Information and Communication Technology (ICT) and the Corporate world:

Power point presentation using multimedia; Internet and Intranet; Fax; Teleconferencing;

Videoconferencing; LaTeX   1 + 1+ 1

5. Corporate/Business etiquette: Good listening skills, proper dressing and grooming; proper handshake, mobile etiquette, table manners   1 + 1+ 1

UNIT:4 Soft skills for corporate readiness   **(7 hrs)**

4. 1 Importance of soft skills in personal and professional life 1hrs
4.2 Are we hardwired for success? 1hrs
4.3 Importance of developing a positive attitude   1hrs
4.4 Lateral Thinking   1hrs
4.5 Teamsmanship   1 hrs
4.6 Emotional intelligence   1 hrs
4.7 Leadership Skills   1 hrs

Teaching Methods: Chalk& Board/ PPT/Video Lectures/Lecture by Industry Expert/MOOCS

Text Books:

1. An Introduction to Professional English and Soft Skills by B. K. Das et al., Cambridge University Press.
2. Communicative English for Engineers and Professionals by Nitin Bhatnagar and Mamta Bhatnagar. Published by DK/Pearson.
3. Communication Skills by Sanjay Kumar & Pushp Lata , Oxford University Press

Reference Books:

1. Technical Communication , Principle and Practice by Meenakshi Raman & Sangeeta Sharma, Oxford University Press
2. Business Communication Today by Bovee, Courtland L., Thill, John V. Prentice Hall.
3. The Ace of Soft Skills: Attitude, Communication and Etiquette for Success by Gopalaswamy Ramesh and Mahadevan Ramesh. Pearson.
4. Oxford Guide to English Grammar by John Easthood. Oxford University Press.
5. 365 Ways to Change Your World by Norman Vincent Peale by Orient Paperbacks.

Course Code	Course Title	L	T	P	C	QP
BBSBS 1121	**Engineering Physics Laboratory**	**0**	**0**	**2**	**1**	

Pre -Requisite:	

Course Educational Objective

CEO1: Students will understand the basic principles of physics and their mathematical description.

CEO2: Students will be able to use the laws of physics and calculus to solve problems

CEO3: Students will be able to work together in collaborative groups to perform experiments, gather data and reach conclusions.

Course Outcome

CO1	Understand the uses of various Basic Instruments for different Physical measurements.
CO2	Apply the Physical Laws and verify those using standard Experiments.
CO3	Organize experiments to determine different Physical quantities and anlyze those for different application to Physical Systems.
CO4	Evaluate the magnitudes of Physical quantities systematically through experiments and design new experiments with the theoretical knowledge

EXPERIMENTS: 1 Determination of Rigidity modulus of a material of a wire using Barton's apparatus (Static method).

EXPERIMENTS: 2 Determination of Young's modulus of a material of a wire using Searle's apparatus

EXPERIMENTS: 3 Determination of surface tension of water by capillary rise method.

EXPERIMENTS: 4 Determination of acceleration due to gravity by using Bar/ Kater's pendulum.

EXPERIMENTS: 5 Verification of laws of transverse vibration by using Sonometer

EXPERIMENTS: 6 Determination of Young's modulus of a material by bending of beam method.

EXPERIMENTS: 7 Study the characteristics of PN junction diode.

EXPERIMENTS: 8 Study the characteristics of RC circuit.

EXPERIMENTS: 9 Study the characteristics of BJT / FET.

EXPERIMENTS: 10 Determination of grating element of a plane diffraction grating

EXPERIMENTS: 11 Determination of wavelength of light by Newton's Rings apparatus.

EXPERIMENTS: 12 Determination of dielectric constant by Leacher wire method.

EXPERIMENTS: 13 Study of photoemission

EXPERIMENTS: 14 Determination of wavelength of laser by Michelson Interferometer

EXPERIMENTS: 15 Determination of coefficient of viscosity by Stoke's method.

Course Code	Course Title	L	T	P	C	QP
BBSBS1122	**Engineering Chemistry Laboratory**	**0**	**0**	**2**	**1**	

Pre -Requisite:	
Course Educational Objective	
CEO1: To train the students about the applications of chemical sciences in the field of engineering and technology	
Course Outcome	
CO1	Understand the basic methods of chemical analysis and instrumentations involved
CO2	Standardize of Chemicals
CO3	Estimate the hardness, ions in salts and compositions in ores.
CO4	Synthesizes the drugs and know about their applications

EXPERIMENTS: 1 Determination of total hardness of water by using EDTA.

EXPERIMENTS: 2 Determination of amount of NaOH and Na_2CO_3 present in mixture of two.

EXPERIMENTS: 3 Standardization of $KMnO_4$ using sodium oxalate.

EXPERIMENTS: 4 Determination of ferrous ion in Mohr's salt by standardised $KMnO_4$.

EXPERIMENTS: 5 Determination of % of dissolved oxygen in given water sample.

EXPERIMENTS: 6 Estimation of available chlorine in bleaching powder solution.

EXPERIMENTS: 7 Determination of rate constant of acid catalyst Hydrolysis reaction.

EXPERIMENTS: 8 Preparation of aspirin

EXPERIMENTS: 9 Estimation of calcium in limestone.

EXPERIMENTS: 10 Estimation of Zinc in brass.

EXPERIMENTS: 11 To determine the strength of HCl and acetic acid from the mixture of acid by strong alkali (NaOH) by Conductrometry.

EXPERIMENTS: 12 Preparation of nanoparticle.

EXPERIMENTS: 13 Determination of partition coefficient of iodine in benzene and water.

EXPERIMENTS: 14 Preparation and determination of pH of buffer solution.

EXPERIMENTS: 15 To determine the molecular weight of polymer by viscosity measurement.

Course Code	Course Title	L	T	P	C	QP
BBSES1141	**Basics of Electronics Laboratory**	**0**	**0**	**2**	**1**	

Pre -Requisite:

Course Educational Objective

CEO1:

CEO2:

Course Outcome

CO1	Generate sine, square and triangular waveforms with required frequency & amplitude using function generator.
CO2	Demonstrate introductory knowledge of software for schematic capture, circuit simulation, and circuit board layout.
CO3	Analyze the characteristics of different electronic devices and circuits such as diodes, transistors, rectifiers, amplifiers etc.,
CO4	Plan new electronic systems and technically present them

EXPERIMENTS: 1 Familiarization of electronic components and devices (Testing of semiconductor diodes and transistors using digital multi meter)

EXPERIMENTS: 2 Study and use of Oscilloscope, signal generator to view waveforms and measure amplitude and frequency of a given waveform.

EXPERIMENTS: 3 V-I characteristics of semiconductor diode

EXPERIMENTS: 4 Studies on half-wave and full-wave rectifier circuits without and with capacitor filter; recording of the waveforms and measurement of average and rms values of the rectifier output.

EXPERIMENTS: 5 Studies on clipper circuit.

EXPERIMENTS: 6 Studies on clamper circuit.

EXPERIMENTS: 7 V-I characteristic of an n-p-n or p-n-p transistor, DC biasing the transistor in common-emitter configuration and determination of its operating point (i.e., various voltages and currents).

EXPERIMENTS: 8 MOSFET I-V characteristics

EXPERIMENTS: 9 Studies on Logic gates (Truth table verification of various gates).

EXPERIMENTS: 10 Studies and experiments using ADDER CIRCUITS ICs

Course Code		Course Title	L	T	P	C	QP
BBSES 1142		**Basics of Electrical Engineering Laboratory**	0	0	2	1	
Pre -Requisite:							
Course Educational Objective							
CEO1:							
CEO2:							
Course Outcome							
CO1	Calculate currents and voltages in ac and dc circuits using different methods.						
CO2	Analyze the effect of magnetization in different electrical equipments.						
CO3	Design the fundamental electrical circuits using hardware.						
CO4	Analyze different electrical and electronics instrumentations.						
CO5	Illustrate the design of different conventional power plants.						
CO6	Demonstrate different electrical machineries through visiting the laboratories.						

EXPERIMENTS: 1 Study of different electrical equipments(transformer, single phase motors)

1. **EXPERIMENTS: 2** Power factor improvement using capacitor for fluorescent lamp.

2. **EXPERIMENTS: 3** Verification of Superposition and Thevenin's theorem

3. **EXPERIMENTS: 4** Measurement of reactive power by using single watt-meter method

4. **EXPERIMENTS: 5** 3phase Power measurement by using two wattmeter methods.

5. **EXPERIMENTS: 6** Calculation of current, voltage and power in series R-L-C circuit

    excited by single-phase AC supply and calculation of power factor.

EXPERIMENTS: 7 Determination of open circuit characteristics (OCC) of DC shunt generator

EXPERIMENTS: 8 Starting and speed control of a dc shunt motor by (a) field flux control

method, and (b) armature voltage control method.

EXPERIMENTS: 9 V-I characteristics of incandescent lamps and time-fusing current

characteristics of a fuse.

6. **EXPERIMENTS: 10** Connection and testing of a single-phase energy meter.

Course Code	Course Title	L	T	P	C	QP
BBSES 1150	**'C' Programming Laboratory**	**0**	**0**	**2**	**1**	-

Pre -Requisite:

Course Educational Objective

CEO1: To provide the ability to understand how analyze a problem and finding logic, to write programs, compiling, tracing errors, executing programs.

CEO2: The students will be able to understand how to write effective codes using the concepts provided in C language.

Course Outcome

CO1	Develop the algorithms and then implement, compile and debug programs in C language for solving problems and to design programs on decision structures.
CO2	Design programs on loops for solving problems and to develop applications using arrays.
CO3	Develop applications using string operations and applying functions to solve scientific problems
CO4	Design applications using pointers, dynamic memory allocation and develop simple projects involving structure.

Assignment-1:

Introduction to OS: commands, Use of different application software, file and directory management.
(use of linux commands/windows operations)

Assignment-2:

Introduction to the C compilers, simple programs writing, Compilation and Execution Process.

2.1	WAP to display name, address, age using a simple program
2.2	WAP to input 2 numbers and display their difference
2.3	WAP to input three numbers and find their average
2.4	WAP to input your name, age and percentage and then display
2.5	WAP to read two numbers and find their product.

Assignment-3:

3.1	WAP to input radius of a circle. Find the area and perimeter of it.
3.2	WAP to input two numbers and swap them without using intermediate variable.
3.3	WAP to input marks for physics, mathematic, chemistry, English by considering each subject have maximum 100 marks. Find and display their percentage.
3.4	Write a program to accept Fahrenheit and calculate its equivalent Celsius.
3.5	Write a program to input a number and check whether it is greater than 0 or not.

Assignment-4: (Operators, type casting, getchar and putchar)

4.1	Write a program to find the area of the triangle using formula sqrt(s*(s-a)*(s-b)*(s-c)) where 's' is the half perimeter and a,b,c are three sides.
4.2	Write a program to input two numbers into variables x,y. Then Find x^y (means x to the power y)
4.3	Write a program to input two integers into x and y. Apply bitwise AND, OR operations on them and display the results.
4.4	Write a program to input an integer value into a variable X. Find and display X/2 in terms of

	float.
4.5	Write a program to input a float value. Display the integer part and fractional part separately.

Assignment-5: (Operators, type casting, getchar and putchar)

5.1	Write a program to perform x=x*2 without using * operator and also x=x/2 without using / operator.
5.2	Write a program to input three numbers and find the greatest using conditional operator.
5.3	Write a program to input 4 numbers and find the greatest using conditional operator.
5.4	Write a program to input a character using getchar() and display using putchar()
5.5	Write a program to input a string using gets() and display using puts()

Assignment-6: (if..else)

6.1	Write a program to input your age and check whether age>=18 or not using if..else
6.2	Write a program to find greatest among three unequal numbers using else…if ladder.
6.3	Write a program to find the roots of a quadratic equation when three co-efficient values are given.(use if..else)
6.4	Write a program to accept arithmetic operator and two operands. Find the result as per the operator symbol entered using else if ladder.

Assignment -7: (Switch..case)

7.1	Write a program to display weekday as per the digit given within (1 to 7), i.e: 1 – Sunday, 2- Monday, 3-Tuesday etc. Use switch..case
7.2	Write a program to find the greatest among three numbers using switch case.
7.3	Write a program to accept a lower case character and test whether it is vowel or consonant using switch.. case
7.4	Write a program to accept arithmetic operator and two operands. Find the result as per the operator symbol entered using switch..case.

Assignment -8: (Loop)

8.1	Write a program to display all the 256 characters of the C language
8.2	Write a program to find the sum of individual digits of a positive integer.
8.3	Write a program to generate Fibonacci series of N numbers.
8.4	Write a program to find the greatest common divider of two positive numbers given as input

Assignment -9: (Loop)

9.1	Write a program to accept a number test whether it is palindrome or not.
9.2	Write a program to input a number and check whether it is prime or not.
9.3	Write a program to input a number and check whether it is Armstrong or not.
9.4	Write a program to input a positive integer and find its equivalent binary number.

Assignment -10: (Loop)

10.1	Write a C program to display all the natural numbers except the numbers divisible by three within the range 1 to 100
10.2	Write a C program all the prime number between 1 to n where n is the value supplied by the user
10.3	Write a program to find the sine X value of a given number when the X value and the number of terms given input
10.4	Write a program to check a number is magic number or not.

Assignment -11: (Loop)

	Write a program to generate the following pyramid.
	
	             1
	       1 2 3
	   1 2 3 4 5
	1 2 3 4 5 6 7

11.2	Write a program to generate the following pyramid.
	
	             1
	        1 1
	     1 2 1
	   1 3 3 1
	1 4 6 4 1

11.3	Write a program to generate pyramid:
	
	            Z
	       Z Y X
	   Z Y X W V
	Z Y X W V U T

Assignment -12: (1d array)

12.1	Write a program to accept 10 integer in to an array and find largest and smallest integers present in them
12.2	Write a program to input a number and search how many times it is exist in the given list of elements in an array.
12.3	Write a program to accept 10 numbers in to an array and sort it in ascending order

Assignment -13: (2-D Array)

13.1	Write a program to input elements 4x4 matrix. Find the principal diagonal of them.
13.2	Write a program to input values into two matrices P(3x3). Find the sum of individual rows and individual columns or the matrix.
13.3	Write a program to input values into two matrices A(3x4), B(4x3). Perform matrix multiplication and display the resultant matrix C(3X3) matrix.

Assignment -14: (String handling)

14.1	Write a program to input a character and a sentence. Find the frequency of the character in the sentence.
14.2	Write a program to accept a string and test whether it is palindrome or not without using string handling functions
14,3	Write a program to input two strings and check whether they are equal or not using string handling functions.

Assignment -15: (Functions)

15.1	Write a C program to create a user defined function to find the factorial of a given integer.
15.2	Write a C program which contains three UDF's namely add(), subtract() and multiply(). Each function accepts two integers as their arguments and calculate and return the results
15.3	Write a program to create and UDF that tests a number is perfect or not.

Assignment -16: (Functions)

16.1	Write a C program to create an UDF to test a number is strong or not.
16.2	Write a C program to create an UDF which accepts a number and returns the sum of digits of it.
16.3	Write a program to create an UDF which accepts a string and count the vowels present in it.

Assignment -17: (Recursive functions)

17.1	Write a program to find gcd of two integers using recursive function.
17.2	Write a program to input 10 integers, then using recursive function find the largest number.
17.3	Write a program to generate Fibonacci series of N numbers using recursive function.

Assignment -18: (Function with array)

18.1	Write a program to create an UDF which accepts an integer array of 10 elements and returns the count of odd numbers present in it.
18.2	Write a program to create an UDF which accepts a square matrix along with values and displays the transpose of it.
18.3	Write a program to create an UDF which performs addition of two matrices.

Assignment -19: (Pointers)

19.1	Write a program to create user defined function called swap having two integer pointers as its arguments and it has no return value. Call this function for interchanging two values using call-by-address.
19.2	Write a program to input a set of n numbers into an integer array. Create an UDF that accepts the array using pointer and finds number of prime numbers exist in the array.
19.3	Write a program to input two numbers and using call by address concept find LCM and GCD.

Assignment -20: (Pointers & Array)

20.1	Write a program to input a string and then using pointer find how many vowels present in the string.
20.2	Write a program to create an UDF which accepts a number and finds the reverse of it using call by address concept
20.3	Write a program to create an UDF which accepts two strings and then concatenates both strings (use character pointers as parameters in UDF)

Assignment -21: (Pointers & function)

21.1	Write a program to input 10 integers into an array. Create an UDF which accepts the base address of array and finds the sum of even numbers and sum of odd numbers separately.
21.2	Write a program to input 10 integers into an array. Create an UDF which accepts the base address of the array and finds the largest element.
21.3	Write a program to create an UDF which accepts the base address of an integer matrix and it returns the address of largest element present in it.

Assignment -22: (Character pointer)

22.1	Write a program to create an user defined function which accepts a string using a character pointer and returns the length of the string
22.2	Write a program to create an array of character pointers and store a group of strings into it.
22.3	Write a program to accept a string using character pointer and then create an UDF which displays the reverse of the string.

Assignment -23: (Dynamic memory)

23.1	Write a program to store N integers using dynamic memory allocation. Find the mean value of it using a function.
23.2	Write a program to store N float values using DMA and create an UDF which finds the sum of them.
23.3	Write a program to store N numbers in to memory using DMA and then using UDF check how many Armstrong numbers exist in it.

Assignment -24: (Structure)

24.1	Write a program to create a structure called COLLEGE having members: name, location, pincode. Store the details of your college and print again.
24.2	Write a program to create a structure called STUDENT having members: rollno, name, age, branch. Store one student details and display it again.
24.3	Write a program to create a structure called PRODUCT having members: product no, name, manufacturing date. Create another structure called DATE which shall be used for declaring the member manufacturing date. Store a product details and print again.

Assignment -25: (Structure with array)

25.1	Write a program to create a structure CRICKET having members: player name, team name and batting average. Store 10 cricket players details in structure array. Then display only those details where batting average>=50
25.2	Write a program to create a structure BOOKS having members : Book code, book name, author, cost. Store 10 books details using structure array. Find the total cost of all books and the costly book exist.

Assignment -26: (Structure with UDF)

26.1	Write a program to create a structure called complex to represent a complex number. Perform addition of two complex numbers using UDF
26.2	Write a program to create a structure for employee code, name and salary. Store five employee details using structure array and display only employee names whose salary is greater than 25000 using UDF

Assignment -27: (Structure with pointer and array)

27.1	Write a program to create structure called ITEM having members: item code, name, price. Create a structure array of size 10. Store the item details and then using a structure pointer display all the items whose price>=500
27.2	Write a program to create a structure called SUBJECTS having members: rollno, physics, chemistry, maths, total marks. Create a structure array to store 10 students marks. Calculate the total marks of each student. Use a structure pointer to find the topper.

Assignment -28: (Dynamic memory, structure & union)

28.1	Write a program to create a structure for product having members like product code, product name, price and quantity. Create a structure pointer to allocate memory for five products using dynamic memory allocation. Store the product details and display.
28.2	Write a program to create a structure student having members like rollno, name and percentage. Store five student details using structure array. Create an user defined function that accepts the student details using a structure pointer and counts how many first division students present

Course Code	Course Title	L	T	P	C	QP
BBSHS 1160	**Communicative English Laboratory-I**	**0**	**0**	**2**	**1**	-

Pre -Requisite:	

Course Educational Objective

CEO1: To develop the vocabulary and usage skills of students by practice.

CEO2: To develop the communication skills of the students, especially Listening and Speaking skills.

CEO3: To enable students to participate in group discussions through proper listening and speaking.

CEO4: To enable students eliminate grammatical mistakes in speech and writing.

Course Outcome

CO1	Memorise and explain a good range of vocabulary and usage .
CO2	Use grammer for effective speaking in GD and other formats of speaking
CO3	Able and defend in conversational and public speaking comptencies.
CO4	Develop active listening and speaking skill in different real life situation
CO5	

Phonetics & Listening Skills 16 hours = 8 classes [2 listening tests x 10 marks = 20 marks]

Vowels, diphthongs, consonants, consonant clusters; The International Phonetic Alphabet (IPA); phonemic transcription; Problem sounds; Syllable division and word stress; Sentence rhythm and weak forms; Contrastive stress in sentences to highlight different words; Intonation: falling, rising, and falling-rising tunes; Listening to Newspaper reading/Video, etc. Listening with a focus on pronunciation (ear-training): segmental sounds, stress, weak forms, intonation & Listening for comprehension. Reading of English daily newspapers and self-development books be integrated listening and speaking activities.

Speaking skills 16 hours = 8 classes   [4 speaking tests x 10 = 40 marks]
- Topics for 1 minute, 2 minutes, and 5 minutes speaking
- Pictures, Quotations, Attitude-testing Questions may be used.
- Summarizing/responding to handouts, articles, books, magazines and newspapers.
Individual/Group presentations/discussion on given topics

Soft skills development 14 hours = 7 classes   [4 assignments x 10 = 40 marks]
- Positive thinking (Teachers to engage game/activity-oriented classes)

Teaching Methods: Chalk& Board/ PPT/Video Lectures/Lecture by Industry Expert/MOOCS

Text/Reference Books:

1. Business and Corporate Soft skills developed by Rai Tech. University (PDF available)

2. Spoken English (with CD). Sasikumar V and P V Dhamija. New Delhi: Tata McGraw-Hill Education Pvt. Ltd. (2nd Ed.)

Course Code	Course Title	L	T	P	C	QP
BBSES 1171	**Engineering Drawing**	0	0	2	1	

Pre –Requisite:

Course Educational Objective

CEO1: To enable students to acquire and use engineering drawing skills as a means of accurately and clearly communicating ideas, information and instructions

CEO2: To enable students to acquire requisite knowledge, techniques and attitude required for advanced study of engineering drawing

Course outcomes: At the end of the course, the student will be able to:

CO1	Demonstrate the views of different solid object.
CO2	Construct projection of plane surface and solids.
CO3	Develop Sections of various Solids surface.
CO4	Identify the projection in isometric scale.

Unit 1
1. **Introduction**: Introduction to Standards for Engineering Drawing practice, Line work and Dimensioning. **[1 – Sheets]**
2. **Co-ordinate system and reference planes:** Definitions of HP, VP, RPP & LPP. Selection of drawing size and scale. Representation of point and line. **[1 – Sheets]**

Unit -2
3. **Orthographic Projections :** Introduction, Definitions - Planes of projection, reference line, Projections of points in all the four quadrants, Projections of straight lines (located in First quadrant/first angle only),True and apparent lengths, True and apparent inclinations to reference planes. **[1 – Sheets]**
4. **Orthographic Projections of Plane Surfaces (First Angle Projection Only):** Introduction, Definitions–projections of plane surfaces–triangle, square, rectangle, hexagon and circle. **[1 – Sheets]**
5. **Projections of Solids (First Angle Projection Only) :** Introduction, Definitions – Projections of right regular tetrahedron, hexahedron (cube), prisms, cylinders and cones in different positions. **[1-sheet]**

Unit -3
6. **Sections and Development of Lateral Surfaces of Solids :** Introduction, Section planes, Sections, Section views, Sectional views, Apparent shapes and True shapes of Sections of right regular prisms, pyramids, cylinders and cones resting with base on HP. **[2 – Sheets]**

Unit -4
7. **Isometric Projection (Using Isometric Scale Only) :** Introduction, Isometric scale, Isometric projection of tetrahedron, cones and spheres. **[1 – Sheets]**

Teaching Methods: Chalk& Board

TEXT BOOKS

1. Engineering Drawing - N.D. Bhatt & V.M. Panchal, Charotar Publishing House, Gujarat.
2. Computer Aided Engineering Drawing - S. Trymbaka Murthy, -I.K. International Publishing House Pvt. Ltd., New Delhi
   1. 3. Engineering Drawing by N. S. Parthasarathy and Vela Murali Oxford University Press.

Course Code	Course Title	L	T	P	C	QP
BBSES 1172	**Engineering Workshop**	**0**	**0**	**2**	**1**	

Pre -Requisite:

Course Educational Objective

CEO1: To enable students to work on different trades like Fitting, Carpentry, Black smithy etc… which makes the students to learn how various joints are made using wood and other metal pieces

CEO2: To familiarize with the basic manufacturing processes and to study the various tools and equipment used, hands-on training is given in different sections

Course outcomes: At the end of the course, the student will be able to:

CO1	**Explain** various safety precaution and use of various hand tools
CO2	**Demonstrate** the process configuration and basic mechanism of different machines like Lathe, Shaper and Milling machine.
CO3	**Identify** and **apply** suitable tools for machining processes including turning, thread cutting, facing, knurling and drilling.
CO4	Practice on manufacturing of components using workshop trades including fitting and welding

Unit -1
1. **Safety Precaution:** To study the various Safety precautions in workshop.
2. **Fitting :**
(i)   Study of different hand tools and Machine tools used in fitting.
(ii)   Preparation of a male and female fitting job by using different hand tools.

Unit -2
3. **Machining:**
(i)   Study of various components and working principle of lathe machine
(ii)   Preparation of a cylindrical job by lathe (turning, Thread-cutting, knurling)
(iii)   Study on Shaper and Milling Machine

Unit -3
4. **Welding Practice :**
(i) Hand on practice on Electric Arc Welding to prepare Lap Joint, Butt Joint, T- Joint and Corner Joint .
(ii) Study of Oxyacetylene Gas welding and Gas cutting.

Teaching Methods: Chalk & Board, Hands on practice.

Reference Books:
1. Elements of Workshop Technology, Vol. I and II by Hajra choudhary, Khanna Publishers
2. Workshop Technology by WAJ Chapman, Viva Books
3. Workshop Manual by Kannaiah / Narayana, Scitech Publicaitons(P) Ltd.

COURSE STRUCTURE

SEMESTER-II

SL.	Course Category	Course Code	Course Title	L	T	P	C	QP
THEORY								
1.	BS	BBSBS2010	Engineering Mathematics-II	3	1		4	
2.	BS	BBSBS1021	Engineering Physics	3	0		3	
		BBSBS1022	Engineering Chemistry					
3.	ES	BBSES1031	Basics of Mechanics	3	0		3	
		BBSES1032	Basics of Thermodynamics					
4.	ES	BBSES1041	Basics of Electronics	3	0		3	
		BBSES1042	Basics Electrical Engineering/					
5.	ES	BBSES2050	Data Structure Using 'C++'	3	0		3	
6.	HS	BBSHS2060	Communicative English-II	2	0		2	
PRACTICAL								
1.	BS	BBSBS1121	Engineering Physics Lab			2	1	
		BBSBS1122	Engineering Chemistry Lab					
2.	ES	BBSES1141	Basics of Electronics Lab			2	1	
		BBSES1142	Basics Electrical Engineering Lab					
3.	ES	BBSES2150	Data Structure Using C++ Lab			2	1	
4.	HS	BBSHS2160	Communicative English-II Lab			2	1	
5.	ES	BBSES1171	Engineering Drawing			2	1	
		BBSES1172	Engineering Workshop					
6.	HS	BBSHS2180	YOGA / Project Work			2	1	
TOTAL				**17**	**1**	**12**	**24**	

Course Code	Course Title	L	T	P	C	QP
BBSBS 2011	**Engineering Mathematics-II**	**3**	**1**	**0**	**4**	

Pre -Requisite:

Course Educational Objective
CEO1: To apply Laplace Transform methods to solve initial value problems for constant coefficient linear ODEs.
CEO2: To calculate the gradients and directional derivatives of functions of several variables
CEO3: To introduce the concept of Vector differentiation and integration that finds applications in various fields like solid mechanics, fluid flow, heat problems and potential theory

Course Outcome	
CO1	To Solve Ordinary differential and partial differential equation by using Laplace transform and its application in Network theory, wave equation etc
CO2	To execute the technique of Fourier Integral and transform for learning in advanced Engineering Mathematics
CO3	To relate gradient, curl and divergence and its application in electromagnetic theory
CO4	To evaluate multiple integrals by using Green's, Stokes' and divergence theorem to give physical interpretation of the curl and divergence of a vector field

UNIT:1   Laplace Transforms   (15 Hours)

Laplace Transforms: Definition, existence of Laplace Transform, Properties of Laplace Transform, Evaluation of integrals by Laplace Transforms, Inverse transforms, convolution theorem, transforms of unit step function, unit impulse function, periodic function.

UNIT:2   (12 Hours)
Introduction of Fourier transform and Fourier Integral, Simple application to ordinary differential equations by Laplace Transform,

UNIT:3   (10 Hours)
Vector differential calculus: vector and scalar functions and fields, Derivatives, Curves, tangents and arc Length, gradient, divergence, curl and their applications.

UNIT:4   (16 Hours)
Definition and evaluation of double integration and triple integration.
Vector integral calculus: Evaluation of line integral, Surface integral and volume integral and their application, Greens theorem, stokes theorem, Gauss theorem (without proof)

Teaching Methods: Chalk& Board/ PPT/Video Lectures/Lecture by Industry Expert/MOOCS

Text Books
1. Advanced Engineering Mathematics by E. Kreyszig, John Willey & Sons Inc. 10th Edition

Ref. Books
1. Higher Engineering Mathematics by B. V. Ramana , Mc Graw Hill Education.
2. Higher Engineering Mathematics by BS Grewal : Khanna Publishers, New Delhi.
3. Advanced Engineering mathematics by H. K. Das.

Course Code	Course Title	L	T	P	C	QP
BBSES 2050	**Data Structure using 'C++'**	**3**	**0**	**0**	**3**	

Pre -Requisite:

Course Educational Objective

CEO1: Understand the object oriented concepts and to develop C++ programs for performing different operations on arrays, stack, Queue, linked list. Analyze the difference between them and understand different applications.

CEO2: Understand different searching and sorting methods and compare them in terms of performance and applications.

Course Outcome

CO1	Develop algorithms for performing different operations on 1D array, matrix, stack, Queue, analyze the difference between them and understand different applications.
CO2	Understand different searching and sorting methods, Linked lists and them compare them in terms of performance and applications.
CO3	Understand the Binary Tree and its memory representation; analyze Binary search Tree and its applications, compare the BST with AVL Tree and examine the advantages.
CO4	Design Heap Tree, observe its applications in sorting. Understand the memory representation of graph; analyze traversal methods and applications of graph. Analyze the Hashing techniques in compare with other sorting techniques.

Unit I   **[12 hours]**

Basic concepts: Data abstraction, Algorithm specification, Memory Representation of 1D and 2D Array.Stack: Introduction to stack, basic operations and implementation of stack using arraysQueue: Introduction to linear queue, basic operations and implementation of linear queue using arrays, circularqueue, basic circular queue operations& Representation of Double ended Queue.

Applications on stack – Recursion, infix to postfix conversion, Evaluation of postfix

Unit II   **[12 hours]**

Searching: Linear search and Binary search using linear array

Sorting: Bubble sort, Insertion sort, Selection sort, Quick sort, Bucket Sort using linear array.

Linked Lists: Basic operations of singly, doubly and circular linked lists, implementation of stack and queue using singly linked list.

Unit III   **[12 hours]**

Trees: Introduction, Terminology, Binary Trees, Representation of Binary Trees using arrays and linked lists, Binarytree traversals, Creation of binary tree from in-order&pre-order sequences - Creation of binary tree from in-order & post-order

Binary Search Trees: definition, basic operations of BST (Searching, Insertion and deletion)

Introduction to AVL trees, Height of an AVL Tree, Balancing AVL tree by rotations afterinsertions and deletions ofa data node.

Unit IV   **[12 hours]**

Heaps: Introduction to binary heaps, definition of a Max-heap, Min-heap, creating Max-Heap, Applications: Heapsort, Priority queue.

Graphs: Definitions, Graph representation - Adjacency matrix, Incidence Matrix, adjacency lists, Graph Traversals (BFS & DFS), Single source shortest path algorithm (Dijkstra's Algorithm) Topological Sorting.

Hashing: Hashing Functions, Open hashing (chaining), closed hashing (Open addressing – linear probing, quadraticprobing, double hashing), rehashing.

Teaching Methods: Chalk& Board/ PPT/Video Lectures/Lecture by Industry Expert/MOOCS
Text Books: **1.** Gilberg and Forouzan: "Data Structure- A Pseudo code approach with C" by Thomson Publication. **2.** "Data structure in C" by Tanenbaum, PHI publication / Pearson publication. 3. Pai: "Data Structures & Algorithms; Concepts, Techniques & Algorithms "Tata McGraw Hill.
Reference Books: 1. "Fundamentals of data structure in C" Horowitz, Sahani & Freed, Computer Science Press. 2. "Fundamental of Data Structure" (Schaums Series) Tata-McGraw-Hill.

Course Code	Course Title	L	T	P	C	QP
BBSHS 2060	**Communicative English-II**	**2**	**0**	**0**	**2**	

Pre -Requisite:

Course Educational Objective

CEO1: To develop the communication skills and soft skills of the students

CEO2: To enhance the ability of the students to develop employability and entrepreneurial skills

CEO3: To enable students to successfully participate in GDs and PIs

CEO4: To make students communicate effectively using technologies and techniques

CEO5: To inculcate a sense of professionalism in students

Course Outcome

CO1	Understand the nature and scope of corporate communication and try to be industry ready
CO2	Able to use language skills for professional growth
CO3	Distinguish fact from opinion in reading passages from different text books
CO4	Create professional documents like Resume, Job Application letter for their career needs

UNIT-1 Introduction to Technical Communication   [7 hours]

1.1 Essence of Technical Communication 1

1.2 Nature and Scope of Technical Communication: 1 +1 +1

Technical Communication -- Interactive and Adaptable; Technical Communication -- Reader Centered; Technical Communication and teamwork; Technical Communication Has Ethical, Legal, and Political Dimensions; Technical Communication – its International and Cross-Cultural nature; Technical communication and use of ICT.

1.3 Need of Technical communication for career development 1

1.4 Computer Assisted Language Learning (CALL) – Self learning through use of technology, Effectiveness of CALL for developing English Language Skills; Use of Internet 1 +1

UNIT - 2 Career Communication   [17 hours]

2.1. Career making: Setting Goals, SWOT analysis   1

2.3 Preparing a Résumé: Elements of a Résumé; Types of Résumés: Chronological Résumé, Functional Résumé; Use of job portals   1 +1 +1

2.4 Effective Job Application Letter/Cover letter   1 +1

2.5 Group Discussion   1 +1

2.6 Job Interview 1 +1 +1+1 +1

2.7 Effective Oral Presentation   1+1

2.7 Handling a Meeting   1+1

UNIT-3 Technical Approach to Reading   **[8 Hours]**

3.1 Know your Reading speed; Advantages of speed reading   1

3.2 SQ4R Techniques of Reading 1+1

3.3. Techniques of Rapid reading: skimming, scanning 1+1

3.4 Understanding coherence and cohesion 1

3.5 Note taking, Mind maps 1+1

UNIT-4 Technical Writing   **[14 hours]**

4.1 Writing a technical paper 1+1

4.2 Writing business letters – significance, purpose, structure and elements, layout; types of business letters 1+1+1+1

4.3 Memos   1+1

4.4 Business Reports and Technical proposals   1+1+1+1
4.5 Using the Social media for better communication   1+1

Teaching Methods: Chalk& Board/ PPT/Video Lectures/Lecture by Industry Expert/MOOCS

Text Books:

1. Business Communication Today by Bovee, Courtland L., Thill, John V. Prentice Hall.

2. Technical Communication Today by Richard Johnson-Sheehan. Edition 5. Pearson.

3. Communicative English for Engineers and Professionals by Nitin Bhatnagar and Mamta

Bhatnagar. Published by DK/Pearson.

 Reference Books

1. Basic Communication Skills for Technology by Andre J. Rutherford, Pearson Education

Asia, Patparganj, New Delhi.

2. Business Communication by Varinder Kumar and Bodh Raj. Kalyani Publishers.

3. A Textbook of English Phonetics for Indian Students by T. Balasubramanian

4. Technical Communication, Principle and Practice by Meenakshi Raman & Sangeeta

Sharma, Oxford University Press.

5. How to Read better and Faster by Norman Lewis. 4th Edition. Publisher: Crowell.

Course Code	Course Title	L	T	P	C	QP
BBSES 2150	**Data Structures using 'C++' Laboratory**	0	0	2	1	

Pre -Requisite:

Course Educational Objective

CEO1: Develop algorithms for performing different operations on arrays, stack, Queue, linked list. Analyze the difference between them and understand different applications.

CEO2: Understand different searching and sorting methods and compare them in terms of performance and applications. Understand and analyze Binary search Tree, AVL Tree, Heap Tree and their applications.

CEO3: Understand the memory representation of graph, its traversal methods and applications. Analyze the Hashing techniques in compare with other sorting techniques.

Course Outcome

CO1	Understand and implement the object oriented concepts by in developing the programs for different operations.
CO2	Develop programs for performing different operations on 1D array, matrix, stack, Queue, analyze the difference between them and understand their applications.
CO3	Design code for different searching and sorting methods and analyze their performance.
CO4	Develop the codes for different operations on Linked lists and compare with other data structures.

Lab1: introduction to OOPs (C++ features), cin, cout, object, class, Simple programs.

Lab2: Access Specifiers, inline, private, public, arrays of objects, programs on them.

Lab3: Experiment No.1

1) Write a C++ program to create a class called student to store your rollno, name, age. Create an array of object to input 5 students data and then display where age>=20.
2) Write a C++ program to create a class having methods for operations insertion, deletion and display to perform operations on 1D array of elements.

Lab4: Experiment No.2

Write a C++ program to create a class having methods: insertion, multiply and display for performing multiplication on a matrix of elements.

Lab5: Experiment No.3

Write a program using C++ to create a stack using class and perform:
(i) push operation (ii) pop operation (iii) display operation

Lab6: Experiment No.4

Write a C++ program that uses Stack operations to converting an infix expression into equivalent postfix expression.

Lab7: Experiment No.5

Write a C++ program to create a linear queue and perform the following operations: (i) insertion ii) deletion and iii) Traversal

Lab8: Experiment No.6

Write C++ programs that use both recursive and non-recursive functions to perform the linear & binary searchoperation for a Key value in a given list of integers.

Lab9: Experiment No.7

Write a C++ menu driven program to implement bubble sort, selection sort and insertion sort for a given list of integers in increasing order.

Lab10: Experiment No.8
Write a C++ program to implement quick sort to a given list of integers to sort in ascending order.

Lab11: Experiment No.9
Write a C++ program that uses functions to perform the following operations on linear linked list: i) Creation ii) Insertion iii) Deletion iv) Traversal

Lab12: Experiment No.10
Write a C++ program that uses functions to perform the following operations on Double linked list: i) Creation ii) Insertion iii) Deletioniv) Traversal.

Course Code	Course Title	L	T	P	C	QP
BBSHS 2160	**Communicative English Laboratory-II**	**0**	**0**	**2**	**1**	

Pre -Requisite:

Course Educational Objective

CEO1: To enable students to successfully participate in GDs and PIs

CEO2: To make students communicate effectively by classroom practice.

CEO3: To inculcate a sense of professionalism in students

Course Outcome

CO1	Memorise and explain a good range of vocabulary and usage
CO2	Use grammer for effective speaking in GD and other formats of speaking
CO3	Able and defend in conversational and public speaking comptencies
CO4	Develop active listening and speaking skill in different real life situation

1. Writing an Effective Job Application Letter/Cover letter	(4 Hours)
2. Writing a winning resume and posting in job portals	(4 Hours)
3. Group Discussion	(8 Hours)
4. Job Interview	(8 Hours)
5. Oral presentation	(6 Hours)
6. Organizing a Meeting	(4 Hours)
7. Note making and Note taking	(4 Hours)
8. Memo writing	(2 Hours)
9. Profiling a company	(4 Hours)
10. Summarizing books/research paper/news report.	

Teaching Methods: Chalk& Board/ PPT/Video Lectures/Lecture by Industry Expert/MOOCS

Text Books:

1. Business Communication Today by Bovee, Courtland L., Thill, John V. Prentice Hall.

2. Technical Communication Today by Richard Johnson-Sheehan. Edition 5. Pearson.

3. Communicative English for Engineers and Professionals by Nitin Bhatnagar and Mamta Bhatnagar. Published by DK/Pearson.

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4. Technical Communication, Principle and Practice by Meenakshi Raman & Sangeeta Sharma, Oxford University Press.

5. How to Read better and Faster by Norman Lewis. 4th Edition. Publisher: Crowell.