Highlighted Employability Courses (B.Tech) for the Academic Year - 2020-2021

INDEX

ARTIFICIAL INTELLIGENCE & DATA SCIENCE

Regulation: R20							I / IV - B.TECH I - Semester		
ARTIFICIAL INTELLIGENCE & DATA SCIENCE (under Choice Based Credit System / Elective Course System)									
SCHEME OF INSTRUCTION &EXAMINATION (With effect from 2020-21 admitted Batch onwards)									
Course Code	**Course Name**	**Category**	**Cr.**	**L**	**T**	**P**	**Int. Marks**	**Ext. Marks**	**Total Marks**
B20 HS1101	English	HS	3	3	0	0	30	70	100
B20 BS1101	Mathematics-I	BS	3	3	0	0	30	70	100
B20 BS1102	Applied Physics	BS	3	3	0	0	30	70	100
B20 CS1102	Programming for Problem Solving Using C	ES	3	3	0	0	30	70	100
B20 IT1101	Fundamentals of Computers and Information Technology	ES	3	3	0	0	30	70	100
B20 IT1103	Programming for Problem Solving Using C Lab	ES	1.5	0	0	3	15	35	50
B20 BS1107	Applied Physics Lab	BS	1.5	0	0	3	15	35	50
B20 CS1104	Computer Engineering Workshop	ES	1.5	0	0	3	15	35	50
		TOTAL	19.5	15	0	9	195	455	650

ARTIFICIAL INTELLIGENCE & DATA SCIENCE

SYLLABUS : ENGLISH (B20HS1101)

(Common to AIDS, CE, CSE, ECE, EEE, IT&ME)

UNIT-I : Lesson: A Drawer full of happiness from *Infotech English*, Maruthi Publications.
Listening: Listening to short audio texts and identifying the topic, context and specific pieces of information to answer a series of questions both in speaking and writing.
Speaking: Self-introduction and introducing others. Asking and answering general questions on topics such as home, family, work, studies and interests.
Reading: Skimming text to get the main idea. Scanning to look for specific pieces of information.
Reading for Writing: Paragraph Writing (Hints Development), general essays using suitable cohesive devices; linkers, sign posts and transition signals; mechanics of writing, punctuation.
Vocabulary: Technical vocabulary from across technical branches (20) GRE Vocabulary (20), antonyms and synonyms, word applications, verbal reasoning and sequencing of words.
Grammar: Content words and function words; parts of Speech, tenses, word order in sentences, sentence structures.

UNIT-II : Lesson-: Nehru's letter to his daughter, Indira on her birthday from *Infotech English***,** Maruthi Publications**.**
Listening: Answering a series of questions about main idea and supporting ideas after listening to audio texts both in speaking and writing.
Speaking: Discussion in pairs/ small groups on specific topics followed by short structured talks, functional English: greetings and leave takings.
Reading: Identifying sequence of ideas; recognizing verbal techniques that help to link the ideas in aparagraph together.
Reading for Writing: Identifying the main ideas, rephrasing and summarizing them (précis writing);avoiding redundancies and repetitions.
Vocabulary: Technical vocabulary from across technical branches (20words).GRE Vocabulary Analogies (20 words), antonyms and synonyms, word applications.
Grammar: Articles, prepositions, conjunctions, use of synonyms and antonyms.

UNIT-III: Lesson: Stephen Hawking-Positivity' Benchmark' from *Infotech English*, Maruthi Publications.
Listening: Listening for global comprehension and summarizing what is listened to both in speaking and writing.
Speaking: Discussing specific topics in pairs or small groups and reporting what is discussed. Functional English: complaining and apologizing.
Reading: Reading a text in detail by making basic inferences -recognizing: and interpreting specific context clues; strategies to use text clues for comprehension, critical reading.
Reading for Writing: Letter writing- types, format and principles of letter writing, E-mail etiquette, writing a Resume/CV and covering letter.
Vocabulary: Technical vocabulary from across technical branches (20 words. GRE. Vocabulary 20words), Idioms & Phrasal verbs, Homonyms, word applications, sequencing of words.
Grammar: Sentence Structures, Transformation of sentences (Active and passive Voice, Degrees of comparison, Simple, Compound and Complex).

UNIT-IV:Lesson: Liking a Tree, Unbowed: Wangari Maathai biography from *Infotech English*, Maruthi Publications.
Listening: Making predictions while listening to conversations/ transactional dialogues without video (only audio), listening to audio-visual texts.

Speaking: Role plays for practice of conversational English in academic contexts (formal and informal) - asking for and giving information/directions. Functional English: asking for permissions, requesting, Inviting.

Reading: Studying the use of graphic elements in texts to convey information, reveal trends/patterns/relationships, communicative process or display complicated data.

Reading for Writing: Information transfer; describe, compare, contrast, identify significance/trends based on information provided in figures/charts/graphs/tables. Pamphlet writing, writing for media, writing SOP's.

Vocabulary: Technical vocabulary from across technical branches (20 words GRE Vocabulary (20words), antonyms and synonyms, word applications, cloze encounters, foreign phrases.

Grammar: Quantifying expressions - adjectives and adverbs: comparing and contrasting, question Tags, direct and indirect speech, reporting for academic purposes.

UNIT-V: Lesson: Stay Hungry–Stay Foolish from *Infotech English*, Maruthi Publicationsj.

Listening: Identifying key terms, understanding concepts and interpreting the concepts both in speaking and writing.

Speaking: Formal oral presentationsontopics from academic contexts–with/without the use of PPT slides. Functional English: Suggesting/Opiniongiving.

Reading: Reading for comprehension, RAP Strategy - intensive reading and extensive reading techniques. **Reading for Writing:** Report writing, writing academic proposals- writing research articles: format and style. **Vocabulary:** Technical vocabulary from across technical branches (20 words GRE 'Vocabulary (20 words, antonyms and synonyms, word applications, coherence, matchingemotions.

Grammar: Editing short texts — identifying and correcting common errors in grammar and usage (articles, prepositions, tenses, subject-verb agreement, parallel structures, phrases and clauses).

Course Outcomes for First Year First Semester Course	
Course Code: B20HS1101	
Course Title: ENGLISH	
CO-1	Identify the context, topic and pieces of specific information by understanding and responding to the social or transactional dialogues spoken by native speakers of English.
CO-2	Apply suitable strategies for skimming and scanning to get the main idea of a text and locate specific information.
CO-3	Build confidence and adapt themselves to the social and public discourses, discussions and presentations.
CO-4	Apply the principles of writing to paragraphs, arguments, essays and formal/informal communication.
CO-5	Construct sentences using proper grammatical structures and correct word forms.

SYLLABUS: MATHEMATICS-I (B20BS1101)
(LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS)
(Common to AIDS, CE, CSE, ECE, EEE, IT & ME)

UNIT-I: Linear systems of equations: Rank, Echelon form, Normal form, consistency of system of linear equations, Solution oflinear systems by Gauss elimination, Jacobi and Gauss-Seidel methods.

UNIT-II: Eigen values - Eigen vectors and Quadratic forms: Eigen values, Eigen vectors, Properties, Cayley- Hamilton theorem, Inverse and powers of a matrix using Cayley-Hamilton theorem, Reduction to diagonal form, Quadratic forms, Reduction of a Quadratic form to Canonical form.

UNIT-III: Differential equations of first order and first degree: Linear, Bernoulli, Exact, Reducible to exact types. Applications: Orthogonal trajectories, Newton's Law of cooling, Simple electrical circuits.(R-L and R-C circuits only)

UNIT-IV: Linear differential equations of higher order: Linear Non-homogeneous equations of higher order with constant coefficients with source (RHS) term of the type e^{ax}, sin ax, cos ax, polynomials in x, $e^{ax}V(x)$, x V(x). Simultaneous differential equations with constant coefficients, Method of Variation of parameters.

UNIT-V: Laplace transformation: Laplace transforms of standard functions, properties, transforms of tf(t), f(t)/t, transforms of derivatives and integrals, transforms of unit step function, Dirac delta function; Inverse Laplace transforms, convolution theorem (without proof).
Applications: Solving ordinary differential equations (initial value problems) using Laplace transforms.

Course Outcomes for First Year First Semester Course	
Course Code: B20BS1101	
Course Title: MATHEMATICS – I	
CO-1	Solve a given system of linear algebraic equations
CO-2	Determine Eigen values and Eigen vectors of a system represented by a matrix.
CO-3	Solve ordinary differential equations of first order and first degree.
CO-4	Apply the knowledge in simple applications such as Newton's law of cooling, orthogonal trajectories and simple electrical circuits
CO-5	Solve linear ordinary differential equations of second order and higher order.
CO-6	Determine Laplace transform, inverse Laplace transform and solve linear ODE

SYLLABUS: APPLIED PHYSICS (B20BS1102)

(Common to AIDS, CE, EEE & ME)

UNIT-I: WAVE OPTICS: Interference: Principle of super position. Interference of light, interference in thin films (reflected light) – Wedge film and Newton`s rings – Applications
Diffraction: Types of diffraction, Fraunh offer diffraction at a single alit, Diffraction grating, grating spectrum. Missing order, Resolving power, Rayleigh's Criterion, Resolving power of Grating.

UNIT-II: DIELECTRICS AND MAGNETICS: Dielectrics : Introduction to dielectrics, Electric Polarization, Dielectric polariz ability, Susceptibility, Dielectric constant, Types of Polarization, Frequency dependence of Polarization, Internal field in a dielectric, Claussius and Mosotti equation, Applications of dielectrics.
Magnetics: Introduction to magnetics, Magnetic dipole moment , Magnetization, Magnetic susceptibility and Permeability, Origin of permanent magnetic moment, Classification of magnetic materials (Dia , Para, Ferro, Antiferro and ferri), Hysteresis – Weiss Domain theory – Ferrites, soft and hard magnetic materials, Magnetic device applications.

UNIT-III: LASERS AND FIBER OPTICS: Lasers: Introduction, Interaction of radiation with matter, condition for light amplification, Einstein's relations. Requirements of lasers device Types of lasers, Design and working of Ruby and He – Ne lasers, Laser characteristics and applications.
Fiber Optics: Introduction to optical fibers, Principle of light propagation in fiber, Acceptance angle, Numerical aperture, Modes of propagations, types of fibers, classification of fibers based on refractive index profile, applications of fibers with emphasis on fiber optic communication.

UNIT-IV: SEMICONDUCTORS: Introduction, intrinsic semi conductors, density of charge carries, Fermi energy, Electrical conductivity – Extrinsic semi conductors – P-type and N-type, Density of charge carriers, dependence of Fermi energy on carrier concentration and temperature, direct and indirect band – gap semi conductors, Hall effect, Applications of Hall effect. Drift and diffusion currents, Continuity equation, applications of semiconductors.

UNIT-V: ULTRASONICS AND NANOMATERIALS: Ultrasonics: Introduction, Production of Ultrasonics – Piezoelectric and Magnetostriction methods, detection of ultrasonics, acoustic grating - determination of wavelength and velocity of ultrasonics, applications of ultrasonics.
Nanomaterials: Introduction, salient features of Nanomaterials, Synthesis methods – Ball milling, Condensation, Chemical Vapour Deposition and Sol – Gel methods, Characterization techniques for nano materials - The scanning tunneling microscopy (STM)and The atomic force microscopy (AFM), Carbon nanotubes (CNTS), Applications of Nano materials.

Course Outcomes for First Year First Semester Course	
Course Code: B20 BS1102	
Course Title: APPLIED PHYSICS	
CO-1	Interpret the behavior of light radiation in interference and diffraction Phenomena and their applications.
CO-2	Explain the classification and properties of dielectric and magnetic materials suitable for engineering applications.
CO-3	Understand the basics of modern optical technologies like lasers and optical fibers and their utility in various fields.
CO-4	Explain the important aspects of semiconductors and electrical conductivity in them.
CO-5	Understand the basics of technology of Ultrasonics in various fields and demonstrate the synthesis and applications of nano s aterials.

SYLLABUS: PROGRAMMING FOR PROBLEM SOLVING USING C

(B20CS1102)

(Common to AIDS, CSE, ECE & IT)

UNIT-I: Introduction to Computers: Creating and running Programs, Computer Numbering System, Storing Integers, Storing Real Numbers Introduction to the C Language: Background, C Programs, Identifiers, Types, Variable, Constants, Input/output, Programming Examples, Scope, Storage Classes and Type Qualifiers. Structure of a C Program: Expressions Precedence and Associativity, Side Effects, Evaluating Expressions, Type Conversion Statements, Simple Programs, Command Line Arguments.

UNIT-II: Bitwise Operators: Exact Size Integer Types, Logical Bitwise Operators, Shift Operators. Selection & Making Decisions: Logical Data and Operators, Two Way Selection, Multi way Selection, More Standard Functions. Repetition: Concept of Loop, Pretest and Post-test Loops, Initialization and Updating, Event and Counter Controlled Loops, Loops in C, Other Statements Related to Looping, Looping Applications, Programming Examples.

UNIT-III: Arrays: Concepts, Using Array in C, Array Application, Two Dimensional Arrays, Multidimensional Arrays, Programming Example – Calculate Averages Strings: String Concepts, C String, String Input / Output Functions, Arrays of Strings, String Manipulation Functions String/ Data Conversion, A Programming Example – Morse Code Enumerated, Structure, and Union: The Type Definition (Type def), Enumerated Types, Structure, Unions, and ProgrammingApplication.

UNIT-IV: Pointers: Introduction, Pointers to pointers, Compatibility, L value and R value Pointer Applications: Arrays, and Pointers, Pointer Arithmetic and Arrays, Memory Allocation Function, Array of Pointers, Programming Application. Processor Commands: Processor
Commands.

UNIT-V: Functions: Designing, Structured Programs, Function in C, User Defined Functions, Inter Function Communication, Standard Functions, Passing Array to Functions, Passing Pointers to Functions, Recursion Text Input / Output: Files, Streams, Standard Library Input / Output Functions, Formatting Input / Output Functions, Character Input / Output Functions Binary Input / Output: Text versus Binary Streams, Standard Library, Functions for Files, Converting File Type.

Course Outcomes for First Year First Semester Course	
Course Code: B20CS1102	
Course Title: PROGRAMMING FOR PROBLEM SOLVING USING C	
CO-1	Apply Precedence and Associativity rules to evaluate Expressions.
CO-2	Make use of Decision Making and Looping statements to solve various problems in C.
CO-3	Illustrate the importance of Arrays and Strings and to apply various operations on them.
CO-4	Solve various problems by making use of Structure and Union concepts.
CO-5	Design and implement programs to analyze the different pointer applications
CO-6	Develop programs using Functions and Pointers.

SYLLABUS: FUNDAMENTALS OF COMPUTERS AND INFORMATION TECHNOLOGY (B20IT1101)

(Common to AIDS &IT)

UNIT-I: Computer Basics & Organization: Introduction, Evolution of computers, Generation of computers, Computer Concepts, Computer System, Applications of Computers. Introduction, Central Processing Unit, Internal Communications, Machine cycle, The Bus, InstructionSet.

UNIT-II: Computer Architecture & I/O Devices: Memory & Storage systems: Memory Representation, RAM, ROM, Magnetic Storage Systems, Optical Storage Systems, Solid-State Storage Devices**. Input and Output Devices**: Keyboard, Pointing Devices, Scanning Devices, Optical Recognition Devices, Data Acquisition Sensors, Media Input Devices, Display Monitors, Printers, Plotters, Terminals.

UNIT-III: Computer Software and Programming Languages: Introduction, Types of Computer Software, System Management Programs, System Development Programs, Standard Application Programs, Unique Application Programs, Problem Solving, Structuring the Logic, Using the computer. **Operating Systems (OS)**: Introduction, History of OS, Functions of OS, Types of Operating Systems, Popular Operating Systems. **Microsoft Software**: MS-DOS, MS Word System, MS Excel System, MS Power point System, MS Access System. **Programming Languages**: History of Programming Languages, Generations of Programming Languages, Characteristics of Good Programming Language, Categorizations of High Level Languages, Popular High level Languages, Developing a Program, Running a Program.

UNIT-IV: Data Communications, Networks, Internet and Security: Introduction, Data communication using MODEMS, Computer Network, Network Protocols and Software, Network Devices, **Internet**: Introduction, Evolution of Internet, Basic Internet Terms, Internet applications: E-mail, FTP, Telnet, Internet Relay Chat (IRC), Chatting and instant messaging, Internet Telephony, Video Conferencing, Commerce Through Internet. **Security**: Introduction, Computer Security definition, Malicious Programs: Virus, Other destructive Programs, Affecting and Protecting Computer Systems, Cryptography, Digital Signature, Firewall.

UNIT-V: Database Fundamentals: Introduction, Database Definition, Logical Data Concepts, Physical Data Concepts, Database Management System, DBMS Architecture, database Models, **MS Access**: Introduction, Starting with Access database, Working with Tables, Creating Forms using Wizard. **Current and Future Trends in IT**: Introduction, Electronic Commerce, Electronic Data Interchange, Smart Card, Radio frequency Identification(RFID), Brain computer Interface(BCI), Imminent technologies.

Course Outcomes for First Year First Semester Course	
Course Code: B20IT1101	
Course Title: FUNDAMENTALS OF COMPUTERS AND INFORMATION TECHNOLOGY	
CO-1	Apply Precedence and Associativity rules to evaluate Expressions.
CO-2	Make use of Decision Making and Looping statements to solve various problems in C.
CO-3	Illustrate the importance of Arrays and Strings and to apply various operations on them.
CO-4	Solve various problems by making use of Structure and Union concepts.
CO-5	Design and implement programs to analyze the different pointer applications
CO-6	Develop programs using Functions and Pointers.

SYLLABUS: PROGRAMMING FOR PROBLEM SOLVING USING C LAB (B20CS1103)

(Common to AIDS, CSE, ECE & IT)

1. Exercise1:
   1. Write a C program to print a block F using hash (#), where the F has a height of six characters and width of five and four characters.
   2. Write a C program to compute the perimeter and area of a rectangle with a height of 7 inches and width of 5inches.
   3. Write a C program to display multiplevariables.
2. Exercise2:
   1. Write a C program to calculate the distance between the twopoints.
   2. Write a C program that accepts 4 integers p,q, r,s from the user where rands are positive and p is even. If q is greater than r and s is greater than p and if the sum of r and s is greater than the sum of p and q print "Correct values", otherwise print "Wrong values".
3. Exercise3:
   1. Write a C program to convert a string to a longinteger.
   2. Write a program in C which is a Menu-Driven Program to compute the area of the various geometrical `shape.
   3. Write a C program to calculate the factorial of a givennumber.
4. Exercise4:
   1. Write a program in C to displaythe n terms of even natural number and their sum.
   2. Write a program in C to display the n terms of harmonic series and their sum. 1 + 1/2 + 1/3 +1/4+ 1/5 ... 1/n terms.
   3. Write a C program to check whether a given number is an Armstrong numberor not.
5. Exercise5:
   1. Write a program in C to print all unique elements in anarray.
   2. Write a program in C to separate odd and even integers in separatearrays.
   3. Write a program in C to sort elements of array in ascendingorder.
6. Exercise6:
   1. Write a program in C for multiplication of two squareMatrices.
   2. Write a program in C to find transpose of a givenmatrix.
7. Exercise7:
   1. Write a program in C to search an element in a row wise and column wise sortedmatrix.
   2. Write a program in C to print individual characters of string in reverseorder.
8. Exercise8:
   1. Write a program in C to compare two strings without using string libraryfunctions.
   2. Write a program in C to copy one string to anotherstring.
9. Exercise9:
   1. Write a C Program to Store Information Using Structures with DynamicallyMemory Allocation
   2. Write a program in C to demonstrate how to handle the pointers in theprogram.
10. Exercise10:
    1. WriteaprograminCtodemonstratetheuseof&(addressof)and*(valueataddress)operator.
    2. Write a program in C to add two numbers usingpointers
11. Exercise11:
    1. Write a program in C to add numbers using call byreference.
    2. Write a program in C to find the largest element using Dynamic MemoryAllocation
12. Exercise12:
    1. Write a program in C to swap elements using call byreference.
    2. WriteaprograminCto countthenumberofvowelsandconsonants in astringusingapointer.

13. Exercise13:
    1. Write a program in C to show how a function returningpointer.
    2. Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using malloc( )function
14. Exercise14:
    1. Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using calloc( ) function. Understand the difference between the above twoprogram.
    2. Write a program in C to convert decimal number to binary number using thefunction.
15. Exercise15:
    1. Write a program in C to check whether a number is a prime number or not using the function.
    2. Write a program in C to get the largest element of an array using thefunction.
16. Exercise16:
    1. Write a program in C to append multiple lines at the end of a textfile.
    2. Write a program in C to copy a file in anothername.
    3. Write a program in C to remove a file from thedisk.

Course Outcomes for First Year First Semester Course	
Course Code: B20CS1103	
Course Title: PROGRAMMING FOR PROBLEM SOLVING USING C LAB	
CO-1	Write, Trace and Debug the programs and correct syntax and logical errors..
CO-2	Solve various Problems by making use of Arrays, Strings, Structures, Unions and Pointers
CO-3	Solve a complex problem by decomposing into several modules by using Functions
CO-4	Apply various File I/O operations

SYLLABUS: APPLIED PHYSICS LAB (B20 BS 1107)

(Common to AIDS, CSE, ECE & IT)

1. Determination of the Wave length of light from a source– Diffraction rating–Normal incidence.
2. Determination of radius of curvature of Plano convex lens – Newton's Rings.
3. Determination of the thickness of a thin spacer using interference – Air Wedge method.
4. DeterminationofMagneticfieldalongtheaxisofacurrentcarryingcoil–StewartandGee'sapparatus.
5. VerificationofLawsofseriesandparallelcombinationsofresistances–CareyFoster'sbridge.
6. Determination of Temperature Coefficient of Resistance of a thermistor.
7. To study the characteristics of PN Junction diode.
8. To determine the Numerical aperture of a given optical fiber and hence to find its acceptance angle.
9. Determination of Planck constant
10. Determination of the Rigidity modulus of elasticity of a material – Torsional pendulum.
11. Verification of the laws of vibrations in stretched stings -Sonometer.
12. Determination of the frequency of the AC supply – AC Sonometer.
13. To determine refractive indices (μo and μe) of a birefringent material (prism).

Course Outcomes for First Year First Semester Course	
Course Code: B20 BS 1107	
Course Title: APPLIED PHYSICS LAB	
CO-1	Get hands on experience in setting up experiments and using the instruments / equipment individually
CO-2	Get introduced to using new / advanced technologies and understand their significance.

SYLLABUS: COMPUTER ENGINEERING WORKSHOP (B20 CS 1104)
(Common to AIDS, CSE & IT)

Task1: Identification of the peripherals of a computer - Prepare a report containing the block diagram of the computer along with the configuration of each component and its functionality. Describe about various I/O Devices and itsusage.

Task2: Practicing disassembling and assembling components of a PC.

Task3: Installation of Device Drivers, MS Windows, Linux Operating systems and Disk Partitioning, dual boating with Windows andLinux.

Task4: Introduction to Memory and Storage Devices, I/O Port, Assemblers, Compilers, Interpreters, Linkers andLoaders.

Task5: Demonstration of Hardware and Software Troubleshooting.

Task6: Demonstrating Importance of Networking, Transmission Media, Networking Devices-Gateway, Routers, Hub, Bridge, NIC, Bluetooth Technology, Wireless Technology, Modem, DSL, and Dialup Connection.

Task7: Surfing the Web using Web Browsers, Awareness of various threats on the Internet and its solutions, Search engines and usage of various search engines, Need of anti-virus, Installation of anti-virus, configuring personal firewall and windows update.

(Students should get connected to their Local Area Network and access the Internet. In the process they should configure the TCP/IP setting and demonstrate how to access the websites and email. Students customize their web browsers using bookmarks, search toolbars and pop up blockers).

Task8: Productivity Tools: Basic HTML tags, Introduction to HTML5 and its tags, Introduction to CSS3 and its properties. Preparation of a simple website/ homepage,

Assignment: Develop your home page using HTML Consisting of your photo, name, address and education details as a table and your skill set as a list.

Features to be covered:- Layouts, Inserting text objects, Editing text objects, Inserting Tables, Working with menu objects, Inserting pages, Hyper linking, Renaming, deleting, modifying pages, etc.,

Task9: Demonstration and Practice of various features of Microsoft Word Assignment:

1. Create a project certificate. 2.Creating a news letter

Features to be covered:-Formatting Fonts, Paragraphs, Text effects, Spacing, Borders and Colors, Header and Footer, Date and Time option, tables, Images, Bullets and Numbering, Table of Content, Newspaper columns, Drawing toolbar and Word Art and Mail Merge in word etc.,

Task10: Demonstration and Practice of various features Microsoft Excel Assignment:

1. Creating a scheduler 2. Calculating GPA 3.Calculating Total, average of marks in various subjects and ranks of Students based on marks

Features to be covered:- Format Cells, Summation, auto fill, Formatting Text, Cell Referencing, Formulae in excel, Charts, Renaming and Inserting worksheets, etc.,

Task11: Demonstration and Practice of various features Microsoft Power Point

Features to be covered:- Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Hyperlinks Tables and Charts, Master Layouts, Types of views, Inserting – Background, textures, Design Templates, etc.,

Task12: Demonstration and Practice of various features LaTeX document preparation, presentation (Features covered in Task 9 and Task 11 need to be explored in LaTex).

Task13: Tools for converting word to pdf and pdf to word

Task14: Internet of Things (IoT): IoT fundamentals, applications, protocols, communication models, architecture, IoT devices.

Course Outcomes for First Year First Semester Course	
Course Code: B20 CS 1104	
Course Title: COMPUTER ENGINEERING WORKSHOP	
CO-1	Identify, assemble and update the components of a computer
CO-2	Configure, evaluate and select hardware platforms for the implementation and execution of computer applications, services and systems
CO-3	Make use of tools for converting pdf to word and vice versa.
CO-4	Develop presentation, documents and small applications using productivity tools such as word processor, presentation tools, spreadsheets, HTML, LaTex.

ARTIFICIAL INTELLIGENCE & DATA SCIENCE

SYLLABUS : MATHEMATICS – II (B20BS1201)

(FOURIER ANALYSIS AND PARTIAL DIFFERENTIAL EQUATIONS)

(Common to AIDS, CE, CSE, ECE, EEE, IT & ME)

UNIT-I: Fourier Series: Introduction, Periodic functions, Fourier series of a periodic function, Dirichlet's conditions, Change of interval. Even and odd functions, Half-range sine and cosine series.

UNIT-II: Fourier Transforms: Fourier integral theorem (without proof), Complex form of Fourier integral, Fourier sine and cosine integrals, Fourier transform, Fourier sine and cosine transforms, Finite Fourier transforms, properties, inverse transforms, Parseval'sIdentities.

UNIT-III: Partial differentiation: Introduction, Homogeneous functions, Euler's theorem, Chain rule, Total derivative, Jacobians and their properties. Applications: Taylor series expansion for a function of two variables, Maxima and Minima of functions of two variables with and without constraints, Lagrange's method. Leibnitz's rules for differentiation under integral sign.

UNIT-IV: First order and higher order partial differential equations: Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions, solutions of Lagrange linear equation. Solutions of Linear homogeneous and non-homogeneous partial differential equations with constant coefficients –source (RHS) terms of the type e^{ax+by}, sin (ax+by), cos (ax+by),$x^m y^n$.

UNIT-V: Applications of partial differential equations: Method of separation of variables, One–dimensional wave equation, the D'Alembert's solution, one- dimensional heat equation.

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1201	
Course Title: MATHEMATICS–II	
CO-1	Determine Fourier series and half range series of functions.
CO-2	Determine Fourier transforms of non-periodic functions and also use them to evaluate integrals
CO-3	Compute partial derivatives, total derivative and Jacobians.
CO-4	Find maxima/minima of functions of two variables and evaluate some real definite integrals.
CO-5	Identify the discourse features, and improve intensive and extensive reading skills Form partial differential equations and solve Lagrange linear equation. Solve linear higher order homogeneous and non-homogeneous PDEs
CO-6	Find theoretical solution of one-dimensional wave equation and one-dimensional heat equation

SYLLABUS: APPLIED CHEMISTRY
(B20BS1203)

(Common to AIDS, CE, EEE & ME)

UNIT-I: High Polymers and Plastics; Rubbers & Elastomers: Polymerization Definition, Types of Polymerization, free radical Mechanism of addition polymerization, Plastics as engineering materials, Thermoplastics and Thermosetting plastics, Compounding of plastics, Fabrication of plastics (4 techniques); Preparation, Properties and applications of Polyethylene, PVC, Bakelite, Nylon - 6,6, Bullet Proof plastics -polycarbonate and Kelvar; Fiber reinforced plastics, conducting polymers, Biodegradable Polymers - PHBV, Nylon 2, Nylon 6. Natural rubber – Vulcanization – Compounding of Rubber; Preparation, properties andapplications of Buna – S; Buna – N;

UNIT-II: Energy Sources and Applications: Nuclear Energy: Nuclear fission and Nuclear fusion – Nuclear Power reactor – Applications. Thermal fuels – Introduction – Classification – Calorific value – HCV and LCV – Bomb calorimeter; Coal : Proximate and ultimate analysis of coal – Significance of the analysis – Manufacture of coke by Otto Hoffman's by Product Process , Refining crude oil; Knocking; Chemical structure-Knocking, Octane number of gasoline, Cetane number of diesel oil, synthetic Petrol; LPG,CNG.

UNIT-III: Electrochemical cells and Corrosion: Galvanic cell, single electrode potential, Calomel electrode; Modern batteries: - Lead – Acid battery; Fuel cells- Hydrogen – Oxygen fuel cell, Lithium battery Theories of corrosion (i) dry Corrosion (ii) wet corrosion. Types of corrosion - differential aeration corrosion, pitting corrosion, galvanic corrosion, stress corrosion, Factors influencing corrosion, Protection from corrosion-material selection & design, cathodic protection, Protective coatings- metallic coatings – Galvanizing, Tinning, Electroplating; Electro less plating ; Paints.

UNIT-IV: Water technology: Sources of water – Hardness of water – Estimation of hardness of water by EDTA method; Boiler troubles – sludge and scale formation, Boiler corrosion, caustic embrittlement, Priming and foaming; Softening of water by Lime – Soda Process, Zeolite Process, Ion – Exchange Process; Municipal water treatment; Desalination of sea water by Electro dialysis and Reverse osmosis methods.

UNIT-V: Chemistry of Engineering Materials& Advanced Engineering materials: Cement:- Manufacture of Portland cement, setting and hardening of cement, Deterioration of cement concrete.

Refractories: Definition, Characteristics, classification, Properties and failure of refactories.

Solar Energy: Construction and working of Photovoltaic cell, applications.

Solid State Materials: Crystal imperfections, Semi Conductors, Classification and chemistry of semi conductors: Intrinsic semiconductors; Extrinsic semiconductors; Defect semiconductors, Compound Semiconductors and Organic Semiconductors.

Liquid Crystals: - Definition – Classification with examples – Applications

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1203	
Course Title: APPLIED CHEMISTRY	
CO-1	Develop polymer composites, synthetic polymers and formulation of polymers and their use in design
CO-2	Apply the knowledge about quality of water and its treatment methods for domestic and industrial applications. Understanding the principle, mechanism of corrosion and utilization of various techniques to control.
CO-3	Develop the knowledge of fuels and their economics, advantages and limitations. Make use of the basic concepts of semiconductors and liquid crystals for engineering applications..
CO-4	Identify constituents of various ceramic materials, characteristics and their appropriate use in construction. Apply the knowledge of electrochemistry principles to design energy storage

SYLLABUS: DIGITAL LOGIC DESIGN
(B20IT1201)

(Common to AIDS & IT)

UNIT-I: Digital Systems and Binary Numbers: Digital Systems, Binary Numbers, Octal and Hexadecimal Numbers, Complements of Numbers, Signed Binary Numbers, Arithmetic addition and subtraction, 4-bit codes: BCD, EXCESS 3, alphanumeric codes, 9's complement, 2421,etc.

UNIT-II: Concept of Boolean algebra: Basic Theorems and Properties of Boolean algebra, Boolean Functions, Canonical and Standard Forms, Minterms and Maxterms. Gate level Minimization Map Method, Three- Variable K- Map, Four Variable K-Maps. Products of Sum Simplification, Sum of Products Simplification, Don't – Care Conditions, NAND and NOR Implementation, Exclusive-ORFunction.

UNIT-III: Combinational Logic: Introduction, Analysis Procedure, Binary Adder–Subtractor, Binary Multiplier, Decoders, Encoders, Multiplexers, Demultiplexers, Priority Encoder, Code Converters, Magnitude Comparator, HDL Models of Combinational Circuits. Realization of Switching Functions Using PROM, PAL and PLA.

UNIT-IV: Synchronous Sequential Logic: Introduction to Sequential Circuits, Storage Elements: Latches, Flip-Flops, RS- Latch Using NAND and NOR Gates, Truth Tables. RS, JK, T and D Flip Flops, Truth and Excitation Tables, Conversion of Flip Flops

UNIT-V: Registers and Counters: Registers, Shift Registers, Ripple Counters, Synchronous Counters, Ring Counter, Johnson Counter.

Course Outcomes for First Year Second Semester Course	
Course Code: B20IT1201	
Course Title: DIGITAL LOGIC DESIGN	
CO-1	Demonstrate different number systems, binary addition and subtraction, 2's complement representation and operations with this representation
CO-2	Understand the different switching algebra theorems and apply them for logic functions.
CO-3	Define the Karnaugh map for a few variables and make use for an algorithmic reduction of logic functions.
CO-4	Understand various logic gates starting from simple ordinary gates to complex programmable logic devices & arrays and design different combinational logic circuits
CO-5	Design various sequential circuits starting from flip-flop to registers and counters.

SYLLABUS: OBJECT ORIENTED PROGRAMMING THROUGH C++ (B20IT1202)(Common to AIDS & IT)

UNIT-I: Introduction to C++: Difference between C and C++, Evolution of C++, The Object Oriented Technology, Disadvantage of Conventional Programming-, Key Concepts of Object Oriented Programming, Advantage of OOP, Object Oriented Language.

UNIT-II: Classes and Objects &Constructors and Destructor: Classes in C++-Declaring Objects,Access Specifiers and their Scope, Defining Member Function-Overloading Member Function, Nested class, Constructors and Destructors, Introduction, Constructors and Destructor- Characteristics of Constructor and Destructor, Application with Constructor, Constructor with Arguments (parameterized Constructor, Destructors- Anonymous Objects.

UNIT-III: Operator Overloading and Type Conversion & Inheritance: The Keyword Operator, Overloading Unary Operator, Operator Return Type, Overloading Assignment Operator (=), Rules for Overloading Operators, Inheritance, Reusability, Types of Inheritance, Virtual Base Classes, Object as a Class Member, Abstract Classes, Advantages of Inheritance- Disadvantages ofInheritance.

UNIT-IV: Pointers & Binding Polymorphisms and Virtual Functions: Pointer, Features of Pointers, Pointer Declaration, Pointer to Class, Pointer Object, The this Pointer, Pointer to Derived Classes and Base Class, Binding Polymorphisms and Virtual Functions, Binding in C++, Virtual Functions, Rules for Virtual Function, VirtualDestructor.

UNIT-V: Generic Programming with Templates, Need for Templates, Definition of class Templates, Normal Function Templates, Overloading of Template Function, Bubble Sort Using Function Templates, Difference Between Templates and Macros, Linked Lists with Templates, Exception Handling, Principles of Exception Handling, The Keywords try throw and catch, Multiple Catch Statements – Specifying Exceptions.

Course Outcomes for First Year Second Semester Course	
Course Code: B20IT1202	
Course Title: OBJECT-ORIENTED PROGRAMMING THROUGH C++	
CO-1	Differentiate between the procedural and object oriented paradigm..
CO-2	Design object oriented applications using dynamic memory management techniques and overloading concepts
CO-3	Demonstrate inheritance, pointer, polymorphism and virtual functions
CO-4	Apply implement generic programming, Exception handling in real time applications.

SYLLABUS: PRINCIPLES OF ELECTRICAL AND ELECTRONICS ENGINEERING (B20EE1203)(Common to AIDS & IT)

UNIT-I: Introduction to Electrical circuits: Introduction to electrical concepts. Types of network elements, Ohms Law, Kirchhoff's Laws, Series and parallel Circuits connection of resistances with DC excitation. Representation of sinusoidal waveforms - Peak, Average and RMS values - Phasor representation - real power -Reactive power - apparent power - power factor. Analysis of single-phase ac circuits consisting of RL - RC - RLC series circuits.

UNIT-II: D.C Machines: Faraday's Laws-Induced EMF - Principle of operation of DC Generator - EMF equation – Construction-Types of DC generator-DC motor types, Torque equation –Losses.

UNIT-III: Transformers and AC machines: Principle of operation of single-phase transformer - EMF equation - equivalent circuit – losses– Transformer efficiency. principle and operation of Induction Motor [Elementary treatment only].

UNIT-IV: Semiconductors and P-N junction diode: Types of semiconductors. Basic operation and V-I Characteristics of semiconductor diode, Operation of PN junction diode as rectifier, Avalanche breakdown and Zener breakdown phenomenon, Operation of Zener diode as regulator. Light Emitting Diode (LED).

UNIT-V: Bipolar Junction Transistor (BJT) and Field Effect Transistors (FET): Introduction, construction, basic operation of NPN and PNP transistors, Transistor circuit Configurations- CE, CB, and CC- Input and output Characteristics in various configurations, Transistor as an amplifier, Junction field Effect Transistors (JFET), JFET characteristics [Elementary treatment of **FET** only].

Course Outcomes for First Year Second Semester Course	
Course Code: B20EE1203	
Course Title: PRINCIPLES OF ELECTRICAL AND ELECTRONICS ENGINEERING	
CO-1	Apply concepts of Ohm's Law, Kirchhoff's laws for solving DC circuits
CO-2	Apply Phasor representation concept to Analyze single-phase AC circuits Consisting of series RL - RC – RLC combinations
CO-3	Apply the Faraday's laws and induced EMF concepts to describe the operating Principles and characteristics of DC Machines, Transformers and Induction motors.
CO-4	Understand and apply basic concepts of semiconductors devices such as PN Junction diode and Zener diode.
CO-5	Understand and Analyze the characteristics of BJT in CE, CB, CC configurations and Analyze the characteristics of JFET

SYLLABUS: APPLIED CHEMISTRY LAB

(B20BS1208)

(Common to AIDS,CE,EEE & ME)

LIST OF PROGRAMS:

1. Determination of Alkalinity of water sample.
2. Determination of total hardness of water by EDTA method.
3. Estimation of Ferrous Iron by $KMnO_4$.
4. Estimation of oxalic acid by$KMnO_4$.
5. Estimation of Mohr's salt by$K_2Cr_2O_7$.
6. Estimation of Dissolved oxygen by Winkler's method.
7. Determination of pH of water and soil sample.
8. Determination of Chlorides present in water sample.
9. Conducto metric titration of strong acid Vs strong base.
10. Potentio metric titration of strong acid Vs strong base.
11. Potentio metric titration of strong acid Vs weak base.
12. Preparation of Phenol formal dehyderesin.
13. Determination of saponification value of oils.
14. Determination of pour and cloud points of lubricating oil.
15. Determination of Acid value of oil.

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1208	
Course Title: APPLIED CHEMISTRY LAB	
CO-1	Gain technical knowledge of measuring, operating and testing of chemical instruments and equipments. Carrying out different types of chemical reactions for analysing different materials in micro level quantities
CO-2	Analyze and generate experimental skills to enhance the analytical thinking capabilities in the modern trends in engineering and technology

SYLLABUS: COMMUNICATION SKILLS LAB
(B20HS1202)

(Common to AIDS, CE, CSE, ECE, EEE, IT & ME)

UNIT-I: A list of communicative expressions (Requests, Permissions, Asking/ giving directions, Thanking and Responding to Thanks, Clarifying, Inviting, Congratulating, Advising, Agreeing and disagreeing etc.,) Common Errors.

UNIT-II: Pronunciation Letters and Sounds The Sounds of English Stress and Intonation Phonetic Transcription.

UNIT-III: Group Discussions.

UNIT-IV: Presentation Skills

UNIT-V: Interview Skills, Resume/ Curriculum VitaeCovering Letter, FAQ's, Telephonic Interviews/ Etiquette Mock Interviews.

Course Outcomes for First Year Second Semester Course	
Course Code: B20HS1202	
Course Title: COMMUNICATION SKILLS LAB	
CO-1	Apply their linguistic competence in all LSRW skills to professional and personal settings
CO-2	Apply communication skills learnt through various language learning activities to their advancement in academics and competitive examinations.
CO-3	Draft job application letters, E-Mail messages and other writing discourses.
CO-4	Adopt professional etiquette consistent with formal settings
CO-5	Improve fluency and clarity in both spoken and written English

SYLLABUS: OBJECT ORIENTED PROGRAMMING THROUGH C++ LAB (B20IT1203)

(Common to AIDS & IT)

1. Write a C++ Program to display Names, Roll No., and grades of 3 students who have appeared in the examination. Declare the class of name, Roll No. and grade. Create an array of class objects. Read and display the contents of thearray.
2. Write a C++ program to declare Struct. Initialize and displaycontents of member variables.
3. Write a C++ to illustrate the static methods andmembers.
4. Write a C++ program to find the sum for the given variables using function with default arguments.
5. Write a C++ Program to illustrate Enumeration and FunctionOverloading
6. Write a C++ program to declare a class. Declare pointer to class. Initialize and display the contents of the classmember.
7. To write a C++ program to find the value of a number raised to its power that demonstrates a function using call byvalue.
8. To write a C++ program and to implement the concept of Call byAddress.
9. Given that an EMPLOYEE class contains following members: data members: Employee number, Employee name, Basic, DA, IT, Net Salary and print datamembers.
10. Write a C++ program to read the data of N employee and compute Net salary of each employee (DA=52% of Basic and Income Tax (IT) =30% of the grosssalary).
11. Write a C++ to illustrate the concepts of console I/Ooperations.
12. Write a C++ program to use scope resolution operator. Display the various values of the same variables declared at different scopelevels.
13. Write a C++ program to allocate memory using newoperator.
14. Write a C++ program to create multilevel inheritance. (Hint: Classes A1, A2,A3)
15. WriteaC++programtocreateanarrayofpointers.Invokefunctionsusingarrayobjects.
16. Write a C++ program to use pointer for both base and derived classes and call the member function. Use Virtualkeyword
17. Write a C++ program for swapping two values using functiontemplates

Course Outcomes for First Year Second Semester Course	
Course Code: B20IT1203	
Course Title: OBJECT ORIENTED PROGRAMMING THROUGH C++ LAB	
CO-1	Apply the basic concepts in C++ like Class and objects
CO-2	Analyze memory management techniques like constructor, destructor and overloading mechanisms
CO-3	Apply reusability of code and usage of exception handling and generic programming.

CIVIL ENGINEERING

CIVIL ENGINEERING

SYLLABUS : ENGLISH (B20 HS 1101)

(Common to AIDS, CE, CSE, ECE, EEE, IT&ME)

UNIT-I : Lesson: A Drawer full of happiness from *Infotech English*, Maruthi Publications.
Listening: Listening to short audio texts and identifying the topic, context and specific pieces of information to answer a series of questions both in speaking andwriting.

Speaking: Self-introduction and introducing others. Asking and answering generalquestions on topics such as home, family, work, studies and interests.

Reading: Skimming text to get the main idea. Scanning to look for specific pieces of information.

Reading for Writing: Paragraph Writing (Hints Development), general essays using suitable cohesive devices; linkers, sign posts and transition signals; mechanics of writing, punctuation.

Vocabulary: Technical vocabulary from across technical branches (20) GRE Vocabulary (20), antonyms and synonyms, word applications, verbal reasoning and sequencing of words.
Grammar: Content words and function words; parts of Speech, tenses, word order in sentences, sentence structures.

UNIT-II : Lesson-: Nehru's letter to his daughter, Indira on her birthday from *Infotech English***,** Maruthi Publications**.**
Listening: Answering a series of questions about main idea and supporting ideas after listening to audio texts both in speaking and writing.

Speaking: Discussion in pairs/ small groups on specific topics followed by short structured talks, functional English: greetings and leave takings.

Reading: Identifying sequence of ideas; recognizing verbal techniques that help to link the ideas in aparagraph together.

Reading for Writing: Identifying the main ideas, rephrasing and summarizing them (précis writing); avoiding redundancies and repetitions.
Vocabulary: Technical vocabulary from across technical branches (20words).GRE Vocabulary Analogies (20 words), antonyms and synonyms, word applications.
Grammar: Articles, prepositions, conjunctions, use of synonyms and antonyms.

UNIT-III: Lesson: Stephen Hawking-Positivity' Benchmark' from *Infotech English*, MaruthiPublications. **Listening:** Listening for global comprehension and summarizing what is listenedto both in speaking and writing.
Speaking: Discussing specific topics in pairs or small groups and reporting whatis discussed. Functional English: complaining and apologizing.
Reading: Reading a text in detail by making basic inferences -recognizing: and interpreting specific context clues; strategies to use text clues for comprehension, critical reading.
Reading for Writing: Letter writing- types, format and principles of letterwriting, E-mail etiquette, writing a Resume/CV and covering letter.
Vocabulary: Technical vocabulary from across technical branches (20 words. GRE. Vocabulary 20words), Idioms & Phrasal verbs, Homonyms, wordapplications,sequencing of words.
Grammar: Sentence Structures, Transformation of sentences (Active and passive Voice, Degrees of comparison, Simple, Compound and Complex).

UNIT-IV: Lesson: Liking a Tree, Unbowed: Wangari Maathai biography from *Infotech English*, Maruthi Publications.
Listening: Making predictions while listening to conversations/ transactional dialogues without video (only audio), listening to audio-visual texts.

Speaking: Role plays for practice of conversational English in academic contexts(formal and informal) - asking for and giving information/directions. Functional English: asking for permissions, requesting,Inviting.

Reading: Studyingthe use of graphic elements in texts to convey information, reveal trends/patterns/relationships, communicative process or display complicated data.

Reading for Writing: Information transfer; describe, compare, contrast, identify significance/trends based on information provided in figures/charts/graphs/tables. Pamphlet writing, writing for media, writing SOP's.

Vocabulary: Technical vocabulary from across technical branches (20 words GRE Vocabulary (20words), antonyms and synonyms, word applications, cloze encounters, foreign phrases.

Grammar: Quantifying expressions - adjectives and adverbs: comparing and contrasting, question Tags, direct and indirect speech, reporting for academic purposes.

UNIT-V: Lesson: Stay Hungry–Stay Foolish from *Infotech English*, Maruthi Publications.

Listening: Identifying key terms, understanding concepts and interpreting theconcepts both in speaking and writing.

Speaking: Formal oral presentationsontopics from academic contexts–with/without the use of PPT slides. Functional English: Suggesting/Opiniongiving.

Reading: Reading for comprehension, RAP Strategy - intensive reading andextensivereading techniques. **Reading for Writing:** Report writing, writing academic proposals- writing researcharticles: format and style. **Vocabulary:** Technical vocabulary from across technical branches (20 words GRE 'Vocabulary (20 words, antonyms and synonyms, word applications, coherence, matchingemotions.

Grammar: Editing short texts — identifying and correcting common errors in grammar and usage (articles, prepositions, tenses, subject-verb agreement, parallel structures, phrases and clauses).

Course Outcomes for First Year First Semester Course	
Course Code: B20 HS 1101	
Course Title: ENGLISH	
CO-1	Identify the context, topic and pieces of specific information by understanding and responding to the social or transactional dialogues spoken by native speakers of English.
CO-2	Apply suitable strategies for skimming and scanning to get the main idea of a text and locate specific information.
CO-3	Build confidence and adapt themselves to the social and public discourses, discussions and presentations.
CO-4	Apply the principles of writing to paragraphs, arguments, essays and formal/informal communication.
CO-5	Construct sentences using proper grammatical structures and correct word forms.

SYLLABUS: MATHEMATICS-I (B20 BS 1101)

(LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS)

(Common to AIDS, CE, CSE, ECE, EEE, IT & ME)

UNIT-I: Linear systems of equations: Rank, Echelon form, Normal form, consistency of system of linear equations, Solution of unear systems by Gauss elimination, Jacobi and Gauss-Seidelmethods.

UNIT-II: Eigen values - Eigen vectors and Quadratic forms: Eigen values, Eigen vectors, Properties, Cayley- Hamilton theorem, Inverse and powers of a matrix using Cayley-Hamilton theorem, Reduction to diagonal form, Quadratic forms, Reduction of a Quadratic form to Canonical form.

UNIT-III: Differential equations of first order and first degree: Linear, Bernoulli, Exact, Reducible to exact types. Applications: Orthogonal trajectories, Newton's Law of cooling, Simple electrical circuits.(R-L and R-C circuits only)

UNIT-IV: Linear differential equations of higher order: Linear Non-homogeneous equations of higher order with constant coefficients with source (RHS) term of the type e^{ax}, sin ax, cos ax, polynomials in x, $e^{ax}V(x)$, x V(x). Simultaneous differential equations with constant coefficients, Method of Variation of parameters.

UNIT-V: Laplace transformation: Laplace transforms of standard functions, properties, transforms of tf(t), f(t)/t, transforms of derivatives and integrals, transforms of unit step function, Dirac delta function; Inverse Laplace transforms, convolution theorem (without proof).
Applications: Solving ordinary differential equations (initial value problems) using Laplace transforms.

Course Outcomes for First Year First Semester Course	
Course Code: B20BS1101	
Course Title: MATHEMATICS – I	
CO-1	Solve a given system of linear algebraic equations
CO-2	Determine Eigen values and Eigen vectors of a system represented by a matrix.
CO-3	Solve ordinary differential equations of first order and first degree.
CO-4	Apply the knowledge in simple applications such as Newton's law of cooling, orthogonal trajectories and simple electrical circuits
CO-5	Solve linear ordinary differential equations of second order and higher order.
CO-6	Determine Laplace transform, inverse Laplace transform and solve linear ODE

SYLLABUS: APPLIED PHYSICS (B20 BS1102)

(Common to AIDS, CE, EEE & ME)

UNIT-I: WAVE OPTICS: Interference: Principle of super position. Interference of light, interference in thin films (reflected light) – Wedge film and Newton`s rings – Applications
Diffraction: Types of diffraction, Fraunh offer diffraction at a single alit, Diffraction grating, grating spectrum. Missing order, Resolving power, Rayleigh's Criterion, Resolvingpower of Grating.

UNIT-II: DIELECTRICS AND MAGNETICS: Dielectrics : Introduction to dielectrics, Electric Polarization, Dielectric polariz ability, Susceptibility, Dielectric constant, Types of Polarization, Frequency dependence of Polarization, Internal field in a dielectric, Claussius and Mosotti equation, Applications of dielectrics.
Magnetics: Introduction to magnetics, Magnetic dipole moment , Magnetization, Magnetic susceptibility and Permeability, Origin of permanent magnetic moment, Classification of magnetic materials (Dia , Para, Ferro, Antiferro and ferri), Hysteresis – Weiss Domain theory – Ferrites, soft and hard magnetic materials, Magnetic device applications.

UNIT-III: LASERS AND FIBER OPTICS: Lasers: Introduction, Interaction of radiation with matter, condition for light amplification,Einstein's relations. Requirements of lasers device Types of lasers, Design and working of Ruby and He – Ne lasers, Laser characteristics and applications.
Fiber Optics: Introduction to optical fibers, Principle of light propagation in fiber, Acceptance angle, Numerical aperture, Modes of propagations, types of fibers, classification of fibers based on refractive index profile, applications of fibers with emphasis on fiber opticcommunication.

UNIT-IV: SEMICONDUCTORS: Introduction, intrinsic semi conductors, density of charge carries, Fermi energy, Electrical conductivity – Extrinsic semi conductors – P-type and N-type, Density of charge carriers, dependence of Fermi energy on carrier concentration and temperature, direct and indirect band – gap semi conductors, Hall effect, Applications of Hall effect. Drift and diffusion currents, Continuity equation, applications of semiconductors.

UNIT-V: ULTRASONICS AND NANOMATERIALS: Ultrasonics: Introduction, Production of Ultrasonics – Piezoelectric and Magnetostriction methods, detection of ultrasonics, acoustic grating - determination of wavelength and velocity of ultrasonics, applications of ultrasonics.
Nanomaterials: Introduction, salient features of Nanomaterials, Synthesis methods – Ball milling, Condensation,
Chemical Vapour Deposition and Sol – Gel methods, Characterization techniques for nano materials - The scanning tunneling microscopy (STM)and The atomic force microscopy (AFM), Carbon nanotubes (CNTS), Applications of Nano materials.

Course Outcomes for First Year First Semester Course	
Course Code: B20 BS1102	
Course Title: APPLIED PHYSICS	
CO-1	Interpret the behavior of light radiation in interference and diffraction Phenomena and their applications
CO-2	Explain the classification and properties of dielectric and magnetic materials suitable for engineering applications.
CO-3	Understand the basics of modern optical technologies like lasers and optical fibers and their utility in various fields
CO-4	Explain the important aspects of semiconductors and electrical conductivity in them
CO-5	Understand the basics of technology of Ultrasonics in various fields and demonstrate the synthesis and applications of nano materials.

SYLLABUS: ENGINEERING DRAWING
(B20ME1101)

(Common to CE, EEE & ME)

UNIT-I: Geometrical Constructions and Engineering Curves: Introduction to Engineering Drawing, Geometrical Constructions, Engineering Curves: Parabola, Ellipse and Hyperbola by general method (Eccentricity method only), cycloid, epicycloid, hypocycloid, involutes, tangent & normal for these curves.

UNIT-II: Orthographic Projections: Introduction to orthographic projection, projections of points invarious quadrants, projections of lines: lines perpendicular to one of the reference planes (HP,VP or PP), Projections of straight lines inclined to one reference plane and parallel to other, Projections of straight lines inclined to both the planes.

UNIT-III: Projections of planes: Regular planes perpendicular to one reference plane and parallel toother, planes perpendicular to one reference plane and inclined to the other reference plane; planes inclined to both the reference planes.

UNIT-IV: Projections of Solids: – Prisms, Pyramids, Cones and Cylinders with the axis inclined to one of the referenceplanes.
Sections of Solids: Sections and Sectional views of Right and Regular Solids – Prism, Cylinder, Pyramid and Cone – Auxiliaryviews.

UNIT-V: Development of Solids: Development of Surfaces of Right and Regular Solids – Prism, Cylinder, Pyramid and Cone.
Isometric Projection: Introduction to Isometric projection and Isometric projection of simple Right and Regular Solids – Prism, Cylinder, Pyramid and Cone.

Course Outcomes for First Year First Semester Course	
Course Code: B20ME1101	
Course Title: ENGINEERING DRAWING	
CO-1	Apply principles of drawing to Construct polygons and engineering curves.
CO-2	Apply principles of Orthographic projections to draw the projections of points and lines.
CO-3	Apply principles of drawing to draw the projections of planes.
CO-4	Apply principles of drawing to draw projections of solids and their sectional views.
CO-5	Apply principles of drawing to draw developments and pictorial view of solids.

SYLLABUS: ENGINEERING GEOLOGY
(B20CE1101)
(For CE)

UNIT-I: Introduction: Branches of Geology, Importance of Geology in Civil Engineering with casestudies.
Weathering: Weathering of rocks, Geological agents, weathering process of Rock,Geological work of rivers

UNIT-II: Mineralogy and Petrology: Definitions of mineral and rock-Different methods of study of mineral and rock. Physical properties of minerals and rocks for Megascopic study for the following minerals and rocks.
Common rock forming minerals: Feldspar, Quartz Group, Olivine, Augite, Hornblende, Mica Group, Asbestos, Talc, Chlorite, Kyanite, Garnet, Calcite.
Ore forming minerals are Pyrite, Hematite, Magnetite, Chlorite, Galena, Pyrolusite, Graphite, Chromite, Magnetite and Bauxite.
Classification, structures, textures and forms: Igneous rocks, Sedimentary rocks, Metamorphic rocks and Megascopic study of granite varieties, (pink, gray, green). Pegmatite, Dolerite, Basalt etc., Shale, Sand Stone, Lime Stone, Laterite, Quartzite, Gneiss, Schist, Marble, Khondalite and Slate.

UNIT-III: Structural Geology: Strike, Dip and Outcrop, study of common geological structuresassociated with the rocks such as Folds, Faults, Joints and Unconformities- parts, types, mechanism and their importance in CivilEngineering.

UNIT-IV: Ground Water: Water table, Cone of depression, Geological controls of Ground Water Movement, Ground Water Exploration Techniques.
Earthquakes and Land Slides: Terminology, Classification, causes and effects, Shield areas and Seismic bells, Richter scale intensity, Precautions of building constructions in seismic areas. Classification of Landslides, Causes and Effects, measures to be taken prevent their occurrence of Landslides.
Geophysics: Importance of Geophysical methods, Classification, Principles of Geophysical study by Gravity method, Magnetic method, Electrical methods, Seismic methods, Radiometric method and Electrical resistivity, Seismic refraction methods and Engineering properties ofrocks.

UNIT-V: Geology of Dams, Reservoirs and Tunnels: Types and purpose of Dams, Geological considerations in the selection of a Dam site. Geology consideration for successful constructions of reservoirs, Life of Reservoirs. Purpose of Tunneling, effects, Lining of Tunnels. Influence of Geology for successfulTunneling.

Course Outcomes for First Year First Semester Course	
Course Code: B20CE1101	
Course Title: ENGINEERING GEOLOGY	
CO-1	Understand the basic knowledge on the most central part of engineering geology
CO-2	Develop an appreciation of geologic processes and their influence in civil engineering works.
CO-3	Demonstrate the engineering properties of rock and soil materials.
CO-4	Apply basic knowledge of engineering geology and the importance of engineering geology related to technical issues during construction.
CO-5	Analyze the relevance of engineering geology in complex projects in and on solid rock.

SYLLABUS: ENGINEERING GEOLOGY LAB
(B20CE1102) (For CE)

1. Study of physical properties and identification ofminerals
2. Megascopic identification of rocks and their Engineeringproperties
3. Description and Identification of Geomorphologicalmodels
4. Description and Identification of Structural geologymodels
5. Simple Structural Geology problemsExercise1:

Course Outcomes for First Year First Semester Course	
Course Code: B20CE1102	
Course Title: ENGINEERING GEOLOGY LAB	
CO-1	Elucidate the mega-scopic identification of minerals
CO-2	Categorize the rocks according to mega-scopic description
CO-3	Interpret geological knowledge in various sectors
CO-4	Know the occurrence of materials using the strike & dip problems.

SYLLABUS: APPLIED PHYSICS LAB
(B20BS1107)

(Common to AIDS, CSE, ECE & IT)

1. DeterminationoftheWavelengthoflightfromasource–DiffractionGrating–Normalincidence.
2. Determination of radius of curvature of Plano convex lens – Newton's Rings.
3. Determination of the thickness of a thin spacer using interference – Air Wedge method.
4. DeterminationofMagneticfieldalongtheaxisofacurrentcarryingcoil–StewartandGee'sapparatus.
5. VerificationofLawsofseriesandparallelcombinationsofresistances–CareyFoster'sbridge.
6. Determination of Temperature Coefficient of Resistance of a thermistor.
7. To study the characteristics of PN Junction diode.
8. To determine the Numerical aperture of a given optical fiber and hence to find its acceptance angle.
9. Determination of Planck constant
10. Determination of the Rigidity modulus of elasticity of a material – Torsional pendulum.
11. Verification of the laws of vibrations in stretched stings -Sonometer.
12. Determination of the frequency of the AC supply – AC Sonometer.
13. To determine refractive indices (μo and μe) of a birefringent material (prism).

Course Outcomes for First Year First Semester Course	
Course Code: B20BS1107	
Course Title: APPLIED PHYSICS LAB	
CO-1	Get hands on experience in setting up experiments and using the instruments / equipment individually
CO-2	Get introduced to using new / advanced technologies and understand their significance.

SYLLABUS: BASICS OF CIVIL ENGINEERING WORK SHOP

(B20 CE 1103)

(For CE)

LIST OF PROGRAMS:

1. Demonstration on usage of chain
2. Ranging – offsets –chain age
3. To find the area of an irregular polygon using chain by using horizontal measurement
4. Demonstration on various Building materials used in construction
5. Estimation of quantity of bricks, concrete, wood, paint for the given single room building.
6. Masonry work hands – on practice work different types of bonds in brick masonry.
7. Identification of quality of brick through physical tests
8. Identification of soil based on their physical properties
9. Setting out of building: The student is required to set out a building (Single room only) as per the given building plan using tape and cross staff
10. Demonstration on Installation of simple sanitary fittings and fixtures like Tap, T-joint, Elbow, bend, thread in get c.
11. Computation of Centre of gravity and moment of inertia of (i) I-section and (ii) Channel section.
12. Welding (arc welding and gas welding)(Demonstration)
13. Carpentry(Demonstration)
14. Identify different types of roads in the campus and write the physical characteristics of layers
15. Demonstration on making of cement mortar/concrete for the given nominal mix

Course Outcomes for First Year First Semester Course	
Course Code: B20CE1103	
Course Title: BASICS OF CIVIL ENGINEERING WORK SHOP	
CO-1	Identify various components of a building and give lump-sum estimate
CO-2	Determine distances and irregular areas using conventional survey instruments like chain, tape and cross- staff.
CO-3	Identify different soils
CO-4	Determine centre of gravity and moment of inertia of channel and I-sections
CO-5	Prepare a single room building plan as per the building byelaws
CO-6	Select simple sanitary fitting
CO-7	Illustrate the process of making cement mortar / concrete for nominal mix

CIVIL ENGINEERING

SYLLABUS : MATHEMATICS – II (B20 BS 1201)

(FOURIER ANALYSIS AND PARTIAL DIFFERENTIALEQUATIONS)

(Common to AIDS, CE, CSE, ECE, EEE, IT & ME)

UNIT-I: Fourier Series: Introduction, Periodic functions, Fourier series of a periodic function, Dirichlet's conditions, Change of interval. Even and odd functions, Half-range sine and cosine series.

UNIT-II: Fourier Transforms: Fourier integral theorem (without proof), Complex form of Fourier integral, Fourier sine and cosine integrals, Fourier transform, Fourier sine and cosine transforms, Finite Fourier transforms, properties, inverse transforms, Parseval's Identities.

UNIT-III: Partial differentiation: Introduction, Homogeneous functions, Euler's theorem, Chain rule, Total derivative, Jacobians and their properties. Applications: Taylor series expansion for a function of two variables, Maxima and Minima of functions of two variables with and without constraints, Lagrange's method. Leibnitz's rules for differentiation under integral sign.

UNIT-IV: First order and higher order partial differential equations: Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions, solutions of Lagrange linear equation. Solutions of Linear homogeneous and non-homogeneous partial differential equations with constant coefficients –source (RHS) terms of the type e^{ax+by}, sin (ax+by), cos (ax+by), $x^m y^n$.

UNIT-V: Applications of partial differential equations: Method of separation of variables, One–dimensional wave equation, the D'Alembert's solution, one- dimensional heat equation.

Course Outcomes for First Year Second Semester Course	
Course Code: B20 BS 1201	
Course Title: MATHEMATICS–II	
CO-1	Determine Fourier series and half range series of functions.
CO-2	Determine Fourier transforms of non-periodic functions and also use them to evaluate integrals
CO-3	Compute partial derivatives, total derivative and Jacobians.
CO-4	Find maxima/minima of functions of two variables and evaluate some real definite integrals.
CO-5	Identify the discourse features, and improve intensive and extensive reading skills Form partial differential equations and solve Lagrange linear equation. Solve linear higher order homogeneous and non-homogeneous PDEs
CO-6	Find theoretical solution of one-dimensional wave equation and one-dimensional heat equation

SYLLABUS: APPLIED CHEMISTRY
(B20 BS 1203)(Common to AIDS, CE, EEE & ME)

UNIT-I: High Polymers and Plastics; Rubbers & Elastomers: Polymerization Definition, Types of Polymerization, free radical Mechanism of addition polymerization, Plastics as engineering materials, Thermoplastics and Thermosetting plastics, Compounding of plastics, Fabrication of plastics (4 techniques); Preparation, Properties and applications of Polyethylene, PVC, Bakelite, Nylon - 6,6, Bullet Proof plastics -polycarbonate and Kelvar; Fiber reinforced plastics, conducting polymers, Biodegradable Polymers - PHBV, Nylon 2, Nylon 6. Natural rubber – Vulcanization – Compounding of Rubber; Preparation, properties and applications of Buna – S; Buna – N;

UNIT-II: Energy Sources and Applications: Nuclear Energy: Nuclear fission and Nuclear fusion – Nuclear Power reactor – Applications. Thermal fuels – Introduction – Classification – Calorific value – HCV and LCV – Bomb calorimeter; Coal : Proximate and ultimate analysis of coal – Significance of the analysis – Manufacture of coke by Otto Hoffman's by Product Process , Refining crude oil; Knocking; Chemical structure-Knocking, Octane number of gasoline, Cetane number of diesel oil, synthetic Petrol; LPG,CNG.

UNIT-III: Electrochemical cells and Corrosion: Galvanic cell, single electrode potential, Calomel electrode; Modern batteries: - Lead – Acid battery; Fuel cells- Hydrogen – Oxygen fuel cell, Lithium battery Theories of corrosion (i) dry Corrosion (ii) wet corrosion. Types of corrosion - differential aeration corrosion, pitting corrosion, galvanic corrosion, stress corrosion, Factors influencing corrosion, Protection from corrosion-material selection & design, cathodic protection, Protective coatings- metallic coatings – Galvanizing, Tinning, Electroplating; Electrro less plating ; Paints.

UNIT-IV: Water technology: Sources of water – Hardness of water – Estimation of hardness of water by EDTA method; Boiler troubles – sludge and scale formation, Boiler corrosion, caustic embrittlement, Priming and foaming; Softening of water by Lime – Soda Process, Zeo lite Process, Ion – Exchange Process; Municipal water treatment; Desalination of sea water by Electro dialysis and Reverse osmosis methods.

UNIT-V: Chemistry of Engineering Materials& Advanced Engineering materials: Cement:- Manufacture of Portland cement, setting and hardening of cement, Deterioration of cement concrete. **Refractories:** Definition, Characteristics, classification, Properties and failure of re factories.

Solar Energy: Construction and working of Photovoltaic cell, applications.

Solid State Materials: Crystal imperfections, Semi Conductors, Classification and chemistry of semi conductors: Intrinsic semiconductors; Extrinsic semiconductors; Defect semiconductors, Compound Semiconductors and Organic Semiconductors.

Liquid Crystals: - Definition – Classification with examples – Applications

Course Outcomes for First Year Second Semester Course	
Course Code: B20 BS 1203	
Course Title: APPLIED CHEMISTRY	
CO-1	Develop polymer composites, synthetic polymers and formulation of polymers and their use in design
CO-2	Apply the knowledge about quality of water and its treatment methods for domestic and industrial applications. Understanding the principle, mechanism of corrosion and utilization of various techniques to control.
CO-3	Develop the knowledge of fuels and their economics, advantages and limitations. Make use of the basic concepts of semiconductors and liquid crystals for engineering applications.
CO-4	Identify constituents of various ceramic materials, characteristics and their appropriate use in construction. Apply the knowledge of electrochemistry principles to design energy storage

SYLLABUS: PROGRAMMING FOR PROBLEM SOLVING USING C (B20CS1201)

(Common to CE, EEE &ME)

UNIT-I: Introduction to Computers: Creating and running Programs, Computer Numbering System, Storing Integers, Storing Real Numbers Introduction to the C Language: Background, C Programs, Identifiers, Types, Variable, Constants, Input/output, Programming Examples, Scope, Storage Classes and Type Qualifiers. Structure of a C Program: Expressions Precedence and Associativity, Side Effects, Evaluating Expressions, Type Conversion Statements, Simple Programs, Command Line Arguments.

UNIT-II: Bitwise Operators: Exact Size Integer Types, Logical Bitwise Operators, Shift Operators. Selection & Making Decisions: Logical Data and Operators, Two Way Selection, Multiway Selection, More Standard Functions. Repetition: Concept of Loop, Pretest and Post-test Loops, Initialization and Updating, Event and Counter Controlled Loops, Loops in C, Other Statements Related to Looping, Looping Applications, Programming Examples.

UNIT-III: Arrays: Concepts, Using Array in C, Array Application, Two Dimensional Arrays, Multidimensional Arrays, Programming Example – Calculate Averages Strings: String Concepts, C String, String Input / Output Functions, Arrays of Strings, String Manipulation Functions String/ Data Conversion, A Programming Example – Morse Code Enumerated, Structure, and Union: The Type Definition (Type def), Enumerated Types, Structure, Unions, and ProgrammingApplication.

UNIT-IV: Pointers: Introduction, Pointers to pointers, Compatibility, L value and R value Pointer Applications: Arrays, and Pointers, Pointer Arithmetic and Arrays, Memory Allocation Function, Array of Pointers, Programming Application. Processor Commands: Processor
Commands.

UNIT-V: Functions: Designing, Structured Programs, Function in C, User Defined Functions, Inter Function Communication, Standard Functions, Passing Array to Functions, Passing Pointers to Functions, Recursion Text Input / Output: Files, Streams, Standard Library Input / Output Functions, Formatting Input / Output Functions, Character Input / Output Functions Binary Input / Output: Text versus Binary Streams, Standard Library, Functions for Files, Converting File Type.

Course Outcomes for First Year First Semester Course	
Course Code: B20CS1201	
Course Title: PROGRAMMING FOR PROBLEM SOLVING USING C	
CO-1	Apply Precedence and Associativity rules to evaluate Expressions.
CO-2	Make use of Decision Making and Looping statements to solve various problems in C.
CO-3	Illustrate the importance of Arrays and Strings and to apply various operations on them.
CO-4	Solve various problems by making use of Structure and Union concepts.
CO-5	Design and implement programs to analyze the different pointer applications
CO-6	Develop programs using Functions and Pointers.

SYLLABUS: ENGINEERING MECHANICS (B20CE1201)

(For CE)

UNIT-I: Resultant and Equilibrium of Concurrent forces in a plane, Friction – Coulombs laws of dry friction– Limiting friction, Problems on Wedge friction.

UNIT-II: Parallel forces in a plane; Centroid and Moment of inertia {areas and masses}, radius of gyration, parallel axis theorem, Principle axes. Composite sections.

UNIT-III: General Case of Forces in a Plane, Resultant and equilibrium of general case of forces in a plane, Statically determinate plane trusses-Method of joints and Method of sections (Trusses NOT more than 9 members). Introduction to Principle of virtual work.

UNIT-IV: Kinematics of particles – rectilinear & curvilinear motion, rectangular components, tangential & normal components. Kinetics of particles –Newton's second law, Energy method, Impulse & momentum method.

UNIT-V: Kinematics of rigid bodies – translation, rotation, plane motion, instantaneous centre of rotation. Plane motion of rigid bodies – forces & acceleration, D'Alembert's principle, energy & momentum methods.

Course Outcomes for First Year Second Semester Course	
Course Code: B20CE1201	
Course Title: ENGINEERING MECHANICS	
CO-1	Apply laws of mechanics for various force conditions and properties of bodies
CO-2	Calculate Centroid and moment of inertia of plane figures
CO-3	Apply laws of mechanics for general case of forces in plane
CO-4	Apply laws of kinematics and kinetics to particles
CO-5	Apply laws of kinematics and kinetics to rigid bodies

SYLLABUS: BUILDING MATERIALS AND CONCRETE TECHNOLOGY (B20CE1202)

(For CE)

UNIT-I: Stones, Bricks, Tiles and Wood: Stones: Classification of Stones – Properties of stones in structural requirements **Bricks:** Composition of good brick earth, Various methods of manufacturing of bricks

Tiles: Characteristics of good tile – Manufacturing methods, Types of tiles

Wood: Structure – Properties – Seasoning of timber – Classification of various types of woods used in buildings – Defects in timber

UNIT-II: Cement and Admixtures Portland: Cement: Chemical composition, Hydration- Bogues Compounds, Structure of hydrated cement – Setting of cement, Fineness of cement, Tests for physical properties – Different grades of cements

Admixtures: Mineral and Chemical admixtures**,** Fly ash, GGBS, Silica fume, Rice husk ash, Calcinated ash (Basic properties and their contribution to concrete strength)

UNIT-III: Aggregates: Aggregates: Classification of aggregate, Bond, Strength and other mechanical properties of aggregate, Physical properties of aggregate, bulking of sand, Deleterious substance in aggregate, Soundness of aggregate, Alkali-Aggregate reaction – Thermal properties, Sieve analysis – Fineness modulus – Grading curves – Grading of fine and coarse aggregates as per relevant IS code.

UNIT-IV: Fresh Concrete: Manufacture of concrete – Mixing and vibration of concrete, Workability – Segregation and bleeding – Factors affecting workability, Measurement of workability by different tests, Effect of time and temperature on workability – Quality of mixing water, Ready mix concrete, Shotcrete. BIS method of mix design.

UNIT-V: Hardened Concrete: Water / Cement ratio – Abram's Law – Gel space ratio – Nature of strength of concrete – Maturity concept – Strength in tension & compression – Factors affecting strength – Relation between compression & tensile strength.

Testing of Hardened Concrete:- Compression tests – Tension tests– Flexure tests –Splitting tests – Non-destructive testing methods and their codal provisions.

Course Outcomes for First Year Second Semester Course	
Course Code: B20CE1202	
Course Title: BUILDING MATERIALS AND CONCRETE TECHNOLOGY	
CO-1	Identify various engineering properties of building construction materials and suggest their suitability
CO-2	Describe the functional role of various ingredients of concrete
CO-3	Use the workability and durability requirements of fresh concrete to design the concrete mix as per IS code
CO-4	Use the fundamental knowledge to know and test the hardened properties of concrete

SYLLABUS: APPLIED CHEMISTRY LAB (B20BS1208)

(Common to AIDS, CE, EEE & ME)

LIST OF PROGRAMS:

1. Determination of Alkalinity of water sample.
2. Determination of total hardness of water by EDTA method.
3. Estimation of Ferrous Iron by $KMnO_4$.
4. Estimation of oxalic acid by $KMnO_4$.
5. Estimation of Mohr's salt by $K_2Cr_2O_7$.
6. Estimation of Dissolved oxygen by Winkler's method.
7. Determination of pH of water and soil sample.
8. Determination of Chlorides present in water sample.
9. Conducto metric titration of strong acid Vs strong base.
10. Potentio metric titration of strong acid Vs strong base.
11. Potentio metric titration of strong acid Vs weak base.
12. Preparation of Phenol formal dehyderesin.
13. Determination of saponification value of oils.
14. Determination of pour and cloud points of lubricating oil.
15. Determination of Acid value of oil.

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1208	
Course Title: APPLIED CHEMISTRY LAB	
CO-1	Gain technical knowledge of measuring, operating and testing of chemical instruments and equipments. Carrying out different types of chemical reactions for analysing different materials in micro level quantities
CO-2	Analyze and generate experimental skills to enhance the analytical thinking capabilities in the modern trends in engineering and technology

SYLLABUS: COMMUNICATION SKILLS LAB
(B20HS1202)

(Common to AIDS, CE, CSE, ECE, EEE, IT & ME)

UNIT-I: A list of communicative expressions (Requests, Permissions, Asking/ giving directions, Thanking and Responding to Thanks, Clarifying, Inviting, Congratulating, Advising, Agreeing and disagreeing etc.,) Common Errors.

UNIT-II: Pronunciation Letters and Sounds The Sounds of English Stress and Intonation Phonetic Transcription.

UNIT-III: Group Discussions.

UNIT-IV: Presentation Skills

UNIT-V: Interview Skills, Resume/ Curriculum Vitae Covering Letter, FAQ's, Telephonic Interviews/ Etiquette Mock Interviews.

Course Outcomes for First Year Second Semester Course	
Course Code: B20HS1202	
Course Title: COMMUNICATION SKILLS LAB	
CO-1	Apply their linguistic competence in all LSRW skills to professional and personal settings
CO-2	Apply communication skills learnt through various language learning activities to their advancement in academics and competitive examinations.
CO-3	Draft job application letters, E-Mail messages and other writing discourses.
CO-4	Adopt professional etiquette consistent with formal settings
CO-5	Improve fluency and clarity in both spoken and written English

SYLLABUS: PROGRAMMING FOR PROBLEM SOLVING USING C LAB

(B20CS1205) (Common to AIDS, CSE, ECE & IT)

1. Exercise1:
    1. Write a C program to print a block F using hash (#), where the F has a height of six characters and width of five and four characters.
    2. Write a C program to compute the perimeter and area of a rectangle with a height of 7 inches and width of 5inches.
    3. Write a C program to display multiple variables.
2. Exercise2:
    1. Write a C program to calculate the distance between the two points.
    2. Write a C program that accepts 4 integers p,q, r,s from the user where rands are positive and p is even. If q is greater than r and s is greater than p and if the sum of r and s is greater than the sum of p and q print "Correct values", otherwise print "Wrong values".
3. Exercise3:
    1. Write a C program to convert a string to a long integer.
    2. Write a program in C which is a Menu-Driven Program to compute the area of the various geo metrical shape.
    3. Write a C program to calculate the factorial of a given number.
4. Exercise4:
    1. Write a program in C to display the n terms of even natural number and their sum.
    2. Write a program in C to display the n terms of harmonic series and their sum. 1 + 1/2 + 1/3 +1/4+ 1/5 ... 1/n terms.
    3. Write a C program to check whether a given number is an Armstrong number or not.
5. Exercise5:
    1. Write a program in C to print all unique elements in an array.
    2. Write a program in C to separate odd and even integers in separate arrays.
    3. Write a program in C to sort elements of array in ascending order.
6. Exercise6:
    1. Write a program in C for multiplication of two square Matrices.
    2. Write a program in C to find transpose of a given matrix.
7. Exercise7:
    1. Write a program in C to search an element in a row wise and column wise sorted matrix.
    2. Write a program in C to print individual characters of string in reverse order.
8. Exercise8:
    1. Write a program in C to compare two strings without using string library functions.
    2. Write a program in C to copy one string to another string.
9. Exercise9:
    1. Write a C Program to Store Information Using Structures with Dynamically Memory Allocation.
    2. Write a program in C to demonstrate how to handle the pointers in the program.
10. Exercise10:
    1. Write a program in C to demonstrate the use of & (address of) and*(value at address) operator.
    2. Write a program in C to add two numbers using pointers
11. Exercise11:
    1. Write a program in C to add numbers using call by reference.
    2. Write a program in C to find the largest element using Dynamic Memory Allocation
12. Exercise12:
    1. Write a program in C to swap elements using call by reference.

2. Write a program in C to count the number of vowels and consonants in a string using a pointer.

13. Exercise13:
    1. Write a program in C to show how a function returning pointer.
    2. Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using malloc ( )function
14. Exercise14:
    1. Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using calloc ( ) function. Understand the difference between the above two program.
    2. Write a program in C to convert decimal number to binary number using the function.
15. Exercise15:
    1. Write a program in C to check whether a number is a prime number or not using the function.
    2. Write a program in C to get the largest element of an array using the function.
16. Exercise16:
    1. Write a program in C to append multiple lines at the end of a text file.
    2. Write a program in C to copy a file in another name.
    3. Write a program in C to remove a file from the disk.

Course Outcomes for First Year First Semester Course	
Course Code: B20CS1205	
Course Title: PROGRAMMING FOR PROBLEM SOLVING USING C LAB	
CO-1	Write, Trace and Debug the programs and correct syntax and logical errors..
CO-2	Solve various Problems by making use of Arrays, Strings, Structures, Unions and Pointers
CO-3	Solve a complex problem by decomposing into several modules by using Functions
CO-4	Apply various File I/O operations

COMPUTER SCIENCE & BUSINESS SYSTEM

COMPUTER SCIENCE & BUSINESS SYSTEM SYLLABUS: DISCRETE MATHEMATICS (B20 BS1104) (For CSBS)

UNIT-I : Logic: Propositional calculus - propositions and connectives, syntax; Semantics –truth assignments and truth tables, validity and satisfy ability, tautology; Adequate set of connectives; Equivalence and normal forms; Compactness and resolution; Formal reducibility - natural deduction system and axiom system; Soundness and completeness.

UNIT-II: Boolean algebra: Introduction of Boolean algebra, truth table, basic logic gate, basic postulates of Boolean algebra, principle of duality, canonical form, Karnaughmap.

UNIT-III: Abstract Algebra: Set, relations and their properties, binary operations, algebraic system, semi group, monoid, groups and their properties, subgroup, simple examples, ring –definition and example, field – definition and example.

UNIT-IV: Combinatorics: Basic counting, balls and bins problems, generating functions, recurrence relations, Methods of solving recurrence relations, principle of mathematical induction, pigeonhole principle, principle of inclusion-exclusion and relatedproblems.

UNIT-V: Graph Theory: Graphs and digraphs, complement, isomorphism, connectedness and reachability, adjacency matrix, Eulerian paths and circuits in graphs and digraphs, Hamiltonian paths and circuits in graphs and tournaments, trees and their properties; Planar graphs, Euler‟s formula, dual of a planer graph, independence number and clique number, chromatic number, statement of Four-color theorem.

Course Outcomes for First Year First Semester Course	
Course Code: B20 BS1104	
Course Title: DISCRETE MATHEMATICS	
CO-1	Translate the arguments using propositions and predicates to verify their validity.
CO-2	Utilize Boolean expressions and their simplifications.
CO-3	Make use of sets & relations in different functioning procedures.
CO-4	Illustrate the properties of Groups, Rings, Fields.
CO-5	Solve different counting problems and recurrence relations.
CO-6	Apply graph theory techniques to solve some problems related to computer science.

SYLLABUS: INTRODUCTORY TOPICS IN STATISTICS, PROBABILITY AND CALCULUS

(B20BS1105)(For CSBS)

UNIT-I: Introduction to Statistics: Definition of Statistics. Basic objectives. Applications in various branches of science with examples. Collection of Data: Internal and external data, Primary and secondary Data. Population and sample, Representative sample. Descriptive Statistics: Classification and tabulation of uni variate data, graphical representation, Frequency curves. Central tendency (Mean, Median and Mode) and dispersion (S.D, M.D, Q.D and Range). Bivariate data. Summarization, marginal and conditional frequency distribution.

UNIT-II: Probability: Concept of experiments, sample space, event. Classical definition of Probability, axiomaticapproach.AdditionandMultiplicationlawsofProbabilityConditionalProbability,Baye‟sTheorem.

UNIT-III: Expected values and moments: Review of basic concepts of Random Variable **(no questions may be set on review).** Mathematical expectation and its properties, Moments (including variance) and their properties, interpretation, Moment generating function.
Discrete Probability Distributions: Binomial, Poisson and Geometric distributions - Definition, Mean, Variance, moments, m.g.f., Characteristic function and applications.

UNIT-IV: Continuous Probability Distributions: Uniform Distribution-Mean, variance and moments. Normal Distribution- Mean, Variance, m.g.f., Characteristic function, Applications of Normal Distribution. Exponential Distribution- Mean, Variance and Memory less property of Exponential distribution. Chi-square, Student - t and F Distributions-Definition, Characteristics like mean, variance and applications **(without proofs)**.

UNIT-V: Multi variable calculus– Functions of two variables, Partial differentiation, Homogeneous functions, Total derivative, Jacobians, Maxima and Minima of functions two variables.
Basic Concepts of Double integrals, change of variables, change of order of integration and applications of double integral to find Areas of plane regions.

Course Outcomes for First Year First Semester Course	
Course Code: B20BS1105	
Course Title: INTRODUCTORY TOPICS IN STATISTICS, PROBABILITY AND CALCULUS	
CO-1	Understand the concepts of data science and their applications.
CO-2	Make use of the concepts of probability and their applications.
CO-3	Understand the concepts of Expectations and Moment generating function. Apply discrete probability distributions.
CO-4	Predict the discrete distribution suitable for the given data from its moments.
CO-5	Predict the continuous distribution suitable for the given data from its moments
CO-6	Understand the concepts of calculus and application of double integral.

SYLLABUS: FUNDAMENTALS OF PHYSICS
(B20BS1106)
(For CSBS)

UNIT-I: Oscillations: Periodic motion-simple harmonic motion-characteristics of simple harmonic motion- vibration of simple spring-mass system, damped harmonic oscillator – heavy, critical and light damping, energy decay in a damped harmonic oscillator, forced oscillations and resonance in mechanical and electrical systems, qualityfactor.

UNIT-II: Wave Optics: Theory of interference fringes – types of Interference-Fresnel‟ sprismNewton‟srings,Diffraction-twokindsofdiffraction-Differencebetweeninterference and diffraction- Fraunhofer diffraction at single slit, plane diffraction grating; temporal andspatial coherence;
Polarization - concept of production of polarized beam of light from two SHM acting at right angle; plane,ellipticalandcircularlypolarizedlight,Brewster‟slaw,double refraction.

UNIT-III: Quantum Mechanics: Introduction-Planck‟s quantum theory-Matter waves, de-Broglie wave length,Heisenberg‟sUncertaintyprinciple,time-independentandtime-dependentSchrödingerwaveequation, physical significance of wave function, particle in a one dimensional potential well, Heisenbergpicture.
Crystallography: Basic terms-types of crystal systems, Bravais lattices, Miller indices, d- spacing, Atomic packing factor for SC, BCC, FCC and HCP structures.
Solid State Physics: Conductor, Semiconductor and Insulator; Basic concept of Bandtheory.

UNIT-IV: Lasers and Fiber Optics: Einstein‟s theory of matter-radiation interaction and A and B coefficients; amplification of light by population inversion, different types of lasers: Ruby, CO2 and Neodymium lasers; properties of laser beams: mono- chromaticity, coherence, directionality and brightness, laser speckles, applications of lasers in engineering. Fiber optics and applications, types of optical fibers.

UNIT-V: Thermodynamics: Zeroth law of thermodynamics, first law of thermodynamics, brief discussion on application of first law, second law of thermodynamics and concept of engine, entropy, change in entropy in reversible and irreversible processes, third law of thermodynamics.

Course Outcomes for First Year First Semester Course	
Course Code: B20BS1106	
Course Title: FUNDAMENTALS OF PHYSICS	
CO-1	Use the fundamentals of oscillatory systems and the analogy of mechanical and electrical systems.
CO-2	Use interference, diffraction and polarization in optical systems
CO-3	Apply the fundamentals of quantum mechanics, crystallography and solid state physics.
CO-4	Describe the working of a few commonly used lasers.
CO-5	Classify optical fibers and describe their applications.
CO-6	Use the three laws of thermodynamics and apply them to a heat engine.

SYLLABUS: PRINCIPLES OF ELECTRICAL ENGINEERING (B20EE1103) (For CSBS)

UNIT-I: Basic concepts of Electrical circuits: Concept of Potential difference, voltage, current, Fundamental linear passive and active elements to their functional current-voltage relation, voltage sources and current sources, ideal and practical sources, concept of dependent and independent sources, Kirchhoff-s laws and applications to network solutions using mesh and nodal analysis, Concept of work, power and energy.

UNIT-II: DC Circuits: Current-voltage relations of the electric network by mathematical equations to analyze the network (Thevenin's theorem, Norton's Theorem, Maximum Power Transfer theorem), Superposition theorem. Simplifications of networks using series-parallel, Star/Delta transformation.

UNIT-III: AC Circuits: AC waveform definitions, form factor, peak factor, study of R-L, R-C, RLC series circuit, phasor representation in polar and rectangular form, concept of impedance, admittance, active, reactive, apparent and complex power, power factor. Introduction to 3 phase Balanced AC Circuits, voltage and current relations (Y-Δconnection).

UNIT-IV: Electrostatics and Electromagnetism: Electrostatic field, electric field strength, concept of permittivity in dielectrics, capacitors, capacitors in series and parallel, energy stored in capacitors, charging and discharging of capacitors. Magnetic field and Faraday's law, self and mutual inductance. Single phase transformer, principle of operation, EMF equation, voltage ratio, current ratio, KVA rating, efficiency. Principle of batteries, types and applications.

UNIT-V: Measurements, Sensors and Safety: Introduction to measuring devices/sensors and transducers (Piezoelectric and thermo-couple) related to electrical signals, Elementary methods for the measurement of single-phase power. Electrical Wiring: Basic layout of the distribution system, necessity of earthing, types of earthing, Safety devices & system.

Course Outcomes for First Year First Semester Course	
Course Code: B20EE1103	
Course Title: PRINCIPLES OF ELECTRICAL ENGINEERING	
CO-1	**Apply** Mesh and Nodal analysis to solve the circuits and conduct experiments to verify Ohm's law and Kirchhoff's laws for electrical circuits.
CO-2	**Apply** Network theorems and transformation techniques to solve DC circuits and conduct experiments to verify Network theorems for given electrical circuits.
CO-3	**Calculate** form factor, peak factor and determine power in AC circuits and conduct experiment to measure the power in AC circuit and determine the parameters of iron core inductor.
CO-4	**Apply** the concepts of electrostatics and electromagnetism to understand the operation of capacitor and transformer and conduct the experiment to determine the performance of single phase transformer.
CO-5	**Understand and apply** electrical safety measures while handling electrical equipment.

SYLLABUS: FUNDAMENTALS OF COMPUTER SCIENCE & PROGRAMMING (B20CB1101)

(Common to AIDS & IT)

UNIT-I: General problem-solving concepts: Algorithm, and Flowchart for problem solving with Sequential Logic Structure, Decisions and Loops.
Imperative languages: Introduction to imperative language; syntax and constructs of a specific language (ANSI C) **Types Operator and Expressions with discussion of variable naming and Hungarian Notation:** Variable Names, Data Type and Sizes (Little Endian Big Endian), Constants, Declarations, Arithmetic Operators, Relational Operators, Logical Operators, Type Conversion, Increment Decrement Operators, Bitwise Operators, Assignment Operators and Expressions, Precedence and Order of Evaluation, proper variable naming and Hungarian Notation.

UNIT-II: Control Flow with discussion on structured and unstructured programming: Statements and Blocks, If- Else-If, Switch, Loops – while, do, for, break and continue, gotoLabels, structured and unstructured programming.
Functions and Program Structure with discussion on standard library: Basics of functions, parameter passing and returning type, C main return as integer, External, Auto,Local, Static, Register Variables, Scope Rules, Block structure, Initialization, Recursion, Preprocessor, Standard Library Functions and returntypes.

UNIT-III: Pointers and Arrays: Pointers and address, Pointers and Function Arguments, Pointers and Arrays, Address Arithmetic, character Pointers and Functions, Pointer Arrays, Pointer to Pointer, Multi-dimensional array and Row/column major formats, Initialization of Pointer Arrays, Command line arguments, Pointer to functions, complicated declarations and how they areevaluated.

UNIT-IV: Structures: Basic Structures, Structures and Functions, Array of structures, Pointer ofstructures, Self- referral Structures, Table look-up, Typedef, Unions, Bit-fields.
Input and Output: Standard I/O, Formatted Output – printf, formatted Input – scanf, Variable length argument list.

UNIT-V: File: file access including FILE structure, fopen, stdin, stdout and stderr, Error Handling including exit, p error and error.h, Line I/O, related miscellaneous functions.
Unix system Interface: File Descriptor, Low level I/O – read and write, Open, create, close and unlink, Random access– lseek, Discussions on Listing Directory, Storage allocator.
Programming Method: Debugging, Macro, User Defined Header, User Defined Library Function, make file utility.

Course Outcomes for First Year First Semester Course	
Course Code: B20CB1101	
Course Title: FUNDAMENTALS OF COMPUTER SCIENCE & PROGRAMMING	
CO-1	**Develop** the algorithms, Programs and draw flowcharts for solving Mathematical and Engineering problems using basic elements like variables, operators and expressions.
CO-2	**Utilize** control statements, Functions to develop structured and unstructured programs and apply code reusability with user defined functions.
CO-3	**Develop** programs using arrays and pointers to implement static and dynamic memory allocation.
CO-4	**Design**, implement, test and debug programs that use Structures and I/O operations.
CO-5	**Develop** C programs for simple applications using files.

SYLLABUS: BUSINESS COMMUNICATION & VALUE SCIENCE - I LAB (B20CS1103)

(Common to AIDS, CSE, ECE & IT)

1. Exercise-1: **Overview of LOL** (include activity on introducing self)
   Class activity – presentation on favorite cricket captain in IPL and the skills and values they demonstrate.
   Self-work with immersion – interview a maid, watchman, sweeper, cab driver, beggar and narrate what you think are the values that drive them
2. Exercise 2:**Activity**: Write a newspaper report on an IPL match
   Activity: Record a conversation between a celebrity and an interviewer.
   Quiz Time, Self-awareness – identity, body awareness, stress management
3. Exercise3: **Essential Grammar–I:** Refresher on Parts of Speech–Listen to an audio clip and note down the different parts of speech followed by discussion
   Tenses: Applications of tenses in Functional Grammar – Take a quiz and then discuss
   Sentence formation (general & Technical), Common errors, Voices. Show sequence from film where a character uses wrong sentence structure (e.g. Zindagi Na Milegi Do bara where the characters use the‟ before every word)
4. Exercise4:**CommunicationSkills:**OverviewofCommunicationSkills,Barriersofcommunication,Effective communication
   Types of communication- verbal and non – verbal – Role-play based learning **Importance of Questioning,**
   Listening Skills: Law of nature- Importance of listening skills, Difference between listening and hearing, Types of listening.
5. Exercise 5: **Expressing self**, connecting with emotions, visualizing and experiencing purpose
   Activity: Skit based on communication skills
   Evaluation on Listening skills – listen to recording and answer questions based on them
6. Exercise 6: **Email writing**: Formal and informal emails, activity
   Verbal communication: Pronunciation, clarity of speech
7. Exercise 7: **Vocabulary Enrichment:** Exposure to words from General Service List (GSL) by West, Academic word list (AWL) technical specific terms related to the field of technology, phrases, idioms, significant abbreviations formal business vocabulary–Read Economic Times, Reader‟s Digest, National Geographic and take partina GD, using the words you learnt/liked from the articles. Group discussion using words learnt. **Practice:** Toastmaster style Table Topics speech with evaluation.
8. Exercise 8: **Written Communication**: Summary writing, story writing
   Build your CV – start writing your comprehensive CV including every achievement in your life, no format, no page limit
   Project: Create a podcast on a topic that will interest college students
   Life skill: Stress management, working with rhythm and balance, colours, and teamwork
9. Exercise 9: **Understanding Life Skills:** Movie based learning – **Pursuit of Happiness.** What are the skills and values you can identify, what can you relate to?
   Introduction to life skills: What are the critical life skills.
10. Exercise 10: **Life skill:** Community service – work with an NGO and make a presentation
    Life skill: Join a trek – Values to be learned: Leadership, teamwork, dealing with ambiguity, managing stress, motivating people, creativity, result orientation.

Course Outcomes for First Year First Semester Course	
Course Code: B20HS1102	
Course Title: BUSINESS COMMUNICATION & VALUE SCIENCE - I LAB	
CO-1	Recognize the need for life skills and values.
CO-2	Recognize own strengths and opportunities.
CO-3	Apply the life skills to different situations.
CO-4	Understand the basic tenets of communication.
CO-5	Apply the basic communication practices in different types of communication.

SYLLABUS: FUNDAMENTALS OF PHYSICS LAB (B20BS1109)

(For CSBS)

1. Magnetic field along the axis of current carrying coil – Stewart and Gee
2. Verification of laws of seriesand parallel combinations of resistances using Carey-foster"s bridge
3. To Study the Characteristics of PN Junctiondiode.
4. To determine thenumericalapertureofa givenopticalfiberandhencetofinditsacceptance angle
5. To determine the energy gap of asemiconductor.
6. Tocalculatewavelengthsofprominentlinesusingdiffractiongratingnormalincidence.
7. Determination of wave length of light by Newton"s ringsmethod
8. Determination of diameter of thin wire/thickness of paper piece using wedgemethod
9. Determination of Plankconstant.
10. Determination of the frequency of the AC supply – ACSonometer.

Course Outcomes for First Year First Semester Course	
Course Code: B20BS1109	
Course Title: FUNDAMENTALS OF PHYSICS LAB	
CO-1	Describe the various procedures and techniques for the experiments.
CO-2	Develop design/problem solving skills, practical experience through laboratory assignments which provide opportunities for developing team in multidisciplinary environments.
CO-3	Recognize and describe to test the optical components using principles of interference, diffraction, laser & optical fiber parameters.
CO-4	Apply the analytical techniques and graphical analysis to the experimental data.

SYLLABUS: FUNDAMENTALS OF COMPUTER SCIENCE & PROGRAMMING LAB (B20CB1102)(For CSBS)

1. Introducing Raptor tool for drawing flow charts for ProblemSolving.
2. Structured code writing with:
   a. Small but tricky codes
   b. Proper parameter passing
   c. Command line Arguments
   d. Variable parameter
   e. Pointer to functions
   f. User defined header
   g. Make file utility
   h. Multi file program and user defined libraries
   i.Interesting substring matching / searching programs
   j.Parsing related assignments

Course Outcomes for First Year First Semester Course	
Course Code: B20CB1102	
Course Title: FUNDAMENTALS OF COMPUTER SCIENCE & PROGRAMMING LAB	
CO-1	Design the algorithms and draw flowcharts for the given mathematical and engineering problems.
CO-2	Write computer programs for the given algorithm.
CO-3	Design programs with the relevant control structure and parameter passing using functions and derived data types.
CO-4	Create and use header files and C pre-processor directive as utility.
CO-5	Use Pattern searching and parsing strategies in problem solving.

COMPUTER SCIENCE & BUSINESS SYSTEM SYLLABUS : LINEAR ALGEBRA (B20BS1205) (For CSBS)

UNIT-I: Introduction to Matrices, Determinants, Solution of Linear Equations by Triangle method, Cramer's rule and Gaussian elimination; Inverse of a Matrix by Gauss – Jordan method.

UNIT-II: Vectors and linear combinations; Rank of a matrix by Gaussian elimination; Solving Systems of Linear Equations using LU Decomposition and Gauss Seidel methods

UNIT-III: Vector space; Dimension; Basis; Orthogonality; Projections; Gram-Schmidt Orthogonalization and QR decomposition.

UNIT-IV: Eigen Values and Eigen Vectors; Linear transformations: vector space of L.T., properties of Linear operator, Rank and Nullity of L.T.; Hermitian and unitary matrices.

UNIT-V: Singular value decomposition and Principal component analysis; Introduction to their applications in Image Processing and Machine Learning.

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1205	
Course Title: LINEAR ALGEBRA	
CO-1	Apply knowledge of basics of Matrices and applying Methods to solve the system of equations.
CO-2	Calculate Eigen values, Eigen Vectors and applications of Caley Hamilton Theorem.
CO-3	Determine the Linear Transformations of given function also rank and nullity of L.T.
CO-4	Determine the Inner products and proving some inequalities.
CO-5	Describe Vector Space, Orthogonality and Projection. Applying Gram-Schmidt orthogonalization and QR decomposition method.
CO-6	Describe Singular value decomposition and Principal component analysis with applications.

SYLLABUS: STATISTICAL METHODS (B20BS1206)

(For CSBS)

UNIT-I: Linear Statistical Models: Scatter diagram. Correlation, Types of correlation, correlation coefficient, properties of correlation coefficient (without proofs), Rank correlation, Linear regression, Multiple regression & multiple correlation.

UNIT-II: Sampling Techniques: Types of sampling- Random sampling. Sampling from finite and infinite populations. Parameter, statistic, sampling distribution and standard error (sampling with replacement and sampling without replacement), Sampling distribution of sample mean (σ known) and variance. Sampling distribution of differences and sums.

UNIT-III: Curve fitting by Least squares method-Fitting of straight line, second degree polynomial, power and exponential curves.

Estimation: Point estimation, criteria for good estimates (un-biasedness, consistency),Interval estimation, Methods of estimation - maximum likelihood estimation.

Sufficient Statistic: Concept & examples, complete sufficiency, their application in estimation.

UNIT-IV: ANOVA: Analysis of Variance (one-way classification), Analysis of Variance (two-way classification).

Basics of Time Series Analysis & Forecasting: Stationary, ARIMA Models: Identification, Estimation and Forecasting.

UNIT-V: Test of hypothesis: Concept & formulation, Type I and Type II errors, Ney man Pearson lemma (without proof), Procedures of testing of hypothesis.

Non-parametric Inference: Comparison with parametric inference, Use of order statistics. Sign test, Wilcox on signed rank test, Mann-Whitney test, Run test, Kolmogorov-Smirnov test. Spearman's and Kendall's test. Tolerance region.

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1206	
Course Title: STATISTICAL METHODS	
CO-1	Apply different Correlation and linear regression methods.
CO-2	Illustrate sampling techniques and generate a sampling distribution to the given sample data.
CO-3	Understand the concept of Method of least squares and apply it to fit various types of curves.
CO-4	Make use of the concepts of estimation and predict the maximum likelihood estimate from the given model.
CO-5	Apply ANOVA techniques and forecasting methods to the given time series data.
CO-6	Make use of testing of hypothesis and its applications to the non-parametric data.

SYLLABUS: PRINCIPLES OF ELECTRONICS ENGINEERING (B20EC1201)
(For CSBS)

UNIT-I: Semiconductors: Electrical properties, Energy band theory of solids, Fermi levels, Properties& energy band diagrams of Conductors, Semiconductors & insulators, Intrinsic & extrinsic semiconductors, P-type and N-type semiconductors, Mobility and conductivity, Dependence of conductivity on temperature, Drift & diffusion currents and their densities.

UNIT-II: Diodes: Formation of P-N junction & depletion zone, Energy band diagram, Built-in- potential, Forward and reverse biased P-N junction, V-I characteristics, Zener diode and its reverse characteristics.
Diode Circuits: Half-wave & Full-wave Bridge Rectifiers, PIV, DC voltage and current, Ripple factor, Efficiency &Zener diode as a voltage regulator.

UNIT-III: Bipolar Junction Transistor (Simple theory only): BJT introduction, Principle of construction & operation, PNP & NPN transistors, Basic transistor action, CE, CB, CC configurations, Input and Output characteristics, Active, cut-off and saturation modes of operation, Transistor Biasing: Fixed bias & Self bias, Transistor as an Amplifier & Switch.
Field Effect Transistors (Simple theory only): JFET structure & operation, Characteristics and parameters, MOSFETs, Depletion and Enhancement types, Basic Principles of CMOS, FET advantages & applications.

UNIT-IV: Principles of Feedback Amplifiers, Oscillators and Operational Amplifiers (Simpletheory, concepts & block diagram description only): Feedback concept, Advantages, Positive and negative feedback, Loop gain, Feedback factor, Topologies of feedback amplifier, Effect of negative feedback on gain, Effect of positive feedback: Instability and oscillation, Condition of oscillation, Barkhausen criteria.
Introduction to integrated circuits, Operational amplifier (OPAMP) parameters & terminal properties, OP- AMP Applications: Inverting and non-inverting Amplifiers, Difference amplifier, Adders &subtractors, Comparator, Integrator, Differentiator, OP-AMP RC phase shift oscillator

UNIT-V: Digital Electronics Fundamentals: Difference between analog and digital signals, Number systems: Binary, Decimal, Octal, Hexa-decimal and conversions, Logic gates & ICs, Half & Full adder/subtractor, 2x1 & 4x1 Multiplexers, Demultiplexer, Flip-flops: SR, T, D flip- flops, Simple shift registers &counters.

Course Outcomes for First Year Second Semester Course	
Course Code: B20EC1201	
Course Title: PRINCIPLES OF ELECTRONICS ENGINEERING	
CO-1	Understand the basics of semiconductors with respect to current carrying capability and the operation of diode, diode circuits and rectifiers and practically study and analyze characteristics of PN junction diode, Zener diode and rectifier circuits.
CO-2	Explain the structure & operation of BJT, JFET and MOSFET devices as well as amplifier circuits and analyze characteristics of BJT and FET amplifiers practically.
CO-3	Understand the principles of feedback, its advantages & disadvantages and Explain the properties & practically understand the applications of an operational amplifier.
CO-4	Explain the difference between analog and digital signals and implement basic digital system operations at component level by designing combinational and sequential logic circuits and test their operations.

SYLLABUS: DATA STRUCTURES AND ALGORITHMS (B20CB1201)
(For CSBS)

UNIT-I: Basic Terminologies and Introduction to Algorithm & Data Organization: Algorithm specification, Recursion, Performance analysis, Asymptotic Notation - The Big-O, Omega and Theta notation, Programming Style, Refinement of Coding - Time-Space Trade Off,
Testing, Data Abstraction

UNIT-II: Linear Data Structure: Array, Stack, Queue, Linked-list and its types,Various Representations, Operations & Applications of Linear Data Structures

UNIT-III: Non-linear Data Structure: Trees (Binary Tree, Threaded Binary Tree, Binary Search Tree, B & B+ Tree, AVL Tree, Splay Tree) and Graphs (Directed, Undirected), Various Representations, Operations & Applications of Non-Linear DataStructures.

UNIT-IV: Searching and Sorting on Various Data Structures: Sequential Search, Binary Search, Comparison Trees, Breadth First Search, Depth First Search Insertion Sort, Selection Sort, Shell Sort, Divide and Conquer Sort, Merge Sort, Quick Sort, Heap sort, Introduction toHashing

UNIT-V: File: Organization (Sequential, Direct, Indexed Sequential, Hashed) and various types of accessing schemes.
Graph: Basic Terminologies and Representations, Graph search and traversal algorithmsand complexity analysis.

Course Outcomes for First Year Second Semester Course	
Course Code: B20CB1201	
Course Title: DATA STRUCTURES AND ALGORITHMS	
CO-1	**Identify** different parameters to analyze the performance of algorithms and implement linear data structures.
CO-2	**Design** algorithms to perform operations with Non Linear data structures.
CO-3	**Illustrate** different techniques for searching and sorting for given data.
CO-4	**Understand** the concepts of files and implement accessing schemes on data structure.

SYLLABUS: FUNDAMENTALS OF ECONOMICS (B20HS1201)

(For CSBS)

UNIT-I: Nature of Economics: Definitions of Economics- Wealth, Welfare and Scarcity; Classification of subject matter of Economics- Micro and Macro Economics.
Demand Analysis : Definition, Law of Demand and its limitations; Demand Schedule, Demand Curve; Elasticity of Demand - Definition: Types of Elasticity and their practical importance.
Demand Forecasting: Types, Objectives and Purpose of Forecasting; Methods of demand Forecasting: Survey and Opinion methods; Forecasting demand for new products.
Supply Analysis: Meaning of Supply, Law of Supply and Supply function; Factors influencing change in Supply.

UNIT-II: Welfare Analysis: Definition of Welfare Economics, deference between positive economics and welfare economics.
Utility Analysis: Meaning, Law of Diminishing Marginal Utility and its assumptions, exceptions and importance.
Indifference Curve Analysis: Assumptions, Schedule and Map, Properties or Characteristics of Indifference Curves; Uses, importance and application value of Indifference Curves.

UNIT-III: Theory of Production: Meaning of production, Assumptions of Production Function– Use of production function in decision making.
Cost Analysis: Fixed Cost, Variable Cost, Marginal Cost, Average Cost, Short Run Cost, Long Run Cost; Cost-Output relationship in Short Run and Long Run.
Market Structures: Classification of Markets; SalientFeatures of Perfect Competition, Monopoly, Duopoly, Oligopoly and Monopolistic Competition.

UNIT-IV: Macro Economics: Definitions of National Income; Concepts of National Income GNP, NNP, NI,PI, DI; Measurement of National Income -Production method, Income method and expenditure method.
Public Finance: Public Revenue-Taxes, Classification of taxes; Public expenditure- Importance and causes of increase in public expenditure.
Inflation-Definition, Causes, Control of inflation- Monetary, Fiscal and non- monetary measures.

UNIT-V: Money – Definitions, Functions of money; Essentials of good money, demand formoneyand supply ofmoney.
Trade Cycles- Meaning of Trade cycles, Phases of a trade cycle, The Cobweb theory of Trade cycle , Remedial Measures of trade cycles- Monetary and Fiscal Policies.

Course Outcomes for First Year Second Semester Course	
Course Code: B20HS1201	
Course Title: FUNDAMENTALS OF ECONOMICS	
CO-1	Understand the definitions of Economics and the classification of Economics.
CO-2	Prepare Schedules of Demand, Supply and able to predict Demand.
CO-3	Explain the importance of Welfare Analysis and Utility Analysis.
CO-4	Describe the Production theory, Cost Analysis and Market Structures.
CO-5	Analyze the role of Government in the economy and identify Government policies.
CO-6	Discuss the impact of Macro Economics on the economy.

SYLLABUS: STATISTICAL METHODS LAB (B20BS1209)

(For CSBS)

LIST OF PROGRAMS:

R statistical programming language:

1. Introduction toR
2. Functions
3. Control flow andLoops
4. Working with Vectors andMatrices
5. Reading inData
6. WritingData
7. Working withData
8. ManipulatingData
9. Simulation
10. Linearmodel
11. DataFrame
12. Graphics inR

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1209	
Course Title: STATISTICAL METHODS LAB	
CO-1	Write the programs in R to solve the statistical problems.
CO-2	Apply various built in functions in R to solve the computational and modeling problems.
CO-3	Interpret the statistical data by various functions of graphical representation.
CO-4	Understand- reading, writing, working and manipulating the data in various data frames.

SYLLABUS: DATA STRUCTURES AND ALGORITHMS LAB (B20CB1202)
(For CSBS)

Data Structures And Algorithms Lab using C programming language:

1. Sorting a list using Bubble sort and then apply binarysearch.
2. Implement quick sortalgorithm.
3. Implement the operations on stacks usingArray
4. Towers of Hanoi using user definedstacks.
5. Implement the operations on queues usingArray.
6. Implement the operations on circular queues usingArrays.
7. Implement the Single Linked List operations (Insertion,Deletion).
8. Reading, writing, and addition ofpolynomials.
9. Implement the Circular Single Linked List operations (Insertion,Deletion).
10. Implement the Double Linked List operations (Insertion,Deletion).
11. Create a binary search tree and for implementing the inorder, preorder, postorder traversal usingrecursion.
12. Finding the Depth First Search of a graph, and Breadth First Search of agraph
13. Finding the transitive closure of adigraph
14. Line editors with line count, word count showing on thescreen.
15. Finding the shortest paths from a given source to any vertex in a digraph using Dijkstra‟salgorithm.
16. Saving / retrieving non-linear data structure in/from afile

Course Outcomes for First Year Second Semester Course	
Course Code: B20CB1202	
Course Title: DATA STRUCTURES AND ALGORITHMS LAB	
CO-1	Design and analyze the time and space efficiency of the data structure.
CO-2	Identity the appropriate data structure for given problem.
CO-3	Have practical knowledge on the applications of data structures.
CO-4	Have practical knowledge on handling data structures with files.

SYLLABUS: BUSINESS COMMUNICATION & VALUE SCIENCE - II (B20HS1203)
(For CSBS)

Exercise-1: Icebreaker. 1)Participate in„Join Hands Movement". Individual identification of social issues.2) Each Individual chooses one particular social issue which they would like to address. 3) Class to be divided in teams for the entire semester. All activities to be done in teams and the grades, credit points will be captured in the leader board in the class room.4)Theory to introduce the participant Slam book to be used for capturing individual learning points and observations. Research on the social cause each group will workfor.
Class discussion- Good and Bad Writing. Common errors, punctuation rules, use of words. **Group Practical** – As a group, they will work on the social issue identified by them. Research, read and generate a report based on the findings.(Apply the learning and recap from the session)
Practical: Plan and design an E Magazine. Apply and assimilate the knowledge gathered from Sem-1 till date. Share objective & guideline. All members to contribute an article to the magazine, trainer to evaluate the content.

Exercise-2: Lucid Writing: Encourage the students to go through the links given about Catherine Morris and Joanie McMahon"s writingtechniques.
Create the magazine, SATORI – Participants share the personal take away acquired from GD, writing and reading skills activities captured in their handbook. Share the most important learning points from the activities done so far and how that learning has broughta change. Launching an E Magazine.

Exercise-3: Each group will form an NGO. Create Vision, Mission, Value statement, tagline and Design a logo.
Introduction to basic presentation skills& ORAI app
Groups to present their NGOs. Apply the learning gathered from session 2. Presentation to be recorded by the groups.
Feedback from the audience/ Professor
Group to come back and share their findings from the recording. Post work- individualwrite up to be written and evaluated for the E- magazine
Prepare and publish the Second episode of the E Magazine.

Exercise-4: Speed Reading session: Introduction to skimming and scanning; practice the same. SATORI – Join the dots-ParticipantstoconnecttheirlearninggatheredfromAIPUnit-2withtheirexistingcurriculum
Quiz Time.

Exercise-5: Ad campaign- Brain storming session- Students to discuss and explore the means ofarticulating and amplifying the social issue their NGOs are working for.
Design a skit- a) write the script articulating the message of their respective NGOs. Readout the script. (Skit time-5 minutes). Feedback of Theory.
Promote the play through a social media and gather your audience. Enact the play. Capturethe numbers of likes and reviews. Theory to assign grades to individual team.
(1) Theorytofindoutfromtheparticipantstheirviews,observationsandexperiencesofworkinginateam
(2) IntroofDr.MeredithBelbinandhisresearchonteamworkandhowindividualscontribute.
(3) Belbin's 8 Team Roles and Lindgren's Big 5 personalitytraits.
(4) Belbin's 8 team playerstyles.

Exercise-6:
(1) Team Falcon Practical to identify individual personality traits with Belbin's 8 teamplayerstyles
(2) Similar personality types to formgroups
(3) Groups present theirtraits.
Prepare and publish the third episode of the E Magazine.
SATORI – (join the dots with participants personal life) Participants share the personal take away acquired from working in teams, GD, learning about presentations, presentingtheir NGOs

Exercise-7: Ten minutes of your time – a short film on diversity. Play the video (link to be attached inthe FG) Discuss key take away of the film. Theory to connect the key take away of the film to theconcept of empathy. Touch the target (Blind man) - Debriefing of the Practical.

Exercise-8: Film: "The fish and I"‟‟ by BabakHabibifar" (1.37mins)
Groups to create a story – 10 minutes of a person's life affected by the social issue groups are working on.
Narrate the story in first person.
Feedbacks to be shared by the other groups.

Exercise-9: Research on a book, incident or film based on the topic of your respective NGO
Write a review in a blog on the topics they are covering in their research. Theory will givegrades to each team.
Teams to video record interviews of people from diverse groups (Ask 5 questions). Share the recordings in FB.

Exercise-10: Debate on the topic of diversity with an angle of ethics, morality and respect for individual (In the presence of an external moderator). Groups will be graded by the professor.
Prepared speech- Every student will narrate the challenges faced by a member of a diversegroup in 4 minutes (speech in first person).
Theory to give feedback to each student.

Exercise-11: Discussion on TCS values, Respect for Individual and Integrity.Prepare and
publish the final episode of the E Magazine.
SATORI –Participants share the personal take away acquired from working in teams, GD,learning about presentations and understanding diversity inclusion.
Revisit your resume Include your recent achievements in your resume.

Exercise-12: Project-1) Each team to look for an NGO/ social group in the city which is working on the issue their college group is supporting. 2) Spend **a day with the NGO/ social group** to understand exactly how they work and the challenges they face.
3) Render voluntary service to the group for oneday
4) Invite the NGO/ social group to address their university students for couple of hours. Plan the entire event, decide a suitable venue in the university, gather audience, invite faculty members etc. (they need to get their plan ratified their professor). Outcome-- Hostan interactive session with the NGOspokesperson.
The groups to present their experience of **a day with the NGO** and inspire students towork for the cause.

Course Outcomes for First Year Second Semester Course	
Course Code: B20HS1203	
Course Title: BUSINESS COMMUNICATION & VALUE SCIENCE - II	
CO-1	Understand and use tools of structured written communication.
CO-2	Understand the basics of presentation and apply efficacious techniques to make presentations in the electronic/social media to share concepts and ideas required for any organization.
CO-3	Design various activities of communication resulting in building a team-spirit and creating social awareness.
CO-4	Understand the basic concepts of Morality and Diversity.
CO-5	Create communication material to share concepts and ideas.

COMPUTER SCIENCE AND ENGINEERING

Regulation: R20			I / IV - B.Tech. I - Semester						
COMPUTER SCIENCE & ENGINEERING (under Choice Based Credit System / Elective Course System)									
SCHEME OF INSTRUCTION &EXAMINATION (With effect from 2020-21 admitted Batch onwards)									
Course Code	**Course Name**	**Category**	**Cr.**	**L**	**T**	**P**	**Int. Marks**	**Ext. Marks**	**Total Marks**
B20 HS1101	English	HS	3	3	0	0	30	70	100
B20 BS1101	Mathematics-I	BS	3	3	0	0	30	70	100
B20 BS1103	Applied Chemistry	BS	3	3	0	0	30	70	100
B20 CS1101	Programming for Problem Solving Using C	ES	3	3	0	0	30	70	100
B20 CS1102	Computer Fundamentals and Digital Logic	ES	3	3	0	0	30	70	100
B20 CS1103	Programming for Problem Solving Using C Lab	ES	1.5	0	0	3	15	35	50
B20 BS1108	Applied Chemistry Lab	BS	1.5	0	0	3	15	35	50
B20 CS1104	Computer Engineering Workshop	ES	1.5	0	0	3	15	35	50
		TOTAL	**19.5**	**15**	**0**	**9**	**195**	**455**	**650**

COMPUTER SCIENCE & ENGINEERING

SYLLABUS : ENGLISH (B20HS1101)

(Common to AIDS, CE, CSE, ECE, EEE, IT&ME)

UNIT-I : Lesson: A Drawer full of happiness from *Infotech English*, Maruthi Publications.
Listening: Listening to short audio texts and identifying the topic, context and specific pieces of information to answer a series of questions both in speaking andwriting.

Speaking: Self-introduction and introducing others. Asking and answering generalquestions on topics such as home, family, work, studies and interests.

Reading: Skimming text to get the main idea. Scanning to look for specific pieces of information.

Reading for Writing: Paragraph Writing (Hints Development), general essays using suitable cohesive devices; linkers, sign posts and transition signals; mechanics of writing, punctuation.

Vocabulary: Technical vocabulary from across technical branches (20) GRE Vocabulary (20), antonyms and synonyms, word applications, verbal reasoning and sequencing of words.
Grammar: Content words and function words; parts of Speech, tenses, word order in sentences, sentence structures.

UNIT-II : Lesson-: Nehru's letter to his daughter, Indira on her birthday from *Infotech English***,** Maruthi Publications**.**
Listening: Answering a series of questions about main idea and supporting ideas after listening to audio texts both in speaking and writing.

Speaking: Discussion in pairs/ small groups on specific topics followed by short structured talks, functional English: greetings and leave takings.

Reading: Identifying sequence of ideas; recognizing verbal techniques that help to link the ideas in aparagraph together.

Reading for Writing: Identifying the main ideas, rephrasing and summarizing them (précis writing);avoiding redundancies and repetitions.
Vocabulary: Technical vocabulary from across technical branches (20words). GRE Vocabulary Analogies (20 words), antonyms and synonyms, word applications.
Grammar: Articles, prepositions, conjunctions, use of synonyms and antonyms.

UNIT-III: Lesson: Stephen Hawking-Positivity' Benchmark' from *Infotech English*, MaruthiPublications. **Listening:** Listening for global comprehension and summarizing what is listenedto both in speaking and writing.
Speaking: Discussing specific topics in pairs or small groups and reporting whatis discussed. Functional English: complaining and apologizing.
Reading: Reading a text in detail by making basic inferences -recognizing: and interpreting specific context clues; strategies to use text clues for comprehension, critical reading.
Reading for Writing: Letter writing- types, format and principles of letterwriting, E-mail etiquette, writing a Resume/CV and covering letter.
Vocabulary: Technical vocabulary from across technical branches (20 words. GRE. Vocabulary 20words), Idioms & Phrasal verbs, Homonyms, wordapplications,sequencing of words.
Grammar: Sentence Structures, Transformation of sentences (Active and passive Voice, Degrees of comparison, Simple, Compound and Complex).

UNIT-IV:Lesson:LikingaTree,Unbowed:WangariMaathaibiographyfrom*Infotech English*, MaruthiPublications.
Listening: Making predictions while listening to conversations/ transactional dialogues without video (only audio), listening to audio-visual texts.

Speaking: Role plays for practice of conversational English in academic contexts(formal and informal) - asking for and giving information/directions. Functional English: asking for permissions, requesting,Inviting.

Reading: Studyingthe use of graphic elements in texts to convey information, reveal trends/patterns/relationships, communicative process or display complicated data.

Reading for Writing: Information transfer; describe, compare, contrast, identify significance/trends based on information provided in figures/charts/graphs/tables. Pamphlet writing, writing for media, writing SOP's.

Vocabulary: Technical vocabulary from across technical branches (20 words GRE Vocabulary (20words), antonyms and synonyms, word applications, cloze encounters, foreign phrases.

Grammar: Quantifying expressions - adjectives and adverbs: comparing and contrasting, question Tags, direct and indirect speech, reporting for academic purposes.

UNIT-V: Lesson: Stay Hungry–Stay Foolish from *Infotech English*, Maruthi Publications.

Listening: Identifying key terms, understanding concepts and interpreting theconcepts both in speaking and writing.

Speaking: Formal oral presentationsontopics from academic contexts–with/without the use of PPT slides. Functional English: Suggesting/Opiniongiving.

Reading: Reading for comprehension, RAP Strategy - intensive reading andextensivereading techniques. **Reading for Writing:** Report writing, writing academic proposals- writing researcharticles: format and style. **Vocabulary:** Technical vocabulary from across technical branches (20 words GRE 'Vocabulary (20 words, antonyms and synonyms, word applications, coherence, matchingemotions.

Grammar: Editing short texts — identifying and correcting common errors in grammar and usage (articles, prepositions, tenses, subject-verb agreement, parallel structures, phrases and clauses).

Course Outcomes for First Year First Semester Course	
Course Code: B20HS1101	
Course Title: ENGLISH	
CO-1	Identify the context, topic and pieces of specific information by understanding and responding to the social or transactional dialogues spoken by native speakers of English.
CO-2	Apply suitable strategies for skimming and scanning to get the main idea of a text and locate specific information.
CO-3	Build confidence and adapt themselves to the social and public discourses, discussions and presentations.
CO-4	Apply the principles of writing to paragraphs, arguments, essays and formal/informal communication.
CO-5	Construct sentences using proper grammatical structures and correct word forms.

SYLLABUS: MATHEMATICS-I
(B20BS1101)

(LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS)

(Common to AIDS, CE, CSE, ECE, EEE, IT & ME)

UNIT-I: Linear systems of equations: Rank, Echelon form, Normal form, consistency of system of linear equations, Solution of linear systems by Gauss elimination, Jacobi and Gauss-Seidel methods.

UNIT-II: Eigen values - Eigen vectors and Quadratic forms: Eigen values, Eigen vectors, Properties, Cayley- Hamilton theorem, Inverse and powers of a matrix using Cayley-Hamilton theorem, Reduction to diagonal form, Quadratic forms, Reduction of a Quadratic form to Canonical form.

UNIT-III: Differential equations of first order and first degree: Linear, Bernoulli, Exact, Reducible to exact types. Applications: Orthogonal trajectories, Newton's Law of cooling, Simple electrical circuits.(R-L and R-C circuits only)

UNIT-IV: Linear differential equations of higher order: Linear Non-homogeneous equations of higher order with constant coefficients with source (RHS) term of the type e^{ax}, sin ax, cos ax, polynomials in x, e^{ax} V(x), x V(x). Simultaneous differential equations with constant coefficients, Method of Variation of parameters.

UNIT-V: Laplace transformation: Laplace transforms of standard functions, properties, transforms of tf(t), f(t)/t, transforms of derivatives and integrals, transforms of unit step function, Dirac delta function; Inverse Laplace transforms, convolution theorem (without proof).
Applications: Solving ordinary differential equations (initial value problems) using Laplace transforms.

Course Outcomes for First Year First Semester Course	
Course Code: B20BS1101	
Course Title: MATHEMATICS – I	
CO-1	Solve a given system of linear algebraic equations
CO-2	Determine Eigen values and Eigen vectors of a system represented by a matrix.
CO-3	Solve ordinary differential equations of first order and first degree.
CO-4	Apply the knowledge in simple applications such as Newton's law of cooling, orthogonal trajectories and simple electrical circuits
CO-5	Solve linear ordinary differential equations of second order and higher order.
CO-6	Determine Laplace transform, inverse Laplace transform and solve linear ODE

SYLLABUS: APPLIED CHEMISTRY
(B20BS1103)

(Common to AIDS, CE, EEE & ME)

UNIT-I: High Polymers and Plastics; Rubbers & Elastomers: Polymerization Definition, Types of Polymerization, free radical Mechanism of addition polymerization, Plastics as engineering materials, Thermoplastics and Thermosetting plastics, Compounding of plastics, Fabrication of plastics (4 techniques); Preparation, Properties and applications of Polyethylene, PVC, Bakelite, Nylon - 6,6, Bullet Proof plastics -polycarbonate and Kelvar; Fiber reinforced plastics, conducting polymers, Biodegradable Polymers - PHBV, Nylon 2, Nylon 6. Natural rubber – Vulcanization – Compounding of Rubber; Preparation, properties andapplications of Buna – S; Buna – N;

UNIT-II: Energy Sources and Applications: Nuclear Energy: Nuclear fission and Nuclear fusion – Nuclear Power reactor – Applications. Thermal fuels – Introduction – Classification – Calorific value – HCV and LCV – Bomb calorimeter; Coal : Proximate and ultimate analysis of coal – Significance of the analysis – Manufacture of coke by Otto Hoffman's by Product Process , Refining crude oil; Knocking; Chemical structure-Knocking, Octane number of gasoline, Cetane number of diesel oil, synthetic Petrol; LPG,CNG.

UNIT-III: Electrochemical cells and Corrosion: Galvanic cell, single electrode potential, Calomel electrode; Modern batteries: - Lead – Acid battery; Fuel cells- Hydrogen – Oxygen fuel cell, Lithium battery Theories of corrosion (i) dry Corrosion (ii) wet corrosion. Types of corrosion - differential aeration corrosion, pitting corrosion, galvanic corrosion, stress corrosion, Factors influencing corrosion, Protection from corrosion-material selection & design, cathodic protection, Protective coatings- metallic coatings – Galvanizing, Tinning, Electroplating; Electrrolessplating ; Paints.

UNIT-IV: Water technology: Sources of water – Hardness of water – Estimation of hardness of water by EDTA method; Boiler troubles – sludge and scale formation, Boiler corrosion, caustic embrittlement, Priming and foaming; Softening of water by Lime – Soda Process, Zeolite Process, Ion – Exchange Process; Municipal water treatment; Desalination of sea water by Electrodialysis and Reverse osmosis methods.

UNIT-V: Chemistry of Engineering Materials& Advanced Engineering materials: Cement:- Manufacture of Portland cement, setting and hardening of cement, Deterioration of cement concrete.
Refractories: Definition, Characteristics, classification, Properties and failure of refactories.
Solar Energy: Construction and working of Photovoltaic cell, applications.
Solid State Materials: Crystal imperfections, Semi Conductors, Classification and chemistry of semi conductors: Intrinsic semiconductors; Extrinsic semiconductors; Defect semiconductors, Compound Semiconductors and Organic Semiconductors.
Liquid Crystals: - Definition – Classification with examples – Applications

Course Outcomes for First Year First Semester Course	
Course Code: B20BS1103	
Course Title: APPLIED CHEMISTRY	
CO-1	Develop polymer composites, synthetic polymers and formulation of polymers and their use in design
CO-2	Apply the knowledge about quality of water and its treatment methods for domestic and industrial applications. Understanding the principle, mechanism of corrosion and utilization of various techniques to control.

CO-3	Develop the knowledge of fuels and their economics, advantages and limitations. Make use of the basic concepts of semiconductors and liquid crystals for engineering applications.
CO-4	Identify constituents of various ceramic materials, characteristics and their appropriate use in construction. Apply the knowledge of electrochemistry principles to design energy storage.

SYLLABUS: PROGRAMMING FOR PROBLEM SOLVING USING C (B20CS1101)

(Common to AIDS, CSE, ECE & IT)

UNIT-I: Introduction to Computers: Creating and running Programs, Computer Numbering System, Storing Integers, Storing Real Numbers Introduction to the C Language: Background, C Programs, Identifiers, Types, Variable, Constants, Input/output, Programming Examples, Scope, Storage Classes and Type Qualifiers. Structure of a C Program: Expressions Precedence and Associativity, Side Effects, Evaluating Expressions, Type Conversion Statements, Simple Programs, Command Line Arguments.

UNIT-II: Bitwise Operators: Exact Size Integer Types, Logical Bitwise Operators, Shift Operators. Selection & Making Decisions: Logical Data and Operators, Two Way Selection, Multiway Selection, More Standard Functions. Repetition: Concept of Loop, Pretest and Post-test Loops, Initialization and Updating, Event and Counter Controlled Loops, Loops in C, Other Statements Related to Looping, Looping Applications, Programming Examples.

UNIT-III: Arrays: Concepts, Using Array in C, Array Application, Two Dimensional Arrays, Multidimensional Arrays, Programming Example – Calculate Averages Strings: String Concepts, C String, String Input / Output Functions, Arrays of Strings, String Manipulation Functions String/ Data Conversion, A Programming Example – Morse Code Enumerated, Structure, and Union: The Type Definition (Type def), Enumerated Types, Structure, Unions, and ProgrammingApplication.

UNIT-IV: Pointers: Introduction, Pointers to pointers, Compatibility, L value and R value Pointer Applications: Arrays, and Pointers, Pointer Arithmetic and Arrays, Memory Allocation Function, Array of Pointers, Programming Application. Processor Commands: Processor
Commands.

UNIT-V: Functions: Designing, Structured Programs, Function in C, User Defined Functions, Inter Function Communication, Standard Functions, Passing Array to Functions, Passing Pointers to Functions, Recursion Text Input / Output: Files, Streams, Standard Library Input / Output Functions, Formatting Input / Output Functions, Character Input / Output Functions Binary Input / Output: Text versus Binary Streams, Standard Library, Functions for Files, Converting File Type.

Course Outcomes for First Year First Semester Course	
Course Code: B20CS1101	
Course Title: PROGRAMMING FOR PROBLEM SOLVING USING C	
CO-1	Apply Precedence and Associativity rules to evaluate Expressions.
CO-2	Make use of Decision Making and Looping statements to solve various problems in C.
CO-3	Illustrate the importance of Arrays and Strings and to apply various operations on them.
CO-4	Solve various problems by making use of Structure and Union concepts.
CO-5	Design and implement programs to analyze the different pointer applications
CO-6	Develop programs using Functions and Pointers.

SYLLABUS: COMPUTER FUNDAMENTALS AND DIGITAL LOGIC (B20 CS1102)
(For CSE)

UNIT-I: Computer Fundamentals: Basics of Introduction to Computer: History, Generations, Classifications of Computers, The Computer System Hardware: CPU, Memory, Input and Output Devices: Input Output Unit, Input Devices and Output devices,IO-Ports

UNIT-II: Number Theory and BooleanAlgebra: Binary Systems and Boolean Algebra Digital Systems. Binary Numbers. Number Base Conversions. Octal and Hexadecimal Numbers. Complements. Signed Binary Numbers. Binary Logic, Basic Definitions of Boolean
algebra. Axiomatic Definition of Boolean Algebra. Basic Theorems and Properties of Boolean Algebra, Boolean Functions.

UNIT-III: Logic Gates and Gate-Level Minimization Canonical and Standard Forms. LogicGates. The Map Method. Four-Variable Map. Five-Variable Map. Product of Sums Simplification. Don/t-Care Conditions.

UNIT-IV: Combinational Logic Design: Design Procedure, Binary Adder-Subtractor. Decimal Adder. Binary Comparator. Decoders. Encoders. Multiplexers.

UNIT-V: Sequential Logic design Sequential Circuits: Latches. Flip-Flops. Truth Tables. RS, JK, T and D Flip Flops, Truth and Excitation Tables, Conversion of Flip Flops. Analysis ofSequential Circuits. State Reduction and Assignment. Designs Procedure.

Course Outcomes for First Year First Semester Course	
Course Code: B20 CS1102	
Course Title: COMPUTER FUNDAMENTALS AND DIGITAL LOGIC	
CO-1	Familiar with computer fundamentals and internet of things concepts.
CO-2	Differentiate binary, decimal, octal and hexadecimal number system.
CO-3	mplement the Boolean functions using logic gates and Simplification Boolean expression using K-Map.
CO-4	Implement various combinational circuits
CO-5	Implement various Sequential circuits.

SYLLABUS: PROGRAMMING FOR PROBLEM SOLVING USING C LAB (B20CS1103)

(Common to AIDS, CSE, ECE & IT)

1. Exercise1:
   1. Write a C program to print a block F using hash (#), where the F has a height of six charactersand width of five and fourcharacters.
   2. Write a C program to compute the perimeter and area of a rectangle with a height of 7 inches andwidth of 5inches.
   3. Write a C program to display multiplevariables.
2. Exercise2:
   1. Write a C program to calculate the distance between the twopoints.
   2. WriteaCprogramthataccepts4integersp,q, r,s fromtheuserwhererandsarepositiveandpiseven. If q is greater than r and s is greater than p and if the sum of r and s is greater than the sumof p and q print "Correct values", otherwise print "Wrong values".
3. Exercise3:
   1. Write a C program to convert a string to a longinteger.
   2. Write a program in C which is a Menu-Driven Program to compute the area of the various geometricalshape.
   3. Write a C program to calculate the factorial of a givennumber.
4. Exercise4:
   1. Write a program in C to displaythe n terms of even natural number and their sum.
   2. Write a program in C to display the n terms of harmonic series and their sum. 1 + 1/2 + 1/3 +1/4 + 1/5 ... 1/n terms.
   3. Write a C program to check whether a given number is an Armstrong numberor not.
5. Exercise5:
   1. Write a program in C to print all unique elements in anarray.
   2. Write a program in C to separate odd and even integers in separatearrays.
   3. Write a program in C to sort elements of array in ascendingorder.
6. Exercise6:
   1. Write a program in C for multiplication of two squareMatrices.
   2. Write a program in C to find transpose of a givenmatrix.
7. Exercise7:
   1. Write a program in C to search an element in a row wise and column wise sortedmatrix.
   2. Write a program in C to print individual characters of string in reverseorder.
8. Exercise8:
   1. Write a program in C to compare two strings without using string libraryfunctions.
   2. Write a program in C to copy one string to anotherstring.
9. Exercise9:
   1. Write a C Program to Store Information Using Structures with DynamicallyMemory Allocation
   2. Write a program in C to demonstrate how to handle the pointers in theprogram.
10. Exercise10:
    1. WriteaprograminCtodemonstratetheuseof&(addressof)and*(valueataddress)operator.
    2. Write a program in C to add two numbers usingpointers
11. Exercise11:
    1. Write a program in C to add numbers using call byreference.
    2. Write a program in C to find the largest element using Dynamic MemoryAllocation
12. Exercise12:
    1. Write a program in C to swap elements using call byreference.
    2. WriteaprograminCto countthenumberofvowelsandconsonants in astringusingapointer.

13. Exercise13:
    1. Write a program in C to show how a function returningpointer.
    2. Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using malloc( )function
14. Exercise14:
    1. Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using calloc( ) function. Understand the difference between the above twoprogram.
    2. Write a program in C to convert decimal number to binary number using thefunction.
15. Exercise15:
    1. Write a program in C to check whether a number is a prime number or not using thefunction.
    2. Write a program in C to get the largest element of an array using thefunction.
16. Exercise16:
    1. Write a program in C to append multiple lines at the end of a textfile.
    2. Write a program in C to copy a file in anothername.
    3. Write a program in C to remove a file from thedisk.

Course Outcomes for First Year First Semester Course	
Course Code: B20CS1103	
Course Title: PROGRAMMING FOR PROBLEM SOLVING USING C LAB	
CO-1	Write, Trace and Debug the programs and correct syntax and logical errors..
CO-2	Solve various Problems by making use of Arrays, Strings, Structures, Unions and Pointers
CO-3	Solve a complex problem by decomposing into several modules by using Functions
CO-4	Apply various File I/O operations

SYLLABUS: APPLIED CHEMISTRY LAB (B20 BS 1108)

(Common to AIDS, CE, EEE & ME)

LIST OF PROGRAMS:

1.Determination of Alkalinity of water sample.

2.Determination of total hardness of water by EDTAmethod.

3.Estimation of Ferrous Iron by$KMnO_4$.

4.Estimation of oxalic acid by $KMnO_4$.

5.Estimation of Mohr's salt by$K_2Cr_2O_7$.

6.Estimation of Dissolved oxygen by Winkler's method.

7.Determination of pH of water and soil sample.

8. Determination of Chlorides present in watersample.

9. Conductometric titration of strong acid Vs strongbase.

10. Potentiometric titration of strong acid Vs strongbase.

11. Potentiometric titration of strong acid Vs weakbase.

12. Preparation of Phenol formaldehyderesin.

13. Determination of saponification value ofoils.

14. Determination of pour and cloud points of lubricatingoil.

15. Determination of Acid value ofoil.

Course Outcomes for First Year Second Semester Course	
Course Code: B20 BS 1108	
Course Title: APPLIED CHEMISTRY LAB	
CO-1	Gain technical knowledge of measuring, operating and testing of chemical instruments and equipments. Carrying out different types of chemical reactions for analysing different materials in micro level quantities
CO-2	Analyze and generate experimental skills to enhance the analytical thinking capabilities in the modern trends in engineering and technology

SYLLABUS: COMPUTER ENGINEERING WORKSHOP (B20CS1104)

(Common to AIDS, CSE & IT)

Task1: Identification of the peripherals of a computer - Prepare a report containing the block diagram of the computer along with the configuration of each component and its functionality. Describe about various I/O Devices and itsusage.

Task2: Practicing disassembling and assembling components of a PC.

Task3: Installation of Device Drivers, MS Windows, Linux Operating systems and Disk Partitioning, dual boating with Windows andLinux.

Task4: Introduction to Memory and Storage Devices, I/O Port, Assemblers, Compilers, Interpreters, Linkers andLoaders.

Task5: Demonstration of Hardware and Software Troubleshooting.

Task6: Demonstrating Importance of Networking, Transmission Media, Networking Devices-Gateway, Routers, Hub, Bridge, NIC, Bluetooth Technology, Wireless Technology, Modem, DSL, and Dialup Connection.

Task7: Surfing the Web using Web Browsers, Awareness of various threats on the Internet and its solutions, Search engines and usage of various search engines, Need of anti-virus, Installation of anti-virus, configuring personal firewall and windows update.

(Students should get connected to their Local Area Network and access the Internet. In the process they should configure the TCP/IP setting and demonstrate how to access thewebsites and email. Students customize their web browsers using bookmarks, search toolbars and pop up blockers).

Task8: Productivity Tools: Basic HTML tags, Introduction to HTML5 and its tags, Introduction to CSS3 and its properties. Preparation of a simple website/ homepage,

Assignment: Develop your home page using HTML Consisting of your photo, name,address and education details as a table and your skill set as a list.

Features to be covered:- Layouts, Inserting text objects, Editing text objects, Inserting Tables, Working with menu objects, Inserting pages, Hyper linking, Renaming, deleting, modifying pages, etc.,

Task9: Demonstration and Practice of various features of Microsoft Word Assignment:

1. Create a project certificate. 2.Creating anewsletter

Features to be covered:-Formatting Fonts, Paragraphs, Text effects, Spacing, Borders and Colors, Header and Footer, Date and Time option, tables, Images, Bullets and Numbering, Table of Content, Newspaper columns, Drawing toolbar and Word Art and Mail Merge in word etc.,

Task10: Demonstration and Practice of various features Microsoft ExcelAssignment:

1. Creating a scheduler2. Calculating GPA 3. Calculating Total, average of marks in various subjects and ranks of Students based onmarks

Features to be covered:- Format Cells, Summation, auto fill, Formatting Text, Cell Referencing, Formulae in excel, Charts, Renaming and Inserting worksheets, etc.,

Task11: Demonstration and Practice of various features Microsoft Power Point

Features to be covered:- Slide Layouts, Inserting Text, Word Art, Formatting Text,Bullets and Numbering, Auto Shapes, Hyperlinks Tables and Charts, Master Layouts, Types of views, Inserting – Background, textures, Design Templates, etc.,

Task12: DemonstrationandPracticeofvariousfeaturesLaTeX–documentpreparation,presentation(Featurescovered in Task 9 and Task 11 need to be explored inLaTex).

Task13: Tools for converting word to pdf and pdf to word

Task14: Internet of Things (IoT): IoT fundamentals, applications, protocols, communicationmodels, architecture, IoT devices.

Course Outcomes for First Year First Semester Course	
Course Code: B20CS1104	
Course Title: COMPUTER ENGINEERING WORKSHOP	
CO-1	Identify, assemble and update the components of a computer
CO-2	Configure, evaluate and select hardware platforms for the implementation and execution of computer applications, services and systems
CO-3	Make use of tools for converting pdf to word and vice versa.
CO-4	Develop presentation, documents and small applications using productivity tools such as word processor, presentation tools, spreadsheets, HTML, LaTex.

COMPUTER SCIENCE & ENGINEERING

SYLLABUS : MATHEMATICS – II (B20BS1201)

(FOURIER ANALYSIS AND PARTIAL DIFFERENTIAL EQUATIONS)

(Common to AIDS, CE, CSE, ECE, EEE, IT & ME)

UNIT-I: Fourier Series: Introduction, Periodic functions, Fourier series of a periodic function, Dirichlet's conditions, Change of interval. Even and odd functions, Half-range sine and cosine series.

UNIT-II: Fourier Transforms: Fourier integral theorem (without proof), Complex form of Fourier integral, Fourier sineandcosine integrals, Fourier transform, Fourier sine and cosine transforms, Finite Fourier transforms, properties, inverse transforms, Parseval'sIdentities.

UNIT-III: Partial differentiation: Introduction, Homogeneous functions, Euler's theorem, Chain rule, Total derivative, Jacobians and their properties. Applications: Taylor series expansion for a function of two variables, Maxima and Minima of functions of two variables with and without constraints, Lagrange's method. Leibnitz's rules for differentiation under integralsign.

UNIT-IV: First order and higher order partial differential equations: Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions, solutions of Lagrange linear equation. Solutions of Linear homogeneous and non-homogeneous partial differential equations with constant coefficients –source (RHS) terms of the type e^{ax+by}, sin (ax+by), cos (ax+by),$x^m y^n$.

UNIT-V: Applications of partial differential equations: Method of separation of variables, One–dimensional wave equation, the D'Alembert'ssolution, one- dimensional heatequation.

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1201	
Course Title: MATHEMATICS–II	
CO-1	Determine Fourier series and half range series of functions.
CO-2	Determine Fourier transforms of non-periodic functions and also use them to evaluate integrals
CO-3	Compute partial derivatives, total derivative and Jacobians.
CO-4	Find maxima/minima of functions of two variables and evaluate some real definite integrals.
CO-5	Identify the discourse features, and improve intensive and extensive reading skills Form partial differential equations and solve Lagrange linear equation. Solve linear higher order homogeneous and non-homogeneous PDEs
CO-6	Find theoretical solution of one-dimensional wave equation and one-dimensional heat equation

SYLLABUS: APPLIED PHYSICS (B20BS1202)

(Common to AIDS, CE, EEE & ME)

UNIT-I: WAVE OPTICS: Interference: Principle of super position. Interference of light, interference in thin films (reflected light) – Wedge film and Newton`s rings – Applications

Diffraction: Types of diffraction, Fraunh offer diffraction at a single alit, Diffraction grating, grating spectrum. Missing order, Resolving power, Rayleigh's Criterion, Resolvingpower of Grating.

UNIT-II: DIELECTRICS AND MAGNETICS: Dielectrics : Introduction to dielectrics, Electric Polarization, Dielectric polariz ability, Susceptibility, Dielectric constant, Types of Polarization, Frequency dependence of Polarization, Internal field in a dielectric, Claussius and Mosotti equation, Applications of dielectrics.

Magnetics: Introduction to magnetics, Magnetic dipole moment , Magnetization, Magnetic susceptibility and Permeability, Origin of permanent magnetic moment, Classification of magnetic materials (Dia , Para, Ferro, Antiferro and ferri), Hysteresis – Weiss Domain theory – Ferrites, soft and hard magnetic materials, Magnetic device applications.

UNIT-III: LASERS AND FIBER OPTICS: Lasers: Introduction, Interaction of radiation with matter, condition for light amplification,Einstein's relations. Requirements of lasers device Types of lasers, Design and working of Ruby and He – Ne lasers, Laser characteristics and applications.

Fiber Optics: Introduction to optical fibers, Principle of light propagation in fiber, Acceptance angle, Numerical aperture, Modes of propagations, types of fibers, classification of fibers based on refractive index profile, applications of fibers with emphasis on fiber opticcommunication.

UNIT-IV: SEMICONDUCTORS: Introduction, intrinsic semi conductors, density of charge carries, Fermi energy, Electrical conductivity – Extrinsic semi conductors – P-type and N-type, Density of charge carriers, dependence of Fermi energy on carrier concentration and temperature, direct and indirect band – gap semi conductors, Hall effect, Applications of Hall effect. Drift and diffusion currents, Continuity equation, applications of semiconductors.

UNIT-V: ULTRASONICS AND NANOMATERIALS: Ultrasonics: Introduction, Production of Ultrasonics – Piezoelectric and Magnetostriction methods, detection of ultrasonics, acoustic grating - determination of wavelength and velocity of ultrasonics, applications of ultrasonics.

Nanomaterials: Introduction, salient features of Nanomaterials, Synthesis methods – Ball milling, Condensation, Chemical Vapour Deposition and Sol – Gel methods, Characterization techniques for nano materials - The scanning tunneling microscopy (STM)and The atomic force microscopy (AFM), Carbon nanotubes (CNTS), Applications of Nano materials.

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1202	
Course Title: APPLIED PHYSICS	
CO-1	Interpret the behavior of light radiation in interference and diffraction Phenomena and their applications
CO-2	Explain the classification and properties of dielectric and magnetic materials suitable for engineering applications.
CO-3	Understand the basics of modern optical technologies like lasers and optical fibers and their utility in various fields
CO-4	Explain the important aspects of semiconductors and electrical conductivity in them
CO-5	Understand the basics of technology of Ultrasonics in various fields and demonstrate the synthesis and applications of nanomaterials.

SYLLABUS: MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE (B20BS1204)
(For CSE)

UNIT-I: Mathematical Logic: Propositional Calculus: Statements and Notations, Connectives, Well-formed Formulae, Truth Tables, Tautologies, Equivalence of Formulas, Duality Law, Normal Forms, Theory of Inference for Statement Calculus, Consistency ofPremises.
Predicate Calculus: Predicative Logic, Statement Functions, Variables and Quantifiers, Free and Bound Variables, Inference Theory for Predicate Calculus.

UNIT-II: Combinatorics: Basics of Counting, Permutations, Permutations with Repetitions, Circular Permutations, Restricted Permutations, Combinations, Restricted Combinations, Generating Functions of Permutations and Combinations, Binomial and Multinomial Theorems, Binomial and Multinomial Coefficients, Principle ofInclusion–Exclusion.

UNIT-III: Relations, Lattices & Boolean Algebra: Relations : Definition of Relation, Properties of Binary Relations, Relation matrix and diagraph, Operations on Relations, Transitive Closure, Warshall's algorithm, Equivalence and Compatibility relations, Partial Ordering Relations, Hasse Diagrams.
Lattices & Boolean Algebra: Lattices and their properties, different types of lattices, Boolean algebra- Boolean expressions, truth tables and karnaugh maps

UNIT-IV: Recurrence Relations: Generating Functions, Partial Fractions, Calculating Coefficient of Generating Functions, Recurrence Relations, Formulation as Recurrence Relations, Solving Recurrence Relations by Substitution and Generating Functions, Method of Characteristic Roots, Solving Inhomogeneous Recurrence Relations.

UNIT-V: Graph Theory: Basic Concepts of Graphs, Sub graphs, Isomorphism of Graphs, Paths and circuits, Eulerian and Hamiltonian Graphs, Multigraphs, Bipartite graphs, Planar Graphs, Euler'sFormula.
Trees: Definition of Tree, properties of Trees, Different tree structures, Binary trees, Spanning trees, Minimal Spanning Trees, Kruskal's and Prim's Algorithms.

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1204	
Course Title: MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE	
CO-1	Write and verify the arguments for their validity using propositional and predicate logic
CO-2	Utilize different counting methods in their fields of study
CO-3	Make use of various types of relations and their properties.
CO-4	Identify different Lattices and Boolean expressions.
CO-5	Formulate and solve the recurrence relations.
CO-6	Utilize the concepts in graphs and trees

SYLLABUS: COMPUTER ORGANIZATION (B20CS1202)

(Common to AIDS & IT)

UNIT-I: Digital Computers and Arithmetic: Historical perspective and von Neumann computers, Fixed and floating-point representation of numbers, Addition and Subtraction, Multiplication and Division algorithms, Floating- point arithmetic operations.

UNIT-II: Basic Computer Organization and Design: Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory-Reference Instructions, Input Output and Interrupt, Complete Computer Description, Design of Basic Computer.
Micro programmed Control: Control Memory, Address Sequencing, Micro program Example, Design of Control Unit

UNIT-III: Central Processing Unit: Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, Reduced InstructionSetComputer(RISC).

UNIT-IV: Memory and I/O Organization: Memory Hierarchy, Associative Memory,Cache Memory, Virtual memory.
I/O Organization: Peripheral devices, I/O interface, Asynchronous data transfer, Modes oftransfer, Priority interrupt, direct memory access and IOP.

UNIT-V: Pipeline and Vector Processing: Parallel Processing, Pipelining, Arithmetic and Instruction Pipelines, RISK Pipeline, Vector Processing, Array Processors. Multiprocessors, Interconnection structures, Cache coherence.

Course Outcomes for First Year Second Semester Course	
Course Code: B20CS1202	
Course Title: COMPUTER ORGANIZATION	
CO-1	Identify basic building blocks of a computer.
CO-2	Design of computer functional blocks.
CO-3	Identify Regular operation of a computer
CO-4	Identify the parameters that enhance system performance.

SYLLABUS: DATA STRUCTURES (B20CS1203)

(For CSE)

UNIT-I: Basic Concepts: Arrays, Structures:
System Life Cycle, Algorithm Specification, Data Abstraction, Performance Analysis, Space Complexity, Time Complexity, Asymptotic Notation, Comparing Time Complexities. Array as an Abstract Data Type, Polynomial Abstract Data Type, Structures and Unions, Internal Implementation of Structures, Self-Referential Structures
Simple Searching and Sorting Techniques: Introduction to Searching, Sequential Search, Binary Search, Interpolation Search, Selection Sort, Bubble Sort, Insertion Sort, Shell Sort, Introduction to Merge Sort, **Introduction to Recursion**: Towers of Hanoi, Quick Sort, Merge Sort, Complexity Analysis of Basic Sorting and Searching techniques

UNIT-II: Stacks, Queues
Stack Abstract Data Type, Queue Abstract Data Type, Stacks and Queues using arrays, Introduction to Evaluation of Expressions, Evaluating Postfix Expressions, Infix to Postfix and Prefix conversion, Circular Queues using arrays. Pointers, Dynamically AllocatedStorage using pointers, Dynamically Linked Stacks and Queues

UNIT-III: Linked Lists:
Singly Linked Lists: Representation in memory, Algorithms of several operations:Traversing, Searching, Insertion into, Deletion from linked list, Radix Sort. **Circular Linked Lists**: Representation in memory, Algorithms of several operations: Traversing, Searching, Insertion into, Deletion from Circular Linked Lists. **Doubly Linked Lists**: Representation in memory, Algorithms of several operations: Traversing, Searching, Insertion into, Deletion from Doubly Linked Lists. **Polynomials**: Representing Polynomials as Singly Linked Lists, Adding Polynomials, ErasingPolynomials.

UNIT-IV: Trees: Representation of Trees, Binary Trees Abstract Data Type, Properties of Binary Trees, Binary Tree Representations, Binary Tree Traversals, Additional Binary Tree Operations, Threaded Binary Trees, Heap Abstract Data Type, Insertion into a max heap, Deletion from a max heap, Heap Sort, Introduction to Binary Search Trees, Searching a Binary Search Tree, Inserting an Element into a Binary Search Tree, Deleting an Element from a Binary Search Tree, Height of a Binary Search Tree.

UNIT-V: Graphs: Graph Abstract Data Type, Definitions, Graph Representations, Elementary Graph Operations, Depth First Search, Breadth First Search, Connected Components, Spanning Trees, Minimum Cost Spanning Trees, Prim's and Kruskal's Algorithms, Shortest Paths and Transitive Closure, Single Source All Destination - Dijkstra'sAlgorithm

Course Outcomes for First Year Second Semester Course	
Course Code: B20CS1203	
Course Title: DATA STRUCTURES	
CO-1	Demonstrate the concept of recursion, the way arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory
CO-2	Implement stacks, linked lists, queues and trees and apply them to solve different Computer Science problems and Engineering problems.
CO-3	Compare alternative implementations of data structures with respect to performance
CO-4	Apply the principal algorithms for sorting and searching to the given data and analyze the computational efficiency
CO-5	Make use of Graphs to solve real life applications.

SYLLABUS: APPLIED PHYSICS LAB (B20BS1207)

(Common to AIDS, CSE, ECE & IT)

1. DeterminationoftheWavelength oflightfromasource– DiffractionGrating–Normalincidence.
2. Determination of radius of curvature of Plano convex lens – Newton'sRings.
3. Determination of the thickness of a thin spacer using interference – Air Wedgemethod.
4. DeterminationofMagneticfieldalongtheaxisofacurrentcarryingcoil–StewartandGee'sapparatus.
5. VerificationofLawsofseriesandparallelcombinationsofresistances–CareyFoster'sbridge.
6. Determination of Temperature Coefficient of Resistance of athermistor.
7. To study the characteristics of PN Junctiondiode.
8. TodeterminetheNumericalapertureof a given opticalfiberandhencetofinditsacceptanceangle.
9. Determination of Planckconstant
10. Determination of the Rigidity modulus of elasticity of a material – Torsionalpendulum.
11. Verification of the laws of vibrations in stretched stings -Sonometer.
12. Determination of the frequency of the AC supply – ACSonometer.
13. To determine refractive indices (μo and μe) of a birefringent material(prism).

Course Outcomes for First Year First Semester Course	
Course Code: B20BS1207	
Course Title: APPLIED PHYSICS LAB	
CO-1	Get hands on experience in setting up experiments and using the instruments / equipment individually
CO-2	Get introduced to using new / advanced technologies and understand their significance.

SYLLABUS: COMMUNICATION SKILLS LAB (B20HS1202)

(Common to AIDS, CE, CSE, ECE, EEE, IT & ME)

UNIT-I: A list of communicative expressions (Requests, Permissions, Asking/ giving directions, Thanking and Responding to Thanks, Clarifying, Inviting, Congratulating, Advising, Agreeing and disagreeing etc.,) Common Errors.

UNIT-II: Pronunciation Letters and Sounds The Sounds of English Stress and Intonation Phonetic Transcription.

UNIT-III: Group Discussions.

UNIT-IV: Presentation Skills

UNIT-V: Interview Skills, Resume/ Curriculum VitaeCovering Letter, FAQ's, Telephonic Interviews/ Etiquette Mock Interviews.

Course Outcomes for First Year Second Semester Course	
Course Code: B20HS1202	
Course Title: COMMUNICATION SKILLS LAB	
CO-1	Apply their linguistic competence in all LSRW skills to professional and personal settings
CO-2	Apply communication skills learnt through various language learning activities to their advancement in academics and competitive examinations.
CO-3	Draft job application letters, E-Mail messages and other writing discourses.
CO-4	Adopt professional etiquette consistent with formal settings
CO-5	Improve fluency and clarity in both spoken and written English

SYLLABUS: DATA STRUCTURES LAB (B20CS1206)

(Common to AIDS & IT)

1. Write a program for sorting a list using Bubble sort and then apply binarysearch.
2. Write a program to implement the operations onstacks.
3. Write a program to implement the operations on circularqueues.
4. Write a program for evaluating a given postfix expression usingstack.
5. Write a program for converting a given infix expression to postfix form usingstack
6. Write a program for implement the following usingrecursion
   i) Towers ofHanoi
   ii) GCD of two numbers
   iii)Maximum element in anarray
7. Write a program to implement insert, delete, traverse, search operations on singly linkedlists
8. Write a program to implement insert, delete, traverse, search operations on circular linkedlists
9. Write a program to implement insert, delete, traverse, search operations on doubly linkedlists
10. Write a program for the representation of polynomials using linked list and for the addition of two suchpolynomials.
11. Write a program for quick sort.
12. Write a program for Mergesort.
13. Write a program for Heap sort.
14. Write a program to create a binary search tree and for implementing the in order, preorder, post order traversal usingrecursion.
15. Write a program for finding the transitive closure of adigraph.
16. Write a program for finding the shortest path from a given source to any vertex in a digraph using Dijkstra'salgorithm.
17. a.Write a program for finding the Depth First Search of a graph.
    b.Write a program for finding the Breadth First Search of agraph
18. Write a program to implement PrimsAlgorithm.

Course Outcomes for First Year Second Semester Course	
Course Code: B20CS1206	
Course Title: DATA STRUCTURES LAB	
CO-1	Student will be able to write programs to implement stacks and queues.
CO-2	Ability to implement various searching and sorting techniques.
CO-3	Ability to implement programs using trees and graphs.

SYLLABUS: PROFESSIONAL ETHICS AND HUMAN VALUES (B20MC1202)

(Common to CSE, ECE & IT)

UNIT-I: Human Values: Morals,ValuesandEthics-Integrity-WorkEthic-ServicelearningCivicVirtue Respect for others Living Peacefully Caring Sharing Honesty -Courage-Cooperation Commitment Empathy Self Confidence Character Spirituality.

UNIT-II: Engineering Ethics: Senses of 'Engineering Ethics-Variety of moral issued- Types of inquiry Moral dilemmas Moral autonomy- Kohlberg's theory- -Consensus andcontroversy Models of professional roles-Theories about right action-Self-interest - Customs and religion Uses of Ethical theories Valuing time Cooperation Commitment.

UNIT-III: Engineering as Social Experimentation: Engineering As Social Experimentation- Framing the problem- Determining the facts codes of Ethics- Clarifying Concepts- Application issues Common Ground –General Principles- Utilitarian thinking respect forpersons.

UNIT-IV: Engineers Responsibility for Safety and Risk: Safety and risk Assessment of safety and risk. Risk benefit analysis and reducing risk-Safety and the Engineer-Designing for the safety- Intellectual Property rights(IPR).

UNIT-V: Global Issues: Globalization- Cross-culture issues-Environmental Ethics- Computer Ethics Computers as the instrument of Unethical behavior Computers as the object of Unethical acts Autonomous Computers-Computer codes of Ethics- Weapons Development -Ethics and Research Analyzing Ethical Problems in research awareness.

Course Outcomes for First Year Second Semester Course	
Course Code: B20MC1202	
Course Title: Professional Ethics and Human Values	
CO-1	Identify and analyze an ethical issue in the subject matter under investigation or in a relevant field. Demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships and fieldwork.
CO-2	Identify the multiple ethical interests at stake in a real-world situation or practice and Articulate what makes a particular course of action ethically defensible.
CO-3	Assess their own ethical values and the social context of problems.
CO-4	Identify ethical concerns in research and intellectual contexts, including academic integrity, use and citation of sources, the objective presentation of data, and the treatment of human subjects
CO-5	Integrate, synthesize, and apply knowledge of ethical dilemmas and resolutions in academic settings, including focused and interdisciplinary research

ELECTRONICS AND COMMUNICATIONS ENGINEERING

Regulation: R20			I / IV - B.Tech. I - Semester						
ELECTRONICS & COMMUNICATION ENGINEERING (under Choice Based Credit System / Elective Course System)									
SCHEME OF INSTRUCTION &EXAMINATION (With effect from 2020-21 admitted Batch onwards)									
Course Code	**Course Name**	**Category**	**Cr.**	**L**	**T**	**P**	**Int. Marks**	**Ext. Marks**	**Total Marks**
B20 HS1101	English	HS	3	3	0	0	30	70	100
B20 BS1101	Mathematics-I	BS	3	3	0	0	30	70	100
B20 BS1103	Applied Chemistry	BS	3	3	0	0	30	70	100
B20 CS1101	Programming for Problem Solving Using C	ES	3	3	0	0	30	70	100
B20 EC1101	Basic Electronics	ES	3	3	0	0	30	70	100
B20 CS1103	Programming for Problem Solving Using C Lab	ES	1.5	0	0	3	15	35	50
B20 BS1108	Applied Chemistry Lab	BS	1.5	0	0	3	15	35	50
B20 EC1102	Electronics Workshop	ES	1.5	0	0	3	15	35	50
		TOTAL	19.5	15	0	9	195	455	650

ELECTRONICS & COMMUNICATION ENGINEERING

SYLLABUS : ENGLISH (B20HS1101)

(Common to AIDS, CE, CSE, ECE, EEE, IT&ME)

UNIT-I : Lesson: A Drawer full of happiness from *Infotech English*, Maruthi Publications.
Listening: Listening to short audio texts and identifying the topic, context and specific pieces of information to answer a series of questions both in speaking andwriting.

Speaking: Self-introduction and introducing others. Asking and answering generalquestions on topics such as home, family, work, studies and interests.

Reading: Skimming text to get the main idea. Scanning to look for specific pieces of information.

Reading for Writing: Paragraph Writing (Hints Development), general essays using suitable cohesive devices; linkers, sign posts and transition signals; mechanics of writing, punctuation.

Vocabulary: Technical vocabulary from across technical branches (20) GRE Vocabulary (20), antonyms and synonyms, word applications, verbal reasoning and sequencing of words.
Grammar: Content words and function words; parts of Speech, tenses, word order in sentences, sentence structures.

UNIT-II : Lesson-: Nehru's letter to his daughter, Indira on her birthday from *Infotech English***,** Maruthi Publications**.**
Listening: Answering a series of questions about main idea and supporting ideas after listening to audio texts both in speaking and writing.

Speaking: Discussion in pairs/ small groups on specific topics followed by short structured talks, functional English: greetings and leave takings.

Reading: Identifying sequence of ideas; recognizing verbal techniques that help to link the ideas in aparagraph together.

Reading for Writing: Identifying the main ideas, rephrasing and summarizing them (précis writing); avoiding redundancies and repetitions.
Vocabulary: Technical vocabulary from across technical branches (20words). GRE Vocabulary Analogies (20 words), antonyms and synonyms, word applications.
Grammar: Articles, prepositions, conjunctions, use of synonyms and antonyms.

UNIT-III: Lesson: Stephen Hawking-Positivity' Benchmark' from *Infotech English*, MaruthiPublications.
Listening: Listening for global comprehension and summarizing what is listenedto both in speaking and writing.
Speaking: Discussing specific topics in pairs or small groups and reporting whatis discussed. Functional English: complaining and apologizing.
Reading: Reading a text in detail by making basic inferences -recognizing: and interpreting specific context clues; strategies to use text clues for comprehension, critical reading.
Reading for Writing: Letter writing- types, format and principles of letterwriting, E-mail etiquette, writing a Resume/CV and covering letter.
Vocabulary: Technical vocabulary from across technical branches (20 words. GRE. Vocabulary 20words), Idioms & Phrasal verbs, Homonyms, wordapplications,sequencing of words.
Grammar: Sentence Structures, Transformation of sentences (Active and passive Voice, Degrees of comparison, Simple, Compound and Complex).

UNIT-IV:Lesson:LikingaTree,Unbowed:WangariMaathaibiographyfrom*Infotech English*, MaruthiPublications.
Listening: Making predictions while listening to conversations/ transactional dialogues without video (only audio), listening to audio-visual texts.

Speaking: Role plays for practice of conversational English in academic contexts(formal and informal) - asking for and giving information/directions. Functional English: asking for permissions, requesting,Inviting.
Reading: Studyingthe use of graphic elements in texts to convey information, reveal trends/patterns/relationships, communicative process or display complicated data.
Reading for Writing: Information transfer; describe, compare, contrast, identify significance/trends based on information provided in figures/charts/graphs/tables. Pamphlet writing, writing for media, writing SOP's.
Vocabulary: Technical vocabulary from across technical branches (20 words GRE Vocabulary (20words), antonyms and synonyms, word applications, cloze encounters, foreign phrases.
Grammar: Quantifying expressions - adjectives and adverbs: comparing and contrasting, question Tags, direct and indirect speech, reporting for academic purposes.

UNIT-V: Lesson: Stay Hungry–Stay Foolish from *Infotech English*, Maruthi Publications.
Listening: Identifying key terms, understanding concepts and interpreting theconcepts both in speaking and writing.
Speaking: Formal oral presentationsontopics from academic contexts–with/without the use of PPT slides. Functional English: Suggesting/Opiniongiving.
Reading: Reading for comprehension, RAP Strategy - intensive reading andextensivereading techniques.
Reading for Writing: Report writing, writing academic proposals- writing researcharticles: format and style.
Vocabulary: Technical vocabulary from across technical branches (20 words GRE 'Vocabulary (20 words, antonyms and synonyms, word applications, coherence, matchingemotions.
Grammar: Editing short texts — identifying and correcting common errors in grammar and usage (articles, prepositions, tenses, subject-verb agreement, parallel structures, phrases and clauses).

Course Outcomes for First Year First Semester Course	
Course Code: B20HS1101	
Course Title: ENGLISH	
CO-1	Identify the context, topic and pieces of specific information by understanding and responding to the social or transactional dialogues spoken by native speakers of English.
CO-2	Apply suitable strategies for skimming and scanning to get the main idea of a text and locate specific information.
CO-3	Build confidence and adapt themselves to the social and public discourses, discussions and presentations.
CO-4	Apply the principles of writing to paragraphs, arguments, essays and formal/informal communication.
CO-5	Construct sentences using proper grammatical structures and correct word forms.

SYLLABUS: MATHEMATICS-I (B20BS1101)

(LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS)

(Common to AIDS, CE, CSE, ECE, EEE, IT & ME)

UNIT-I: Linear systems of equations: Rank, Echelon form, Normal form, consistency of system of linear equations, Solution oflinear systems by Gauss elimination, Jacobi and Gauss-Seidelmethods.

UNIT-II: Eigen values - Eigen vectors and Quadratic forms: Eigen values, Eigen vectors, Properties, Cayley-Hamilton theorem, Inverse and powers of a matrix using Cayley-Hamilton theorem, Reduction to diagonal form, Quadratic forms,Reduction of a Quadratic form to Canonical form.

UNIT-III: Differential equations of first order and first degree: Linear, Bernoulli, Exact, Reducible to exact types. Applications: Orthogonal trajectories, Newton's Law of cooling, Simple electrical circuits.(R-L and R-C circuits only)

UNIT-IV: Linear differential equations of higher order: Linear Non-homogeneous equations of higher order with constant coefficients with source (RHS) term of the type e^{ax}, sin ax, cos ax, polynomials in x, $e^{ax}V(x)$, x V(x). Simultaneous differential equations with constant coefficients, Method of Variation of parameters.

UNIT-V: Laplace transformation: Laplace transforms of standard functions, properties, transforms of tf(t), f(t)/t, transforms of derivatives and integrals, transforms of unit step function, Dirac delta function; Inverse Laplace transforms, convolution theorem (without proof).
Applications: Solving ordinary differential equations (initial value problems) using Laplace transforms.

Course Outcomes for First Year First Semester Course	
Course Code: B20BS1101	
Course Title: MATHEMATICS – I	
CO-1	Solve a given system of linear algebraic equations
CO-2	Determine Eigen values and Eigen vectors of a system represented by a matrix.
CO-3	Solve ordinary differential equations of first order and first degree.
CO-4	Apply the knowledge in simple applications such as Newton's law of cooling, orthogonal trajectories and simple electrical circuits
CO-5	Solve linear ordinary differential equations of second order and higher order.
CO-6	Determine Laplace transform, inverse Laplace transform and solve linear ODE

SYLLABUS: APPLIED CHEMISTRY (B20BS1103)

(Common to AIDS, CE, EEE & ME)

UNIT-I: High Polymers and Plastics; Rubbers & Elastomers: Polymerization Definition, Types of Polymerization, free radical Mechanism of addition polymerization, Plastics as engineering materials, Thermoplastics and Thermosetting plastics, Compounding of plastics, Fabrication of plastics (4 techniques); Preparation, Properties and applications of Polyethylene, PVC, Bakelite, Nylon - 6,6, Bullet Proof plastics -polycarbonate and Kelvar; Fiber reinforced plastics, conducting polymers, Biodegradable Polymers - PHBV, Nylon 2, Nylon 6. Natural rubber – Vulcanization – Compounding of Rubber; Preparation, properties andapplications of Buna – S; Buna – N;

UNIT-II: Energy Sources and Applications: Nuclear Energy: Nuclear fission and Nuclear fusion – Nuclear Power reactor – Applications. Thermal fuels – Introduction – Classification – Calorific value – HCV and LCV – Bomb calorimeter; Coal : Proximate and ultimate analysis of coal – Significance of the analysis – Manufacture of coke by Otto Hoffman's by Product Process , Refining crude oil; Knocking; Chemical structure-Knocking, Octane number of gasoline, Cetane number of diesel oil, synthetic Petrol; LPG,CNG.

UNIT-III: Electrochemical cells and Corrosion: Galvanic cell, single electrode potential, Calomel electrode; Modern batteries: - Lead – Acid battery; Fuel cells- Hydrogen – Oxygen fuel cell, Lithium battery Theories of corrosion (i) dry Corrosion (ii) wet corrosion. Types of corrosion - differential aeration corrosion, pitting corrosion, galvanic corrosion, stress corrosion, Factors influencing corrosion, Protection from corrosion-material selection & design, cathodic protection, Protective coatings- metallic coatings – Galvanizing, Tinning, Electroplating; Electrrolessplating ; Paints.

UNIT-IV: Water technology: Sources of water – Hardness of water – Estimation of hardness of water by EDTA method; Boiler troubles – sludge and scale formation, Boiler corrosion, caustic embrittlement, Priming and foaming; Softening of water by Lime – Soda Process, Zeolite Process, Ion – Exchange Process; Municipal water treatment; Desalination of sea water by Electrodialysis and Reverse osmosis methods.

UNIT-V: Chemistry of Engineering Materials& Advanced Engineering materials: Cement:-Manufacture of Portland cement, setting and hardening of cement, Deterioration of cement concrete.
Refractories: Definition, Characteristics, classification, Properties and failure of refactories.
Solar Energy: Construction and working of Photovoltaic cell, applications.
Solid State Materials: Crystal imperfections, Semi Conductors, Classification and chemistry of semi conductors: Intrinsic semiconductors; Extrinsic semiconductors; Defect semiconductors, Compound Semiconductors and Organic Semiconductors.
Liquid Crystals: - Definition – Classification with examples – Applications

Course Outcomes for First Year First Semester Course	
Course Code: B20BS1103	
Course Title: APPLIED CHEMISTRY	
CO-1	Develop polymer composites, synthetic polymers and formulation of polymers and their use in design
CO-2	Apply the knowledge about quality of water and its treatment methods for domestic and industrial applications. Understanding the principle, mechanism of corrosion and utilization of various techniques to control.
CO-3	Develop the knowledge of fuels and their economics, advantages and limitations. Make use of the basic concepts of semiconductors and liquid crystals for engineering applications..
CO-4	Identify constituents of various ceramic materials, characteristics and their appropriate use in construction. Apply the knowledge of electrochemistry principles to design energy storage

SYLLABUS: PROGRAMMING FOR PROBLEM SOLVING USING C (B20CS1101)

(Common to AIDS, CSE, ECE & IT)

UNIT-I: Introduction to Computers: Creating and running Programs, Computer Numbering System, Storing Integers, Storing Real Numbers Introduction to the C Language: Background, C Programs, Identifiers, Types, Variable, Constants, Input/output, Programming Examples, Scope, Storage Classes and Type Qualifiers. Structure of a C Program: Expressions Precedence and Associativity, Side Effects, Evaluating Expressions, Type Conversion Statements, Simple Programs, Command Line Arguments.

UNIT-II: Bitwise Operators: Exact Size Integer Types, Logical Bitwise Operators, Shift Operators. Selection & Making Decisions: Logical Data and Operators, Two Way Selection, Multiway Selection, More Standard Functions. Repetition: Concept of Loop, Pretest and Post-test Loops, Initialization and Updating, Event and Counter Controlled Loops, Loops in C, Other Statements Related to Looping, Looping Applications, Programming Examples.

UNIT-III: Arrays: Concepts, Using Array in C, Array Application, Two Dimensional Arrays, Multidimensional Arrays, Programming Example – Calculate Averages Strings: String Concepts, C String, String Input / Output Functions, Arrays of Strings, String Manipulation Functions String/ Data Conversion, A Programming Example – Morse Code Enumerated, Structure, and Union: The Type Definition (Type def), Enumerated Types, Structure, Unions, and ProgrammingApplication.

UNIT-IV: Pointers: Introduction, Pointers to pointers, Compatibility, L value and R value Pointer Applications: Arrays, and Pointers, Pointer Arithmetic and Arrays, Memory Allocation Function, Array of Pointers, Programming Application. Processor Commands: Processor
Commands.

UNIT-V: Functions: Designing, Structured Programs, Function in C, User Defined Functions, Inter Function Communication, Standard Functions, Passing Array to Functions, Passing Pointers to Functions, Recursion Text Input / Output: Files, Streams, Standard Library Input / Output Functions, Formatting Input / Output Functions, Character Input / Output Functions Binary Input / Output: Text versus Binary Streams, Standard Library, Functions for Files, Converting File Type.

Course Outcomes for First Year First Semester Course	
Course Code: B20CS1101	
Course Title: PROGRAMMING FOR PROBLEM SOLVING USING C	
CO-1	Apply Precedence and Associativity rules to evaluate Expressions.
CO-2	Make use of Decision Making and Looping statements to solve various problems in C.
CO-3	Illustrate the importance of Arrays and Strings and to apply various operations on them.
CO-4	Solve various problems by making use of Structure and Union concepts.
CO-5	Design and implement programs to analyze the different pointer applications
CO-6	Develop programs using Functions and Pointers.

SYLLABUS: BASIC ELECTRONICS (B20EC1101)

(For ECE)

UNIT-I: Basic Circuit Theory & Measuring Instruments:
Independent DC & AC sources, Passive and active circuit components, Resistors, Inductors, Capacitors, V-I relationships, Series and parallel connections, Resistance, Reactance, Impedance, KVL, KCL, Concept of charging and discharging, Frequency response of a 1st order RC circuit.
Basics of Voltmeter, Ammeter and Multimeter, Basics of CRO: Functional block diagram, Operation, Measurement of voltage and current amplitude along with frequency.

UNIT-II: Semiconductor Materials and Properties: Energy band theory of solids, Classification of Materials, Fermi-level, Intrinsic and Extrinsic semiconductors, P-type and N-type semiconductors, Mobility and conductivity, Dependence of conductivity on temperature,
Charge densities, Drift and diffusion currents and their densities, Hall effect.

UNIT-III: Fundamentals of P-N Junction Diode and Special Diodes:
Elementary concepts, Forward and reverse biased P-N junction, V-I characteristics, Linear piecewise model, DC load line, Applications of PN junction diode, Varactor diode, Zener diode, LED, Photo diode.
Diode as a Rectifier: Half wave, Full wave rectifiers, PIV, DC voltage and current, Ripple factor, Efficiency, Capacitor filter, Zener diode as a voltage regulator.

UNIT-IV: Fundamentals of Transistors and Integrated Circuits (IC):
Bipolar Junction Transistor (BJT) construction and Basic operation, Active, Cut-off, Saturation modes of operation, CB, CE and CC configurations, Input and Output characteristics, Early effect, Transistor as an Amplifier and a Switch, Comparison of three configurations, Advantages of FET over BJT, Junction-Field Effect Transistor (JFET) Operation, Introduction to Integrated Circuits: Classification of ICs and Fabrication of MonolithicICs.

UNIT-V: Digital Electronics (Introductory level only)
Difference between analog and digital signals, Number Systems: Binary, Decimal, Octal, Hexa-Decimal number systems and Conversions among them, Logic Gates: AND, OR, NOT, XOR, NAND and NOR; Half and Full adder/subtractor, Latches and Flip Flops: SR, JK, T, D flip-flops.

Course Outcomes for First Year First Semester Course	
Course Code: B20EC1101	
Course Title: BASIC ELECTRONICS	
CO-1	Describe the concepts of circuit theory and measuring instruments.
CO-2	Explain the basic concepts of semiconductors, drift and diffusion current densities.
CO-3	Interpret the structure and operation of various diodes and rectifier circuits.
CO-4	Illustrate the characteristics of BJT, FET along with the fabrication process of Monolithic IC.
CO-5	Relate the concepts of number systems, logic gates and flip flops.

SYLLABUS: PROGRAMMING FOR PROBLEM SOLVING USING C LAB (B20CS1103)

(Common to AIDS, CSE, ECE & IT)

1. Exercise1:
   1. Write a C program to print a block F using hash (#), where the F has a height of six charactersand width of five and fourcharacters.
   2. Write a C program to compute the perimeter and area of a rectangle with a height of 7 inches andwidth of 5inches.
   3. Write a C program to display multiplevariables.
2. Exercise2:
   1. Write a C program to calculate the distance between the twopoints.
   2. WriteaCprogramthataccepts4integersp,q, r,s fromtheuserwhererandsarepositiveandpiseven. If q is greater than r and s is greater than p and if the sum of r and s is greater than the sumof p and q print "Correct values", otherwise print "Wrong values".
3. Exercise3:
   1. Write a C program to convert a string to a longinteger.
   2. Write a program in C which is a Menu-Driven Program to compute the area of the various geometricalshape.
   3. Write a C program to calculate the factorial of a givennumber.
4. Exercise4:
   1. Write a program in C to displaythe n terms of even natural number and their sum.
   2. Write a program in C to display the n terms of harmonic series and their sum. 1 + 1/2 + 1/3 +1/4 + 1/5 ... 1/n terms.
   3. Write a C program to check whether a given number is an Armstrong numberor not.
5. Exercise5:
   1. Write a program in C to print all unique elements in an array.
   2. Write a program in C to separate odd and even integers in separate arrays.
   3. Write a program in C to sort elements of array in ascendingorder.
6. Exercise6:
   1. Write a program in C for multiplication of two square Matrices. 2. Write a program in C to find transpose of a given matrix.
7. Exercise7:
   1. Write a program in C to search an element in a row wise and column wise sorted matrix.
   2. Write a program in C to print individual characters of string in reverse order.
8. Exercise8:
   1. Write a program in C to compare two strings without using string library functions.
   2. Write a program in C to copy one string to another string.
9. Exercise9:
   1. Write a C Program to Store Information Using Structures with Dynamically Memory Allocation
   2. Write a program in C to demonstrate how to handle the pointers in theprogram.
10. Exercise10:
    1. WriteaprograminCtodemonstratetheuseof&(addressof)and*(valueataddress)operator.
    2. Write a program in C to add two numbers using pointers
11. Exercise11:
    1. Write a program in C to add numbers using call by reference.
    2. Write a program in C to find the largest element using Dynamic Memory Allocation
12. Exercise12:
    1. Write a program in C to swap elements using call by reference.
    2. WriteaprograminCto countthenumberofvowelsandconsonants in astringusingapointer.

13. Exercise13:
    1. Write a program in C to show how a function returningpointer.
    2. Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using malloc( )function
14. Exercise14:
    1. Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using calloc( ) function. Understand the difference between the above twoprogram.
    2. Write a program in C to convert decimal number to binary number using thefunction.
15. Exercise15:
    1. Write a program in C to check whether a number is a prime number or not usingthe function.
    2. Write a program in C to get the largest element of an array using thefunction.
16. Exercise16:
    1. Write a program in C to append multiple lines at the end of a textfile.
    2. Write a program in C to copy a file in anothername.
    3. Write a program in C to remove a file from thedisk.

Course Outcomes for First Year First Semester Course	
Course Code: B20CS1103	
Course Title: PROGRAMMING FOR PROBLEM SOLVING USING C LAB	
CO-1	Write, Trace and Debug the programs and correct syntax and logical errors..
CO-2	Solve various Problems by making use of Arrays, Strings, Structures, Unions and Pointers
CO-3	Solve a complex problem by decomposing into several modules by using Functions
CO-4	Apply various File I/O operations

SYLLABUS: APPLIED CHEMISTRY LAB (B20 BS1108)

(Common to AIDS, CE, EEE & ME)

LIST OF PROGRAMS:

1.Determination of Alkalinity of water sample.

2.Determination of total hardness of water by EDTAmethod.

3.Estimation of Ferrous Iron by$KMnO_4$.

4.Estimation of oxalic acid by $KMnO_4$.

5.Estimation of Mohr's salt by$K_2Cr_2O_7$.

6.Estimation of Dissolved oxygen by Winkler's method.

7.Determination of pH of water and soil sample.

8. Determination of Chlorides present in watersample.

9. Conductometric titration of strong acid Vs strongbase.

10. Potentiometric titration of strong acid Vs strongbase.

11. Potentiometric titration of strong acid Vs weakbase.

12. Preparation of Phenol formaldehyderesin.

13. Determination of saponification value ofoils.

14. Determination of pour and cloud points of lubricatingoil.

15. Determination of Acid value ofoil.

Course Outcomes for First Year Second Semester Course	
Course Code: B20 BS 1108	
Course Title: APPLIED CHEMISTRY LAB	
CO-1	Gain technical knowledge of measuring, operating and testing of chemical instruments and equipments. Carrying out different types of chemical reactions for analysing different materials in micro level quantities
CO-2	Analyze and generate experimental skills to enhance the analytical thinking capabilities in the modern trends in engineering and technology

SYLLABUS: ELECTRONICS WORKSHOP (B20EC1102)
(For ECE)

LIST OF EXPERIMENTS:

I.Components Identification andTesting:

A. Identify,understand,anddrawthedifferentcircuitcomponentsandsymbolsusedinElectronics labs.
B. Resistance value using colorcode.
C. Breadboard and BNCConnectors.
D. Study & Identification of different switches andrelays.
E. Classification of Active and Passiveelements.

II.**LaboratoryEquipment:**

A. Study of Power Supplies, DMM, Function Generator andCRO
B. Measurement of Voltage Amplitude &Frequency
C. Measurement of Inductance andCapacitance.
D. Measurement of Voltage & Current with Series & Parallelconnections

III.**SolderingPractice:**

A. Solder practice with different components available inlab
B. A demo on PCBfabrication:
(i) Artwork & printing of a simple PCB.
(ii)Etching & Drilling of PCB

IV.I ntroduction to Technical Software andTools:

A. EDA Tools: PSPICEdemo
B. MATLAB Introduction: Demo, Signals &Plotting
C. Google Docs, Sheets, Slides and Forms for Documentation andCollaboration

V.**Personal Computer (PC) and Electronic HardwareBoards:**

A. Study of PCHardware
B. PC Software installation (OS andCompilers)
C. Basics and Demonstration of Arduino and Raspberry Piboards

Course Outcomes for First Year First Semester Course	
Course Code: B20EC1102	
Course Title: ELECTRONICS WORKSHOP	
CO-1	Identify electronic components like resistors, capacitors, diodes, transistors etc.
CO-2	Use measuring instruments and equipment such as multimeter, function generator, power supply and CRO. Assemble circuits on a breadboard, analyze the performance of the circuits, evaluate the results and confirm the validity of established concepts.
CO-3	Describe the PCB fabrication process, Solder and de-solder components on PCB.
CO-4	Use EDA/System tools such as PSPICE and MATLAB
CO-5	Examine the PC Hardware, Software and Arduino/Raspberry Pi boards

ELECTRONICS & COMMUNICATION ENGINEERING

SYLLABUS : MATHEMATICS – II (B20BS1201)

(FOURIER ANALYSIS AND PARTIAL DIFFERENTIAL EQUATIONS)

(Common to AIDS, CE, CSE, ECE, EEE, IT & ME)

UNIT-I: Fourier Series: Introduction, Periodic functions, Fourier series of a periodic function, Dirichlet's conditions, Change of interval. Even and odd functions, Half-range sine and cosine series.

UNIT-II: Fourier Transforms: Fourier integral theorem (without proof), Complex form of Fourier integral, Fourier sineandcosine integrals, Fourier transform, Fourier sine and cosine transforms, Finite Fourier transforms, properties, inverse transforms, Parseval'sIdentities.

UNIT-III: Partial differentiation: Introduction, Homogeneous functions, Euler's theorem, Chain rule, Total derivative, Jacobians and their properties. Applications: Taylor series expansion for a function of two variables, Maxima and Minima of functions of two variables with and without constraints, Lagrange's method. Leibnitz's rules for differentiation under integralsign.

UNIT-IV: First order and higher order partial differential equations: Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions, solutions of Lagrange linear equation. Solutions of Linear homogeneous and non-homogeneous partial differential equations with constant coefficients –source (RHS) terms of the type e^{ax+by}, sin (ax+by), cos (ax+by),$x^m y^n$.

UNIT-V: Applications of partial differential equations: Method of separation of variables, One–dimensional wave equation, the D'Alembert'ssolution, one- dimensional heatequation.

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1201	
Course Title: MATHEMATICS–II	
CO-1	Determine Fourier series and half range series of functions.
CO-2	Determine Fourier transforms of non-periodic functions and also use them to evaluate integrals
CO-3	Compute partial derivatives, total derivative and Jacobians.
CO-4	Find maxima/minima of functions of two variables and evaluate some real definite integrals.
CO-5	Identify the discourse features, and improve intensive and extensive reading skills Form partial differential equations and solve Lagrange linear equation. Solve linear higher order homogeneous and non-homogeneous PDEs
CO-6	Find theoretical solution of one-dimensional wave equation and one-dimensional heat equation

SYLLABUS: APPLIED PHYSICS (B20BS1203)

(Common to AIDS, CE, EEE & ME)

UNIT-I: WAVE OPTICS: Interference: Principle of super position. Interference of light, interference in thin films (reflected light) – Wedge film and Newton`s rings – Applications

Diffraction: Types of diffraction, Fraunh offer diffraction at a single alit, Diffraction grating, grating spectrum. Missing order, Resolving power, Rayleigh's Criterion, Resolvingpower of Grating.

UNIT-II: DIELECTRICS AND MAGNETICS: Dielectrics : Introduction to dielectrics, Electric Polarization, Dielectric polariz ability, Susceptibility, Dielectric constant, Types of Polarization, Frequency dependence of Polarization, Internal field in a dielectric, Claussius and Mosotti equation, Applications of dielectrics.

Magnetics: Introduction to magnetics, Magnetic dipole moment , Magnetization, Magnetic susceptibility and Permeability, Origin of permanent magnetic moment, Classification of magnetic materials (Dia , Para, Ferro, Antiferro and ferri), Hysteresis – Weiss Domain theory – Ferrites, soft and hard magnetic materials, Magnetic device applications.

UNIT-III: LASERS AND FIBER OPTICS: Lasers: Introduction, Interaction of radiation with matter, condition for light amplification,Einstein's relations. Requirements of lasers device Types of lasers, Design and working of Ruby and He – Ne lasers, Laser characteristics and applications.

Fiber Optics: Introduction to optical fibers, Principle of light propagation in fiber, Acceptance angle, Numerical aperture, Modes of propagations, types of fibers, classification of fibers based on refractive index profile, applications of fibers with emphasis on fiber opticcommunication.

UNIT-IV: SEMICONDUCTORS: Introduction, intrinsic semi conductors, density of charge carries, Fermi energy, Electrical conductivity – Extrinsic semi conductors – P-type and N-type, Density of charge carriers, dependence of Fermi energy on carrier concentration and temperature, direct and indirect band – gap semi conductors, Hall effect, Applications of Hall effect. Drift and diffusion currents, Continuity equation, applications of semiconductors.

UNIT-V: ULTRASONICS AND NANOMATERIALS: Ultrasonics: Introduction, Production of Ultrasonics – Piezoelectric and Magnetostriction methods, detection of ultrasonics, acoustic grating - determination of wavelength and velocity of ultrasonics, applications of ultrasonics.

Nanomaterials: Introduction, salient features of Nanomaterials, Synthesis methods – Ball milling, Condensation, Chemical Vapour Deposition and Sol – Gel methods, Characterization techniques for nano materials - The scanning tunneling microscopy (STM)and The atomic force microscopy (AFM), Carbon nanotubes (CNTS), Applications of Nano materials.

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1203	
Course Title: APPLIED PHYSICS	
CO-1	Interpret the behavior of light radiation in interference and diffraction Phenomena and their applications
CO-2	Explain the classification and properties of dielectric and magnetic materials suitable for engineering applications.
CO-3	Understand the basics of modern optical technologies like lasers and optical fibers and their utility in various fields
CO-4	Explain the important aspects of semiconductors and electrical conductivity in them
CO-5	Understand the basics of technology of Ultrasonics in various fields and demonstrate the synthesis and applications of nanomaterials.

SYLLABUS: BASIC ELECTRICAL ENGINEERING (B20EE1201)

(Common to AIDS & IT)

UNIT-I: D.C Machines: Principle of operation and construction of DC generator – EMF equation – types of DC machines – OCC of DC shunt generator - Torque equation of DC motor - applications – losses and efficiency - Brake test- Swinburne's test - speed control of DC shunt motor- Simple Problems.

UNIT-II: Introduction to AC Circuits: Representation of sinusoidal waveforms - Peak, Average and RMS values - Phasor representation - power factor - Analysis of single-phase ac circuits consisting of pure resistor, pure inductor, pure capacitor, R-L, R-C, RLC series circuits-instantaneous power- real power - reactive power - apparent power.

UNIT-III: Transformers: Principle of operation of Single-Phase Transformer – EMF equation - Losses and efficiencyof transformer- Regulation of transformer- OC and SC tests on single phase transformer- Predetermination of efficiencyand regulation -SimpleProblems.

UNIT-IV: Induction Machines: Principle of operation and construction of three phase Induction Motors- slip ring and squirrel cage motors-Torque Equation - Torque-Slip Characteristics- Brake test on three phase Induction motor- Simple Problems.

UNIT-V: Synchronous Machines: Principle of operation and construction of Alternators –Types of Alternators-EMF equation of three phase Alternator - Regulation of Alternator by Synchronous impedance method. Principle of operation and construction of Synchronous Motor- Starting methods of Synchronous motor.

Course Outcomes for First Year Second Semester Course	
Course Code: B20EE1201	
Course Title: BASIC ELECTRICAL ENGINEERING	
CO-1	Explain the principle of operation of DC machines and analyze their characteristics. Acquire the skills to analyze the speed control methods of DC motors.
CO-2	Analyze single-phase AC circuits consisting of series RL - RC - RLC combinations.
CO-3	Explain the operation of single-phase transformer.
CO-4	Analyze the slip – torque characteristics of a 3-phase induction motor.
CO-5	Explain the operation of synchronous generators.

SYLLABUS: ENGINEERING DRAWING (B20ME1203)

(For ECE)

UNIT-I: Geometrical Constructions and Engineering Curves: Introduction to Engineering Drawing, Geometrical Constructions, Engineering Curves: Parabola, Ellipse and Hyperbola by general method (Eccentricity method only), cycloid, epicycloid, hypocycloid, involutes, tangent & normal for these curves.

UNIT-II: Orthographic Projections: Introduction to orthographic projection, projections of points invarious quadrants, projections of lines: lines perpendicular to one of the reference planes (HP,VP or PP), Projections of straight lines inclined to one reference plane and parallel to other, Projections of straight lines inclined to both the planes.

UNIT-III: Projections of planes: Regular planes perpendicular to one reference plane and parallel toother, planes perpendicular to one reference plane and inclined to the other referenceplane;
planes inclined to both the reference planes.

UNIT-IV: Projections of Solids: – Prisms, Pyramids, Cones and Cylinders with the axis inclined toone of the reference planes.
SectionsofSolids: Sections and Sectional views of Right and Regular Solids – Prism, Cylinder, Pyramid and Cone – Auxiliaryviews.

UNIT-V: Development of Solids: Development of Surfaces of Right and Regular Solids – Prism, Cylinder, Pyramid and Cone.
Isometric Projection: Introduction to Isometric projection and Isometric projection of simple Right and Regular Solids – Prism, Cylinder, Pyramid and Cone.

Course Outcomes for First Year Second Semester Course	
Course Code: B20ME1203	
Course Title: ENGINEERING DRAWING	
CO-1	Apply principles of drawing to Construct polygons and engineering curves.
CO-2	Apply principles of Orthographic projections to draw the projections of points and lines.
CO-3	Apply principles of drawing to draw the projections of planes.
CO-4	Apply principles of drawing to draw projections of solids and their sectional views.
CO-5	Apply principles of drawing to draw developments and pictorial view of solids.

SYLLABUS: NETWORK ANALYSIS (B20EE1202)

(For ECE)

UNIT-I: DC CIRCUITS AND THEOREMS: Electrical circuit elements (R - L and C), Types of sources- Ohm's Law- Kirchhoff laws – Network reduction techniques (series, parallel, series-parallel and Star-Delta Transformations), Source transformation, Mesh analysis and nodal analysis.
Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum power transfer theorem- Problems using dependent sources also.

UNIT-II: DC TRANSIENTS: Inductor, Capacitor, Source free RL, RC and RLC response, Evaluation of Initial conditions, Application of unit step function to RL, RC and RLC circuits, Concept of Natural, Forced and Complete response.

UNIT-III: ANALYSIS OF AC NETWORKS AND RESONANCE: Review of AC circuits, Mesh analysis and nodal analysis, Superposition theorem,Thevenin's theorem, Norton's theorem, Maximum power transfer theorem. Series and Parallel resonance, selectivity, bandwidth and quality factor.

UNIT-IV: TWO-PORT NETWORKS: Introduction, Z-parameters, Y-parameters, ABCD-parameters, h-parameters, Relationshipbetween various parameters, series, parallel & cascaded connection of two port network.

UNIT-V: NETWORK FUNCTIONS: Network functions for single port and two port, calculation of network functions for ladder and general networks, Transfer function, poles and zeros, restriction of poles and zeros for driving point and transfer function, time domain behaviour of poles and zeros for driving point and transfer function, Time domain behaviour from pole-zero plot, Routh-Hurwitz criterion of stability of network function.

Course Outcomes for First Year Second Semester Course	
Course Code: B20EE1202	
Course Title: NETWORK ANALYSIS	
CO-1	Apply concepts of Kirchhoff's laws, Network reduction Techniques for solving DC circuits and apply various network theorems to analyze the various electric circuits.
CO-2	Learn the behavior of energy storage elements (inductance and capacitance) in electric circuits and analyze transient and steady state response.
CO-3	Analyze the RLC circuits in sinusoidal steady state.
CO-4	Determine two port network parameters.
CO-5	Determine network function, poles-zeros and stability of network function.

SYLLABUS: APPLIED PHYSICS LAB (B20BS1207)

(Common to AIDS, CSE, ECE & IT)

1. DeterminationoftheWavelength oflightfromasource– DiffractionGrating–Normalincidence.
2. Determination of radius of curvature of Plano convex lens – Newton'sRings.
3. Determination of the thickness of a thin spacer using interference – Air Wedgemethod.
4. DeterminationofMagneticfieldalongtheaxisofacurrentcarryingcoil–StewartandGee'sapparatus.
5. VerificationofLawsofseriesandparallelcombinationsofresistances–CareyFoster'sbridge.
6. Determination of Temperature Coefficient of Resistance of athermistor.
7. To study the characteristics of PN Junctiondiode.
8. TodeterminetheNumericalapertureof a given opticalfiberandhencetofinditsacceptanceangle.
9. Determination of Planckconstant
10. Determination of the Rigidity modulus of elasticity of a material – Torsionalpendulum.
11. Verification of the laws of vibrations in stretched stings -Sonometer.
12. Determination of the frequency of the AC supply – ACSonometer.
13. To determine refractive indices (μo and μe) of a birefringent material(prism).

Course Outcomes for First Year First Semester Course	
Course Code: B20BS1207	
Course Title: APPLIED PHYSICS LAB	
CO-1	Get hands on experience in setting up experiments and using the instruments / equipment individually
CO-2	Get introduced to using new / advanced technologies and understand their significance.

SYLLABUS: COMMUNICATION SKILLS LAB (B20HS1202)

(Common to AIDS, CE, CSE, ECE, EEE, IT & ME)

UNIT-I: A list of communicative expressions (Requests, Permissions, Asking/ giving directions, Thanking and Responding to Thanks, Clarifying, Inviting, Congratulating, Advising, Agreeing and disagreeing etc.,) Common Errors.

UNIT-II: Pronunciation Letters and Sounds The Sounds of English Stress and Intonation Phonetic Transcription.

UNIT-III: Group Discussions.

UNIT-IV: Presentation Skills

UNIT-V: Interview Skills, Resume/ Curriculum VitaeCovering Letter, FAQ's, Telephonic Interviews/ Etiquette Mock Interviews.

Course Outcomes for First Year Second Semester Course	
Course Code: B20HS1202	
Course Title: COMMUNICATION SKILLS LAB	
CO-1	Apply their linguistic competence in all LSRW skills to professional and personal settings
CO-2	Apply communication skills learnt through various language learning activities to their advancement in academics and competitive examinations.
CO-3	Draft job application letters, E-Mail messages and other writing discourses.
CO-4	Adopt professional etiquette consistent with formal settings
CO-5	Improve fluency and clarity in both spoken and written English

SYLLABUS: BASIC ELECTRICAL ENGINEERING LAB (B20EE1204)

(For ECE)

LIST OF EXPERIMENTS:

1. Verification of ohmslaw
2. Verification of KCL andKVL.
3. Parameters of Iron coreinductor.
4. Magnetization characteristics of D.C. Shuntgenerator.
5. Speed control of D.C. shuntmotor.
6. Brake test on DC shuntmotor.
7. Brake test on DC seriesmotor.
8. Swinburne's test on DCmachine.
9. Load test on DC shuntgenerator.
10. OC & SC tests on single-phasetransformer.
11. Load test on single-phasetransformer.
12. Brake test on three phase inductionmotor.

Course Outcomes for First Year Second Semester Course	
Course Code: B20EE1204	
Course Title: BASIC ELECTRICAL ENGINEERING LAB	
CO-1	Verify ohms law and Kirchhoff's laws for a given circuit
CO-2	Determine the parameters of iron core inductor
CO-3	Predetermine the performance of DC machines and transformers.
CO-4	Make use of DC shunt machines for applications.
CO-5	Perform brake test on 3-phase induction motor.

SYLLABUS: PROFESSIONAL ETHICS AND HUMAN VALUES (B20MC1202)

(Common to CSE, ECE & IT)

UNIT-I: Human Values: Morals,ValuesandEthics-Integrity-WorkEthic-ServicelearningCivicVirtue Respect for others Living Peacefully Caring Sharing Honesty -Courage-Cooperation Commitment Empathy Self Confidence Character Spirituality.

UNIT-II: Engineering Ethics: Senses of 'Engineering Ethics-Variety of moral issued- Types of inquiry Moral dilemmas Moral autonomy- Kohlberg's theory- -Consensus andcontroversy Models of professional roles-Theories about right action-Self-interest - Customs and religion Uses of Ethical theories Valuing time Cooperation Commitment.

UNIT-III: Engineering as Social Experimentation: Engineering As Social Experimentation- Framing the problem- Determining the facts codes of Ethics- Clarifying Concepts- Application issues Common Ground –General Principles- Utilitarian thinking respect forpersons.

UNIT-IV: Engineers Responsibility for Safety and Risk: Safety and risk Assessment of safety and risk. Risk benefit analysis and reducing risk-Safety and the Engineer-Designing for the safety- Intellectual Property rights(IPR).

UNIT-V: Global Issues: Globalization- Cross-culture issues-Environmental Ethics- Computer Ethics Computers as the instrument of Unethical behavior Computers as the object of Unethical acts Autonomous Computers-Computer codes of Ethics- Weapons Development -Ethics and Research Analyzing Ethical Problems in research awareness.

Course Outcomes for First Year Second Semester Course	
Course Code: B20MC1202	
Course Title: PROFESSIONAL ETHICS AND HUMAN VALUES	
CO-1	Identify and analyze an ethical issue in the subject matter underinvestigationor in a relevantfield. Demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships and field work.
CO-2	Identify the multiple ethical interests at stake in a real-world situation or practice and Articulate what makes a particular course of action ethically defensible.
CO-3	Assess their own ethical values and the social context of problems.
CO-4	Identify ethical concerns in research and intellectual contexts, including academic integrity, use and citation of sources, the objective presentation of data, and the treatment of human subjects.
CO-5	Integrate, synthesize, and apply knowledge of ethical dilemmas and resolutions in academic settings, including focused and interdisciplinary research.

ELECTRICAL AND ELECTRONICS ENGINEERING

Regulation: R20			I / IV - B.Tech. I - Semester						
ELECTRICAL & ELECTRONICS ENGINEERING (under Choice Based Credit System / Elective Course System)									
SCHEME OF INSTRUCTION &EXAMINATION (With effect from 2020-21 admitted Batch onwards)									
Course Code	**Course Name**	**Category**	**Cr.**	**L**	**T**	**P**	**Int. Marks**	**Ext. Marks**	**Total Marks**
B20 HS1101	English	HS	3	3	0	0	30	70	100
B20 BS1101	Mathematics-I	BS	3	3	0	0	30	70	100
B20 BS1102	Applied Physics	BS	3	3	0	0	30	70	100
B20 ME1101	Engineering Drawing	ES	3	2	0	2	30	70	100
B20 EE1101	Introduction to Electrical Systems	ES	3	3	0	0	30	70	100
B20 EE1104	Basic Electrical SystemsLab	ES	1.5	0	0	3	15	35	50
B20 BS1107	Applied Physics Lab	BS	1.5	0	0	3	15	35	50
B20 ME1102	Workshop Practice	ES	1.5	0	0	3	15	35	50
		TOTAL	**19.5**	**14**	**0**	**11**	**195**	**455**	**650**

ELECTRICAL & ELECTRONICS ENGINEERING

SYLLABUS : ENGLISH (B20HS1101)

(Common to AIDS, CE, CSE, ECE, EEE, IT&ME)

UNIT-I : Lesson: A Drawer full of happiness from *Infotech English*, Maruthi Publications.
Listening: Listening to short audio texts and identifying the topic, context and specific pieces of information to answer a series of questions both in speaking andwriting.

Speaking: Self-introduction and introducing others. Asking and answering generalquestions on topics such as home, family, work, studies and interests.

Reading: Skimming text to get the main idea. Scanning to look for specific pieces of information.

Reading for Writing: Paragraph Writing (Hints Development), general essays using suitable cohesive devices; linkers, sign posts and transition signals; mechanics of writing, punctuation.

Vocabulary: Technical vocabulary from across technical branches (20) GRE Vocabulary (20), antonyms and synonyms, word applications, verbal reasoning and sequencing of words.
Grammar: Content words and function words; parts of Speech, tenses, word order in sentences, sentence structures.

UNIT-II : Lesson-: Nehru's letter to his daughter, Indira on her birthday from *Infotech English***,** Maruthi Publications**.**
Listening: Answering a series of questions about main idea and supporting ideas after listening to audio texts both in speaking and writing.

Speaking: Discussion in pairs/ small groups on specific topics followed by short structured talks, functional English: greetings and leave takings.

Reading: Identifying sequence of ideas; recognizing verbal techniques that help to link the ideas in aparagraph together.

Reading for Writing: Identifying the main ideas, rephrasing and summarizing them (précis writing); avoiding redundancies and repetitions.
Vocabulary: Technical vocabulary from across technical branches (20words). GRE Vocabulary Analogies (20 words), antonyms and synonyms, word applications.
Grammar: Articles, prepositions, conjunctions, use of synonyms and antonyms.

UNIT-III: Lesson: Stephen Hawking-Positivity' Benchmark' from *Infotech English*, MaruthiPublications.
Listening: Listening for global comprehension and summarizing what is listenedto both in speaking and writing.
Speaking: Discussing specific topics in pairs or small groups and reporting whatis discussed. Functional English: complaining and apologizing.
Reading: Reading a text in detail by making basic inferences -recognizing: and interpreting specific context clues; strategies to use text clues for comprehension, critical reading.
Reading for Writing: Letter writing- types, format and principles of letterwriting, E-mail etiquette, writing a Resume/CV and covering letter.
Vocabulary: Technical vocabulary from across technical branches (20 words. GRE. Vocabulary 20 words), Idioms & Phrasal verbs, Homonyms, wordapplications,sequencing of words.
Grammar: Sentence Structures, Transformation of sentences (Active and passive Voice, Degrees of comparison, Simple, Compound and Complex).

UNIT-IV:Lesson:LikingaTree,Unbowed:WangariMaathaibiographyfrom*Infotech English*, MaruthiPublications.
Listening: Making predictions while listening to conversations/ transactional dialogues without video (only audio), listening to audio-visual texts.

Speaking: Role plays for practice of conversational English in academic contexts(formal and informal) - asking for and giving information/directions. Functional English: asking for permissions, requesting,Inviting.
Reading: Studyingthe use of graphic elements in texts to convey information, reveal trends/patterns/relationships, communicative process or display complicated data.
Reading for Writing: Information transfer; describe, compare, contrast, identify significance/trends based on information provided in figures/charts/graphs/tables. Pamphlet writing, writing for media, writing SOP's.
Vocabulary: Technical vocabulary from across technical branches (20 words GRE Vocabulary (20words), antonyms and synonyms, word applications, cloze encounters, foreign phrases.
Grammar: Quantifying expressions - adjectives and adverbs: comparing and contrasting, question Tags, direct and indirect speech, reporting for academic purposes.

UNIT-V: Lesson: Stay Hungry–Stay Foolish from *Infotech English*, Maruthi Publications.
Listening: Identifying key terms, understanding concepts and interpreting theconcepts both in speaking and writing.
Speaking: Formal oral presentationsontopics from academic contexts–with/without the use of PPT slides. Functional English: Suggesting/Opiniongiving.
Reading: Reading for comprehension, RAP Strategy - intensive reading andextensivereading techniques.
Reading for Writing: Report writing, writing academic proposals- writing researcharticles: format and style.
Vocabulary: Technical vocabulary from across technical branches (20 words GRE 'Vocabulary (20 words, antonyms and synonyms, word applications, coherence, matchingemotions.
Grammar: Editing short texts — identifying and correcting common errors in grammar and usage (articles, prepositions, tenses, subject-verb agreement, parallel structures, phrases and clauses).

Course Outcomes for First Year First Semester Course	
Course Code: B20HS1101	
Course Title: ENGLISH	
CO-1	Identify the context, topic and pieces of specific information by understanding and responding to the social or transactional dialogues spoken by native speakers of English.
CO-2	Apply suitable strategies for skimming and scanning to get the main idea of a text and locate specific information.
CO-3	Build confidence and adapt themselves to the social and public discourses, discussions and presentations.
CO-4	Apply the principles of writing to paragraphs, arguments, essays and formal/informal communication.
CO-5	Construct sentences using proper grammatical structures and correct word forms.

SYLLABUS: MATHEMATICS-I (B20BS1101)

(LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS)

(Common to AIDS, CE, CSE, ECE, EEE, IT & ME)

UNIT-I: Linear systems of equations: Rank, Echelon form, Normal form, consistency of system of linear equations, Solution oflinear systems by Gauss elimination, Jacobi and Gauss-Seidelmethods.

UNIT-II: Eigen values - Eigen vectors and Quadratic forms: Eigen values, Eigen vectors, Properties, Cayley-Hamilton theorem, Inverse and powers of a matrix using Cayley-Hamilton theorem, Reduction to diagonal form, Quadratic forms,Reduction of a Quadratic form to Canonical form.

UNIT-III: Differential equations of first order and first degree: Linear, Bernoulli, Exact, Reducible to exact types. Applications: Orthogonal trajectories, Newton's Law of cooling, Simple electrical circuits.(R-L and R-C circuits only)

UNIT-IV: Linear differential equations of higher order: Linear Non-homogeneous equations of higher order with constant coefficients with source (RHS) term of the type e^{ax}, sin ax, cos ax, polynomials in x, $e^{ax}V(x)$, x V(x). Simultaneous differential equations with constant coefficients, Method of Variation of parameters.

UNIT-V: Laplace transformation: Laplace transforms of standard functions, properties, transforms of tf(t), f(t)/t, transforms of derivatives and integrals, transforms of unit step function, Dirac delta function; Inverse Laplace transforms, convolution theorem (without proof).
Applications: Solving ordinary differential equations (initial value problems) using Laplace transforms.

Course Outcomes for First Year First Semester Course	
Course Code: B20BS1101	
Course Title: MATHEMATICS – I	
CO-1	Solve a given system of linear algebraic equations
CO-2	Determine Eigen values and Eigen vectors of a system represented by a matrix.
CO-3	Solve ordinary differential equations of first order and first degree.
CO-4	Apply the knowledge in simple applications such as Newton's law of cooling, orthogonal trajectories and simple electrical circuits
CO-5	Solve linear ordinary differential equations of second order and higher order.
CO-6	Determine Laplace transform, inverse Laplace transform and solve linear ODE

SYLLABUS: APPLIED PHYSICS (B20 BS1102)

(Common to AIDS, CE, EEE & ME)

UNIT-I: WAVE OPTICS: Interference: Principle of super position. Interference of light, interference in thin films (reflected light) – Wedge film and Newton`s rings – Applications

Diffraction: Types of diffraction, Fraunh offer diffraction at a single alit, Diffraction grating, grating spectrum. Missing order, Resolving power, Rayleigh's Criterion, Resolvingpower of Grating.

UNIT-II: DIELECTRICS AND MAGNETICS: Dielectrics : Introduction to dielectrics, Electric Polarization, Dielectric polariz ability, Susceptibility, Dielectric constant, Types of Polarization, Frequency dependence of Polarization, Internal field in a dielectric, Claussius and Mosotti equation, Applications of dielectrics.

Magnetics: Introduction to magnetics, Magnetic dipole moment , Magnetization, Magnetic susceptibility and Permeability, Origin of permanent magnetic moment, Classification of magnetic materials (Dia , Para, Ferro, Antiferro and ferri), Hysteresis – Weiss Domain theory – Ferrites, soft and hard magnetic materials, Magnetic device applications.

UNIT-III: LASERS AND FIBER OPTICS: Lasers: Introduction, Interaction of radiation with matter, condition for light amplification,Einstein's relations. Requirements of lasers device Types of lasers, Design and working of Ruby and He – Ne lasers, Laser characteristics and applications.

Fiber Optics: Introduction to optical fibers, Principle of light propagation in fiber, Acceptance angle, Numerical aperture, Modes of propagations, types of fibers, classification of fibers based on refractive index profile, applications of fibers with emphasis on fiber opticcommunication.

UNIT-IV: SEMICONDUCTORS: Introduction, intrinsic semi conductors, density of charge carries, Fermi energy, Electrical conductivity – Extrinsic semi conductors – P-type and N-type, Density of charge carriers, dependence of Fermi energy on carrier concentration and temperature, direct and indirect band – gap semi conductors, Hall effect, Applications of Hall effect. Drift and diffusion currents, Continuity equation, applications of semiconductors.

UNIT-V: ULTRASONICS AND NANOMATERIALS: Ultrasonics: Introduction, Production of Ultrasonics – Piezoelectric and Magnetostriction methods, detection of ultrasonics, acoustic grating - determination of wavelength and velocity of ultrasonics, applications of ultrasonics.

Nanomaterials: Introduction, salient features of Nanomaterials, Synthesis methods – Ball milling, Condensation, Chemical Vapour Deposition and Sol – Gel methods, Characterization techniques for nano materials - The scanning tunneling microscopy (STM)and The atomic force microscopy (AFM), Carbon nanotubes (CNTS), Applications of Nano materials.

Course Outcomes for First Year First Semester Course	
Course Code: B20 BS1102	
Course Title: APPLIED PHYSICS	
CO-1	Interpret the behavior of light radiation in interference and diffraction Phenomena and their applications
CO-2	Explain the classification and properties of dielectric and magnetic materials suitable for engineering applications.
CO-3	Understand the basics of modern optical technologies like lasers and optical fibers and their utility in various fields
CO-4	Explain the important aspects of semiconductors and electrical conductivity in them
CO-5	Understand the basics of technology of Ultrasonics in various fields and demonstrate the synthesis and applications of nanomaterials.

SYLLABUS: ENGINEERING DRAWING (B20ME1101)

(Common to CE, EEE & ME)

UNIT-I: Geometrical Constructions and Engineering Curves: Introduction to Engineering Drawing, Geometrical Constructions, Engineering Curves: Parabola, Ellipse and Hyperbola by general method (Eccentricity method only), cycloid, epicycloid, hypocycloid, involutes, tangent & normal for these curves.

UNIT-II: Orthographic Projections: Introduction to orthographic projection, projections of points invarious quadrants, projections of lines: lines perpendicular to one of the reference planes (HP,VP or PP), Projections of straight lines inclined to one reference plane and parallel to other, Projections of straight lines inclined to both the planes.

UNIT-III: Projections of planes: Regular planes perpendicular to one reference plane and parallel toother, planes perpendicular to one reference plane and inclined to the other reference plane; planes inclined to both the reference planes.

UNIT-IV: Projections of Solids: – Prisms, Pyramids, Cones and Cylinders with the axis inclined to one of the referenceplanes.
Sections of Solids: Sections and Sectional views of Right and Regular Solids – Prism, Cylinder, Pyramid and Cone – Auxiliaryviews.

UNIT-V: Development of Solids: Development of Surfaces of Right and Regular Solids – Prism, Cylinder, Pyramid and Cone.
Isometric Projection: Introduction to Isometric projection and Isometric projection of simple Right and Regular Solids – Prism, Cylinder, Pyramid and Cone.

Course Outcomes for First Year First Semester Course	
Course Code: B20ME1101	
Course Title: ENGINEERING DRAWING	
CO-1	Apply principles of drawing to Construct polygons and engineering curves.
CO-2	Apply principles of Orthographic projections to draw the projections of points and lines.
CO-3	Apply principles of drawing to draw the projections of planes.
CO-4	Apply principles of drawing to draw projections of solids and their sectional views.
CO-5	Apply principles of drawing to draw developments and pictorial view of solids.

SYLLABUS: INTRODUCTION TO ELECTRICAL SYSTEMS(B20EE1101)

(ForEEE)

UNIT-I: ELECTRICITY GENERATION: History of Electricity generation, Basic electrical quantities- Voltage, Current, Power and energy, DC and AC power supplies, frequency and rms value of sinusoidal voltage, Electric generator - principle of operation, Major sources ofelectricity generation: schematics of conventional power plants (Thermal and Hydro), Non-conventional sources (solar and wind)- principles and advantages, Power generation scenario in India.

UNIT-II: TRANSMISSION AND DISTRIBUTION OF ELECTRICITY: Transmission of Electrical Energy: Layout of power system, Overhead lines and cables, Power transmission at high voltage, Transformer - Working principle, Construction, Distribution of electrical energy - schematics diagrams of radial and ring main distribution , Substations - substation layout, substation equipment and their purpose. Overview of Indian power grid.

UNIT-III: ELECTRICAL ENERGY CONSUMPTION: Conversion to mechanical energy -Classification of Electrical motors and their applications, DC motor - Working principle, Torque equation, AC motor - Working principle of 3-phase Induction motor, slip, .Illumination - laws of illumination, Fluorescent lamp, LED lamp, Electrical energy consumption in India.

UNIT-IV: POWER CONVERTERS AND STORAGE: Need of power conversion, Rectifier- Single phase full wave diode rectifier with C-filter, rectifier applications, Inverter- Single phase full bridge inverter operation, Inverter Applications, Electricity storage- Batteries, types of batteries , Lead acid battery, Li ion batteries, Ratings and basic parameters of batteries, battery pack, Domestic Uninterrupted power supply(UPS) system.

UNIT-V: ELECTRICAL SAFETY AND EQUIPMENT PROTECTION: Hazards in electrical systems, Different types of hazards, Electric Shock, Electrical safetymeasures, Earthing, Different methods of earthing. Domestic Protective Devices - Fuses and their ratings, Miniature Circuit Breaker (MCB), Earth Leakage Circuit Breaker(ELCB), Powerratings of different domestic loads - Fans, Lights, Air conditioners, Refrigerators, etc.

Course Outcomes for First Year First Semester Course	
Course Code: B20EE1101	
Course Title: INTRODUCTION TO ELECTRICAL SYSTEMS	
CO-1	**Apply** basic knowledge to understand principles of power generation and it scenario in India.
CO-2	**Identity** different components of transmission and distribution substations and understand the Indian Powergrid scenario.
CO-3	**Apply** energy conversion principles to understand operation of electrical utility components
CO-4	**Apply** basic knowledge to understand operation of rectifier, Inverter, batteries and Uninterrupted power supply
CO-5	**Understand and apply** the Electrical safety measures while handling electrical equipment.

SYLLABUS: BASIC ELECTRICAL SYSTEMS LAB (B20EE1104)

(For EEE)

LIST OF EXPERIMENTS

1. Obtain the open circuit characteristics of DC shuntGenerator
2. Obtain the I-V Characteristics SolarPanel
3. Determination of polarity and transformation ratio of a giventransformer
4. Obtain the Torque-speed Characteristics of DC Motor
5. Slip calculation of Induction Motor for different loads
6. Single phase Uninterrupted power supply connection
7. Measurement of phase voltage ,line voltage, phase current and line current of a three phase supply
8. Verification of miniature circuit breaker operation
9. Measurement of energy using single phase energy meter
10. Measurement of Earth resistance
11. Determination of luminous efficiency of light source.
12. Fluorescent lamp connection

Course Outcomes for First Year First Semester Course	
Course Code: B20EE1104	
Course Title: BASIC ELECTRICAL SYSTEMS LAB	
CO-1	**Analyze** the performance of AC and DC Machines by Testing
CO-2	**Conduct** experiments to obtain I–V Characteristics of Solar panel
CO-3	**Measure** voltage, current, power and energy in different electrical power supply systems.
CO-4	**Demonstrate** wiring connection for domestic uninterrupted power supply
CO-5	**Analyze** the safety measures in handling electrical equipment
CO-6	**Calculate** luminous efficiency of different light sources

SYLLABUS: APPLIED PHYSICS LAB (B20BS1107)

(Common to AIDS, CSE, ECE & IT)

1. DeterminationoftheWavelengthoflightfromasource–DiffractionGrating–Normalincidence.
2. Determination of radius of curvature of Plano convex lens – Newton'sRings.
3. Determination of the thickness of a thin spacer using interference – Air Wedgemethod.
4. DeterminationofMagneticfieldalongtheaxisofacurrentcarryingcoil–StewartandGee'sapparatus.
5. VerificationofLawsofseriesandparallelcombinationsofresistances–CareyFoster'sbridge.
6. Determination of Temperature Coefficient of Resistance of athermistor.
7. To study the characteristics of PN Junctiondiode.
8. TodeterminetheNumericalapertureof a given opticalfiberandhencetofinditsacceptanceangle.
9. Determination of Planckconstant
10. Determination of the Rigidity modulus of elasticity of a material – Torsionalpendulum.
11. Verification of the laws of vibrations in stretched stings -Sonometer.
12. Determination of the frequency of the AC supply – ACSonometer.
13. To determine refractive indices (μo and μe) of a birefringent material(prism).

Course Outcomes for First Year First Semester Course	
Course Code: B20BS1107	
Course Title: APPLIED PHYSICS LAB	
CO-1	Get hands on experience in setting up experiments and using the instruments / equipment individually
CO-2	Get introduced to using new / advanced technologies and understand their significance.

SYLLABUS: WORKSHOP PRACTICE (B20ME1102)

(Common to EEE & ME)

LIST OF PROGRAMS:

CARPENTRY

1. T LapJoint
2. Corner HalvingJoint
3. DovetailJoint
4. Mortise and TenonJoint

FITTING:

1. Veefit
2. Squarefit
3. Half roundfit
4. Dovetailfit

TIN SMITHY

1. SquareTray
2. Frustum ofcone
3. StraightPipe
4. OpenScoop

HOUSE WIRING:

1. One Lamp Control by oneswitch
2. Parallel/Series Connection of threebulbs
3. Stair casewiring
4. Florescent LampFitting

Course Outcomes for First Year First Semester Course	
Course Code: B20ME1102	
Course Title: WORKSHOP PRACTICE	
CO-1	Apply wood working skills in real world applications.
CO-2	Build different parts with metal sheets in real world applications.
CO-3	Apply fitting operations in various applications.
CO-4	Apply different types of basic electric circuit connections.

ELECTRICAL & ELECTRONICS ENGINEERING

SYLLABUS : MATHEMATICS – II (B20BS1201)

(FOURIER ANALYSIS AND PARTIAL DIFFERENTIAL EQUATIONS)

(Common to AIDS, CE, CSE, ECE, EEE, IT & ME)

UNIT-I: Fourier Series: Introduction, Periodic functions, Fourier series of a periodic function, Dirichlet's conditions, Change of interval. Even and odd functions, Half-range sine and cosine series.

UNIT-II: Fourier Transforms: Fourier integral theorem (without proof), Complex form of Fourier integral, Fourier sineandcosine integrals, Fourier transform, Fourier sine and cosine transforms, Finite Fourier transforms, properties, inverse transforms, Parseval'sIdentities.

UNIT-III: Partial differentiation: Introduction, Homogeneous functions, Euler's theorem, Chain rule, Total derivative, Jacobians and their properties. Applications: Taylor series expansion for a function of two variables, Maxima and Minima of functions of two variables with and without constraints, Lagrange's method. Leibnitz's rules for differentiation under integralsign.

UNIT-IV: First order and higher order partial differential equations: Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions, solutions of Lagrange linear equation. Solutions of Linear homogeneous and non-homogeneous partial differential equations with constant coefficients –source (RHS) terms of the type e^{ax+by}, sin (ax+by), cos (ax+by),$x^m y^n$.

UNIT-V: Applications of partial differential equations: Method of separation of variables, One–dimensional wave equation, the D'Alembert'ssolution, one- dimensional heatequation.

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1201	
Course Title: MATHEMATICS–II	
CO-1	Determine Fourier series and half range series of functions.
CO-2	Determine Fourier transforms of non-periodic functions and also use them to evaluate integrals
CO-3	Compute partial derivatives, total derivative and Jacobians.
CO-4	Find maxima/minima of functions of two variables and evaluate some real definite integrals.
CO-5	Identify the discourse features, and improve intensive and extensive reading skills Form partial differential equations and solve Lagrange linear equation. Solve linear higher order homogeneous and non-homogeneous PDEs
CO-6	Find theoretical solution of one-dimensional wave equation and one-dimensional heat equation

SYLLABUS: APPLIED CHEMISTRY (B20BS1203)

(Common to AIDS, CE, EEE & ME)

UNIT-I: High Polymers and Plastics; Rubbers & Elastomers: Polymerization Definition, Types of Polymerization, free radical Mechanism of addition polymerization, Plastics as engineering materials, Thermoplastics and Thermosetting plastics, Compounding of plastics, Fabrication of plastics (4 techniques); Preparation, Properties and applications of Polyethylene, PVC, Bakelite, Nylon - 6,6, Bullet Proof plastics -polycarbonate and Kelvar; Fiber reinforced plastics, conducting polymers, Biodegradable Polymers - PHBV, Nylon 2, Nylon 6. Natural rubber – Vulcanization – Compounding of Rubber; Preparation, properties andapplications of Buna – S; Buna – N;

UNIT-II: Energy Sources and Applications: Nuclear Energy: Nuclear fission and Nuclear fusion – Nuclear Power reactor – Applications. Thermal fuels – Introduction – Classification – Calorific value – HCV and LCV – Bomb calorimeter; Coal : Proximate and ultimate analysis of coal – Significance of the analysis – Manufacture of coke by Otto Hoffman's by Product Process , Refining crude oil; Knocking; Chemical structure-Knocking, Octane number of gasoline, Cetane number of diesel oil, synthetic Petrol; LPG,CNG.

UNIT-III: Electrochemical cells and Corrosion: Galvanic cell, single electrode potential, Calomel electrode; Modern batteries: - Lead – Acid battery; Fuel cells- Hydrogen – Oxygen fuel cell, Lithium battery Theories of corrosion (i) dry Corrosion (ii) wet corrosion. Types of corrosion - differential aeration corrosion, pitting corrosion, galvanic corrosion, stress corrosion, Factors influencing corrosion, Protection from corrosion-material selection & design, cathodic protection, Protective coatings- metallic coatings – Galvanizing, Tinning, Electroplating; Electrrolessplating ; Paints.

UNIT-IV: Water technology: Sources of water – Hardness of water – Estimation of hardness of water by EDTA method; Boiler troubles – sludge and scale formation, Boiler corrosion, caustic embrittlement, Priming and foaming; Softening of water by Lime – Soda Process, Zeolite Process, Ion – Exchange Process; Municipal water treatment; Desalination of sea water by Electrodialysis and Reverse osmosis methods.

UNIT-V: Chemistry of Engineering Materials& Advanced Engineering materials: Cement:-Manufacture of Portland cement, setting and hardening of cement, Deterioration of cement concrete.
Refractories: Definition, Characteristics, classification, Properties and failure of refactories.
Solar Energy: Construction and working of Photovoltaic cell, applications.
Solid State Materials: Crystal imperfections, Semi Conductors, Classification and chemistry of semi conductors: Intrinsic semiconductors; Extrinsic semiconductors; Defect semiconductors, Compound Semiconductors and Organic Semiconductors.
Liquid Crystals: - Definition – Classification with examples – Applications

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1203	
Course Title: APPLIED CHEMISTRY	
CO-1	Develop polymer composites, synthetic polymers and formulation of polymers and their use in design
CO-2	Apply the knowledge about quality of water and its treatment methods for domestic and industrial applications. Understanding the principle, mechanism of corrosion and utilization of various techniques to control.
CO-3	Develop the knowledge of fuels and their economics, advantages and limitations. Make use of the basic concepts of semiconductors and liquid crystals for engineering applications..
CO-4	Identify constituents of various ceramic materials, characteristics and their appropriate use in construction. Apply the knowledge of electrochemistry principles to design energy storage

SYLLABUS: PROGRAMMING FOR PROBLEM SOLVING USING C (B20CS1201)

(Common to CE, EEE &ME)

UNIT-I: Introduction to Computers: Creating and running Programs, Computer Numbering System, Storing Integers, Storing Real Numbers Introduction to the C Language: Background, C Programs, Identifiers, Types, Variable, Constants, Input/output, Programming Examples, Scope, Storage Classes and Type Qualifiers. Structure of a C Program: Expressions Precedence and Associativity, Side Effects, Evaluating Expressions, Type Conversion Statements, Simple Programs, Command Line Arguments.

UNIT-II: Bitwise Operators: Exact Size Integer Types, Logical Bitwise Operators, Shift Operators. Selection & Making Decisions: Logical Data and Operators, Two Way Selection, Multiway Selection, More Standard Functions. Repetition: Concept of Loop, Pretest and Post-test Loops, Initialization and Updating, Event and Counter Controlled Loops, Loops in C, Other Statements Related to Looping, Looping Applications, Programming Examples.

UNIT-III: Arrays: Concepts, Using Array in C, Array Application, Two Dimensional Arrays, Multidimensional Arrays, Programming Example – Calculate Averages Strings: String Concepts, C String, String Input / Output Functions, Arrays of Strings, String Manipulation Functions String/ Data Conversion, A Programming Example – Morse Code Enumerated, Structure, and Union: The Type Definition (Type def), Enumerated Types, Structure, Unions, and ProgrammingApplication.

UNIT-IV: Pointers: Introduction, Pointers to pointers, Compatibility, L value and R value Pointer Applications: Arrays, and Pointers, Pointer Arithmetic and Arrays, Memory Allocation Function, Array of Pointers, Programming Application. Processor Commands: Processor
Commands.

UNIT-V: Functions: Designing, Structured Programs, Function in C, User Defined Functions, Inter Function Communication, Standard Functions, Passing Array to Functions, Passing Pointers to Functions, Recursion Text Input / Output: Files, Streams, Standard Library Input / Output Functions, Formatting Input / Output Functions, Character Input / Output Functions Binary Input / Output: Text versus Binary Streams, Standard Library, Functions for Files, Converting File Type.

Course Outcomes for First Year Second Semester Course	
Course Code: B20CS1201	
Course Title: PROGRAMMING FOR PROBLEM SOLVING USING C	
CO-1	Apply Precedence and Associativity rules to evaluate Expressions.
CO-2	Make use of Decision Making and Looping statements to solve various problems in C.
CO-3	Illustrate the importance of Arrays and Strings and to apply various operations on them.
CO-4	Solve various problems by making use of Structure and Union concepts.
CO-5	Design and implement programs to analyze the different pointer applications
CO-6	Develop programs using Functions and Pointers.

SYLLABUS: DIGITAL COMPUTER FUNDAMENTALS (B20CS1204)

(For EEE)

UNIT-I: Introduction to digital computers: History, Binary system, Bit storage and registers, Computer block diagram, problem solving by computer, algorithm importance and flowcharts, factors that affect computer performance (Hardware, software and architecture), classification (Main frames, Minis, PCs etc), Applications

UNIT-II: I/O Devices and Memory: Different Input devices: Keyboard, Mouse, Joystick, Microphone, Bar code reader etc., specifications, Output devices: Monitor, Classification of Monitors, Printers different types, Plotters, Speaker etc., Main memory: RAM and ROM, Semiconductor memory, Secondary memory Devices,Magnetic Memory, Optical Memory, MemoryHierarchy

UNIT-III: Central Processing Unit (CPU) :CPU block diagram, A simple CPU example, Instruction execution process, Different CPUs, specifications, application specific processors like GPUs, Recent processors and their characteristics-Mobileprocessors

UNIT-IV: Computer Software: System software &application software, Operating systems, Different OS examples, Examples of application software, Different Programming Languages, Database Managementsystems.

UNIT-V: Computer Networking &Security : Fundamentals of Data Communication, Introduction to Communication Devices, Computer Networks, Internet, LAN, MAN, WAN Information Security Concerns, Software Vulnerabilities, Network SecurityandAuthentication

Course Outcomes for First Year Second Semester Course	
Course Code: B20CS1204	
Course Title: DIGITAL COMPUTER FUNDAMENTALS	
CO-1	Understand various hardware and software components of computers
CO-2	Distinguish different input/output devices and memory devices of computers
CO-3	Know the importance of CPU in computers
CO-4	Distinguish various types of software
CO-5	Know various types of computer networks and security issues

SYLLABUS: PRIME MOVERS AND PUMPS (B20ME1204)

(For EEE)

UNIT-I: I.C Engines: Classification, working principles – SI Engine, CI Engine – Air standard cycles:Carnot cycle, Otto, Diesel-P-vand T-S diagrams, thermal efficiency,fuel injection, carburetion.

UNIT-II: Basic Steam Engineering: Generation, Dryness fraction, Analysis of Various Thermodynamic Processes undergone by Steam and properties of steam, function of boilers, working principle of Lancashire boiler, Babcock, and Wilcox boiler. Vapor power cycles: Rankine cycle, Re-heat, and Regeneration cycles.

UNIT-III: Steam turbines: Classification of steam turbines, compounding of steam turbines, pressure compounding, velocity compounding, and pressure-velocity compounding.
Gas turbine: Classification of gas turbine-constant pressure combustion cycle, closed cycle, and constant volume combustion gas turbine plants.

UNIT-IV: Pumps: Types of pumps, Centrifugal pumps: Main components, Working principle, multistage pumps. Reciprocating pumps: Working, Discharge, slip, indicator diagrams.

UNIT-V: Hydraulic Turbines: Classification of turbines; Working principle of Pelton Wheel, Francis, and Kaplan turbines; Governing of turbines, Components of hydroelectric power Plant.

Course Outcomes for First Year Second Semester Course	
Course Code: B20ME1204	
Course Title: PRIME MOVERS AND PUMPS	
CO-1	Apply the concept so fair standard cycles in internal combustion engines.
CO-2	Compute various thermodynamic processes under gone by steam by using Mollier Chart and steam tables.
CO-3	Compute the efficiencies of steam and gas power plants.
CO-4	Apply the concepts of fluid mechanics to understand the working of turbines and pumps

SYLLABUS: APPLIED CHEMISTRY LAB (B20BS1208)

(Common to AIDS,CE,EEE & ME)

LIST OF PROGRAMS:

1.Determination of Alkalinity of water sample.

2.Determination of total hardness of water by EDTAmethod.

3.Estimation of Ferrous Iron by$KMnO_4$.

4.Estimation of oxalic acid by $KMnO_4$.

5.Estimation of Mohr's salt by$K_2Cr_2O_7$.

6.Estimation of Dissolved oxygen by Winkler's method.

7.Determination of pH of water and soil sample.

8.Determination of Chlorides present in watersample.

9. Conductometric titration of strong acid Vs strongbase.

10. Potentiometric titration of strong acid Vs strongbase.

11. Potentiometric titration of strong acid Vs weakbase.

12. Preparation of Phenol formaldehyderesin.

13. Determination of saponification value ofoils.

14. Determination of pour and cloud points of lubricatingoil.

15. Determination of Acid value ofoil.

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1208	
Course Title: APPLIED CHEMISTRY LAB	
CO-1	Gain technical knowledge of measuring, operating and testing of chemical instruments and equipments. Carrying out different types of chemical reactions for analysing different materials in micro level quantities
CO-2	Analyze and generate experimental skills to enhance the analytical thinking capabilities in the modern trends in engineering and technology

SYLLABUS: PROGRAMMING FOR PROBLEM SOLVING USING C LAB (B20CS1205)

(Common to CE,EEE& ME)

1. Exercise1:
   1. Write a C program to print a block F using hash (#), where the F has a height of six charactersand width of five and fourcharacters.
   2. Write a C program to compute the perimeter and area of a rectangle with a height of 7 inches andwidth of 5inches.
   3. Write a C program to display multiplevariables.
2. Exercise2:
   1. Write a C program to calculate the distance between the twopoints.
   2. WriteaCprogramthataccepts4integersp,q, r,s fromtheuserwhererandsarepositiveandpiseven. If q is greater than r and s is greater than p and if the sum of r and s is greater than the sumof p and q print "Correct values", otherwise print "Wrong values".
3. Exercise3:
   1. Write a C program to convert a string to a longinteger.
   2. Write a program in C which is a Menu-Driven Program to compute the area of the various geometricalshape.
   3. Write a C program to calculate the factorial of a givennumber.
4. Exercise4:
   1. Write a program in C to displaythe n terms of even natural number and their sum.
   2. Write a program in C to display the n terms of harmonic series and their sum. 1 + 1/2 + 1/3 +1/4 + 1/5 ... 1/n terms.
   3. Write a C program to check whether a given number is an Armstrong numberor not.
5. Exercise5:
   1. Write a program in C to print all unique elements in anarray.
   2. Write a program in C to separate odd and even integers in separatearrays.
   3. Write a program in C to sort elements of array in ascendingorder.
6. Exercise6:
   1. Write a program in C for multiplication of two squareMatrices.
   2. Write a program in C to find transpose of a givenmatrix.
7. Exercise7:
   1. Write a program in C to search an element in a row wise and column wise sortedmatrix.
   2. Write a program in C to print individual characters of string in reverseorder.
8. Exercise8:
   1. Write a program in C to compare two strings without using string libraryfunctions.
   2. Write a program in C to copy one string to anotherstring.
9. Exercise9:
   1. Write a C Program to Store Information Using Structures with DynamicallyMemory Allocation
   2. Write a program in C to demonstrate how to handle the pointers in theprogram.
10. Exercise10:
    1. WriteaprograminCtodemonstratetheuseof&(addressof)and*(valueataddress)operator.
    2. Write a program in C to add two numbers usingpointers
11. Exercise11:
    1. Write a program in C to add numbers using call byreference.
    2. Write a program in C to find the largest element using Dynamic MemoryAllocation
12. Exercise12:
    1. Write a program in C to swap elements using call byreference.
    2. WriteaprograminCto countthenumberofvowels andconsonants in astringusingapointer.

13. Exercise13:
    1. Write a program in C to show how a function returningpointer.
    2. Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using malloc( )function
14. Exercise14:
    1. Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using calloc( ) function. Understand the difference between the above twoprogram.
    2. Write a program in C to convert decimal number to binary number using thefunction.
15. Exercise15:
    1. Write a program in C to check whether a number is a prime number or not usingthe function.
    2. Write a program in C to get the largest element of an array using thefunction.
16. Exercise16:
    1. Write a program in C to append multiple lines at the end of a textfile.
    2. Write a program in C to copy a file in anothername.
    3. Write a program in C to remove a file from thedisk.

Course Outcomes for First Year First Semester Course	
Course Code: B20CS1205	
Course Title: PROGRAMMING FOR PROBLEM SOLVING USING C LAB	
CO-1	Write, Trace and Debug the programs and correct syntax and logical errors..
CO-2	Solve various Problems by making use of Arrays, Strings, Structures, Unions and Pointers
CO-3	Solve a complex problem by decomposing into several modules by using Functions
CO-4	Apply various File I/O operations

INFORMATION TECHNOLOGY

INFORMATION TECHNOLOGY

SYLLABUS : ENGLISH (B20HS1101)

(Common to AIDS, CE, CSE, ECE, EEE, IT&ME)

UNIT-I : Lesson: A Drawer full of happiness from *Infotech English*, Maruthi Publications.
Listening: Listening to short audio texts and identifying the topic, context and specific pieces of information to answer a series of questions both in speaking andwriting.

Speaking: Self-introduction and introducing others. Asking and answering generalquestions on topics such as home, family, work, studies and interests.

Reading: Skimming text to get the main idea. Scanning to look for specific pieces of information.

Reading for Writing: Paragraph Writing (Hints Development), general essays using suitable cohesive devices; linkers, sign posts and transition signals; mechanics of writing, punctuation.

Vocabulary: Technical vocabulary from across technical branches (20) GRE Vocabulary (20), antonyms and synonyms, word applications, verbal reasoning and sequencing of words.
Grammar: Content words and function words; parts of Speech, tenses, word order in sentences, sentence structures.

UNIT-II : Lesson-: Nehru's letter to his daughter, Indira on her birthday from *Infotech English***,** Maruthi Publications**.**
Listening: Answering a series of questions about main idea and supporting ideas after listening to audio texts both in speaking and writing.

Speaking: Discussion in pairs/ small groups on specific topics followed by short structured talks, functional English: greetings and leave takings.

Reading: Identifying sequence of ideas; recognizing verbal techniques that help to link the ideas in aparagraph together.

Reading for Writing: Identifying the main ideas, rephrasing and summarizing them (précis writing);avoiding redundancies and repetitions.
Vocabulary: Technical vocabulary from across technical branches (20words). GRE Vocabulary Analogies (20 words), antonyms and synonyms, word applications.
Grammar: Articles, prepositions, conjunctions, use of synonyms and antonyms.

UNIT-III: Lesson: Stephen Hawking-Positivity' Benchmark' from *Infotech English*, MaruthiPublications.
Listening: Listening for global comprehension and summarizing what is listenedto both in speaking and writing.
Speaking: Discussing specific topics in pairs or small groups and reporting whatis discussed. Functional English: complaining and apologizing.
Reading: Reading a text in detail by making basic inferences -recognizing: and interpreting specific context clues; strategies to use text clues for comprehension, critical reading.
Reading for Writing: Letter writing- types, format and principles of letterwriting, E-mail etiquette, writing a Resume/CV and covering letter.
Vocabulary: Technical vocabulary from across technical branches (20 words. GRE. Vocabulary 20 words), Idioms & Phrasal verbs, Homonyms, wordapplications,sequencing of words.
Grammar: Sentence Structures, Transformation of sentences (Active and passive Voice, Degrees of comparison, Simple, Compound and Complex).

UNIT-IV:Lesson:LikingaTree,Unbowed:WangariMaathaibiographyfrom*Infotech English*, MaruthiPublications.
Listening: Making predictions while listening to conversations/ transactional dialogues without video (only audio), listening to audio-visual texts.

Speaking: Role plays for practice of conversational English in academic contexts(formal and informal) - asking for and giving information/directions. Functional English: asking for permissions, requesting,Inviting.
Reading: Studyingthe use of graphic elements in texts to convey information, reveal trends/patterns/relationships, communicative process or display complicated data.
Reading for Writing: Information transfer; describe, compare, contrast, identify significance/trends based on information provided in figures/charts/graphs/tables. Pamphlet writing, writing for media, writing SOP's.
Vocabulary: Technical vocabulary from across technical branches (20 words GRE Vocabulary (20words), antonyms and synonyms, word applications, cloze encounters, foreign phrases.
Grammar: Quantifying expressions - adjectives and adverbs: comparing and contrasting, question Tags, direct and indirect speech, reporting for academic purposes.

UNIT-V: Lesson: Stay Hungry–Stay Foolish from *Infotech English*, Maruthi Publications.
Listening: Identifying key terms, understanding concepts and interpreting theconcepts both in speaking and writing.
Speaking: Formal oral presentationsontopics from academic contexts–with/without the use of PPT slides. Functional English: Suggesting/Opiniongiving.
Reading: Reading for comprehension, RAP Strategy - intensive reading andextensivereading techniques.
Reading for Writing: Report writing, writing academic proposals- writing researcharticles: format and style.
Vocabulary: Technical vocabulary from across technical branches (20 words GRE 'Vocabulary (20 words, antonyms and synonyms, word applications, coherence, matchingemotions.
Grammar: Editing short texts — identifying and correcting common errors in grammar and usage (articles, prepositions, tenses, subject-verb agreement, parallel structures, phrases and clauses).

Course Outcomes for First Year First Semester Course	
Course Code: B20HS1101	
Course Title: ENGLISH	
CO-1	Identify the context, topic and pieces of specific information by understanding and responding to the social or transactional dialogues spoken by native speakers of English.
CO-2	Apply suitable strategies for skimming and scanning to get the main idea of a text and locate specific information.
CO-3	Build confidence and adapt themselves to the social and public discourses, discussions and presentations.
CO-4	Apply the principles of writing to paragraphs, arguments, essays and formal/informal communication.
CO-5	Construct sentences using proper grammatical structures and correct word forms.

SYLLABUS: MATHEMATICS-I (B20BS1101)
(LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS)

(Common to AIDS, CE, CSE, ECE, EEE, IT & ME)

UNIT-I: Linear systems of equations: Rank, Echelon form, Normal form, consistency of system of linear equations, Solution oflinear systems by Gauss elimination, Jacobi and Gauss-Seidelmethods.

UNIT-II: Eigen values - Eigen vectors and Quadratic forms: Eigen values, Eigen vectors, Properties, Cayley-Hamilton theorem, Inverse and powers of a matrix using Cayley-Hamilton theorem, Reduction to diagonal form, Quadratic forms,Reduction of a Quadratic form to Canonical form.

UNIT-III: Differential equations of first order and first degree: Linear, Bernoulli, Exact, Reducible to exact types. Applications: Orthogonal trajectories, Newton's Law of cooling, Simple electrical circuits.(R-L and R-C circuits only)

UNIT-IV: Linear differential equations of higher order: Linear Non-homogeneous equations of higher order with constant coefficients with source (RHS) term of the type e^{ax}, sin ax, cos ax, polynomials in x, $e^{ax}V(x)$, x V(x). Simultaneous differential equations with constant coefficients, Method of Variation of parameters.

UNIT-V: Laplace transformation: Laplace transforms of standard functions, properties, transforms of tf(t), f(t)/t, transforms of derivatives and integrals, transforms of unit step function, Dirac delta function; Inverse Laplace transforms, convolution theorem (without proof).
Applications: Solving ordinary differential equations (initial value problems) using Laplace transforms.

Course Outcomes for First Year First Semester Course	
Course Code: B20BS1101	
Course Title: MATHEMATICS – I	
CO-1	Solve a given system of linear algebraic equations
CO-2	Determine Eigen values and Eigen vectors of a system represented by a matrix.
CO-3	Solve ordinary differential equations of first order and first degree.
CO-4	Apply the knowledge in simple applications such as Newton's law of cooling, orthogonal trajectories and simple electrical circuits
CO-5	Solve linear ordinary differential equations of second order and higher order.
CO-6	Determine Laplace transform, inverse Laplace transform and solve linear ODE

SYLLABUS: APPLIED CHEMISTRY (B20BS1103)

(Common to AIDS, CE, EEE & ME)

UNIT-I: High Polymers and Plastics; Rubbers & Elastomers: Polymerization Definition, Types of Polymerization, free radical Mechanism of addition polymerization, Plastics as engineering materials, Thermoplastics and Thermosetting plastics, Compounding of plastics, Fabrication of plastics (4 techniques); Preparation, Properties and applications of Polyethylene, PVC, Bakelite, Nylon - 6,6, Bullet Proof plastics -polycarbonate and Kelvar; Fiber reinforced plastics, conducting polymers, Biodegradable Polymers - PHBV, Nylon 2, Nylon 6. Natural rubber – Vulcanization – Compounding of Rubber; Preparation, properties andapplications of Buna – S; Buna – N;

UNIT-II: Energy Sources and Applications: Nuclear Energy: Nuclear fission and Nuclear fusion – Nuclear Power reactor – Applications. Thermal fuels – Introduction – Classification – Calorific value – HCV and LCV – Bomb calorimeter; Coal : Proximate and ultimate analysis of coal – Significance of the analysis – Manufacture of coke by Otto Hoffman's by Product Process , Refining crude oil; Knocking; Chemical structure-Knocking, Octane number of gasoline, Cetane number of diesel oil, synthetic Petrol; LPG,CNG.

UNIT-III: Electrochemical cells and Corrosion: Galvanic cell, single electrode potential, Calomel electrode; Modern batteries: - Lead – Acid battery; Fuel cells- Hydrogen – Oxygen fuel cell, Lithium battery Theories of corrosion (i) dry Corrosion (ii) wet corrosion. Types of corrosion - differential aeration corrosion, pitting corrosion, galvanic corrosion, stress corrosion, Factors influencing corrosion, Protection from corrosion-material selection & design, cathodic protection, Protective coatings- metallic coatings – Galvanizing, Tinning, Electroplating; Electrrolessplating ; Paints.

UNIT-IV: Water technology: Sources of water – Hardness of water – Estimation of hardness of water by EDTA method; Boiler troubles – sludge and scale formation, Boiler corrosion, caustic embrittlement, Priming and foaming; Softening of water by Lime – Soda Process, Zeolite Process, Ion – Exchange Process; Municipal water treatment; Desalination of sea water by Electrodialysis and Reverse osmosis methods.

UNIT-V: Chemistry of Engineering Materials& Advanced Engineering materials: Cement:-Manufacture of Portland cement, setting and hardening of cement, Deterioration of cement concrete.
Refractories: Definition, Characteristics, classification, Properties and failure of refactories.
Solar Energy: Construction and working of Photovoltaic cell, applications.
Solid State Materials: Crystal imperfections, Semi Conductors, Classification and chemistry of semi conductors: Intrinsic semiconductors; Extrinsic semiconductors; Defect semiconductors, Compound Semiconductors and Organic Semiconductors.
Liquid Crystals: - Definition – Classification with examples – Applications

Course Outcomes for First Year First Semester Course	
Course Code: B20BS1103	
Course Title: APPLIED CHEMISTRY	
CO-1	Develop polymer composites, synthetic polymers and formulation of polymers and their use in design
CO-2	Apply the knowledge about quality of water and its treatment methods for domestic and industrial applications. Understanding the principle, mechanism of corrosion and utilization of various techniques to control.
CO-3	Develop the knowledge of fuels and their economics, advantages and limitations. Make use of the basic concepts of semiconductors and liquid crystals for engineering applications..
CO-4	Identify constituents of various ceramic materials, characteristics and their appropriate use in construction. Apply the knowledge of electrochemistry principles to design energy storage

SYLLABUS: PROGRAMMING FOR PROBLEM SOLVING USING C (B20CS1102)

(Common to AIDS, CSE, ECE & IT)

UNIT-I: Introduction to Computers: Creating and running Programs, Computer Numbering System, Storing Integers, Storing Real Numbers Introduction to the C Language: Background, C Programs, Identifiers, Types, Variable, Constants, Input/output, Programming Examples, Scope, Storage Classes and Type Qualifiers. Structure of a C Program: Expressions Precedence and Associativity, Side Effects, Evaluating Expressions, Type Conversion Statements, Simple Programs, Command Line Arguments.

UNIT-II: Bitwise Operators: Exact Size Integer Types, Logical Bitwise Operators, Shift Operators. Selection & Making Decisions: Logical Data and Operators, Two Way Selection, Multiway Selection, More Standard Functions. Repetition: Concept of Loop, Pretest and Post-test Loops, Initialization and Updating, Event and Counter Controlled Loops, Loops in C, Other Statements Related to Looping, Looping Applications, Programming Examples.

UNIT-III: Arrays: Concepts, Using Array in C, Array Application, Two Dimensional Arrays, Multidimensional Arrays, Programming Example – Calculate Averages Strings: String Concepts, C String, String Input / Output Functions, Arrays of Strings, String Manipulation Functions String/ Data Conversion, A Programming Example – Morse Code Enumerated, Structure, and Union: The Type Definition (Type def), Enumerated Types, Structure, Unions, and ProgrammingApplication.

UNIT-IV: Pointers: Introduction, Pointers to pointers, Compatibility, L value and R value Pointer Applications: Arrays, and Pointers, Pointer Arithmetic and Arrays, Memory Allocation Function, Array of Pointers, Programming Application. Processor Commands: Processor
Commands.

UNIT-V: Functions: Designing, Structured Programs, Function in C, User Defined Functions, Inter Function Communication, Standard Functions, Passing Array to Functions, Passing Pointers to Functions, Recursion Text Input / Output: Files, Streams, Standard Library Input / Output Functions, Formatting Input / Output Functions, Character Input / Output Functions Binary Input / Output: Text versus Binary Streams, Standard Library, Functions for Files, Converting File Type.

Course Outcomes for First Year First Semester Course	
Course Code: B20CS1102	
Course Title: PROGRAMMING FOR PROBLEM SOLVING USING C	
CO-1	Apply Precedence and Associativity rules to evaluate Expressions.
CO-2	Make use of Decision Making and Looping statements to solve various problems in C.
CO-3	Illustrate the importance of Arrays and Strings and to apply various operations on them.
CO-4	Solve various problems by making use of Structure and Union concepts.
CO-5	Design and implement programs to analyze the different pointer applications
CO-6	Develop programs using Functions and Pointers.

SYLLABUS: FUNDAMENTALS OF COMPUTERS AND INFORMATION TECHNOLOGY (B20IT1101)

(Common to AIDS &IT)

UNIT-I: Computer Basics & Organization: Introduction, Evolution of computers, Generation of computers, Computer Concepts, Computer System, Applications of Computers. Introduction, Central Processing Unit, Internal Communications, Machine cycle, The Bus, InstructionSet.

UNIT-II: Computer Architecture & I/O Devices: Memory & Storage systems: Memory Representation, RAM, ROM, Magnetic Storage Systems, Optical Storage Systems, Solid-State Storage Devices**. Input and Output Devices**: Keyboard, Pointing Devices, Scanning Devices, Optical Recognition Devices, Data Acquisition Sensors, Media Input Devices, Display Monitors, Printers, Plotters, Terminals.

UNIT-III: Computer Software and Programming Languages: Introduction, Types of Computer Software, System Management Programs, System Development Programs, Standard Application Programs, Unique Application Programs, Problem Solving, Structuring the Logic, Using the computer. **Operating Systems (OS)**: Introduction, History of OS, Functions of OS, Types of Operating Systems, Popular Operating Systems. **Microsoft Software**: MS-DOS, MS Word System, MS Excel System, MS Power point System, MS Access System. **Programming Languages**: History of Programming Languages, Generations of Programming Languages, Characteristics of Good Programming Language, Categorizations of High Level Languages, Popular High level Languages, Developing a Program, Running a Program.

UNIT-IV: Data Communications, Networks, Internet and Security: Introduction, Data communication using MODEMS, Computer Network, Network Protocols and Software, Network Devices, **Internet**: Introduction, Evolution of Internet, Basic Internet Terms, Internet applications: E-mail, FTP, Telnet, Internet Relay Chat (IRC), Chatting and instant messaging, Internet Telephony, Video Conferencing, Commerce Through Internet. **Security**: Introduction, Computer Security definition, Malicious Programs: Virus, Other destructive Programs, Affecting and Protecting Computer Systems, Cryptography, Digital Signature, Firewall.

UNIT-V: Database Fundamentals: Introduction, Database Definition, Logical Data Concepts, Physical Data Concepts, Database Management System, DBMS Architecture, database Models, **MS Access**: Introduction, Starting with Access database, Working with Tables, Creating Forms using Wizard. **Current and Future Trends in IT**: Introduction, Electronic Commerce, Electronic Data Interchange, Smart Card, Radio frequency Identification(RFID), Brain computer Interface(BCI), Imminent technologies.

Course Outcomes for First Year First Semester Course	
Course Code: B20IT1101	
Course Title: FUNDAMENTALS OF COMPUTERS AND INFORMATION TECHNOLOGY	
CO-1	Apply Precedence and Associativity rules to evaluate Expressions.
CO-2	Make use of Decision Making and Looping statements to solve various problems in C.
CO-3	Illustrate the importance of Arrays and Strings and to apply various operations on them.
CO-4	Solve various problems by making use of Structure and Union concepts.
CO-5	Design and implement programs to analyze the different pointer applications
CO-6	Develop programs using Functions and Pointers.

SYLLABUS: PROGRAMMING FOR PROBLEM SOLVING USING C LAB (B20CS1103)

(Common to AIDS, CSE, ECE & IT)

1. Exercise1:
    1. Write a C program to print a block F using hash (#), where the F has a height of six charactersand width of five and fourcharacters.
    2. Write a C program to compute the perimeter and area of a rectangle with a height of 7 inches andwidth of 5inches.
    3. Write a C program to display multiplevariables.
2. Exercise2:
    1. Write a C program to calculate the distance between the twopoints.
    2. WriteaCprogramthataccepts4integersp,q, r,s fromtheuserwhererandsarepositiveandpiseven. If q is greater than r and s is greater than p and if the sum of r and s is greater than the sumof p and q print "Correct values", otherwise print "Wrong values".
3. Exercise3:
    1. Write a C program to convert a string to a longinteger.
    2. Write a program in C which is a Menu-Driven Program to compute the area of the various geometricalshape.
    3. Write a C program to calculate the factorial of a givennumber.
4. Exercise4:
    1. Write a program in C to displaythe n terms of even natural number and their sum.
    2. Write a program in C to display the n terms of harmonic series and their sum. 1 + 1/2 + 1/3 +1/4 + 1/5 ... 1/n terms.
    3. Write a C program to check whether a given number is an Armstrong numberor not.
5. Exercise5:
    1. Write a program in C to print all unique elements in anarray.
    2. Write a program in C to separate odd and even integers in separatearrays.
    3. Write a program in C to sort elements of array in ascendingorder.
6. Exercise6:
    1. Write a program in C for multiplication of two squareMatrices.
    2. Write a program in C to find transpose of a givenmatrix.
7. Exercise7:
    1. Write a program in C to search an element in a row wise and column wise sortedmatrix.
    2. Write a program in C to print individual characters of string in reverseorder.
8. Exercise8:
    1. Write a program in C to compare two strings without using string libraryfunctions.
    2. Write a program in C to copy one string to anotherstring.
9. Exercise9:
    1. Write a C Program to Store Information Using Structures with DynamicallyMemory Allocation
    2. Write a program in C to demonstrate how to handle the pointers in theprogram.
10. Exercise10:
    1. WriteaprograminCtodemonstratetheuseof&(addressof)and*(valueataddress)operator.
    2. Write a program in C to add two numbers usingpointers
11. Exercise11:
    1. Write a program in C to add numbers using call byreference.
    2. Write a program in C to find the largest element using Dynamic MemoryAllocation
12. Exercise12:
    1. Write a program in C to swap elements using call byreference.
    2. WriteaprograminCto countthenumberofvowelsandconsonants in astringusingapointer.

13. Exercise13:
    1. Write a program in C to show how a function returningpointer.
    2. Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using malloc( )function
14. Exercise14:
    1. Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using calloc( ) function. Understand the difference between the above twoprogram.
    2. Write a program in C to convert decimal number to binary number using thefunction.
15. Exercise15:
    1. Write a program in C to check whether a number is a prime number or not usingthe function.
    2. Write a program in C to get the largest element of an array using thefunction.
16. Exercise16:
    1. Write a program in C to append multiple lines at the end of a textfile.
    2. Write a program in C to copy a file in anothername.
    3. Write a program in C to remove a file from thedisk.

Course Outcomes for First Year First Semester Course	
Course Code: B20CS1103	
Course Title: PROGRAMMING FOR PROBLEM SOLVING USING C LAB	
CO-1	Write, Trace and Debug the programs and correct syntax and logical errors..
CO-2	Solve various Problems by making use of Arrays, Strings, Structures, Unions and Pointers
CO-3	Solve a complex problem by decomposing into several modules by using Functions
CO-4	Apply various File I/O operations

SYLLABUS: APPLIED CHEMISTRY LAB (B20 BS 1108)

(Common to AIDS, CE, EEE & ME)

LIST OF PROGRAMS:

1.Determination of Alkalinity of water sample.

2.Determination of total hardness of water by EDTAmethod.

3.Estimation of Ferrous Iron by$KMnO_4$.

4.Estimation of oxalic acid by $KMnO_4$.

5.Estimation of Mohr's salt by$K_2Cr_2O_7$.

6.Estimation of Dissolved oxygen by Winkler's method.

7.Determination of pH of water and soil sample.

8. Determination of Chlorides present in watersample.

9. Conductometric titration of strong acid Vs strongbase.

10. Potentiometric titration of strong acid Vs strongbase.

11. Potentiometric titration of strong acid Vs weakbase.

12. Preparation of Phenol formaldehyderesin.

13. Determination of saponification value ofoils.

14. Determination of pour and cloud points of lubricatingoil.

15. Determination of Acid value ofoil.

Course Outcomes for First Year Second Semester Course	
Course Code: B20 BS 1108	
Course Title: APPLIED CHEMISTRY LAB	
CO-1	Gain technical knowledge of measuring, operating and testing of chemical instruments and equipments. Carrying out different types of chemical reactions for analysing different materials in micro level quantities
CO-2	Analyze and generate experimental skills to enhance the analytical thinking capabilities in the modern trends in engineering and technology

SYLLABUS: COMPUTER ENGINEERING WORKSHOP (B20CS1104)

(Common to AIDS, CSE & IT)

Task1: Identification of the peripherals of a computer - Prepare a report containing the block diagram of the computer along with the configuration of each component and its functionality. Describe about various I/O Devices and itsusage.

Task2: Practicing disassembling and assembling components of a PC.

Task3: Installation of Device Drivers, MS Windows, Linux Operating systems and Disk Partitioning, dual boating with Windows andLinux.

Task4: Introduction to Memory and Storage Devices, I/O Port, Assemblers, Compilers, Interpreters, Linkers andLoaders.

Task5: Demonstration of Hardware and Software Troubleshooting.

Task6: Demonstrating Importance of Networking, Transmission Media, Networking Devices-Gateway, Routers, Hub, Bridge, NIC, Bluetooth Technology, Wireless Technology, Modem, DSL, and Dialup Connection.

Task7: Surfing the Web using Web Browsers, Awareness of various threats on the Internet and its solutions, Search engines and usage of various search engines, Need of anti-virus, Installation of anti-virus, configuring personal firewall and windows update.

(Students should get connected to their Local Area Network and access the Internet. In the process they should configure the TCP/IP setting and demonstrate how to access thewebsites and email. Students customize their web browsers using bookmarks, search toolbars and pop up blockers).

Task8: Productivity Tools: Basic HTML tags, Introduction to HTML5 and its tags, Introduction to CSS3 and its properties. Preparation of a simple website/ homepage,

Assignment: Develop your home page using HTML Consisting of your photo, name,address and education details as a table and your skill set as a list.

Features to be covered:- Layouts, Inserting text objects, Editing text objects, Inserting Tables, Working with menu objects, Inserting pages, Hyper linking, Renaming, deleting, modifying pages, etc.,

Task9: Demonstration and Practice of various features of Microsoft Word Assignment:

1. Create a project certificate. 2.Creating anewsletter

Features to be covered:-Formatting Fonts, Paragraphs, Text effects, Spacing, Borders and Colors, Header and Footer, Date and Time option, tables, Images, Bullets and Numbering, Table of Content, Newspaper columns, Drawing toolbar and Word Art and Mail Merge in word etc.,

Task10: Demonstration and Practice of various features Microsoft ExcelAssignment:

1. Creating a scheduler2. Calculating GPA 3. Calculating Total, average of marks in various subjects and ranks of Students based onmarks

Features to be covered:- Format Cells, Summation, auto fill, Formatting Text, Cell Referencing, Formulae in excel, Charts, Renaming and Inserting worksheets, etc.,

Task11: Demonstration and Practice of various features Microsoft Power Point

Features to be covered:- Slide Layouts, Inserting Text, Word Art, Formatting Text,Bullets and Numbering, Auto Shapes, Hyperlinks Tables and Charts, Master Layouts, Types of views, Inserting – Background, textures, Design Templates, etc.,

Task12: DemonstrationandPracticeofvariousfeaturesLaTeX–documentpreparation,presentation(Featurescovered in Task 9 and Task 11 need to be explored inLaTex).

Task13: Tools for converting word to pdf and pdf to word

Task14: Internet of Things (IoT): IoT fundamentals, applications, protocols, communicationmodels, architecture, IoT devices.

Course Outcomes for First Year First Semester Course	
Course Code: B20CS1104	
Course Title: COMPUTER ENGINEERING WORKSHOP	
CO-1	Identify, assemble and update the components of a computer
CO-2	Configure, evaluate and select hardware platforms for the implementation and execution of computer applications, services and systems
CO-3	Make use of tools for converting pdf to word and vice versa.
CO-4	Develop presentation, documents and small applications using productivity tools such as word processor, presentation tools, spreadsheets, HTML, LaTex.

INFORMATION TECHNOLOGY

SYLLABUS : MATHEMATICS – II (B20BS1201)

(FOURIER ANALYSIS AND PARTIAL DIFFERENTIAL EQUATIONS)

(Common to AIDS, CE, CSE, ECE, EEE, IT & ME)

UNIT-I: Fourier Series: Introduction, Periodic functions, Fourier series of a periodic function, Dirichlet's conditions, Change of interval. Even and odd functions, Half-range sine and cosine series.

UNIT-II: Fourier Transforms: Fourier integral theorem (without proof), Complex form of Fourier integral, Fourier sineandcosine integrals, Fourier transform, Fourier sine and cosine transforms, Finite Fourier transforms, properties, inverse transforms, Parseval'sIdentities.

UNIT-III: Partial differentiation: Introduction, Homogeneous functions, Euler's theorem, Chain rule, Total derivative, Jacobians and their properties. Applications: Taylor series expansion for a function of two variables, Maxima and Minima of functions of two variables with and without constraints, Lagrange's method. Leibnitz's rules for differentiation under integralsign.

UNIT-IV: First order and higher order partial differential equations: Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions, solutions of Lagrange linear equation. Solutions of Linear homogeneous and non-homogeneous partial differential equations with constant coefficients –source (RHS) terms of the type e^{ax+by}, sin (ax+by), cos (ax+by),$x^m y^n$.

UNIT-V: Applications of partial differential equations: Method of separation of variables, One–dimensional wave equation, the D'Alembert'ssolution, one- dimensional heatequation.

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1201	
Course Title: MATHEMATICS–II	
CO-1	Determine Fourier series and half range series of functions.
CO-2	Determine Fourier transforms of non-periodic functions and also use them to evaluate integrals
CO-3	Compute partial derivatives, total derivative and Jacobians.
CO-4	Find maxima/minima of functions of two variables and evaluate some real definite integrals.
CO-5	Identify the discourse features, and improve intensive and extensive reading skills Form partial differential equations and solve Lagrange linear equation. Solve linear higher order homogeneous and non-homogeneous PDEs
CO-6	Find theoretical solution of one-dimensional wave equation and one-dimensional heat equation

SYLLABUS: APPLIED PHYSICS (B20BS1202)
(Common to AIDS, CE, EEE & ME)

UNIT-I: WAVE OPTICS: Interference: Principle of super position. Interference of light, interference in thin films (reflected light) – Wedge film and Newton`s rings – Applications
Diffraction: Types of diffraction, Fraunh offer diffraction at a single alit, Diffraction grating, grating spectrum. Missing order, Resolving power, Rayleigh's Criterion, Resolvingpower of Grating.

UNIT-II: DIELECTRICS AND MAGNETICS: Dielectrics : Introduction to dielectrics, Electric Polarization, Dielectric polariz ability, Susceptibility, Dielectric constant, Types of Polarization, Frequency dependence of Polarization, Internal field in a dielectric, Claussius and Mosotti equation, Applications of dielectrics.
Magnetics: Introduction to magnetics, Magnetic dipole moment , Magnetization, Magnetic susceptibility and Permeability, Origin of permanent magnetic moment, Classification of magnetic materials (Dia , Para, Ferro, Antiferro and ferri), Hysteresis – Weiss Domain theory – Ferrites, soft and hard magnetic materials, Magnetic device applications.

UNIT-III: LASERS AND FIBER OPTICS: Lasers: Introduction, Interaction of radiation with matter, condition for light amplification,Einstein's relations. Requirements of lasers device Types of lasers, Design and working of Ruby and He – Ne lasers, Laser characteristics and applications.
Fiber Optics: Introduction to optical fibers, Principle of light propagation in fiber, Acceptance angle, Numerical aperture, Modes of propagations, types of fibers, classification of fibers based on refractive index profile, applications of fibers with emphasis on fiber opticcommunication.

UNIT-IV: SEMICONDUCTORS: Introduction, intrinsic semi conductors, density of charge carries, Fermi energy, Electrical conductivity – Extrinsic semi conductors – P-type and N-type, Density of charge carriers, dependence of Fermi energy on carrier concentration and temperature, direct and indirect band – gap semi conductors, Hall effect, Applications of Hall effect. Drift and diffusion currents, Continuity equation, applications of semiconductors.

UNIT-V: ULTRASONICS AND NANOMATERIALS: Ultrasonics: Introduction, Production of Ultrasonics – Piezoelectric and Magnetostriction methods, detection of ultrasonics, acoustic grating - determination of wavelength and velocity of ultrasonics, applications of ultrasonics.
Nanomaterials: Introduction, salient features of Nanomaterials, Synthesis methods – Ball milling, Condensation, Chemical Vapour Deposition and Sol – Gel methods, Characterization techniques for nano materials - The scanning tunneling microscopy (STM)and The atomic force microscopy (AFM), Carbon nanotubes (CNTS), Applications of Nano materials.

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1202	
Course Title: APPLIED PHYSICS	
CO-1	Interpret the behavior of light radiation in interference and diffraction Phenomena and their applications
CO-2	Explain the classification and properties of dielectric and magnetic materials suitable for engineering applications.
CO-3	Understand the basics of modern optical technologies like lasers and optical fibers and their utility in various fields
CO-4	Explain the important aspects of semiconductors and electrical conductivity in them
CO-5	Understand the basics of technology of Ultrasonics in various fields and demonstrate the synthesis and applications of nanomaterials.

SYLLABUS: DIGITAL LOGIC DESIGN (B20IT1201)

(Common to AIDS & IT)

UNIT-I: Digital Systems and Binary Numbers: Digital Systems, Binary Numbers, Octal and Hexadecimal Numbers, Complements of Numbers, Signed Binary Numbers, Arithmetic addition and subtraction, 4-bit codes: BCD, EXCESS 3, alphanumeric codes, 9's complement, 2421,etc.

UNIT-II: Concept of Boolean algebra: Basic Theorems and Properties of Boolean algebra, Boolean Functions, Canonical and Standard Forms, Minterms and Maxterms. Gate level Minimization Map Method, Three- Variable K- Map, Four Variable K-Maps. Products of Sum Simplification, Sum of Products Simplification, Don't – Care Conditions, NAND and NOR Implementation, Exclusive-ORFunction.

UNIT-III: Combinational Logic: Introduction, Analysis Procedure, Binary Adder–Subtractor, Binary Multiplier, Decoders, Encoders, Multiplexers, Demultiplexers, Priority Encoder, Code Converters, Magnitude Comparator, HDL Models of Combinational Circuits. Realization of Switching Functions Using PROM, PAL and PLA.

UNIT-IV: Synchronous Sequential Logic: Introduction to Sequential Circuits, Storage Elements: Latches, Flip-Flops, RS- Latch Using NAND and NOR Gates, Truth Tables. RS, JK, T and D Flip Flops, Truth and Excitation Tables, Conversion of Flip Flops

UNIT-V: Registers and Counters: Registers, Shift Registers, Ripple Counters, Synchronous Counters, Ring Counter, JohnsonCounter.

Course Outcomes for First Year Second Semester Course	
Course Code: B20IT1201	
Course Title: DIGITAL LOGIC DESIGN	
CO-1	Demonstrate different number systems, binary addition and subtraction, 2's complement representation and operations with this representation
CO-2	Understand the different switching algebra theorems and apply them for logic functions.
CO-3	Define the Karnaugh map for a few variables and make use for an algorithmic reduction of logic functions.
CO-4	Understand various logic gates starting from simple ordinary gates to complex programmable logic devices & arrays and design different combinational logic circuits
CO-5	Design various sequential circuits starting from flip-flop to registers and counters.

SYLLABUS: OBJECT ORIENTED PROGRAMMING THROUGH C++ (B20IT1202)

(Common to AIDS & IT)

UNIT-I: Introduction to C++: Difference between C and C++, Evolution of C++, The Object Oriented Technology, Disadvantage of Conventional Programming-, Key Concepts of Object Oriented Programming, Advantage of OOP, Object Oriented Language.

UNIT-II: Classes and Objects &Constructors and Destructor: Classes in C++-Declaring Objects,Access Specifiers and their Scope, Defining Member Function-Overloading Member Function, Nested class, Constructors and Destructors, Introduction, Constructors and Destructor- Characteristics of Constructor and Destructor, Application with Constructor, Constructor with Arguments (parameterized Constructor, Destructors- Anonymous Objects.

UNIT-III: Operator Overloading and Type Conversion & Inheritance: The Keyword Operator, Overloading Unary Operator, Operator Return Type, Overloading Assignment Operator (=), Rules for Overloading Operators, Inheritance, Reusability, Types of Inheritance, Virtual Base Classes, Object as a Class Member, Abstract Classes, Advantages of Inheritance- Disadvantages ofInheritance.

UNIT-IV: Pointers & Binding Polymorphisms and Virtual Functions: Pointer, Features of Pointers, Pointer Declaration, Pointer to Class, Pointer Object, The this Pointer, Pointer to Derived Classes and Base Class, Binding Polymorphisms and Virtual Functions, Binding in C++, Virtual Functions, Rules for Virtual Function, VirtualDestructor.

UNIT-V: Generic Programming with Templates, Need for Templates, Definition of class Templates, Normal Function Templates, Overloading of Template Function, Bubble Sort Using Function Templates, Difference Between Templates and Macros, Linked Lists with Templates, Exception Handling, Principles of Exception Handling, The Keywords try throw and catch, Multiple Catch Statements – Specifying Exceptions.

Course Outcomes for First Year Second Semester Course	
Course Code: B20IT1202	
Course Title: OBJECT-ORIENTED PROGRAMMING THROUGH C++	
CO-1	Differentiate between the procedural and object oriented paradigm..
CO-2	Design object oriented applications using dynamic memory management techniques and overloading concepts
CO-3	Demonstrate inheritance, pointer, polymorphism and virtual functions
CO-4	Apply implement generic programming, Exception handling in real time applications.

SYLLABUS: PRINCIPLES OF ELECTRICAL AND ELECTRONICS ENGINEERING (B20EE1203)

(Common to AIDS & IT)

UNIT-I: Introduction to Electrical circuits: Introduction to electrical concepts. Types of network elements, Ohms Law, Kirchhoff's Laws, Series and parallel Circuits connection of resistances with DC excitation. Representation of sinusoidal waveforms - Peak, Average and RMS values - Phasor representation - real power -Reactive power - apparent power - power factor. Analysis of single-phase ac circuits consisting of RL - RC - RLC seriescircuits.

UNIT-II: D.C Machines: Faraday's Laws-Induced EMF - Principle of operation of DC Generator - EMF equation – Construction-Types of DC generator-DC motor types, Torque equation –Losses.

UNIT-III: Transformers and AC machines: Principle of operation of single-phase transformer - EMF equation - equivalent circuit – losses– Transformer efficiency. principle and operation of Induction Motor [Elementary treatment only].

UNIT-IV: Semiconductors and P-N junction diode: Types of semiconductors. Basic operation and V-I Characteristics of semiconductor diode, Operation of PN junction diode as rectifier, Avalanche breakdown and Zener breakdown phenomenon, Operation of Zener diode as regulator. Light Emitting Diode (LED).

UNIT-V: Bipolar Junction Transistor (BJT) and Field Effect Transistors (FET): Introduction, construction, basic operation of NPN and PNP transistors, Transistor circuit Configurations- CE, CB, and CC- Input and output Characteristics in various configurations, Transistor as an amplifier, Junction field Effect Transistors (JFET), JFET characteristics [Elementary treatment of**FET**only].

Course Outcomes for First Year Second Semester Course	
Course Code: B20EE1203	
Course Title: PRINCIPLES OF ELECTRICAL AND ELECTRONICS ENGINEERING	
CO-1	Apply concepts of Ohm's Law, Kirchhoff's laws for solving DC circuits
CO-2	Apply Phasor representation concept to Analyze single-phase AC circuits Consisting of series RL - RC - RLC combinations
CO-3	Apply the Faraday's laws and induced EMF concepts to describe the operating Principles and characteristics of DC Machines, Transformers and Induction motors.
CO-4	Understand and apply basic concepts of semiconductors devices such as PN Junction diode and Zener diode.
CO-5	Understand and Analyze the characteristics of BJT in CE, CB, CC configurations and Analyze the characteristics of JFET

SYLLABUS: APPLIED CHEMISTRY LAB (B20BS1208)
SYLLABUS: APPLIED PHYSICS LAB (B20BS1207)
(Common to AIDS, CSE, ECE & IT)

1. DeterminationoftheWavelength oflightfromasource– DiffractionGrating–Normalincidence.
2. Determination of radius of curvature of Plano convex lens – Newton'sRings.
3. Determination of the thickness of a thin spacer using interference – Air Wedgemethod.
4. DeterminationofMagneticfieldalongtheaxisofacurrentcarryingcoil–StewartandGee'sapparatus.
5. VerificationofLawsofseriesandparallelcombinationsofresistances–CareyFoster'sbridge.
6. Determination of Temperature Coefficient of Resistance of athermistor.
7. To study the characteristics of PN Junctiondiode.
8. TodeterminetheNumericalapertureof a given opticalfiberandhencetofinditsacceptanceangle.
9. Determination of Planckconstant
10. Determination of the Rigidity modulus of elasticity of a material – Torsionalpendulum.
11. Verification of the laws of vibrations in stretched stings -Sonometer.
12. Determination of the frequency of the AC supply – ACSonometer.
13. To determine refractive indices (μo and μe) of a birefringent material(prism).

Course Outcomes for First Year First Semester Course	
Course Code: B20BS1207	
Course Title: APPLIED PHYSICS LAB	
CO-1	Get hands on experience in setting up experiments and using the instruments / equipment individually
CO-2	Get introduced to using new / advanced technologies and understand their significance.

SYLLABUS: COMMUNICATION SKILLS LAB (B20HS1202)

(Common to AIDS, CE, CSE, ECE, EEE, IT & ME)

UNIT-I: A list of communicative expressions (Requests, Permissions, Asking/ giving directions, Thanking and Responding to Thanks, Clarifying, Inviting, Congratulating, Advising, Agreeing and disagreeing etc.,) Common Errors.

UNIT-II: Pronunciation Letters and Sounds The Sounds of English Stress and Intonation Phonetic Transcription.

UNIT-III: Group Discussions.

UNIT-IV: Presentation Skills

UNIT-V: Interview Skills, Resume/ Curriculum VitaeCovering Letter, FAQ's, Telephonic Interviews/ Etiquette Mock Interviews.

Course Outcomes for First Year Second Semester Course	
Course Code: B20HS1202	
Course Title: COMMUNICATION SKILLS LAB	
CO-1	Apply their linguistic competence in all LSRW skills to professional and personal settings
CO-2	Apply communication skills learnt through various language learning activities to their advancement in academics and competitive examinations.
CO-3	Draft job application letters, E-Mail messages and other writing discourses.
CO-4	Adopt professional etiquette consistent with formal settings
CO-5	Improve fluency and clarity in both spoken and written English

SYLLABUS: OBJECT ORIENTED PROGRAMMING THROUGH C++ LAB (B20IT1203)

(Common to AIDS & IT)

1. Write a C++ Program to display Names, Roll No., and grades of 3 students who have appearedin the examination. Declare the class of name, Roll No. and grade. Create an array of class objects. Read and display the contents of thearray.
2. Write a C++ program to declare Struct. Initialize and displaycontents of member variables.
3. Write a C++ to illustrate the static methods andmembers.
4. Write a C++ program to find the sum for the given variables using function withdefault arguments.
5. Write a C++ Program to illustrate Enumeration and FunctionOverloading
6. Write a C++ program to declare a class. Declare pointer to class. Initialize and display the contents of the classmember.
7. To write a C++ program to find the value of a number raised to its power that demonstrates a function using call byvalue.
8. To write a C++ program and to implement the concept of Call byAddress.
9. Given that an EMPLOYEE class contains following members: data members: Employee number, Employee name, Basic, DA, IT, Net Salary and print datamembers.
10. Write a C++ program to read the data of N employee and compute Net salary of each employee (DA=52% of Basic and Income Tax (IT) =30% of the grosssalary).
11. Write a C++ to illustrate the concepts of console I/Ooperations.
12. Write a C++ program to use scope resolution operator. Display the various values of the same variables declared at different scopelevels.
13. Write a C++ program to allocate memory using newoperator.
14. Write a C++ program to create multilevel inheritance. (Hint: Classes A1, A2,A3)
15. WriteaC++programtocreateanarrayofpointers.Invokefunctionsusingarrayobjects.
16. Write a C++ program to use pointer for both base and derived classes and call the member function. Use Virtualkeyword
17. Write a C++ program for swapping two values using functiontemplates

Course Outcomes for First Year Second Semester Course	
Course Code: B20IT1203	
Course Title: OBJECT ORIENTED PROGRAMMING THROUGH C++ LAB	
CO-1	Apply the basic concepts in C++ like Class and objects
CO-2	Analyze memory management techniques like constructor, destructor and overloading mechanisms
CO-3	Apply reusability of code and usage of exception handling and generic programming.

SYLLABUS: PROFESSIONAL ETHICS AND HUMAN VALUES (B20MC1202)

(Common to CSE, ECE & IT)

UNIT-I: Human Values: Morals,ValuesandEthics-Integrity-WorkEthic-ServicelearningCivicVirtue Respect for others Living Peacefully Caring Sharing Honesty -Courage-Cooperation Commitment Empathy Self Confidence Character Spirituality.

UNIT-II: Engineering Ethics: Senses of 'Engineering Ethics-Variety of moral issued- Types of inquiry Moral dilemmas Moral autonomy- Kohlberg's theory- -Consensus andcontroversy Models of professional roles-Theories about right action-Self-interest - Customs and religion Uses of Ethical theories Valuing time Cooperation Commitment.

UNIT-III: Engineering as Social Experimentation: Engineering As Social Experimentation- Framing the problem- Determining the facts codes of Ethics- Clarifying Concepts- Application issues Common Ground –General Principles- Utilitarian thinking respect forpersons.

UNIT-IV: Engineers Responsibility for Safety and Risk: Safety and risk Assessment of safety and risk. Risk benefit analysis and reducing risk-Safety and the Engineer-Designing for the safety- Intellectual Property rights(IPR).

UNIT-V: Global Issues: Globalization- Cross-culture issues-Environmental Ethics- Computer EthicsComputers as the instrument of Unethical behavior Computers as the object of Unethical acts Autonomous Computers-Computer codes of Ethics- Weapons Development -Ethics and Research Analyzing Ethical Problems in research awareness.

Course Outcomes for First Year Second Semester Course	
Course Code: B20MC1202	
Course Title: PROFESSIONAL ETHICS AND HUMAN VALUES	
CO-1	Identify and analyze an ethical issue in the subject matter underinvestigationor in a relevantfield. Demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships and field work.
CO-2	Identify the multiple ethical interests at stake in a real-world situation or practice and Articulate what makes a particular course of action ethically defensible.
CO-3	Assess their own ethical values and the social context of problems.
CO-4	Identify ethical concerns in research and intellectual contexts, including academic integrity, use and citation of sources, the objective presentation of data, and the treatment of human subjects.
CO-5	Integrate, synthesize, and apply knowledge of ethical dilemmas and resolutions in academic settings, including focused and interdisciplinary research.

MECHANICAL ENGINEERING

MECHANICAL ENGINEERING
SYLLABUS : ENGLISH (B20HS1101)
(Common to AIDS, CE, CSE, ECE, EEE, IT&ME)

UNIT-I : Lesson: A Drawer full of happiness from *Infotech English*, Maruthi Publications.
Listening: Listening to short audio texts and identifying the topic, context and specific pieces of information to answer a series of questions both in speaking andwriting.

Speaking: Self-introduction and introducing others. Asking and answering generalquestions on topics such as home, family, work, studies and interests.

Reading: Skimming text to get the main idea. Scanning to look for specific pieces of information.

Reading for Writing: Paragraph Writing (Hints Development), general essays using suitable cohesive devices; linkers, sign posts and transition signals; mechanics of writing, punctuation.

Vocabulary: Technical vocabulary from across technical branches (20) GRE Vocabulary (20), antonyms and synonyms, word applications, verbal reasoning and sequencing of words.
Grammar: Content words and function words; parts of Speech, tenses, word order in sentences, sentence structures.

UNIT-II : Lesson-: Nehru's letter to his daughter, Indira on her birthday from *Infotech English***,** Maruthi Publications**.**
Listening: Answering a series of questions about main idea and supporting ideas after listening to audio texts both in speaking and writing.

Speaking: Discussion in pairs/ small groups on specific topics followed by short structured talks, functional English: greetings and leave takings.

Reading: Identifying sequence of ideas; recognizing verbal techniques that help to link the ideas in aparagraph together.

Reading for Writing: Identifying the main ideas, rephrasing and summarizing them (précis writing); avoiding redundancies and repetitions.
Vocabulary: Technical vocabulary from across technical branches (20words). GRE Vocabulary Analogies (20 words), antonyms and synonyms, word applications.
Grammar: Articles, prepositions, conjunctions, use of synonyms and antonyms.

UNIT-III: Lesson: Stephen Hawking-Positivity' Benchmark' from *Infotech English*, MaruthiPublications.
Listening: Listening for global comprehension and summarizing what is listenedto both in speaking and writing.
Speaking: Discussing specific topics in pairs or small groups and reporting whatis discussed. Functional English: complaining and apologizing.
Reading: Reading a text in detail by making basic inferences -recognizing: and interpreting specific context clues; strategies to use text clues for comprehension, critical reading.
Reading for Writing: Letter writing- types, format and principles of letterwriting, E-mail etiquette, writing a Resume/CV and covering letter.
Vocabulary: Technical vocabulary from across technical branches (20 words. GRE. Vocabulary 20words), Idioms & Phrasal verbs, Homonyms, wordapplications,sequencing of words.
Grammar: Sentence Structures, Transformation of sentences (Active and passive Voice, Degrees of comparison, Simple, Compound and Complex).

UNIT-IV:Lesson:LikingaTree,Unbowed:WangariMaathaibiographyfrom*Infotech English*, MaruthiPublications.
Listening: Making predictions while listening to conversations/ transactional dialogues without video (only audio), listening to audio-visual texts.

Speaking: Role plays for practice of conversational English in academic contexts(formal and informal) - asking for and giving information/directions. Functional English: asking for permissions, requesting,Inviting.
Reading: Studyingthe use of graphic elements in texts to convey information, reveal trends/patterns/relationships, communicative process or display complicated data.
Reading for Writing: Information transfer; describe, compare, contrast, identify significance/trends based on information provided in figures/charts/graphs/tables. Pamphlet writing, writing for media, writing SOP's.
Vocabulary: Technical vocabulary from across technical branches (20 words GRE Vocabulary (20words), antonyms and synonyms, word applications, cloze encounters, foreign phrases.
Grammar: Quantifying expressions - adjectives and adverbs: comparing and contrasting, question Tags, direct and indirect speech, reporting for academic purposes.

UNIT-V: Lesson: Stay Hungry–Stay Foolish from *Infotech English*, Maruthi Publications.
Listening: Identifying key terms, understanding concepts and interpreting theconcepts both in speaking and writing.
Speaking: Formal oral presentationsontopics from academic contexts–with/without the use of PPT slides. Functional English: Suggesting/Opiniongiving.
Reading: Reading for comprehension, RAP Strategy - intensive reading andextensivereading techniques.
Reading for Writing: Report writing, writing academic proposals- writing researcharticles: format and style.
Vocabulary: Technical vocabulary from across technical branches (20 words GRE 'Vocabulary (20 words, antonyms and synonyms, word applications, coherence, matchingemotions.
Grammar: Editing short texts — identifying and correcting common errors in grammar and usage (articles, prepositions, tenses, subject-verb agreement, parallel structures, phrases and clauses).

Course Outcomes for First Year First Semester Course	
Course Code: B20HS1101	
Course Title: ENGLISH	
CO-1	Identify the context, topic and pieces of specific information by understanding and responding to the social or transactional dialogues spoken by native speakers of English.
CO-2	Apply suitable strategies for skimming and scanning to get the main idea of a text and locate specific information.
CO-3	Build confidence and adapt themselves to the social and public discourses, discussions and presentations.
CO-4	Apply the principles of writing to paragraphs, arguments, essays and formal/informal communication.
CO-5	Construct sentences using proper grammatical structures and correct word forms.

SYLLABUS: MATHEMATICS-I (B20BS1101)
(LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS)
(Common to AIDS, CE, CSE, ECE, EEE, IT & ME)

UNIT-I: Linear systems of equations: Rank, Echelon form, Normal form, consistency of system of linear equations, Solution oflinear systems by Gauss elimination, Jacobi and Gauss-Seidelmethods.

UNIT-II: Eigen values - Eigen vectors and Quadratic forms: Eigen values, Eigen vectors, Properties, Cayley-Hamilton theorem, Inverse and powers of a matrix using Cayley-Hamilton theorem, Reduction to diagonal form, Quadratic forms,Reduction of a Quadratic form to Canonical form.

UNIT-III: Differential equations of first order and first degree: Linear, Bernoulli, Exact, Reducible to exact types. Applications: Orthogonal trajectories, Newton's Law of cooling, Simple electrical circuits.(R-L and R-C circuits only)

UNIT-IV: Linear differential equations of higher order: Linear Non-homogeneous equations of higher order with constant coefficients with source (RHS) term of the type e^{ax}, sin ax, cos ax, polynomials in x, $e^{ax}V(x)$, x V(x). Simultaneous differential equations with constant coefficients, Method of Variation of parameters.

UNIT-V: Laplace transformation: Laplace transforms of standard functions, properties, transforms of tf(t), f(t)/t, transforms of derivatives and integrals, transforms of unit step function, Dirac delta function; Inverse Laplace transforms, convolution theorem (without proof).
Applications: Solving ordinary differential equations (initial value problems) using Laplace transforms.

Course Outcomes for First Year First Semester Course	
Course Code: B20BS1101	
Course Title: MATHEMATICS – I	
CO-1	Solve a given system of linear algebraic equations
CO-2	Determine Eigen values and Eigen vectors of a system represented by a matrix.
CO-3	Solve ordinary differential equations of first order and first degree.
CO-4	Apply the knowledge in simple applications such as Newton's law of cooling, orthogonal trajectories and simple electrical circuits
CO-5	Solve linear ordinary differential equations of second order and higher order.
CO-6	Determine Laplace transform, inverse Laplace transform and solve linear ODE

SYLLABUS: APPLIED PHYSICS (B20 BS1102)
(Common to AIDS, CE, EEE & ME)

UNIT-I: WAVE OPTICS: Interference: Principle of super position. Interference of light, interference in thin films (reflected light) – Wedge film and Newton`s rings – Applications
Diffraction: Types of diffraction, Fraunh offer diffraction at a single alit, Diffraction grating, grating spectrum. Missing order, Resolving power, Rayleigh's Criterion, Resolvingpower of Grating.

UNIT-II: DIELECTRICS AND MAGNETICS: Dielectrics : Introduction to dielectrics, Electric Polarization, Dielectric polariz ability, Susceptibility, Dielectric constant, Types of Polarization, Frequency dependence of Polarization, Internal field in a dielectric, Claussius and Mosotti equation, Applications of dielectrics.
Magnetics: Introduction to magnetics, Magnetic dipole moment , Magnetization, Magnetic susceptibility and Permeability, Origin of permanent magnetic moment, Classification of magnetic materials (Dia , Para, Ferro, Antiferro and ferri), Hysteresis – Weiss Domain theory – Ferrites, soft and hard magnetic materials, Magnetic device applications.

UNIT-III: LASERS AND FIBER OPTICS: Lasers: Introduction, Interaction of radiation with matter, condition for light amplification,Einstein's relations. Requirements of lasers device Types of lasers, Design and working of Ruby and He – Ne lasers, Laser characteristics and applications.
Fiber Optics: Introduction to optical fibers, Principle of light propagation in fiber, Acceptance angle, Numerical aperture, Modes of propagations, types of fibers, classification of fibers based on refractive index profile, applications of fibers with emphasis on fiber opticcommunication.

UNIT-IV: SEMICONDUCTORS: Introduction, intrinsic semi conductors, density of charge carries, Fermi energy, Electrical conductivity – Extrinsic semi conductors – P-type and N-type, Density of charge carriers, dependence of Fermi energy on carrier concentration and temperature, direct and indirect band – gap semi conductors, Hall effect, Applications of Hall effect. Drift and diffusion currents, Continuity equation, applications of semiconductors.

UNIT-V: ULTRASONICS AND NANOMATERIALS: Ultrasonics: Introduction, Production of Ultrasonics – Piezoelectric and Magnetostriction methods, detection of ultrasonics, acoustic grating - determination of wavelength and velocity of ultrasonics, applications of ultrasonics.
Nanomaterials: Introduction, salient features of Nanomaterials, Synthesis methods – Ball milling, Condensation, Chemical Vapour Deposition and Sol – Gel methods, Characterization techniques for nano materials - The scanning tunneling microscopy (STM)and The atomic force microscopy (AFM), Carbon nanotubes (CNTS), Applications of Nano materials.

Course Outcomes for First Year First Semester Course	
Course Code: B20 BS1102	
Course Title: APPLIED PHYSICS	
CO-1	Interpret the behavior of light radiation in interference and diffraction Phenomena and their applications
CO-2	Explain the classification and properties of dielectric and magnetic materials suitable for engineering applications.
CO-3	Understand the basics of modern optical technologies like lasers and optical fibers and their utility in various fields
CO-4	Explain the important aspects of semiconductors and electrical conductivity in them
CO-5	Understand the basics of technology of Ultrasonics in various fields and demonstrate the synthesis and applications of nanomaterials.

SYLLABUS: ENGINEERING DRAWING (B20ME1101)

(Common to CE, EEE & ME)

UNIT-I: Geometrical Constructions and Engineering Curves: Introduction to Engineering Drawing, Geometrical Constructions, Engineering Curves: Parabola, Ellipse and Hyperbola by general method (Eccentricity method only), cycloid, epicycloid, hypocycloid, involutes, tangent & normal for these curves.

UNIT-II: Orthographic Projections: Introduction to orthographic projection, projections of points invarious quadrants, projections of lines: lines perpendicular to one of the reference planes (HP,VP or PP), Projections of straight lines inclined to one reference plane and parallel to other, Projections of straight lines inclined to both the planes.

UNIT-III: Projections of planes: Regular planes perpendicular to one reference plane and parallel toother, planes perpendicular to one reference plane and inclined to the other reference plane; planes inclined to both the reference planes.

UNIT-IV: Projections of Solids: – Prisms, Pyramids, Cones and Cylinders with the axis inclined to one of the referenceplanes.
Sections of Solids: Sections and Sectional views of Right and Regular Solids – Prism, Cylinder, Pyramid and Cone – Auxiliaryviews.

UNIT-V: Development of Solids: Development of Surfaces of Right and Regular Solids – Prism, Cylinder, Pyramid and Cone.
Isometric Projection: Introduction to Isometric projection and Isometric projection of simple Right and Regular Solids – Prism, Cylinder, Pyramid and Cone.

Course Outcomes for First Year First Semester Course	
Course Code: B20ME1101	
Course Title: ENGINEERING DRAWING	
CO-1	Apply principles of drawing to Construct polygons and engineering curves.
CO-2	Apply principles of Orthographic projections to draw the projections of points and lines.
CO-3	Apply principles of drawing to draw the projections of planes.
CO-4	Apply principles of drawing to draw projections of solids and their sectional views.
CO-5	Apply principles of drawing to draw developments and pictorial view of solids.

SYLLABUS: BASIC ELECTRICAL AND ELECTRONICS ENGINEERING (B20EE1102)
(For ME)

UNIT-I: Electrical circuit elements (R - L and C) - Ohm's Law- Kirchhoff laws - Series and parallel connection of resistances with DC excitation - Superposition Theorem - Faraday's Laws - Dynamically induced EMF - Statically induced EMF - Representation of sinusoidal
waveforms: Peak, Average and RMS values - Phasor representation.

UNIT-II: Principle of operation of DC generator – EMF equation – types of DC Generators – principle of operation of DC Motor - torque equation - types of DC Motors – characteristics of DC motors – speed control methods of DC motor-applications

UNIT-III: Principle of operation of Single-Phase Transformer – EMF equation - Equivalent circuit –Losses – Efficiency - OC and SC test on transformer - principle of operation of 3- phase Induction Motor [Elementary treatmentonly].

UNIT-IV: Introduction - Operation of PN junction diode as rectifier, Avalanche breakdown and Zener breakdown phenomenon, Operation of Zener diode as regulator. Light Emitting Diode (LED).

UNIT-V: Introduction, construction, basic operation of NPN and PNP transistors – Transistor as aswitch – Common Emitter (CE)amplifier.
Introduction to sensors and transducers (Piezoelectric and thermo-couple) related to electrical signals. [Elementary treatment only].

Course Outcomes for First Year First Semester Course	
Course Code: B20EE1102	
Course Title: BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	
CO-1	**Apply** concepts of Ohm‘s Law, Kirchhoff's laws, Superposition theorem for solving DC circuits and Phasor representation.
CO-2	**Apply Faraday's** laws and induced EMF concepts to describe the operating principles and characteristics of DC Machines, Transformers and Induction motors.
CO-3	**Analyze** the operation of DC Motors by using Speed Control methods and Transformers with OC & SC Tests.
CO-4	**Illustrate** the concepts of diodes, Zener diodes in different applications like rectifier voltage regulator and Light Emitting Diode.
CO-5	**Explain** transistor operation, sensors and transducers related to electrical signals.

SYLLABUS: BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB (B20EE1105)

(For ME)

LIST OF EXPERIMENTS:

1. Verification of Kirchhofflaws.
2. Verification of SuperpositionTheorem.
3. Swinburne's test on D.C. ShuntMotor.
4. OC and SC tests on single phasetransformer.
5. Speed control of D.C. Shuntmotor.
6. Brake test on D.C. ShuntMotor.
7. Brake test on D.C. SeriesMotor.
8. PN junction diode characteristics a) Forward bias b) Reverse bias (Cut in voltage and Resistance calculations).
9. Half wave rectifier with and withoutfilters.
10. Full wave rectifier with and withoutfilters.
11. Transistor Common Emitter (CE) characteristics (input andoutput).
12. Transistor as aswitch.

Course Outcomes for First Year First Semester Course	
Course Code: B20EE1105	
Course Title: BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB	
CO-1	**Verify** Kirchhoff's Laws & Superposition theorem for dc supply
CO-2	**Analyze** the performance of AC and DC Machines by testing
CO-3	**Perform** speed control of dc shunt motor
CO-4	**Conduct** experiments to obtain I – V Characteristics of Diode
CO-5	**Determine** the ripple factor of half wave & full wave rectifiers

SYLLABUS: APPLIED PHYSICS LAB (B20BS1107)

(Common to AIDS, CSE, ECE & IT)

1. DeterminationoftheWavelength oflightfromasource– DiffractionGrating–Normalincidence.
2. Determination of radius of curvature of Plano convex lens – Newton'sRings.
3. Determination of the thickness of a thin spacer using interference – Air Wedgemethod.
4. DeterminationofMagneticfieldalongtheaxisofacurrentcarryingcoil–StewartandGee'sapparatus.
5. VerificationofLawsofseriesandparallelcombinationsofresistances–CareyFoster'sbridge.
6. Determination of Temperature Coefficient of Resistance of athermistor.
7. To study the characteristics of PN Junctiondiode.
8. TodeterminetheNumericalapertureof a given opticalfiberandhencetofinditsacceptanceangle.
9. Determination of Planckconstant
10. Determination of the Rigidity modulus of elasticity of a material – Torsionalpendulum.
11. Verification of the laws of vibrations in stretched stings -Sonometer.
12. Determination of the frequency of the AC supply – ACSonometer.
13. To determine refractive indices (μo and μe) of a birefringent material(prism).

Course Outcomes for First Year First Semester Course	
Course Code: B20BS1107	
Course Title: APPLIED PHYSICS LAB	
CO-1	Get hands on experience in setting up experiments and using the instruments / equipment individually
CO-2	Get introduced to using new / advanced technologies and understand their significance.

SYLLABUS: WORKSHOP PRACTICE (B20ME1102)

(Common to EEE & ME)

LIST OF PROGRAMS:

CARPENTRY

1. T LapJoint
2. Corner HalvingJoint
3. DovetailJoint
4. Mortise and TenonJoint

FITTING:

1. Veefit
2. Squarefit
3. Half roundfit
4. Dovetailfit

TIN SMITHY

1. SquareTray
2. Frustum ofcone
3. StraightPipe
4. OpenScoop

HOUSE WIRING:

1. One Lamp Control by oneswitch
2. Parallel/Series Connection of threebulbs
3. Stair casewiring
4. Florescent LampFitting

Course Outcomes for First Year First Semester Course	
Course Code: B20ME1102	
Course Title: WORKSHOP PRACTICE	
CO-1	Apply wood working skills in real world applications.
CO-2	Build different parts with metal sheets in real world applications.
CO-3	Apply fitting operations in various applications.
CO-4	Apply different types of basic electric circuit connections.

MECHANICAL ENGINEERING

SYLLABUS : MATHEMATICS – II (B20BS1201)

(FOURIER ANALYSIS AND PARTIAL DIFFERENTIAL EQUATIONS)

(Common to AIDS, CE, CSE, ECE, EEE, IT & ME)

UNIT-I: Fourier Series: Introduction, Periodic functions, Fourier series of a periodic function, Dirichlet's conditions, Change of interval. Even and odd functions, Half-range sine and cosine series.

UNIT-II: Fourier Transforms: Fourier integral theorem (without proof), Complex form of Fourier integral, Fourier sineandcosine integrals, Fourier transform, Fourier sine and cosine transforms, Finite Fourier transforms, properties, inverse transforms, Parseval'sIdentities.

UNIT-III: Partial differentiation: Introduction, Homogeneous functions, Euler's theorem, Chain rule, Total derivative, Jacobians and their properties. Applications: Taylor series expansion for a function of two variables, Maxima and Minima of functions of two variables with and without constraints, Lagrange's method. Leibnitz's rules for differentiation under integralsign.

UNIT-IV: First order and higher order partial differential equations: Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions, solutions of Lagrange linear equation. Solutions of Linear homogeneous and non-homogeneous partial differential equations with constant coefficients –source (RHS) terms of the type e^{ax+by}, sin (ax+by), cos (ax+by),$x^m y^n$.

UNIT-V: Applications of partial differential equations: Method of separation of variables, One–dimensional wave equation, the D'Alembert'ssolution, one- dimensional heatequation.

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1201	
Course Title: MATHEMATICS–II	
CO-1	Determine Fourier series and half range series of functions.
CO-2	Determine Fourier transforms of non-periodic functions and also use them to evaluate integrals
CO-3	Compute partial derivatives, total derivative and Jacobians.
CO-4	Find maxima/minima of functions of two variables and evaluate some real definite integrals.
CO-5	Identify the discourse features, and improve intensive and extensive reading skills Form partial differential equations and solve Lagrange linear equation. Solve linear higher order homogeneous and non-homogeneous PDEs
CO-6	Find theoretical solution of one-dimensional wave equation and one-dimensional heat equation

SYLLABUS: APPLIED CHEMISTRY (B20BS1203)

(Common to AIDS, CE, EEE & ME)

UNIT-I: High Polymers and Plastics; Rubbers & Elastomers: Polymerization Definition, Types of Polymerization, free radical Mechanism of addition polymerization, Plastics as engineering materials, Thermoplastics and Thermosetting plastics, Compounding of plastics, Fabrication of plastics (4 techniques); Preparation, Properties and applications of Polyethylene, PVC, Bakelite, Nylon - 6,6, Bullet Proof plastics -polycarbonate and Kelvar; Fiber reinforced plastics, conducting polymers, Biodegradable Polymers - PHBV, Nylon 2, Nylon 6. Natural rubber – Vulcanization – Compounding of Rubber; Preparation, properties andapplications of Buna – S; Buna – N;

UNIT-II: Energy Sources and Applications: Nuclear Energy: Nuclear fission and Nuclear fusion – Nuclear Power reactor – Applications. Thermal fuels – Introduction – Classification – Calorific value – HCV and LCV – Bomb calorimeter; Coal : Proximate and ultimate analysis of coal – Significance of the analysis – Manufacture of coke by Otto Hoffman's by Product Process , Refining crude oil; Knocking; Chemical structure-Knocking, Octane number of gasoline, Cetane number of diesel oil, synthetic Petrol; LPG,CNG.

UNIT-III: Electrochemical cells and Corrosion: Galvanic cell, single electrode potential, Calomel electrode; Modern batteries: - Lead – Acid battery; Fuel cells- Hydrogen – Oxygen fuel cell, Lithium battery Theories of corrosion (i) dry Corrosion (ii) wet corrosion. Types of corrosion - differential aeration corrosion, pitting corrosion, galvanic corrosion, stress corrosion, Factors influencing corrosion, Protection from corrosion-material selection & design, cathodic protection, Protective coatings- metallic coatings – Galvanizing, Tinning, Electroplating; Electrrolessplating ; Paints.

UNIT-IV: Water technology: Sources of water – Hardness of water – Estimation of hardness of water by EDTA method; Boiler troubles – sludge and scale formation, Boiler corrosion, caustic embrittlement, Priming and foaming; Softening of water by Lime – Soda Process, Zeolite Process, Ion – Exchange Process; Municipal water treatment; Desalination of sea water by Electrodialysis and Reverse osmosis methods.

UNIT-V: Chemistry of Engineering Materials& Advanced Engineering materials: Cement:-Manufacture of Portland cement, setting and hardening of cement, Deterioration of cement concrete.
Refractories: Definition, Characteristics, classification, Properties and failure of refactories.
Solar Energy: Construction and working of Photovoltaic cell, applications.
Solid State Materials: Crystal imperfections, Semi Conductors, Classification and chemistry of semi conductors: Intrinsic semiconductors; Extrinsic semiconductors; Defect semiconductors, Compound Semiconductors and Organic Semiconductors.
Liquid Crystals: - Definition – Classification with examples – Applications

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1203	
Course Title: APPLIED CHEMISTRY	
CO-1	Develop polymer composites, synthetic polymers and formulation of polymers and their use in design
CO-2	Apply the knowledge about quality of water and its treatment methods for domestic and industrial applications. Understanding the principle, mechanism of corrosion and utilization of various techniques to control.
CO-3	Develop the knowledge of fuels and their economics, advantages and limitations. Make use of the basic concepts of semiconductors and liquid crystals for engineering applications..
CO-4	Identify constituents of various ceramic materials, characteristics and their appropriate use in construction. Apply the knowledge of electrochemistry principles to design energy storage

SYLLABUS: PROGRAMMING FOR PROBLEM SOLVING USING C (B20CS1201)

(Common to CE, EEE &ME)

UNIT-I: Introduction to Computers: Creating and running Programs, Computer Numbering System, Storing Integers, Storing Real Numbers Introduction to the C Language: Background, C Programs, Identifiers, Types, Variable, Constants, Input/output, Programming Examples, Scope, Storage Classes and Type Qualifiers. Structure of a C Program: Expressions Precedence and Associativity, Side Effects, Evaluating Expressions, Type Conversion Statements, Simple Programs, Command Line Arguments.

UNIT-II: Bitwise Operators: Exact Size Integer Types, Logical Bitwise Operators, Shift Operators. Selection & Making Decisions: Logical Data and Operators, Two Way Selection, Multiway Selection, More Standard Functions. Repetition: Concept of Loop, Pretest and Post-test Loops, Initialization and Updating, Event and Counter Controlled Loops, Loops in C, Other Statements Related to Looping, Looping Applications, Programming Examples.

UNIT-III: Arrays: Concepts, Using Array in C, Array Application, Two Dimensional Arrays, Multidimensional Arrays, Programming Example – Calculate Averages Strings: String Concepts, C String, String Input / Output Functions, Arrays of Strings, String Manipulation Functions String/ Data Conversion, A Programming Example – Morse Code Enumerated, Structure, and Union: The Type Definition (Type def), Enumerated Types, Structure, Unions, and ProgrammingApplication.

UNIT-IV: Pointers: Introduction, Pointers to pointers, Compatibility, L value and R value Pointer Applications: Arrays, and Pointers, Pointer Arithmetic and Arrays, Memory Allocation Function, Array of Pointers, Programming Application. Processor Commands: Processor
Commands.

UNIT-V: Functions: Designing, Structured Programs, Function in C, User Defined Functions, Inter Function Communication, Standard Functions, Passing Array to Functions, Passing Pointers to Functions, Recursion Text Input / Output: Files, Streams, Standard Library Input / Output Functions, Formatting Input / Output Functions, Character Input / Output Functions Binary Input / Output: Text versus Binary Streams, Standard Library, Functions for Files, Converting File Type.

Course Outcomes for First Year Second Semester Course	
Course Code: B20 CS1201	
Course Title: PROGRAMMING FOR PROBLEM SOLVING USING C	
CO-1	Apply Precedence and Associativity rules to evaluate Expressions.
CO-2	Make use of Decision Making and Looping statements to solve various problems in C.
CO-3	Illustrate the importance of Arrays and Strings and to apply various operations on them.
CO-4	Solve various problems by making use of Structure and Union concepts.
CO-5	Design and implement programs to analyze the different pointer applications
CO-6	Develop programs using Functions and Pointers.

SYLLABUS: ENGINEERING MECHANICS (B20ME1201)

(For ME)

UNIT-I: Basic Concepts: Scalar and vector quantities- Representation of vectors- Free vector force, Specification of force- Effect of force on rigid body- Free body diagram. Concurrent Forces in a plane: Principles of statics-Resolution and Composition of forces in a plane-
Equilibrium of concurrent forces in a plane- Method of projections- Equilibrium of three forces in a plane Method of moments. Parallel Force system in a plane.

UNIT-II: Centroid & Moment of Inertia: Centroid & M.I – Arial & Mass M.I – Radius of Gyration,Parallel axis– Perpendicular axis theorem – SimpleProblems.

UNIT-III: General Case of Forces in a Plane: Resultant and equilibrium of general case of forces in a plane, Statically determinate plane trusses-Method of joints and Method ofsections.
Friction – Coulombs laws of dry friction – Limiting friction, Simple Problems.

UNIT-IV: Dynamics of Particles - Rectilinear Motion – Kinematics, Kinetics – D'Alembert's principle– Work & Energy – Impulse Moment, Direct Central Impact – coefficient of restitution.
Curvilinear Motion – Kinematics, Projectile Motion, Moment of momentum, Work & Energy in Curvilinear motion.

UNIT-V: Dynamics of Rigid Bodies - Rigid body rotation – Kinematics - Kinetics – Work &Energyin Rigid body rotation, Principle of Angular Momentum, Plane Motion – Kinematics – Instantaneous center of rotation, Kinetics - Work-Energy principle in planemotion.

Course Outcomes for First Year Second Semester Course	
Course Code: B20ME1201	
Course Title: ENGINEERING MECHANICS	
CO-1	Solve for the resultant of the given force systems & Analyze force systems using equations of equilibrium.
CO-2	Determine centroid, center of gravity and moment of inertia of areas and bodies.
CO-3	Analyze trusses and solve mechanics problems associated with friction force.
CO-4	Determine the displacement, velocity and acceleration relations and apply the work energy and impulse momentum to dynamic systems in rectilinear and curvilinear motion.
CO-5	Determine the displacement, velocity and acceleration relations and apply the work energy and impulse momentum to rigid bodies.

SYLLABUS: MATERIAL SCIENCE AND METALLURGY (B20ME1202)

(For ME)

UNIT-I: Structure of crystalline solids: Atomic structure & bonding in solids- Unit cell, Space lattice, Crystal structures and its types-calculations of radius, Coordination Number and Atomic Packing Factor for differentcubicstructures,Indicesforplanesanddirections-
Imperfection in solids, point defects, Line defects, Planar defects and Volume defects- Concept of Slip & twinning.

UNIT-II: Phase diagrams: Basic terms-Solid solutions - Gibbs phase rule- Lever rule – cooling curves- Phase diagrams - construction of phase diagrams- binary phase diagrams - Al-Cu and Al-Si phase diagrams- Invariant reactions, eutectic, peritectic, eutectoid, peritectoid reactions, metatectic&monotectic reactions, Iron carbon phase diagram -Heat treatment of steel- Annealing, and its types, normalizing, hardening, tempering, martemering,
austempering.

UNIT-III: TTT diagrams, Construction of TTT diagram, TTT diagram for hypoeutectoid and alloysteels,
CCT diagram- Martensitic transformation, nature of martensitictransformation-
Surface hardening processes like case hardening, carburizing, cyaniding, nitriding, Induction hardening, Flame hardening, hardenabilty, Jominy end-quenchtest.

UNIT-IV: Extraction of metals, Engineering Alloys: Effect of alloying elements of steel -Properties, composition, and uses of Plain carbon, low carbon, medium & high carbon steels. stainless steels, high speed steels, Hadfield steels, tool steels - Cast irons, gray CI, white CI, malleable CI, SG Cast iron-The light alloys- Al & Mg & Titanium alloys- Copper &its
alloys: brasses & bronzes, Shape Memory Alloys.

UNIT-V: Composites: Introduction, classification, Manufacturing using Stir Casting, Powder Metallurgy, Spray Layup, Filament Winding, Resin Transfer Moulding& Chemical Vapour
Deposition Methods & applications of composites

Course Outcomes for First Year Second Semester Course	
Course Code: B20ME1202	
Course Title: MATERIAL SCIENCE AND METALLURGY	
CO-1	Understand the basic terminology used in computer programming.
CO-2	Write, compile and debug programs in C language.
CO-3	Use different data types in a computer program.
CO-4	Design programs involving decision structures, loops and functions.
CO-5	Explain the difference between call by value and call by reference.
CO-6	Understand the dynamics of memory by the use of pointers.
CO-7	Use different data structures and create/update basic data files.

SYLLABUS: APPLIED CHEMISTRY LAB (B20BS1208)

(Common to AIDS,CE, EEE & ME)

LIST OF PROGRAMS:

1. Determination of Alkalinity of watersample.
2. Determination of total hardness of water by EDTAmethod.
3. Estimation of Ferrous Iron by $KMnO_4$.
4. Estimation of oxalic acid by $KMnO_4$.
5. Estimation of Mohr's salt by $K_2Cr_2O_7$.
6. Estimation of Dissolved oxygen by Winkler'smethod.
7. Determination of pH of water and soilsample.
8. Determination of Chlorides present in watersample.
9. Conductometric titration of strong acid Vs strongbase.
10. Potentiometric titration of strong acid Vs strongbase.
11. Potentiometric titration of strong acid Vs weakbase.
12. Preparation of Phenol formaldehyderesin.
13. Determination of saponification value ofoils.
14. Determination of pour and cloud points of lubricatingoil.
15. Determination of Acid value ofoil.

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1208	
Course Title: APPLIED CHEMISTRY LAB	
CO-1	Gain technical knowledge of measuring, operating and testing of chemical instruments and equipments. Carrying out different types of chemical reactions for analysing different materials in micro level quantities
CO-2	Analyze and generate experimental skills to enhance the analytical thinking capabilities in the modern trends in engineering and technology

SYLLABUS: COMMUNICATION SKILLS LAB (B20HS1202)

(Common to AIDS, CE, CSE, ECE, EEE, IT & ME)

UNIT-I: A list of communicative expressions (Requests, Permissions, Asking/ giving directions, Thanking and Responding to Thanks, Clarifying, Inviting, Congratulating, Advising, Agreeing and disagreeing etc.,) Common Errors.

UNIT-II: Pronunciation Letters and Sounds The Sounds of English Stress and Intonation Phonetic Transcription.

UNIT-III: Group Discussions.

UNIT-IV: Presentation Skills

UNIT-V: Interview Skills, Resume/ Curriculum VitaeCovering Letter, FAQ's, Telephonic Interviews/ Etiquette Mock Interviews.

Course Outcomes for First Year Second Semester Course	
Course Code: B20HS1202	
Course Title: COMMUNICATION SKILLS LAB	
CO-1	Apply their linguistic competence in all LSRW skills to professional and personal settings
CO-2	Apply communication skills learnt through various language learning activities to their advancement in academics and competitive examinations.
CO-3	Draft job application letters, E-Mail messages and other writing discourses.
CO-4	Adopt professional etiquette consistent with formal settings
CO-5	Improve fluency and clarity in both spoken and written English

SYLLABUS: PROGRAMMING FOR PROBLEM SOLVING USING C LAB (B20CS1205)

(Common to CE, EEE & ME)

1. Exercise1:
   1. Write a C program to print a block F using hash (#), where the F has a height of six charactersand width of five and fourcharacters.
   2. Write a C program to compute the perimeter and area of a rectangle with a height of 7 inches andwidth of 5inches.
   3. Write a C program to display multiplevariables.
2. Exercise2:
   1. Write a C program to calculate the distance between the twopoints.
   2. WriteaCprogramthataccepts4integersp,q, r,s fromtheuserwhererandsarepositiveandpiseven. If q is greater than r and s is greater than p and if the sum of r and s is greater than the sumof p and q print "Correct values", otherwise print "Wrong values".
3. Exercise3:
   1. Write a C program to convert a string to a longinteger.
   2. Write a program in C which is a Menu-Driven Program to compute the area of the various geometricalshape.
   3. Write a C program to calculate the factorial of a givennumber.
4. Exercise4:
   1. Write a program in C to displaythe n terms of even natural number and their sum.
   2. Write a program in C to display the n terms of harmonic series and their sum. 1 + 1/2 + 1/3 +1/4 + 1/5 ... 1/n terms.
   3. Write a C program to check whether a given number is an Armstrong numberor not.
5. Exercise5:
   1. Write a program in C to print all unique elements in anarray.
   2. Write a program in C to separate odd and even integers in separatearrays.
   3. Write a program in C to sort elements of array in ascendingorder.
6. Exercise6:
   1. Write a program in C for multiplication of two squareMatrices.
   2. Write a program in C to find transpose of a givenmatrix.
7. Exercise7:
   1. Write a program in C to search an element in a row wise and column wise sortedmatrix.
   2. Write a program in C to print individual characters of string in reverseorder.
8. Exercise8:
   1. Write a program in C to compare two strings without using string libraryfunctions.
   2. Write a program in C to copy one string to anotherstring.
9. Exercise9:
   1. Write a C Program to Store Information Using Structures with DynamicallyMemory Allocation
   2. Write a program in C to demonstrate how to handle the pointers in theprogram.
10. Exercise10:
    1. WriteaprograminCtodemonstratetheuseof&(addressof)and*(valueataddress)operator.
    2. Write a program in C to add two numbers usingpointers
11. Exercise11:
    1. Write a program in C to add numbers using call byreference.
    2. Write a program in C to find the largest element using Dynamic MemoryAllocation
12. Exercise12:
    1. Write a program in C to swap elements using call byreference.
    2. WriteaprograminCto countthenumberofvowelsandconsonants in astringusingapointer.

13. Exercise13:
    1. Write a program in C to show how a function returningpointer.
    2. Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using malloc( )function
14. Exercise14:
    1. Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using calloc( ) function. Understand the difference between the above twoprogram.
    2. Write a program in C to convert decimal number to binary number using thefunction.
15. Exercise15:
    1. Write a program in C to check whether a number is a prime number or not usingthe function.
    2. Write a program in C to get the largest element of an array using thefunction.
16. Exercise16:
    1. Write a program in C to append multiple lines at the end of a textfile.
    2. Write a program in C to copy a file in anothername.
    3. Write a program in C to remove a file from thedisk.

Course Outcomes for First Year Second Semester Course	
Course Code: B20CS1205	
Course Title: PROGRAMMING FOR PROBLEM SOLVING USING C LAB	
CO-1	Write, Trace and Debug the programs and correct syntax and logical errors..
CO-2	Solve various Problems by making use of Arrays, Strings, Structures, Unions and Pointers
CO-3	Solve a complex problem by decomposing into several modules by using Functions
CO-4	Apply various File I/O operations