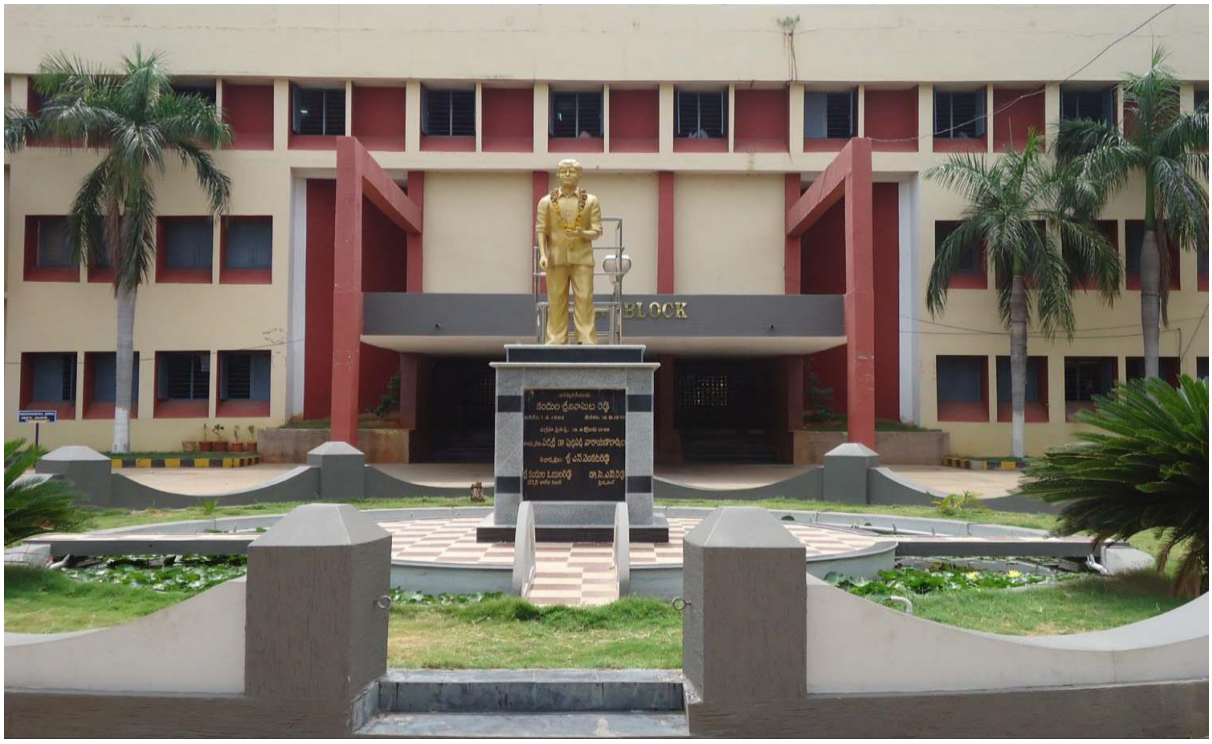
UG Programs in Engineering (R20UG)
Curriculum and Syllabus for

I & II Sem B.Tech

Department of Computer Science and Engineering



KandulaSrinivasa Reddy Memorial College of Engineering (Autonomous)
Kadapa 516003 AP
(Approved by AICTE, Affiliated to JNTUA, Ananthapuramu, Accredited by NAAC)
(An ISO 9001-2008 Certified Institution)

COMPUTER SCIENCE AND ENGINEERING

Approved Course Structure

Semester - 1								
Subject Code	**Subject Category**	**Course Name**	**L**	**T**	**P**	**IM**	**EM**	**CR**
2021101	BS	Linear Algebra and Calculus	3	0	0	30	70	3
2023102	BS	Chemistry	3	0	0	30	70	3
2005103	ES	C-Programming & Data Structures	3	0	0	30	70	3
2014104	ES	Basic Electrical & Electronics Engineering	3	0	0	30	70	3
20EW105	ES	Engineering Workshop	0	0	3	40	60	1.5
2005106	ES	IT Workshop	0	0	3	40	60	1.5
2023107	BS	Chemistry Lab	0	0	3	40	60	1.5
2005108	ES	C-Programming & Data Structures Lab	0	0	3	40	60	1.5
2014109	ES	Basic Electrical & Electronics Engineering Lab	0	0	3	40	60	1.5
		Total						**19.5**

Semester - 2								
Subject Code	**Subject Category**	**Course Name**	**L**	**T**	**P**	**IM**	**EM**	**CR**
2021201	BS	Differential Equations and Vector Calculus	3	0	0	30	70	3
20AP202	BS	Applied Physics	3	0	0	30	70	3
2024203	HS	Communicative English	3	0	0	30	70	3
2005204	ES	Python Programming	3	0	0	30	70	3
2003205	ES	Engineering Drawing	1	0	2	30	70	2
2003206	ES	Engineering Drawing Lab	0	0	2	40	60	1
20AP207	BS	Applied Physics Lab	0	0	3	40	60	1.5
2024208	HS	Communicative English Lab	0	0	3	40	60	1.5
2005209	ES	Python Programming Lab	0	0	3	40	60	1.5
20MC211	MC	Universal Human Values	3	0	0	30	00	0.0
		Total						**19.5**

B.Tech I SEM CSE (R20)

Course Title	LINEAR ALGEBRA & CALCULUS				B.Tech CSE I Sem (R20)		
Course Code	Category	Hours/Week			Credits	Maximum Marks	
2021101	BS	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	0	0	3	30	70	100
Mid Exam Duration: 2 Hours					End Exam Duration: 3Hrs		

Course Objectives:

- This course will illuminate the students in the concepts of calculus and linear algebra.
- To equip the students with standard concepts and tools at an intermediate to advanced level mathematics to develop the confidence and ability among the students to handle various real world problems and their applications

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Develop the use of matrix algebra techniques that is needed by engineers for pract applications
CO 2	Utilize mean value theorems to real life problems
CO 3	Classify the functions of several variables which is useful in optimization techniques.
CO 4	Evaluate multiple integrals.
CO 5	Define Beta and Gamma functions.

Bridge Course: Limits, continuity, Types of matrices

UNIT -I

Rank of a matrix by Echelon form, Normal form. Solving system of homogeneous and non- homogeneous linear equations. Eigen values and Eigen vectors for real matrices – Cayley-Hamilton theorem (without proof), finding inverse and power of a matrix by Cayley–Hamilton theorem. Diagonalisation by orthogonal transformation.

UNIT -II

Mean Value Theorems: (08 Hours)

Rolle's theorem, Lagrange's mean value theorem, Cauchy's mean value theorem, Taylor's and Maclaurin's theorems with remainders (without proof), related problems.

UNIT -III

Multivariable Calculus: (10 Hours)

Partial derivatives, total derivative, chain rule, change of variables, Jacobians, Maxima and minima of functions of two variables – Lagrange's method of undetermined multipliers.

UNIT -IV

Multiple Integrals: **(10 Hours)**

Evaluation of double integrals in Cartesian coordinates and polar coordinates – Change of variables in double integrals – Change the order of integration in double integrals – Evaluation of triple integrals in Cartesian and polar coordinates – Change of variables between Cartesian, cylindrical and spherical polar coordinates.

UNIT -V

Beta and Gamma functions: **(08 Hours)**

Beta and Gamma functions and their properties, relation between Beta and Gamma functions, evaluation of definite integrals using Beta and Gamma functions.

Text Books:

1. Higher Engineering Mathematics, Dr. B.S. Grewal, Khanna Publishers-43 edition 2014.
2. Advanced Engineering Mathematics, Erwin Kreyszig, Wiley Publications, 9th edition- 2013.

Reference Books:

1. Higher Engineering Mathematics, B.V. Ramana, Mc. Graw Hill Education (India) Pvt. Ltd, New Delhi, 11th Edition, Reprint 2010.
2. Linear Algebra: A Modern Introduction, D Poole, 2nd Edition, Brooks/Cole, 2005.
3. A Text Book of Engineering Mathematics, N.P. Bali and Manish Goyal, Lakshmi Publications, Reprint 2008.

Course Title	CHEMISTRY				B.Tech CSE I Sem (R20)		
Course Code	Category	Hours/Week			Credits	Maximum Marks	
2023102	BS	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	0	0	3	30	70	100
Mid Exam Duration: 2 Hours					End Exam Duration: 3Hrs		

Course Objectives:

- To familiarize engineering chemistry and its applications
- To train the students on the principles and applications of electrochemistry and polymers.
- To introduce instrumental methods, molecular machines and switches

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Compare the materials of construction for battery and electrochemical sensors
CO 2	Explain the preparation, properties, and applications of thermoplastics &thermosetting, elastomers & conducting polymers.
CO 3	Explain the principles of spectrometry, slc in separation of solid and liquid mixtures
CO 4	Apply the principle of Band diagrams in application of conductors and semiconductors

UNIT I:

Structure and Bonding Models:

Planck's quantum theory, dual nature of matter, Schrodinger equation, significance of Ψ and Ψ^2, applications to hydrogen, molecular orbital theory – bonding in homo- and heteronuclear diatomic molecules – energy level diagrams of O2 , NO and CO, etc., calculation of bond order.

UNIT II:

Modern Engineering materials:

i).Understanding of materials: Crystal field theory – salient features – splitting in octahedral, tetrahedral and square planar geometry. Properties of coordination compounds-Oxidation state, coordination, magnetic properties and colour.

ii). Semiconductor materials, super conductors- basic concept, band diagrams for conductors, semiconductors and insulators, Effect of doping on band structures.

iii). Nanochemistry: Introduction, classification of nanometerials, properties and applications of Fullerenes, carbonnano tubes and Graphines nanoparticles.

UNIT III:

Electrochemistry and Applications:

Introduction to Electrodes – concepts, reference electrodes (Calomel electrode, Ag/AgCl electrode and glass electrode); Electrochemical cell, Nernst equation, cell potential calculations and numerical problems, potentiometry- potentiometric titrations (redox titrations), concept of conductivity, conductivity cell, conductometric titrations (acid-base titrations), pH metric concepts.

Primary cells – Zinc-air battery, Secondary cells – Nickel-Cadmium (NiCad),and lithium ion batteries- working of the batteries including cell reactions; Fuel cells, hydrogen-oxygen, methanol fuel cells – working of the cells.

UNIT IV:

Polymer Chemistry:

Introduction to polymers, functionality of monomers, chain growth and step growth polymerization, coordination polymerization, copolymerization (stereospecific polymerization) with specific examples and mechanisms of polymer formation.

Plastics - Thermoplastics and Thermosettings, Preparation, properties and applications of – PVC, Teflon, Bakelite, Nylon-6,6.

Elastomers–Buna-S, Buna-N–preparation, properties and applications.

Conducting polymers – polyacetylenes,– mechanism of conduction and applications.

UNIT V:

Instrumental Methods and Applications

Electromagnetic spectrum. Absorption of radiation: Beer-Lambert's law. Regions of Electromagnetic radiation. UV-Visible**,** IR Spectroscopes'- (selection rules, principles and applications). Solid-Liquid Chromatography–TLC, retardation factor.

Text Books:

1. Jain and Jain, Engineering Chemistry, 16/e, DhanpatRai, 2013.
2. Peter Atkins, Julio de Paula and James Keeler, Atkins' Physical Chemistry, 10/e, Oxford University Press, 2010.

Reference Books:

1.G.V.Subba Reddy, K.N.Jayaveera and C. Ramachandraiah, Engineering Chemistry, Mc Graw Hill, 2020.
2. D. Lee, Concise Inorganic Chemistry, 5/e, Oxford University Press, 2008.
3. Skoog and West, Principles of Instrumental Analysis, 6/e, Thomson, 2007.
4. J.M.Lehn, Supra Molecular Chemistry, VCH Publications

<table>
<tr><td colspan="2">Course Title</td><td colspan="5">C PROGRAMMING & DATA STRCUTURES</td><td colspan="3">B.Tech I Sem (CSE, EEE, ME) (R20)
B.Tech II Sem (CE, ECE)</td></tr>
<tr><td colspan="2">Course Code</td><td>Category</td><td colspan="3">Hours/Week</td><td>Credits</td><td colspan="3">Maximum Marks</td></tr>
<tr><td colspan="2" rowspan="2">2005103 (I Sem)
2005203 (II Sem)</td><td rowspan="2">ES</td><td>L</td><td>T</td><td>P</td><td>C</td><td>Continuous Internal Assessment</td><td>End Exams</td><td>Total</td></tr>
<tr><td>3</td><td>0</td><td>0</td><td>3</td><td>30</td><td>70</td><td>100</td></tr>
<tr><td colspan="5">Mid Exam Duration: 2 Hours</td><td colspan="5">End Exam Duration: 3Hrs</td></tr>
<tr><td colspan="10">Course Objectives:
• The course aims to provide exposure to problem-solving through programming
• It aims to train the student to the basic concepts of the C programming language
• Gain knowledge of data structures and their applications</td></tr>
<tr><td colspan="10">Course Outcomes: On successful completion of this course, the students will be able to</td></tr>
<tr><td>CO 1</td><td colspan="9">Formulate simple algorithms for arithmetic and logical problems and to translate algorithms to programs (in C Language).</td></tr>
<tr><td>CO 2</td><td colspan="9">Choose the loops and decision-making statements to solve the problem</td></tr>
<tr><td>CO 3</td><td colspan="9">Implement different Operations on arrays</td></tr>
<tr><td>CO 4</td><td colspan="9">Use functions to solve the given problem</td></tr>
<tr><td>CO 5</td><td colspan="9">Understand structures, unions and pointers</td></tr>
<tr><td>CO 6</td><td colspan="9">Understand need of data structures in real time situations</td></tr>
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UNIT I:

Introduction to C programming: - C language elements, variable declarations and data types, operators and expressions, decision statements - If and switch statements, loop control statements - while, for, do-while statements. **Jumping statements:** break, continue and goto statements

UNIT II:

Arrays: Introduction, Declaration and initialization of 1D and 2D arrays, **Functions:** types of functions, Recursion and argument passing, pointers, storage allocation, pointers to functions, expressions involving pointers, Storage classes – auto, register, static, extern. **Strings:** string handling functions, and Command line arguments.

UNIT III:

Pointers: Introduction to pointers, declaring and initialization of pointer variable, accessing the address of variables, accessing a variable through its pointer, chain of pointers. **Structures and unions:** Introduction, defining a structure, declaring structure variable, structure initialization, accessing members of structure, copying and comparing structure variables, structures within structures, array of structures, and introduction of union.

UNIT IV:

Data Structures: Overview of data structures, stacks and queues, representation of a stack, stack related terms, operations on a stack, implementation of a stack, evaluation of arithmetic expressions, infix, prefix, and postfix notations, evaluation of postfix expression, conversion of expression from infix to postfix, recursion, queues - various positions of queue, representation of queue, insertion, deletion, searching operations.

Searching and sorting: linear search, binary search, bubble (exchange) sort, selection sort, insertion sort.

UNIT V:

Linked Lists – Single linked list, Operations on Single Linked List: insertion, deletion and searching operations, doubly linked lists and its operations, circular linked lists and its operations. **Trees** - Tree terminology, representation, Binary trees, representation, binary tree traversals. Binary tree operations.

TEXT BOOKS

1. E. Balagurusamy, C Programming and Data structures,Fourth Edition, McGrawHill.
2. Rema Theraja, Programming in C, second edition,Oxford.
3. Fundamentals of Data Structures in C, Ellis Horowitz, SartajSahni, Susan Anderson-Freed, Computer Science Press.
4. Programming in C and Data Structures, J.R.Hanly, Ashok N. Kamthane and A. AnandaRao, Pearson Education

REFERENCE TEXT BOOKS

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India
2. R.G. Dromey, How to solve it by Computer,Pearson.
3. YashavantKanetkar, Let us C, 15th edition, BPBPublications.
4. Dr. P. ChennaReddy, Computer Fundamentals and C Programming, SecondEdition.

Course Title	BASIC ELECTRICAL & ELECTRONICS ENGINEERING Part 'A': Basic Electrical Engineering Part 'B': Electronics Engineering				B.Tech CSE I Sem (R20)			
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
2014104	**ES**	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exams**	**Total**
		3	0	0	3	30	70	100
Mid Exam Duration: 2 Hours					**End Exam Duration: 3Hrs**			

Course Objectives:

The objective of the course is to learn basics of DC and AC circuits, Electrical Machines, Transformers and Power Systems. Theory, construction, and operation of electronic devices, biasing of BJTs and FETs, design and construction of amplifiers, concepts & principles of logic devices.

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Understand the basic fundamentals of DC & AC circuits, network reduction techniqu machines and power system fundamentals
CO 2	Understand theory, construction, and operation of electronic devices, working of diodes and its applications, working of transistors, microcontrollers & their applications.
CO 3	Determine the currents, voltages using mesh and nodal analysis, Average and RMS values for different waveforms, equivalent circuit parameters using OC & SC test of single phase transformer.
CO 4	Obtain the EMF equation and characteristics of dc machines and Induction motor.
CO 5	Analyze small signal amplifier circuits to find the amplifier parameters
CO 6	Design small signal amplifiers using proper biasing circuits to fix up proper Q point

Part A: Basic Electrical Engineering

UNIT-I

DC Circuits: Electrical circuit elements (R - L and C) - Kirchhoff laws - Series and parallel connection of resistances with DC excitation. Superposition Theorem. Simple Numerical Problems.

AC Circuits: Representation of sinusoidal waveforms – 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, simple numerical problems.

UNIT-II

DC Machines: Principle and operation of DC Generator - EMF equations - OCC characteristics of DC generator – principle and operation of DC Motor – Torque equation – Performance Characteristics of DC Motor, speed control (Flux & Armature control of shunt motor), Simple numerical problems.

Transformers: Principle and operation of Single Phase Transformer – Emf equation, equivalent circuit, OC and SC tests on transformer, simple numerical problems.

Induction Motor: Principle and operation of 3-phase Induction Motor [Elementary treatment only].

UNIT-III

Basics of Power Systems: Typical AC power supply scheme – Generation of 3-phase supply, Definition of short, medium and long transmission lines – Concepts of AC & DC distribution system.

Text Books

1. D. P. Kothari and I. J. Nagrath - "Basic Electrical Engineering" - Tata McGraw Hill - 2010.
2. V.K. Mehta & Rohit Mehta, "Principles of Power System" – S.Chand – 2018.

References

1. E. Hughes - "Electrical and Electronics Technology" - Pearson - 2010.
2. C.L. Wadhwa – "Generation Distribution and Utilization of Electrical Energy", 3rd Edition, New Age International Publications.

Part 'B'- Electronics Engineering

UNIT-I

Diodes and Applications: Semiconductor Diode, Diode as a Switch& Rectifier, Half Wave and Full Wave Rectifiers with and without Filters; Operation and Applications of Zener Diode, LED, Photo Diode.

Transistor Characteristics: Bipolar Junction Transistor (BJT) – Construction, Operation, Amplifying Action, Common Base, Common Emitter and Common Collector Configurations, Operating Point, Biasing of Transistor Configuration; Field Effect Transistor (FET) – Construction, Characteristics of Junction FET, Concepts of Small Signal Amplifiers –CE & CC Amplifiers.

UNIT-II

Operational Amplifiers and Applications: Introduction to Op-Amp, Differential Amplifier Configurations, CMRR, PSRR, Slew Rate; Block Diagram, Pin Configuration of 741 Op-Amp, Characteristics of Ideal Op-Amp, Concept of Virtual Ground; Op-Amp Applications - Inverting, Non-Inverting, Summing and Difference Amplifiers, Voltage Follower, Comparator, Differentiator, Integrator.

UNIT-III

Digital Electronics: Logic Gates, Simple combinational circuits–Half and Full Adders, BCD Adder. Latches and Flip-Flops (S-R, JK and D), Shift Registers and Counters. Introduction to Microcontrollers and their applications (Block diagram approach only).

Text Books

1. R.L.Boylestad& Louis Nashlesky, Electronic Devices &Circuit Theory, Pearson Education, 2007.
2. Ramakanth A. Gayakwad, Op-Amps & Linear ICs, 4thEdition, Pearson, 2017.
3. R. P. Jain, Modern Digital Electronics,3rd Edition, Tata Mcgraw Hill,2003.
4. Raj Kamal, Microcontrollers: Architecture, Programming, Interfacing and System Design, 2nd Edition, Pearson, 2012.

Reference Books

1. Santiram Kal, Basic Electronics- Devices, Circuits and IT Fundamentals, Prentice Hall, India, 2002.

R. S. Sedha, A Text Book of Electronic Devices and Circuits, S.Chand& Co, 2010

Course Title	ENGINEERING WORKSHOP				B.Tech CSE I Sem (R20)		
Course Code	Category	Hours/Week			Credits	Maximum Marks	
20EW105	ES	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		0	0	3	1.5	40	60	100
					End Exam Duration: 3Hrs		

Course Objectives:

- Sheet metal operations,
- Fitting
- Electrical house wiring skills
- Wood working

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Apply wood working skills in real world applications
CO 2	Build different objects 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
CO 5	Use soldering and brazing techniques

Wood Working:

Familiarity with different types of woods and tools used in wood working and make following joints

Half – Lapjoint

Mortise and Tenonjoint

Corner Dovetail joint or Bridlejoint.

Sheet Metal Working:

Familiarity with different types of tools used in sheet metal working, Developments of following sheet metal job from GI sheets

a)Taperedtray b)Conicalfunnel c)Elbowpipe d)Brazing

Fitting:

Familiarity with different types of tools used in fitting and do the following fitting exercises

a) V-fit b)Dovetailfit c) Semi-circularfit d) square fitting

Electrical Wiring:

Familiarities with different types of basic electrical circuits and make the following connections

a) Parallelandseries b) Twowayswitch c)Godownlighting d) Tubelight

e) Threephasemotor f) Soldering ofwires

Note: In each section a minimum of three exercises are to be carried out.

Course Title	IT WORKSHOP				B.Tech I Sem (CSE, ME) (R20) B.Tech II Sem (CE,EEE, ECE)			
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
2005106 (I Sem) 2005206 (II Sem)	**ES**	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exams**	**Total**
		0	0	3	1.5	40	60	100
					End Exam Duration: 3Hrs			

Course Objectives:

- To make the students know about the internal parts of a computer, assembling and dissembling a computer from the parts, preparing a computer for use by installing the operating system.
- To provide Technical training to the students on Productivity tools like Word processors, Spreadsheets, Presentations and LAteX.
- To learn about Networking of computers and use Internet facility for Browsing and Searching

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Disassemble and Assemble a Personal Computer and prepare the computer ready use.
CO 2	Prepare the Documents using Word processors and Prepare spread sheets for calculations .using excel and also the documents using LAteX.
CO 3	Prepare Slide presentations using the presentation tool.
CO 4	Interconnect two or more computers for information sharing.
CO 5	Access the Internet and Browse it to obtain the required information.

Preparing your Computer

Task 1:

Learn about Computer: Identify the internal parts of a computer, and its peripherals. Represent the same in the form of diagrams including Block diagram of a computer. Write specifications for each part of a computer including peripherals and specification of Desktop computer. Submit it in the form of a report.

Task 2:

Assembling a Computer: Disassemble and assemble the PC back to working condition. Students should be able to trouble shoot the computer and identify working and non-working parts. Student should identify the problem correctly by various methods.

Task 3:
Install Operating system: Student should install Linux on the computer. Student may install another operating system (including proprietary software) and make the system dual boot or multi boot. Students should record the entire installation process.

Task 4:
Operating system features: Students should record the various features that are supported by the operating system(s) installed. They have to submit a report on it. Students should be able to access CD/DVD drives, write CD/DVDs, access pen drives, print files, etc. Students should install new application software and record the installation process.

Networking and Internet
Task 5:

Networking: Students should connect two computers directly using a cable or wireless connectivity and share information. Students should connect two or more computers using switch/hub and share information. Crimpling activity, logical configuration etc. should be done by the student. The entire process has to be documented.

Task 6:
Browsing Internet: Student should access the Internet for Browsing. Students should search the Internet for required information. Students should be able to create e-mail account and send email.

They should get acquaintance with applications like Facebook, skype etc. If Intranet mailing facility is available in the organization, then students should share the information using it. If the operating system supports sending messages to multiple users (LINUX supports it) in the same network, then it should be done by the student. Students are expected to submit the information about different browsers available, their features, and search process using different natural languages, and creating email account.

Task 7:
Antivirus: Students should download freely available Antivirus software, install it and use it to check for threats to the computer being used. Students should submit information about the features of the antivirus used, installation process, about virus definitions, virus engine etc.

Productivity tools

Task 8:

Word Processor: Students should be able to create documents using the word processor tool. Some of the tasks that are to be performed are inserting and deleting the characters, words and lines, Alignment of the lines, Inserting header and Footer, changing the font, changing the colour, including images and tables in the word file, making page setup, copy and paste block of text, images, tables, linking the images which are present in other directory, formatting paragraphs, spell checking, etc. Students should be able to prepare project cover pages, content sheet and chapter pages at the end of the task using the features studied. Students should submit a user manual of the word processor considered,

Image Manipulation tools.

Task 9:

Presentations: creating, opening, saving and running the presentations, selecting the style for slides, formatting the slides with different fonts, colours, creating charts and tables, inserting and deleting text, graphics and animations, bulleting and numbering, hyperlinking, running the slide show, setting the timing for slide show.

Task 10:

Spreadsheet: Students should be able to create, open, save the application documents and format them as per the requirement. Some of the tasks that may be practiced are Managing the worksheet environment, creating cell data, inserting and deleting cell data, format cells, adjust the cell size, applying formulas and functions, preparing charts, sorting cells. Students should submit a user manual of the Spreadsheet.

Task 11:

LateX: Introduction to Latex and its installation and different IDEs. Creating first document using Latex, using content into sections using article and book class of LaTeX. Styling Pages: reviewing and customizing different paper sizes and formats. Formatting text (styles, size, alignment, colors and adding bullets and numbered items, inserting mathematical symbols, and images, etc.). Creating basic tables, adding simple and dashed borders, merging rows and columns. Referencing and Indexing: cross-referencing (refer to sections, table, images), bibliography (references).

References:

1. Introduction to Computers, Peter Norton, McGraw Hill

2. MOS study guide for word, Excel, PowerPoint & Outlook Exams, Joan Lambert, Joyce Cox, PHI.

3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.

4. Networking your computers and devices, Rusen, PHI

5. Trouble shooting, Maintaining & Repairing PCs, Bigelows, TMH

6. Lamport L. LATEX: a document preparation system: user's guide and reference manual. Addison-wesley; 1994.

Course Title	CHEMISTRY LAB				B.Tech CSE I Sem (R20)		
Course Code	Category	Hours/Week			Credits	Maximum Marks	
2023107	BS	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		0	0	3	1.5	40	60	100
					End Exam Duration: 3Hrs		

Course Objectives:

- Verify the fundamental concepts with experiments

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Determine the cell constant and conductance of solutions
CO 2	Prepare advanced polymer Bakelite materials
CO 3	Measure the strength of an acid present in secondary batteries
CO 4	Analyze the IR of some organic compounds

List of Experiments:

1. Measurement of 10Dq by spectrophotometric method
2. Models of potential energy surfaces
3. Conductometric titration of strong acid vs. strong base.
4. Conductometric titration of weak acid vs. strong base
5.pH metric titration of strong acid vs. strong base.
6. pH metric titration of weak acid vs. strong base
7. Determination of cell constant and conductance of solutions
8. Potentiometry - determination of redox potentials and emfs
9. Determination of Strength of an acid in Pb-Acid battery
10. Preparation of a Bakelite and measurement of its mechanical properties (strength.).
11. Verify Lambert-Beer's law
12. Thin layer chromatography
13. Identification of simple organic compounds by IR.
14. Preparation of nanomaterial's by precipitation
15. Estimation of Ferrous Iron by Dichrometry.

Course Title	C PROGRAMMING & DATA STRUCTURES LAB				B.Tech I Sem (CSE, EEE, ME) (R20) B.Tech II Sem (CE, ECE)		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**	
2005108 (I Sem) **2005208 (II Sem)**	**ES**	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exams**	**Total**
		0	0	3	1.5	40	60	100
					End Exam Duration: 3Hrs		

Course Objectives:

- know how to write and debug programs
- know the principles of designing structured programs
- Write basic C programs using, Selection statements, Repetitive statements,
- Functions, Pointers, Arrays, Strings and structures
- To apply suitable data structure to solve real world problems

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Formulate the algorithms for simple problems
CO 2	Translate given algorithms to a working and correct program
CO 3	Correct syntax errors as reported by the compilers
CO 4	Identify and correct logical errors encountered at runtime
CO 5	Write iterative as well as recursive programs
CO 6	Represent data in arrays, strings and structures and manipulate them through a program
CO 7	Write programs on data structures like stack, queue, liked list, trees etc

1. Ramesh ‘s basic salary is input through the keyboard. His dearness allowance is 40% of basic salary and house rent allowance is 20% of basic salary. Write a C program to calculate his grosss alary.
2. Write a program to take input of name, roll no and marks obtained by a student in 5 subjects each have its 100 full marks and display the name, roll no with percentage score secured.
3. a) Write a C program to find out whether a given number is even number or odd number.
   b) Write a C program to check whether a given year is leap year or not.
4. Design and develop an algorithm that takes three coefficients (***a***, ***b***, and ***c***) of a Quadratic equation ($\boldsymbol{a}x^2+\boldsymbol{b}x+\boldsymbol{c}=0$) as input and compute all possible roots. Implement a C program for the developed algorithm and execute the same to output the possible roots for a given set of coefficients with appropriate messages.

5. If the ages of the Ramesh, Suresh and Mahesh are input through the keyboard, write a C program to determine youngest of the three.

6. A character is entered through keyboard. Write a C program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol using if- else and switch case. The following table shows the range of ASCII values for various characters.

Characters	ASCII values
A–Z	65 – 90
a– z	97 – 122
0 – 9	48 – 57
Special symbols	0 – 47, 58 – 64, 91 – 96, 123 – 127.

7. Write a C program which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +, -, *, /, % and use switch statement).

8. Design and develop an algorithm to find whether a given number is Armstrong number or not. Implement a C program for the developed algorithm.
9. Design and develop an algorithm to check whether a given number is palindrome or not. Implement a C program for the same.
10. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
11. Write a C program to generate the first N terms of Fibonacci sequence.
12. Write a C program to find the smallest and largest number in a given array.
13. Write a C program to find the frequency of a particular number in a list of integers.
14. Write a C program to sort the list of elements using
    a) Bubble Sort b) Selection sort.
15. Write a C program to search for an element in a list of elements using
    a) Linear search b) Binary search
16. Write a C program to read two matrices and perform the following operations
    a) Addition of two matrices
    b) Multiplication of two matrices
17. **Partitioning an array**
    Given a randomly ordered array of n elements, write a C program to partition the elements into two subsets such that elements ≤X are in one subset and elements ≥X are in another subset.
18. Write a C program to rearrange the elements in an array so that they appear in reverse order.

19. If a string and its reversed string are same then the string is called as palindrome string. Design and develop an algorithm to check whether a given string is a palindrome or not and implement a C program for the same.

20. Write a C program to read two strings and perform the following operations without using built string library functions.

i) String length ii) String reversing

iii) Comparison of two strings iv) Concatenation of two strings

21. Write a C program to count the number of vowels, consonants, digits, blank space sand special characters in a given string.

22. Write a C program to swap the contents of two variables using

a) Call by value

b) Call by reference.

23. Write a C program using recursion to

a) Find the factorial of a given number

b) Print the Fibonacci series up to a given number.

c) Find the GCD of two integers.

24. Write a C program to define a structure with the following members. Roll No., Name, marks in Sub1, Sub2, Sub3. Read the n students records and find the total marks of each student and print the result in the following format.

Roll No	Name	Sub1	Sub2	Sub3	Total marks	result
189Y1A0501	Kavya	80	70	75	225	Distinction

25. Write C programs that implement stack (its operations) using

i) Arrays

ii) Pointers

26. Write C programs that implement Queue (its operations) using

i) Arrays

ii) Pointers

27. Write a C program that uses Stack operations to perform the following:

i) Converting infix expression into postfix expression

ii) Evaluating the postfix expression

28. Write a C program that uses functions to perform the following operations on single linked list.

i) Creation ii) Insertion iii) Deletion iv) Traversal

29. Write a C program that uses functions to perform the following operations on Double

linked list.

i) Creation ii) Insertion iii) Deletion iv) Traversal

30. Write a C program that uses functions to perform the following:

i) Creating a Binary Tree of integers

ii) Traversing the above binary tree in preorder, inorder and postorder.

TEXT BOOKS

1. Programming in C and Data Structures, J.R.Hanly, Ashok N. Kamthane and A. Ananda Rao, Pearson Education.
2. B.A.Forouzon and R.F. Gilberg, "COMPUTER SCIENCE: A Structured Programming Approach Using C", Third edition, CENGAGE Learning, 2016.
3. Richard F. Gilberg& Behrouz A. Forouzan, "Data Structures: A Pseudocode Approach with C", Second Edition, CENGAGE Learning, 2011
4. E. Balagurusamy, Programming in ANSI C, Fifth Edition, McGrawHill.

Course Title	BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB Part 'A': Basic Electrical Engineering Lab Part 'B': Electronics Engineering Lab				B.Tech CSE I Sem (R20)			
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
2014109	**ES**	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exams**	**Total**
		0	0	3	1.5	40	60	100
					End Exam Duration: 3Hrs			

Course Objectives:
The objective of the course is to verify KCL, KVL, superposition theorem, measurement of real & reactive power for RL & RC circuits, performance characteristics of DC machines and transformers. Analyze the characteristics of Diodes, BJT, MOSFET, UJT, design the amplifier circuits from the given specifications and verification of truth tables.

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Verify Kirchhoff's laws, superposition theorem theoretically and practically for any given circuit, truth table for different logic gates and measure real & reactive power for RL & RC circuits.
CO 2	Illustrate various characteristics of DC machines from the measured data (Practically)
CO 3	Obtain the efficiency and regulation for single phase transformer
CO 4	Learn the characteristics of basic electronic devices like PN junction diode, Zener diode & BJT
CO 5	Analyze the application of diode as rectifiers, clippers and clampers and other circuits

Part A: Basic Electrical Engineering Lab

List of experiments: -
Basic Electrical Engineering Lab (Any 5 experiments)

1. Verification of Kirchhoff laws
2. Verification of Superposition Theorem
3. Magnetization characteristics of a DC Shunt Generator
4. Speed control of DC Shunt Motor
5. OC & SC test of 1 – Phase Transformer

6. Load test on 1-Phase Transformer
7. Brake test on DC Shunt Motor
8. Measurement of Real & Reactive Power by single phase RL,RC circuits

Part B: Electronics Engineering Lab

List of Experiments:

Basic Electronics Engineering Lab (Any 5 experiments)

1. PN Junction diode characteristics A) Forward bias B) Reverse bias.
2. Zener diode characteristics and Zener as voltage Regulator.
3. Full Wave Rectifier with & without filter.
4. Wave Shaping Circuits. (Clippers & Clampers)
5. Input & Output characteristics of Transistor in CB / CE configuration.
6. Frequency response of CE amplifier.
7. Inverting and Non-inverting amplifiers using Op-AMPs.
8. Verification of Truth Table of AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates using ICs.
9. Verification of Truth Tables of S-R, J-K& D flip flops using respective ICs.

B.Tech II SEM CSE (R20)

Course Title	DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS				B.Tech CSE II Sem (R20)		
Course Code	Category	Hours/Week			Credits	Maximum Marks	
2021201	BS	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	0	0	3	30	70	100
Mid Exam Duration: 2 Hours					End Exam Duration: 3Hrs		

Course Objectives:

- To enlighten the learners in the concept of differential equations.
- To furnish the learners with basic concepts and techniques at plus two level to lead them into advanced level by handling various real world applications

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Classify second and higher order liner D.E's with constant coefficients.
CO 2	Solve partial differential equations.
CO 3	Analyze the applications of partial differential equations.
CO 4	Understand vector differentiation concepts.
CO 5	Apply vector integration concepts.

UNIT- I

Linear differential equations of higher order (constant coefficients) :
Definitions, homogeneous and non- homogeneous, complimentary function, general solution, particular integral, Wronskian, Method of variation of parameters.

UNIT-II

Partial Differential Equations:
Introduction and formation of Partial Differential Equations by elimination of arbitrary constants and arbitrary functions, solutions of first order equations using Lagrange's method.

UNIT-III

Applications of Partial Differential Equations:

Classification of PDE, method of separation of variables for second order equations. Applications of Partial Differential Equations: One dimensional Wave equation.

UNIT-IV

Vector differentiation:
Scalar and vector point functions, vector operator del, del applies to scalar point functions-Gradient, del applied to vector point functions-Divergence and Curl, vector identities.

UNIT-V

Vector integration:
Line integral-circulation-work done, surface integral-flux, Green's theorem in the plane (without proof), Stoke's theorem (without proof), volume integral, Divergence theorem (without proof) and applications of these theorems.

Text Books:

1. Higher Engineering Mathematics, Dr. B.S. Grewal, Khanna Publishers-43 edition 2014.
2. Advanced Engineering Mathematics, Erwin Kreyszig, Wiley Publications, 9th edition- 2013
3. Calculus and Analytic geometry, G.B. Thomas and R.L. Finney, Pearson, 9th Edition, Reprint, 2002.

Reference Books:

1. Higher Engineering Mathematics, B.V. Ramana, Mc. Graw Hill Education (India) Pvt. Ltd, New Delhi, 11th Edition, Reprint 2010.
2. A Text Book of Engineering Mathematics, N.P. Bali and Manish Goyal, Lakshmi Publications, Reprint 2008.
3. Differential Equations and Vector Calculus, Dr. B.Rama Bhupal Reddy, G.Sreedhar, Dr. V.Ramachandra Reddy, Research India Publications, Delhi, 2020

Course Title	APPLIED PHYSICS				B.Tech CSE II Sem (R20)		
Course Code	Category	Hours/Week			Credits	Maximum Marks	
20AP202	BS	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	0	0	3	30	70	100
Mid Exam Duration: 2 Hours					End Exam Duration: 3Hrs		

Course Objectives:

- To make a bridge between the physics in school and engineering courses.
- To identify the importance of the optical phenomenon i.e. interference, diffraction and polarization related to its Engineering applications
- To understand the mechanisms of emission of light, the use of lasers as light sources for low and high energy applications, study of propagation of light wave through optical fibres along with engineering applications.
- To explain the significant concepts of dielectric and magnetic materials that leads to potential applications in the emerging micro devices.
- To enlighten the concepts of Quantum Mechanics and to provide fundamentals of de'Broglie waves, quantum mechanical wave equation and its applications, the importance of free electron theory and band theory of solids.
- Evolution of band theory to distinguish materials, basic concepts and transport phenomenon of charge carriers in semiconductors. To give an impetus on the subtle mechanism of superconductors using the concept of BCS theory and their fascinating applications.

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Study the different realms of physics and their applications in both scientific a technological systems through physical optics
CO 2	Identify the wave properties of light and the interaction of energy with the matter
CO 3	Asses the electromagnetic wave propagation and its power in different media
CO 4	Understands the response of dielectric and magnetic materials to the applied electric and magnetic fields.
CO 5	Study the quantum mechanical picture of subatomic world along with the discrepancies between the classical estimates and laboratory observations of electron transportation phenomena by free electron theory and band theory.
CO 6	Elaborate the physical properties exhibited by materials through the understanding of properties of semiconductors and superconductors.

UNIT-I: Wave Optics

Interference- Principle of superposition – Interference of light – Conditions for sustained interference - Interference in thin films (Reflection Geometry) – Colors in thin films – Newton's Rings – Determination of wavelength and refractive index.

Diffraction- Introduction – Fresnel and Fraunhofer diffraction – Fraunhofer diffraction due to single slit, double slit and N-slits (qualitative) – Grating spectrum.

UNIT-II: Lasers and Fiber optics

Lasers- Introduction – Characteristics of laser – Spontaneous and Stimulated emission of radiation – Einstein's coefficients – Population inversion – Lasing action – Pumping mechanisms – Nd-YAG laser – He-Ne laser – Semiconductor diode laser- Applications of lasers.

Fiber optics- Introduction – Principle of optical fiber – Acceptance Angle – Numerical Aperture – Classification of optical fibers based on refractive index profile and modes – Block diagram of Optical fiber Communication system - Propagation Losses (qualitative) – Applications.

UNIT-III: Dielectric and Magnetic Materials

Dielectric Materials- Introduction – Dielectric polarization – Dielectric polarizability, Susceptibility and Dielectric constant – Types of polarizations: Electronic, Ionic and Orientation polarizations (Qualitative) – Lorentz internal field – Clausius-Mossotti equation.

Magnetic Materials- Introduction to magnetic materials (Origin of magnetic moment of an atom and Classification of magnetic materials) –Weiss theory of ferromagnetism-soft ferrites and hard ferrites- Hysteresis – Soft and Hard magnetic materials-Applications magnetic materials.

UNIT IV: Quantum Mechanics, Free Electron Theory

Quantum Mechanics- Dual nature of matter – Schrodinger's time independent and dependent wave equation – Significance of wave function – Particle in a one-dimensional infinite potential well.

Free Electron Theory- Classical free electron theory (Merits and demerits only) – Quantum free electron theory – Equation for electrical conductivity based on quantum free electron theory – Fermi-Dirac distribution – Density of states – Fermi energy.

UNIT – V: Semiconductors and Superconductors

Semiconductors- Introduction – Intrinsic semiconductors – Electrical conductivity – Fermi level – Extrinsic semiconductors –Dependence of Fermi energy on carrier concentration and temperature – Drift and diffusion currents – Einstein's equation – Direct and indirect band gap semiconductors – Hall effect – Hall coefficient – Applications of Hall effect.

Superconductors- Introduction – Properties of superconductors – Meissner effect – Type I and Type II superconductors – BCS theory – Josephson effects (AC and DC) –High T_c superconductors – Applications of superconductors.

Text books:

1. Engineering Physics – Dr. M.N. Avadhanulu & Dr. P.G. Kshirsagar, S. Chand and Company
2. Engineering Physics – B.K. Pandey and S. Chaturvedi, Cengage Learning.

Reference Books:

1. Engineering Physics – Shatendra Sharma, Jyotsna Sharma, Pearson Education, 2018
2. Engineering Physics – K. Thyagarajan, McGraw Hill Publishers
3. Engineering Physics - Sanjay D. Jain, D. Sahasrambudhe and Girish, University Press
4. Semiconductor physics and devices- Basic principle – Donald A, Neamen, Mc Graw Hill.

Course Title	COMMUNICATIVE ENGLISH				B.Tech CSE II Sem (R20)		
Course Code	Category	Hours/Week			Credits	Maximum Marks	
2024203	HS	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	0	0	3	30	70	100
Mid Exam Duration: 2 Hours					End Exam Duration: 3Hrs		

Course Objectives:

- Facilitate effective listening skills for better comprehension of academic lectures and English spoken by native speakers
- Focus on appropriate reading strategies for comprehension of various academic texts and authentic materials
- Help improve speaking skills through participation in activities such as role plays, discussions and structured talks/oral presentations
- Impart effective strategies for good writing and demonstrate the same in summarizing, writing well organized essays, record and report useful information
- Provide knowledge of grammatical structures and vocabulary and encourage their appropriate use in speech and writing

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Retrieve the knowledge of basic grammatical concepts
CO 2	Understand the context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English
CO 3	Apply grammatical structures to formulate sentences and correct word forms
CO 4	Analyze discourse markers to speak clearly on a specific topic in informal discussions
CO 5	Evaluate reading/listening texts and to write summaries based on global comprehension of these texts
CO 6	Create a coherent paragraph interpreting a figure/graph/chart/table

UNIT-I

Lesson: On the Conduct of Life: William Hazlitt

Listening: Identifying the topic, the context and specific pieces of information by listening to short audio texts and answering a series of questions. **Speaking:** Asking and answering general questions on familiar topics such as home, family, work, studies and interests; introducing oneself and others. **Reading:** Skimming to get the main idea of a text; scanning to look for specific pieces of information. **Writing :**Beginnings and endings of paragraphs - introducing the topic, summarizing the main idea and/or providing a transition to the next paragraph.

Grammar and Vocabulary: Parts of Speech; Word formation, synonyms and antonyms; Idioms and Phrases; phrasal verbs.

UNIT-II
Lesson: The Brook: Alfred Tennyson

Listening: Answering a series of questions about main idea and supporting ideas after listening to audio texts. **Speaking:** Discussion in pairs/small groups on specific topics followed by short structured talks. **Reading:** Identifying sequence of ideas; recognizing verbal techniques that help to link the ideas in a paragraph together. **Writing:** Paragraph writing (specific topics) using suitable cohesive devices; mechanics of writing - punctuation, capital letters.
Grammar and Vocabulary: Sentence structure; articles; Tenses; Prepositions.

UNIT-III

Lesson: A City Night Peace - Oliver Goldsmith
Listening: Listening for global comprehension and summarizing what is listened to. **Speaking:** Discussing specific topics in pairs or small groups and reporting what is discussed **Reading:** Reading a text in detail by making basic inferences -recognizing and interpreting specific context clues; strategies to use text clues for comprehension.**Writing:** Summarizing, Paragraph Writing **Grammar and Vocabulary:** Voice; Reported Speech; Degrees of Comparison, Subject with agreement.

UNIT-IV

Lesson: Being Rich, Being Good - Chetan Bhagat
Listening: Making predictions while listening to conversations/ transactional dialogues without video; listening with video. **Speaking:** Role plays for practice of conversational English in academic contexts (formal and informal) - asking for and giving information/directions. **Reading:** Studying the use of graphic elements in texts to convey information, reveal trends/patterns/relationships, communicate processes or display complicated data. **Writing:** Letter Writing: Official Letters/Report Writing
Grammar and Vocabulary: Information Transfer; Simple, Compound and Complex sentences; Question Tags.

UNIT-V

Lesson: Politics and the English Language: George Orwell
Listening: Identifying key terms, understanding concepts and answering a series of relevant questions that test comprehension. Speaking: Formal oral presentations on topics from academic contexts - without the use of PPT slides. Reading: Reading for comprehension. **Writing:** Writing structured essays on specific topics using suitable claims and evidences.
Grammar and Vocabulary: Reading Comprehension; Dialogue Writing; Common Errors.

Prescribed Text:

Language and Life: A Skills Approach- I Edition 2019, Orient Black Swan

Reference Books

- Bailey, Stephen. Academic writing: A handbook for international students. Routledge, 2014.
- Chase, Becky Tarver. Pathways: Listening, Speaking and Critical Thinking. Heinley ELT; 2nd Edition, 2018.
- Raymond Murphy's English Grammar in Use Fourth Edition (2012) E-book
- Hewings, Martin. Cambridge Academic English (B2). CUP, 2012.
- Oxford Learners Dictionary, 12th Edition, 2011
- Norman Lewis Word Power Made Easy- The Complete Handbook for Building a Superior Vocabulary (2014)
- Speed Reading with the Right Brain: Learn to Read Ideas Instead of Just Words by David Butler.

Web links:

www.englishclub.com
www.easyworldofenglish.com
www.languageguide.org/english/
www.bbc.co.uk/learningenglish
www.eslpod.com/index.html
www.myenglishpages.com

Course Title	PYTHON PROGRAMMING				B.Tech CSE II Sem (R20)		
Course Code	Category	Hours/Week			Credits	Maximum Marks	
2005204	ES	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	0	0	3	30	70	100
Mid Exam Duration: 2 Hours					End Exam Duration: 3Hrs		

Course Objectives:

- Understand programming skills using basics of Python language.
- To introduce the object-oriented programming concepts.
- Acquire basics of how to translate problem into object-oriented form.
- To understand object-oriented programming concepts, and apply them in solving problems.

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Demonstrate and acquire knowledge on usage of Data types, operators, input a output statements in python programming
CO 2	Analyze the given problem and develop python program to solve the problem
CO 3	Use proper iterative statements in problem solving
CO 4	Identify the right sequence to solve the real-world problems
CO 5	Apply object-oriented features to solve real time applications

UNIT I:

Features of python, Execution of a python program, comments, identifiers and variables, classification of data types, keywords, constants, Naming conventions in python, Operators and expressions, operator precedence and associativity, input and output statements.

UNIT II:

Control statements: simple if, if..else, nested if, if..elif..else statement. **Loops:** while loop, for loop, nested loops, break , continue , pass and assert statements, Arrays in python, Strings and their operations.

UNIT III:

Functions: define and calling a function, return statement, formal and actual arguments, local and global variables, passing arguments to function, anonymous functions, example programs on functions, recursion.

UNIT IV:

Sequences: Lists, Tuples, Sets, Dictionaries, Operations and methods on Tuples, Lists, Dictionaries. **Files:** Types of files, opening file, closing a file, write data into a file, read data from a file.

UNIT V:

Introduction to Oops:, Introduction to class and objects, self variable in python, constructor, types of variables and methods, Inheritance and polymorphism, abstract class.

Textbooks:

1. Core python programming by Dr. R. Nageswara Rao, Dreamtech press, second edition, 2018
2. Core python programming by Wesley J Chun, Prentice Hall, Second edition.

References:

1. Introduction to Computation and Programming using Python, by John Guttag, PHI Publisher
2. Learning python, Mark Lutz, O'Reilly publications,5th edition, 2013
3. Python: The complete reference by Martin C Brown, McGraw-Hill Publication, 2018.

Course Title	ENGINEERING DRAWING				B.Tech CSE II Sem (R20)		
Course Code	Category	Hours/Week			Credits	Maximum Marks	
2003205	ES	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		1	0	2	2	50	50	100
Mid Exam Duration: 2 Hours					End Exam Duration: 3Hrs		

Course Objectives:

- Bring awareness that Engineering Drawing is the Language of Engineers.
- Familiarize how industry communicates technical information.
- Teach the practices for accuracy and clarity in presenting the technical information. Develop the engineering imagination essential for successful design

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Draw various curves applied in engineering.
CO 2	Show projections of solids and sections graphically.
CO 3	Draw the development of surfaces of solids.
CO 4	Know draw orthographic and isometric projections.
CO 5	Evaluate different methods of perspective view.

UNIT-I

Introduction to Engineering Drawing: Principles of Engineering Drawing and its Significance-Conventions in drawing-lettering - BIS conventions.

a)Conic sections including the rectangular hyperbola- general methodonly,

b) Cycloid, epicycloids andhypocycloid c) Involutes

UNIT- II

Projection of points, lines and planes: Projection of points in any quadrant, lines inclined to one or both planes, finding true lengths, angle made by line. Projections of regular plane surfaces.

Projections of solids: Projections of regular solids inclined to one or both planes by rotational or auxiliary views method.

UNIT- III

Sections of solids: Section planes and sectional view of right regular solids-prism, cylinder, pyramid and cone. True shapes of the sections.

Development of surfaces: Development of surfaces of right regular solids-prism, cylinder, pyramid, cone and their sectional parts.

UNIT-IV

Orthographic Projections: Systems of projections, conventions and application to orthographic projections - simple objects.

Isometric Projections: Principles of isometric projection- Isometric scale; Isometric views: lines, planes, simple solids.

UNIT- V

Perspective projection –applications of perspective view –terminology of perspective view- methods of drawing perspective view-simple problems.

Text Books:

1. K.L.Narayana & P.Kannaiah, Engineering Drawing, 3/e, Scitech Publishers, Chennai, 2012.
2. N.D.Bhatt, Engineering Drawing, 53/e, Charotar Publishers,2016.

Reference Books:

1. Dhanajay A Jolhe, Engineering Drawing, Tata McGraw-Hill, Copy Right,2009
2. Venugopal, Engineering Drawing and Graphics, 3/e, New Age Publishers,2000
3. Shah and Rana, Engineering Drawing, 2/e, Pearson Education,2009
4. K.C.John, Engineering Graphics, 2/e, PHI,2013
5. Basant Agarwal & C.M.Agarwal, Engineering Drawing, Tata McGraw-Hill, Copy Right, 2008.

Additional Sources

1. Youtube: http-sewor, Carleton. cag,kardos/88403/drawings.html conic sections-online, red woods.edu

Course Title	ENGINEERING DRAWING LAB				B.Tech CSE II Sem (R20)		
Course Code	Category	Hours/Week			Credits	Maximum Marks	
2003206	ES	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		0	0	2	1	40	60	100
					End Exam Duration: 3Hrs		

Course Objectives:

- Familiarize how industry communicates technical information.
- Teach the practices for accuracy and clarity in presenting the technical information.
- Develop the engineering imagination essential for successful design.
- Bring awareness that Engineering Drawing is the Language of Engineers
- Instruct the utility of drafting & modeling packages in orthographic and isometric drawings.
- Train the usage of 2D and 3Dmodeling.
- Instruct graphical representation of machine components

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Use computers as a drafting tool
CO 2	Draw isometric and orthographic drawings using CAD packages
CO 3	Analyze orthographic drawings using CAD packages

Computer Aided Drafting:

Introduction to AutoCAD: Basic drawing and editing commands: line, circle, rectangle, erase, view, undo, redo, snap, object editing, moving, copying, rotating, scaling, mirroring, layers, templates, polylines, trimming, extending, stretching, fillets, arrays, dimensions.

Dimensioning principles and conventional representations.

Orthographic Projections: Systems of projections, conventions and application to orthographic projections - simple objects.

Isometric Projections: Principles of isometric projection- Isometric scale; Isometric views: lines, planes, simple solids.

Text Books:

1. K. Venugopal, V.Prabhu Raja, Engineering Drawing + Auto Cad, New Age International Publishers.
2. Kulkarni D.M, AP Rastogi and AK Sarkar, Engineering Graphics with Auto Cad, PHI Learning, Eastern Economy editions.

Reference Books:

1. T. Jayapoovan, Engineering Graphics using Auto Cad, Vikas Publishing House
2. K.L.Narayana & P.Kannaiah, Engineering Drawing, 3/e, Scitech Publishers, Chennai, 2012.
3. Linkan Sagar, BPB Publications, Auto Cad 2018 Training Guide.
4. K.C.John, Engineering Graphics, 2/e, PHI, 2013
5. Basant Agarwal & C.M.Agarwal, Engineering Drawing, Tata McGraw-Hill, Copy Right, 2008.

Additional Sources

1. Youtube: http-sewor,Carleton.cag, kardos/88403/drawings.html
   conic sections-online, red woods.edu

Course Title	APPLIED PHYSICS LAB				B.Tech CSE II Sem (R20)		
Course Code	Category	Hours/Week			Credits	Maximum Marks	
20AP207	BS	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		0	0	3	1.5	40	60	100
					End Exam Duration: 3Hrs		

Course Objectives:

- Understands the concepts of interference, diffraction and their applications.
- Understand the role of optical fiber parameters in communication.
- Recognize the importance of energy gap in the study of conductivity and Hall Effect in a semiconductor.
- Illustrates the magnetic and dielectric materials applications.
- Apply the principles of semiconductors in various electronic devices.

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Operate various optical instruments
CO 2	Estimate wavelength of laser and particles size using laser
CO 3	Evaluate the acceptance angle of an optical fiber and numerical aperture
CO 4	Estimate the susceptibility and related magnetic parameters of magnetic materials
CO 5	Plot the intensity of the magnetic field of circular coil carrying current with distance
CO 6	Determine magnetic susceptibility of the material and its losses by b-h curve
CO 7	Apply the concepts of ultrasonics by acoustic grating

Note: In the following list, out of 15 experiments, any 12 experiments (minimum 10) must be performed in a semester

List of Applied Physics Experiments

1. Determine the thickness of the wire using wedge shape method
2. Determination of the radius of curvature of the lens by Newton's ring method
3. Determination of wavelength by plane diffraction grating method
4. Determination of dispersive power of prism.
5. Determination of wavelength of LASER light using diffraction grating.
6. Determination of particle size using LASER.
7. To determine the numerical aperture of a given optical fiber and hence to find its acceptance angle
8. Determination of dielectric constant by charging and discharging method.

9. Magnetic field along the axis of a circular coil carrying current –Stewart Gee's method.
10. Study the variation of B versus H by magnetizing the magnetic material (B-H curve)
11. To determine the resistivity of semiconductor by Four probe method
12. To determine the energy gap of a semiconductor

References

1. S. Balasubramanian, M.N. Srinivasan "A Text book of Practical Physics"- S Chand Publishers, 2017.
2. http://vlab.amrita.edu/index.php -Virtual Labs, Amrita University

Course Title	COMMUNICATIVE ENGLISH LAB				B.Tech CSE II Sem (R20)		
Course Code	Category	Hours/Week			Credits	Maximum Marks	
2024208	HS	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		0	0	3	1.5	40	60	100
					End Exam Duration: 3Hrs		

Course Objectives:

- Students will be exposed to a variety of self instructional, learner friendly modes of language learning.
- Students will learn better pronunciation through stress, intonation and rhythm.
- Students will be trained to use language effectively to face interviews, group discussions, and public speaking.
- Students will be initiated into greater use of the computer in resume preparation, report writing, format making etc

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Listening and repeating the sounds of English Language
CO 2	Understand the different aspects of the English language
CO 3	proficiency with emphasis on LSRW skills
CO 4	Apply communication skills through various language learning activities
CO 5	Analyze the English speech sounds, stress, rhythm, intonation and syllable
CO 6	Division for better listening and speaking comprehension
CO 7	Evaluate and exhibit acceptable etiquette essential in social and professional settings
CO 8	Improve fluency in spoken English

UNIT-I

- Listening Skills
- Phonetics
- Introducing oneself

UNIT-II

- Describing objects
- JAM / Interpretation of Hypothetical Situations
- Role play

UNIT-III

- Hypothetical situations (If…..... were)
- Elocution
- TED talks videos

UNIT-IV

- Visual Description
- Situational conversations

UNIT-V

- Oral Presentations
- PowerPoint presentations

Suggested Software

- Orell
- Walden Infotech
- Young India Films
- K-Van solutions

Reference Books

1. Bailey, Stephen. Academic writing: A handbook for international students. Routledge, 2014.
2. Chase, Becky Tarver. Pathways: Listening, Speaking and Critical Thinking. Heinley ELT; 2nd Edition, 2018.
3. Skillful Level 2 Reading & Writing Student's Book Pack (B1) Macmillan Educational.
4. Hewings, Martin. Cambridge Academic English (B2). CUP, 2012.
5. A Textbook of English Phonetics for Indian Students by T.Balasubramanyam

Web Links:

www.esl-lab.com
www.englishmedialab.com
www.englishinteractive.net

Course Title	PYTHON PROGRAMMING LAB				B.Tech CSE II Sem (R20)		
Course Code	Category	Hours/Week			Credits	Maximum Marks	
2005209	ES	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		0	0	3	1.5	40	60	100
					End Exam Duration: 3Hrs		

Course Objectives:

- To write, test, and debug simple Python programs.
- Know when and how to use the appropriate statements available in the python
- To implement Python programs with conditionals and loops
- Use functions for structuring Python programs
- Represent compound data using Python lists, tuples, dictionaries.
- Read and write data from/to files in Python

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Understand and solve the basics of python programming
CO 2	Learn and Implement iterative as well as recursive programs in python
CO 3	Represent heterogeneous data with right sequence in python
CO 4	Develop Programs using object-oriented features in python

List of Sample Experiments:

1. Calculate the following programs using Python
   a) Area of Circle
   b) Simple and Compound Interest
   c) Celsius to Fahrenheit
   d) Volume of Sphere

2. Write a Python program to find distance between two points (X1, Y1) and (X2, Y2).

3. Implement the following programs using Python
   a) To find given number is Even or Odd number
   b) Find Maximum of Two numbers
   c) Find given number is Zero, Positive or Negative
   d) Find Minimum of Two numbers
   e) Find given year is leap year or not

4. Write a Python program to find Roots of Quadratic equation.

5. Write a Python program to read credits and grades of five different subjects and display SGPA based on the following table.

Class	SGPA
Distinction	>=7.5
First Class	>=6.5 <7.5
Second Class	>=5.5 <6.5
Pass	>=4.5 <5.5
Fail	<4.5

$$\text{SGPA}=\frac{\sum(C_i*G_i)}{\sum C_i}$$

6. Write a Python program to design arithmetic calculator based on user choice like 1. Addition 2. Subtraction 3. Multiplication 4. Division.

7. Implement the following programs using Python
a) Sum of Digits of a given number
b) Given number is Palindrome or not
c) Find given number is Armstrong number or not
d) Factorial of a given number

8. Write a Python program to display sum of even valued terms and odd valued terms individually by considering terms of Fibonacci series upto n.

9. Implement the following search strategies using Python
a) Linear search b) Binary search

10. Perform the following sorting techniques using Python
a) Selection sort b) Insertion sort c) Merge sort

11. Implement the following programs using Python
a) Given number is Prime or not
b) Display Prime numbers upto given number n

12. Implement the following programs using Python
a) Addition of Two Matrices
b) Multiplication of Two Matrices

13. Implement the following programs using Python
a) Count number of Even and Odd numbers in list
b) Remove all duplicate elements in a list
c) Find Second smallest element in a list
d) Find Second largest element in a list

14. Implement the following programs using Python
   a) Reverse elements of a list without using reverse( ) function
   b) Find GCD, LCM of two numbers. Each function should not exceed one line
   c) Write a Python function, that takes two lists and returns True if they have at least one common number.

15. Implement the following programs using Python
   a) Reverse the string without reverse( ) function
   b) Find list of words that are larger than n from a given list of words

16. Write a Python program to build Stack data structure using list.
(Hint: 1. Push 2. Pop 3. Peep 4. Display 5. Exit)

17. Write a Python program to build Queue data structure using list.
(Hint: 1. Insert 2. Delete 3. Display 4. Exit)

18. Write a Python program to check whether a list contains a sub list.

19. Write a Python program to perform the following operations on Tuple based on the user choice.

(Hint: 1. Insert 2. Delete 3. Search 4. Display 5. Exit)

20. Implement the following programs using Python
   a) Create a dictionary with student names and marks. Retrieve marks by entering the student name.
   b) Find the number of occurrences of each letter in a string using dictionary.

21. Write a Python program to create a student class, that reads n student details like name, marks, gender etc. Calculate and display total marks, percentage and grade.

22. Write a Python program to create a parent class and child class along with their own methods. Access parent class members in child class to implement the following sceneries.
   a) Single level Inheritance
   b) Multi level Inheritance
   c) Multiple Inheritance

23. a) Write a Python program to overload the addition operator '+' to make it act on class objects.

b) Write a Python program to overload sum( ) method of class student

c) Write a Python program to override the area( ) method of square class. (Hint: parent class ⇢ square, child class⇢ circle)

24. Create a 'car' abstract class, which contains abstract methods along with concrete methods. Write a Python program to implement super class 'car' in sub class 'Maruthi'.

25. a) Write a program to print each line of a file in reverse order

b) Write a program to compute the number of characters, words and lines in a file.

Course Title	UNIVERSAL HUMAN VALUES				B.Tech CSE II Sem (R20)		
Course Code	Category	Hours/Week			Credits	Maximum Marks	
20MC211	MC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	0	0	0.0	30	--	30
Mid Exam Duration: 2Hrs							

Course Objectives:

- Development of a holistic perspective based on self-exploration about themselves (human being), family, society and nature/existence.
- Understanding (or developing clarity) of the harmony in the human being, family, society and nature/existence.
- Strengthening of self-reflection.
- Development of commitment and courage to act.

Course Outcomes: On successful completion of this course, the students will be able to

CO 1	Students are expected to become more aware of themselves, and their surroundings (family, society, nature)
CO 2	They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
CO 3	They would have better critical ability.
CO 4	They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
CO 5	It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

UNIT- I

Course Introduction - Need, Basic Guidelines, Content and Process for Value Education

- Purpose and motivation for the course, recapitulation from Universal Human Values-I.
- Self-Exploration–what is it? - Its content and process; 'Natural Acceptance' and Experiential Validation- as the process for self-exploration.
- Continuous Happiness and Prosperity- A look at basic Human Aspirations.
- Right understanding, Relationship and Physical Facility- the basic requirements for fulfillment of aspirations of every human being with their correct priority.

- Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario.
- Method to fulfill the above human aspirations: understanding and living in harmony at various levels.

Include practice sessions to discuss natural acceptance in human being as the innate acceptance for living with responsibility (living in relationship, harmony and co-existence) rather than as arbitrariness in choice based on liking-disliking.

UNIT-II

Understanding Harmony in the Human Being - Harmony in Myself!

- Understanding human being as a co-existence of the sentient 'I' and the material 'Body'
- Understanding the needs of Self ('I') and 'Body' - happiness and physical facility
- Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)
- Understanding the characteristics and activities of 'I' and harmony in 'I'
- Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail
- Programs to ensure Sanyam and Health.

Include practice sessions to discuss the role others have played in making material goods available to me. Identifying from one's own life. Differentiate between prosperity and accumulation. Discuss program for ensuring health vs dealing with disease

UNIT-III

Understanding Harmony in the Family and Society- Harmony in Human- Human Relationship

- Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness; Trust and Respect as the foundational values of relationship
- Understanding the meaning of Trust; Difference between intention and competence
- Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship
- Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals
- Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family.

Include practice sessions to reflect on relationships in family, hostel and institute as extended family, real life examples, teacher-student relationship, goal of education etc. Gratitude as a universal value in relationships. Discuss with scenarios. Elicit examples from students' lives.

UNIT-IV

Understanding Harmony in the Nature and Existence - Whole existence as Coexistence

- Understanding the harmony in the Nature
- Interconnectedness and mutual fulfillment among the four orders of nature- recyclability and self-regulation in nature
- Understanding Existence as Co-existence of mutually interacting units in all- pervasive space
- Holistic perception of harmony at all levels of existence.

Include practice sessions to discuss human being as cause of imbalance in nature (film "Home" can be used), pollution, depletion of resources and role of technology etc.

UNIT-V

Implications of the above Holistic Understanding of Harmony on Professional Ethics

- Natural acceptance of human values
- Definitiveness of Ethical Human Conduct
- Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
- Competence in professional ethics: a. Ability to utilize the professional competence for augmenting universal human order b. Ability to identify the scope and characteristics of people friendly and eco-friendly production systems, c. Ability to identify and develop appropriate technologies and management patterns for above production systems.
- Case studies of typical holistic technologies, management models and production systems
- Strategy for transition from the present state to Universal Human Order: a. At the level of individual: as socially and ecologically responsible engineers, technologists and managers b. At the level of society: as mutually enriching institutions and organizations
- Sum up.

Include practice Exercises and Case Studies will be taken up in Practice (tutorial) Sessions eg. To discuss the conduct as an engineer or scientist etc.

Text Book

1. R R Gaur, R Asthana, G P Bagaria, "A Foundation Course in Human Values and Professional Ethics", 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1
2. R R Gaur, R Asthana, G P Bagaria, "Teachers' Manual for A Foundation Course in Human Values and Professional Ethics", 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2

Reference Books

1. Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amar kantak, 1999.
2. A. N. Tripathi, "Human Values", New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. Mohandas Karamchand Gandhi "The Story of My Experiments with Truth"
5. E. FSchumacher. "Small is Beautiful"
6. Slow is Beautiful –Cecile Andrews
7. J C Kumarappa "Economy of Permanence"
8. Pandit Sunderlal "Bharat Mein Angreji Raj"
9. Dharampal, "Rediscovering India"
10. Mohandas K. Gandhi, "Hind Swaraj or Indian Home Rule"
11. India Wins Freedom - Maulana Abdul Kalam Azad
12. Vivekananda - Romain Rolland(English)
13. Gandhi - Romain Rolland (English)

MOE OF CONDUCT (L-T-P-C 2-1-0-2)

Lecture hours are to be used for interactive discussion, placing the proposals about the topics at hand and motivating students to reflect, explore and verify them. Tutorial hours are to be used for practice sessions.

While analyzing and discussing the topic, the faculty mentor's role is in pointing to essential elements to help in sorting them out from the surface elements. In other words, help the students explore the important or critical elements.

In the discussions, particularly during practice sessions (tutorials), the mentor encourages the student to connect with one's own self and do self-observation, self-reflection and self- exploration.

Scenarios may be used to initiate discussion. The student is encouraged to take up "ordinary" situations rather than" extra-ordinary" situations. Such observations and their analyses are shared and discussed with other students and faculty mentor, in a group sitting.

Tutorials (experiments or practical) are important for the course. The difference is that the laboratory is everyday life, and practicals are how you behave and work in real life. Depending on the nature of topics, worksheets, home assignments and/or activities are included. The practice sessions (tutorials) would also provide support to a student in performing actions commensurate to his/her beliefs. It is intended that this would lead to development of commitment, namely behaving and working based on basic human values.