

I B.TECH I SEMESTER SYLLABUS

LINEAR ALGEBRA AND CALCULUS

I B. TECH- I SEMESTER

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P		C	CIE	SEE
A5BS02	BSC	3	1	-	4	30	70	100
		Contact Classes: 44			Tutorial Classes: 8	Practical Classes: Nil	Total Classes: 52	

COURSE OBJECTIVES

To learn

1. The concept of differential equations and solve them using appropriate methods.
2. Usage of the appropriate test to find the convergence and divergence of the given series.
3. Concept of Rank of a matrix, Consistency and solving system of linear equations.
4. The Rank and Nullity of vectors.
5. Concept of eigen values, eigen vectors and diagonalization of the matrix.

COURSE OUTCOMES

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

1. Identify the different types of differential equations and solve them using appropriate methods
2. Apply the appropriate test to find the convergence and divergence of the given series
3. Solve the system of linear equations using rank of a matrix.
4. Find Rank and Nullity of given vectors.
5. Diagonalize the matrix using eigen values and eigen vectors.

UNIT - I	ORDINARY DIFFERENTIAL EQUATIONS	CLASSES: 12
Introduction- Exact and reducible to Exact differential equations-Newton's Law of cooling-Law of Growth and Decay. Linear differential equations of second and higher order with constant coefficients - Non-Homogeneous term of the type $Q(x) = e^{ax}$, $\sin ax$, $\cos ax$, $e^{ax}v(x)$, $x^n v(x)$ - Method of variation of parameters.		
UNIT - II	SEQUENCES AND SERIES	CLASSES: 08
Basic definitions of Sequences and series – Convergence and divergence –Comparison Test- Ratio Test –Raabe's Test - Cauchy's n^{th} root Test –Integral Test – Absolute and Conditional convergence – Power Series.		
UNIT - III	THEORY OF MATRICES	CLASSES:12
Real matrices: Symmetric-skew-symmetric and orthogonal matrices –Complex matrices: Hermitian, Skew –Hermitian and Unitary matrices –Elementary row and column transformations –Elementary matrix-Finding rank of a matrix by reducing to Echelon form and Normal form-Finding the inverse of a matrix using elementary row/column transformations (Gauss-Jordan method)-Consistency of system of linear equations (homogeneous and non-homogeneous) using the rank of a matrix –Solving $m \times n$ and $n \times n$ linear system of equations by Gauss Elimination		
UNIT - IV	VECTOR SPACES	CLASSES: 10
The n -dimensional Vectors –Vector space – linear dependence of vectors –Basis and dimensions –linear transformations-range and kernel of a linear map – rank and nullity - rank and nullity theorem – inverse of a linear transformation-composition of linear map- Matrix associated with a linear map.		
UNIT - V	EIGEN VALUES, EIGEN VECTORS AND INNER PRODUCT SPACES	CLASSES: 10

Eigen values and Eigen vectors of a matrix- Eigenbases - Diagonalization- Inner product space – Norm of a vector – Schwarz’s Inequality – Normed vector space – Orthogonal and orthonormal sets – Gram Schmidt orthogonalization process.

TEXT BOOKS:

1. Ervin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2. B.S.Grewal, Higher Engineering Mathematics, Khanna publishers, 36th Edition, 2010.
3. V. Krishnamurthy, V.P. Mainra and J.L. Arora, An introduction to Linear Algebra, Affiliated East – West press, Reprint 2005.

REFERENCE BOOKS:

1. G.B.Thomas, calculus and analytical geometry,9th Edition, Pearson Reprint 2006.
2. N.P Bali and Manish Goyal ,A Text of Engineering Mathematics,Laxmi publications,2008.
3. E.L.Ince, Ordinary differential Equations,Dover publications,1958.

WEB REFERENCES:

1. https://www.efunda.com/math/math_home/math.cfm
2. <https://www.ocw.mit.edu/resources/#Mathematics>
3. <https://www.sosmath.com/>
4. <https://www.mathworld.wolfram.com/>

E -TEXT BOOKS:

1. <https://www.e-booksdirectory.com/details.php?ebook=10166>

MOOCS COURSE:

1. <https://swayam.gov.in/>
2. <https://onlinecourses.nptel.ac.in/>

APPLIED CHEMISTRY

I B. TECH- I SEMESTER								
Course Code:	Category	Hours / Week			Credits	Maximum Marks		
A5BS11	BSC	L	T	P	C	CIA	SEE	Total
		4	-	-	4	30	70	100
Contact Classes:50	Tutorial Classes: 0	Practical Classes: 0			Total Classes: 50			
<p>COURSE OBJECTIVES: The course should enable the students to:</p> <ol style="list-style-type: none"> 1. Impart knowledge on soft and hard water types and softening methods. 2. Introduce the basic concepts to develop electrochemical cells. 3. Familiarize the redox principle in batteries and fuel cells. 4. Enhance knowledge on corrosion and its significance. 5. Expose on polymer, nano and smart materials. <p>COURSE OUTCOMES: At the end of the course students will be able to:</p> <ol style="list-style-type: none"> 1. Illustrate the types of hard and soft water, treatment of drinking and industrial water. 2. Demonstrate the basic principles of Electrochemistry in electrochemical cells. 3. Impart knowledge on the basic concepts of battery, biosensors and sources of renewable energy. 4. Apply the methods of metal finishing in solving corrosion related problems. 5. Identify the significance of polymers, nano and smart materials. 								
UNIT - I	WATER AND ITS TREATMENT						CLASSES: 10	
Introduction - Hardness of water- Causes and effects of hardness - Expression and Units of Hardness - Determination of hardness by complex metric method- Numerical problems – Treatment of water by Ion exchange process - Potable water and its specifications – steps involved in treatment of potable water: screening, aeration, sedimentation, coagulation, filtration and sterilisation of water by Chlorination. Desalination of water by Reverse Osmosis.								
UNIT - II	ELECTROCHEMISTRY AND ITS APPLICATIONS						CLASSES:10	
Electro chemical cells – electrode potential - standard electrode potential - Nernst Equation -Types of electrodes - SHE, Calomel, Quinhydrone and Glass electrode -Electrochemical series, and its application- Numerical Problems. Potentiometric: acid- base and redox titration.								
UNIT - III	BATTERIES AND SENSORS						CLASSES: 10	
Batteries - battery characteristics- classification of batteries: primary, secondary, solar batteries- Applications – Construction and Functioning of Primary batteries - Li/MnO ₂ cell, lithium cells, Secondary batteries- Lead acid storage battery and Lithium ion battery- Advantages of battery. Solar cells – advantages of solar cells. Sensors - Biosensors their application and advantages.								
UNIT - IV	CORROSION AND ITS CONTROL						CLASSES: 10	
Introduction-causes and effects-Chemical and Electrochemical corrosion – Mechanism of electrochemical corrosion- factors affecting rate of corrosion- corrosion control methods - cathodic protection and Protective coatings – Metallic coatings- Methods of metallic coatings – Hot dipping methods: Galvanizing, Tinning, cementation (sherardizing) - electroplating (Copper), electroless plating (nickel). Organic coating - Paints (constituents and functions).								

UNIT - V	ENGINEERING MATERIALS	CLASSES: 10
<p>Polymers -Polymeric materials – characteristics of Plastics, fibres and elastomers - thermoplastic and thermosetting resins - Conducting polymers – Preparation, properties and application of Polyacetylene and polyaniline (Polyaniline) - Biodegradable polymers – Advantages- Applications of Polylactic acid and poly glycolic acid.</p> <p>Nanomaterials - characteristics - synthesis (Sol- gel method) – application and Advantages of Nano materials.</p> <p>Smart materials - Introduction - Types of smart materials and applications.</p>		
TEXT BOOKS:		
<ol style="list-style-type: none"> 1. P.C. Jain and M. Jain, Engineering Chemistry, 15/e, Dhanapat Rai & Sons, Delhi, 2014. 2. O G Palanna, Engineering Chemistry, Tata McGraw Hill, 2009. 		
REFERENCE BOOKS:		
<ol style="list-style-type: none"> 1. Sashichawla, A Textbook of Engineering Chemistry, Dhanapath Rai and sons, 2003. 2. Engineering Chemistry (NPTEL Web-book), 11th edition by B.L. Tembe, Kamaluddin and M.S. Krishnan. 3. B.S Murthy and P. Shankar, A Text Book of NanoScience and NanoTechnology, University Press, 2013 		
WEB REFERENCES:		
<ol style="list-style-type: none"> 1. https://www.scribd.com/document/23180395/Engineering-Chemistry-Unit-I-Water-Treatment 2. https://chem.pg.edu.pl/documents/175289/4235721/Electrochemistry-supplement%20text.pdf 3. https://www.nano.gov/you/nanotechnology-benefits 		
E-TEXT BOOKS:		
<ol style="list-style-type: none"> 1. http://www.freebookcentre.net/Chemistry/Chemistry-Books-Online.html 2. http://www.freebookcentre.net/Chemistry/ElectroChemistry-Books-Download.html 3. http://www.freebookcentre.net/Chemistry/Materials-Chemistry-Books.html 4. http://www.freebookcentre.net/Chemistry/Polymer-Chemistry-Books.html 5. http://www.freebookcentre.net/chemistry-books-download/Engineering-Chemistry-by-Bharath-Institute-of-Science-and-Technology.html 		
MOOCS COURSE		
<ol style="list-style-type: none"> 1. http://nptel.ac.in/courses/122101001/34 2. https://ocw.mit.edu/courses/chemistry/ 		

PROGRAMMING FOR PROBLEM SOLVING

I B. TECH- I SEMESTER								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
A5CS01	ESC	L	T	P	C	CIA	SEE	Total
		3	-	-	3	30	70	100
Contact Classes: 64	Tutorial Classes: Nil	Practical Classes: Nil			Total Classes: 64			
<p>COURSE OBJECTIVES</p> <ol style="list-style-type: none"> To impart knowledge about problem solving and algorithmic thinking. To familiarize with the syntax and semantics of C programming language. To learn the usage of structured programming approach in solving problems. To use arrays, pointers, strings and structures in solving problems. To understand how to solve problems related to matrices, Searching and sorting. <p>COURSE OUTCOMES</p> <p>At the end of the course, student will be able to:</p> <ol style="list-style-type: none"> Apply algorithmic thinking to understand, define and solve problems Develop computer programs using programming constructs and control structures Decompose a problem into functions to develop modular reusable code. Use arrays, pointers, strings and structures to formulate algorithms and programs. Use files to perform read and write operations. 								
UNIT - I	INTRODUCTION - PROBLEM SOLVING AND ALGORITHMIC THINKING						CLASSES: 12	
<p>Problem Solving and Algorithmic Thinking Overview – Problem Definition, logical reasoning, Algorithm definition, practical examples, properties, representation, flowchart, algorithms vs programs.</p> <p>Algorithmic Thinking – Constituents of algorithms - Sequence, Selection and Repetition, input-output; Computation – expressions, logic; Problem Understanding and Analysis – problem definition, variables, name binding, data organization: lists, arrays etc. algorithms to programs.</p>								
UNIT - II	OPERATORS, EXPRESSIONS AND CONTROL STRUCTURES						CLASSES: 15	
<p>Introduction to C language: Structure of C programs, data types, data inputs, output statements, Operators, precedence and associativity, evaluation of expressions, type conversions in expressions.</p> <p>Control structures: Decision statements; if and switch statement; Loop control statements: while, for and do while loops, jump statements, break, continue, goto statements.</p>								
UNIT - III	ARRAYS AND FUNCTIONS						CLASSES: 17	
<p>Arrays: Concepts, One dimensional array, declaration and initialization of one dimensional arrays, two dimensional arrays, initialization and accessing, multi dimensional arrays, Basic Searching Algorithms: Linear and Binary search</p> <p>Functions: User defined and built-in Functions, storage classes, Parameter passing in functions, call by value, call by reference, Passing arrays to functions, Recursion as a different way of solving problems. Example programs, such as Finding Factorial, Fibonacci series, Towers of Hanoi etc.</p>								
UNIT - IV	STRINGS AND POINTERS						CLASSES: 10	
<p>Strings: Arrays of characters, variable length character strings, inputting character strings, character library functions, string handling functions.</p> <p>Pointers: Pointer basics, pointer arithmetic, pointers to pointers, generic pointers, array of pointers,</p>								

functions returning pointers, Dynamic memory allocation.		
UNIT - V	STRUCTURES AND FILE HANDLING	CLASSES: 10
<p>Structures and unions: Structure definition, initialization, accessing structures, nested structures, arrays of structures, structures and functions, self-referential structures, unions, typedef , enumerations.</p> <p>File handling: command line arguments, File modes, basic file operations read, write and append, example programs</p>		
TEXT BOOKS:		
<ol style="list-style-type: none"> 1. Riley DD, Hunt K.A. Computational Thinking for the Modern Problem Solver. CRC press, 2014 Mar 27. 2. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rd Edition) 3. Byron Gottfried, "Programming with C", Schaum's Outlines Series, McGraw Hill Education, 3rdedition, 2017. 		
REFERENCE BOOKS:		
<ol style="list-style-type: none"> 1. W. Kernighan Brian, Dennis M. Ritchie, "The C Programming Language", PHI Learning, 2nd Edition, 1988. 2. Yashavant Kanetkar, "Exploring C", BPB Publishers, 2nd Edition, 2003. 3. Schildt Herbert, "C: The Complete Reference", Tata McGraw Hill Education, 4th Edition, 2014. 4. R. S. Bichkar, "Programming with C", Universities Press, 2nd Edition, 2012. 5. Dey Pradeep, Manas Ghosh, "Computer Fundamentals and Programming in C", Oxford University Press, 2nd Edition, 2006. 6. Stephen G. Kochan, "Programming in C", Addison-Wesley Professional, 4th Edition, 2014. 		
WEB REFERENCES:		
<ol style="list-style-type: none"> 1. https://en.wikipedia.org/wiki/Computational_thinking 2. https://nptel.ac.in/courses/106/104/106104128/ 3. https://en.cppreference.com/w/c/language 4. https://www.learn-c.org/ 		
E-TEXT BOOKS:		
<ol style="list-style-type: none"> 1. https://slidelegend.com/queue/computational-thinking-for-the-modern-problem-solver_59d6f01e1723ddb0c7a0df47.html 2. http://flowgorithm.altervista.org/#elf_l1_Lw 3. http://www.freebookcentre.net/Language/Free-C-Programming-Books-Download.htm 		
MOOC COURSE		
<ol style="list-style-type: none"> 1. https://www.coursera.org/learn/computational-thinking-problem-solving 2. https://onlinecourses.nptel.ac.in/noc18_cs33/preview 3. https://www.alison.com/courses/Introduction-to-Programming-in-c 4. http://www.ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-s096-effective-programming-in-c-and-c-january-iap-2014/index.htm 		

ENGLISH

I B. TECH- I SEMESTER

Course Code	Category	Hours / Week			Credits	Maximum Marks		
A5HS01	HSMC	L	T	P	C	CIE	SEE	Total
		2	-	-	2	30	70	100
Contact Classes: 32		Tutorial Classes: 0		Practical Classes: 00			Total Classes: 32	
<p>COURSE OBJECTIVES: Student will be able to:</p> <ol style="list-style-type: none"> 1. Develop language proficiency with emphasis on Vocabulary, Grammar, Reading and Writing skills. 2. Apply the theoretical and practical components of English syllabus to study academic subjects more effectively and critically. 3. Analyze a variety of texts and interpret them to demonstrate in writing or speech. 4. Write/ compose clearly and creatively, and adjust writing style appropriately to the content, the context, and nature of the subject. 5. Develop language components to communicate effectively in formal and informal situations. <p>COURSE OUTCOMES: By the end of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Construct sentences by using appropriate parts of speech. 2. Write letters/paragraphs/reports etc for meaningful professional communication. 3. Make use of appropriate vocabulary in both written and spoken contexts. 4. Comprehend and analyze different levels of written documents. 5. Analyze and correct common errors in spoken and written forms. 								
UNIT - I	Of Studies by Francis Bacon						CLASSES: 06	
Vocabulary: The concept of Word Formation, Prefixes and Suffixes Grammar: Word Families- Nouns, Pronouns, Verbs, Adjectives, Adverbs Reading Skills: Reading for General Details Writing Skills: Punctuation, Writing Paragraphs								
UNIT - II	Scientist in Training: The Oxford Years Stephen Hawking's Biography by Kristine Larsen						CLASSES: 06	
Vocabulary: Synonyms and Antonyms, Standard Abbreviations Grammar: Preposition, Conjunctions, Articles Reading Skills: Reading for Specific Details, Making Inferences Writing Skills: Letter Writing- Letters of Request, Apology and Complaint- Letter of Application with Resume								
UNIT - III	The Teenage Years by Sarah Gray						CLASSES: 07	
Vocabulary: Idioms and Phrasal verbs, Technical Vocabulary Grammar: Sentence Structures, Tenses Reading Skills: Reading between the Lines Writing Skills: Essay writing and Describing Objects, Places and Events								
UNIT - IV	Unlock Your Own Creativity by Robert Von Oech						CLASSES: 07	
Vocabulary: One word Substitutes, Words often confused								

Grammar: Direct and Indirect Speech, Active and Passive Voice Reading Skills: Reading Techniques- Skimming and Scanning of the Text Writing Skills: Technical Report Writing, E-mail writing, Picture Essay		
UNIT - V	A Talk on Advertising by Herman Wouk	CLASSES: 06
Vocabulary: Misplaced Modifiers, Redundancies Grammar: Subject Verb Agreement (Concord), Common Errors in English Reading Skills: Reading Techniques- Intensive and Extensive Reading Writing Skills: Memo, Précis and Resume Writing		
TEXT BOOKS:		
<ol style="list-style-type: none"> 1. Green, David. Contemporary English Grammar Structures and Composition. Second Edition. Trinity Press. 2016. 2. Michael Swan. Practical English Usage. Oxford University Press. 2017. 		
REFERENCE BOOKS:		
<ol style="list-style-type: none"> 1. Murphy, R. Essential Grammar in Use. Cambridge University Press. 2015. 2. Wood, F.T. Remedial English Grammar. Macmillan. 2007. 3. Krishnamurthy. N, Modern English: A Book of Grammar Usage and Composition. Third Edition. Trinity Press. 2016. 4. Zinsser, William. On Writing Well. Harper Resource Book. 2001. 5. Hamp-Lyons, L. Study Writing. Cambridge University Press.2006. 		
WEB REFERENCES:		
<ol style="list-style-type: none"> 1. http://www.bbc.co.uk/learningenglish 2. http://learnenglish.britishcouncil.org 3. https://www.cambridgeenglish.org/learning-english/ 4. https://study.com/academy/subj/english.html 		
E-TEXT BOOKS:		
<ol style="list-style-type: none"> 1. https://www.pdfdrive.com/advanced-english-books.html 		
MOOC COURSE		
<ol style="list-style-type: none"> 1. http://nptel.ac.in/courses/109/106/109106067 2. https://www.britishcouncil.org/tr/en/english/mooc 		

PROGRAMMING FOR PROBLEM SOLVING LAB

I B. TECH- I SEMESTER

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P		C	CIA	SEE
A5CS02	ESC	-	-	3	1.5	30	70	100
		Practical Classes: 48				Total Classes:48		
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 48			Total Classes:48			

COURSE OBJECTIVES:

1. To be familiarize with flowgorithm to solve simple problems
2. To develop programs to solve basic problems by understanding basic concepts in C like operators, control statements etc.
3. To develop modular, reusable and readable C Programs using the concepts like functions, arrays, strings, pointers and structures.

COURSE OUTCOMES

At the end of the course, student will be able to

1. Solve simple mathematical problems using Flowgorithm.
2. Correct syntax errors as reported by the compilers and logical errors encountered at run time
3. Develop programs by using decision making and looping constructs.
4. Implement real time applications using the concept of array, pointers, functions and structures.
5. Solve real world problems using matrices, searching and sorting

LIST OF EXPERIMENTS

Week - 1	INTRODUCTION TO FLOGORITHM
	<ol style="list-style-type: none"> a. Installation and working of Flowgorithm Software. b. Write and implement basic arithmetic operations using Flowgorithm – sum, average, product, difference, quotient and remainder of given numbers etc.
Week - 2	FLOWGORITHM - OPERATORS AND EVALUATION OF EXPRESSIONS
	<ol style="list-style-type: none"> a. Draw a flowchart to calculate area of Shapes (Square, Rectangle, Circle and Triangle). b. Draw a flowchart to find the sum of individual digits of a 3 digit number. c. Draw a flowchart to convert days into years, weeks and days. d. Draw a flowchart to read input name, marks of 5 subjects of a student and display the name of the student, the total marks scored, percentage scored.
Week - 3	FLOWGORITHM –CONDITIONAL STATEMENTS
	<ol style="list-style-type: none"> a. Draw a flowchart to find roots of a quadratic equation. b. Draw a flowchart to find the largest and smallest among three entered numbers and also display whether the identified largest/smallest number is even or odd c. Draw a flowchart to check whether the triangle is equilateral, isosceles or scalene triangle
Week - 4	OPERATORS
	<ol style="list-style-type: none"> a. Write a C program to swap values of two variables with and without using third variable. b. Write a C program to enter temperature in Celsius and convert it into Fahrenheit. c. Write a C program to calculate Simple and Compound Interest. d. Write a C program to calculate $s = ut + (1/2)at^2$ where u and a are the initial velocity in m/sec (= 0) and acceleration in m/sec² (= 9.8 m/s²).

Week - 5	CONDITIONAL STATEMENTS												
<p>a. Write a C program to find largest and smallest of given numbers.</p> <p>b. Write a C program which takes two integer operands and one operator from the user(+, -, *, /, % use switch)</p> <p>c. Write a program to compute grade of students using if else ladder. The grades are assigned as followed:</p> <table style="margin-left: 40px;"> <tr><td>marks < 50</td><td>F</td></tr> <tr><td>50 ≤ marks < 60</td><td>C</td></tr> <tr><td>60 ≤ marks < 70</td><td>B</td></tr> <tr><td>70 ≤ marks</td><td>B+</td></tr> <tr><td>80 ≤ marks < 90</td><td>A</td></tr> <tr><td>90 ≤ marks ≤ 100</td><td>A+</td></tr> </table>		marks < 50	F	50 ≤ marks < 60	C	60 ≤ marks < 70	B	70 ≤ marks	B+	80 ≤ marks < 90	A	90 ≤ marks ≤ 100	A+
marks < 50	F												
50 ≤ marks < 60	C												
60 ≤ marks < 70	B												
70 ≤ marks	B+												
80 ≤ marks < 90	A												
90 ≤ marks ≤ 100	A+												
Week - 6	LOOPING STATEMENTS												
<p>a. Write a C program to find Sum of individual digits of given integer</p> <p>b. Write a C program to generate first n terms of Fibonacci series</p> <p>c. Write a C program to generate prime numbers between 1 and n</p> <p>d. Write a C Program to find the Sum of Series $SUM = 1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^{10}/10!$</p> <p>e. Write a C program to generate Pascal's triangle.</p> <p>f. Write a C program to generate pyramid of numbers.</p> <pre style="margin-left: 40px;"> 1 1 3 1 1 3 5 3 1 </pre>													
Week - 7	ARRAYS												
<p>a. Write a C Program to implement following searching methods</p> <ol style="list-style-type: none"> i. Binary Search ii. Linear Search <p>b. Write a C program to find largest and smallest number in a list of integers</p> <p>c. Write a C program</p> <ol style="list-style-type: none"> i. To add two matrices ii. To multiply two matrices <p>d. Write a C program to find Transpose of a given matrix</p>													
Week - 8	FUNCTIONS												
<p>a. Write a C program to find the factorial of a given integer using functions</p> <p>b. Write a C program to find GCD of given integers using functions</p> <p>c. Write a C Program to find the power of a given number using functions</p>													
Week - 9	RECURSION												
<p>a. Write a C Program to find binary equivalent of a given decimal number using recursive functions.</p> <p>b. Write a C Program to print Fibonacci sequence using recursive functions.</p> <p>c. Write a C Program to find LCM of 3 given numbers using recursive functions</p>													
Week - 10	STRINGS												
<p>a. Write a C program using functions to</p> <ol style="list-style-type: none"> a. Insert a sub string into a given main string from a given position b. Delete n characters from a given position in a string <p>b. Write a C program to determine if given string is palindrome or not</p>													
Week - 11	POINTERS												
<p>a. Write a C program to print 2-D array using pointers</p> <p>b. Write a C program to allocate memory dynamically using memory allocation functions (malloc, calloc, realloc, free)</p>													

Week - 12	STRUCTURES
<p>a. Write a C Program using functions to</p> <ol style="list-style-type: none"> i. Reading a complex number ii. Writing a complex number iii. Add two complex numbers iv. Multiply two complex numbers <p>Note: represent complex number using structure</p> <p>b. Write a C program to read employee details employee number, employee name, basic salary, hra and da of n employees using structures and print employee number, employee name and gross salary of n employees.</p>	
TEXT BOOKS:	
<ol style="list-style-type: none"> 1. Riley DD, Hunt K.A. Computational Thinking for the Modern Problem Solver. CRC press, 2014 Mar 27. 2. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rd Edition) 3. Yashavant Kanetkar, "Let Us C", BPB Publications, New Delhi, 13th Edition, 2012. 	
REFERENCE BOOKS:	
<ol style="list-style-type: none"> 1. Ferragina P, Luccio F. Computational Thinking: First Algorithms, Then Code. Springer; 2018 2. King KN, "C Programming: A Modern Approach", Atlantic Publishers, 2nd Edition, 2015. 3. Kochan Stephen G, "Programming in C: A Complete Introduction to the C Programming Language", Sam's Publishers, 3rd Edition, 2004. 4. Linden Peter V, "Expert C Programming: Deep C Secrets", Pearson India, 1st Edition, 1994. 	
WEB REFERENCES:	
<ol style="list-style-type: none"> 1. http://www.flowgorithm.org/documentation/ 2. http://www.sanfoundry.com/c-programming-examples 3. http://www.geeksforgeeks.org/c 4. http://www.cprogramming.com/tutorial/c 	

APPLIED CHEMISTRY LAB

I B. TECH- I SEMESTER								
Course Code:	Category	Hours / Week			Credits	Maximum Marks		
A5BS12	BSC	L	T	P	C	CIA	SEE	Total
		-	-	3	1.5	30	70	100
Contact Classes: 0	Tutorial Classes: 0	Practical Classes: 39			Total Classes: 39			
COURSE OUTCOMES:								
At the end of the course students will be able to:								
<ol style="list-style-type: none"> 1. Estimate hardness, alkalinity and chloride content in water to check its suitability for drinking. 2. Estimate the percentage content of metal oxide in construction material. 3. The measurement of physical properties like adsorption and viscosity. 4. Demonstrate the digital and instrumental methods of analysis 5. Synthesize various organic compounds. 								
LIST OF EXPERIMENTS								
Experiment - 1	Determination of total hardness of water by complexometric method using EDT							
Experiment - 2	Determination of Alkalinity of given water sample							
Experiment - 3	Estimation of Chloride content of water by Argentometry.							
Experiment - 4	Estimation of amount of HCl by Conductometry.							
Experiment - 5	Estimation of amount of Acetic acid by Conductometry..							
Experiment - 6	Estimation of amount of ferrous ion by potentiometry using potassium dichromat							
Experiment - 7	Estimation of HCl by potentiometry							
Experiment - 8	Determination of Viscosity of a given liquid using Ostwald's Viscometer							
Experiment - 9	Determination of surface tension of a given liquid using Stalagmometer							
Experiment - 10	Synthesis of Aspirin							
Experiment - 11	Synthesis of Thiokol Rubber							
Experiment - 12	Separation of organic mixture by Thin layer Chromatography and calculation of RF values.							
Experiment - 13	Determination of percentage of Calcium Oxide in Cement							
Experiment - 14	Estimation of Manganese Dioxide in Pyrolusite							
REFERENCE BOOKS:								
<ol style="list-style-type: none"> 1. Senior practical physical chemistry, B. D. Khosla, A. Gulati and V. Garg (R. Chand and amp; Co., Delhi) 2. An introduction to practical chemistry, K. K. Sharma and D. S. Sharma (Vikas publishing, N. Delhi) 								

3. Vogel's textbook of practical organic chemistry 5th edition.
4. Text book on Experiments and calculations in Engineering chemistry- S. S. Dara.

WEB REFERENCES:

1. <http://www.arxiv.org/pdf/1510.00032>
2. <http://www.nptel.ac.in/courses/122103010/>
3. http://www.researchgate.net/.../276417736_Video_Presentations_in_Engineering-Ph...
4. <http://www.wileyindia.com/engineering-physics-theory-and-practical.html>

ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

I B. TECH- I SEMESTER

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P		C	CIE	SEE
A5HS02	HSMC	-	-	2	1	30	70	100
		Practical Classes: 32			Total Classes: 32			
Contact Classes: 00	Tutorial Classes: 00							

COURSE OBJECTIVES:

The course should enable the students to:

1. Facilitate computer-assisted multi-media instruction enabling individualized and independent language learning.
2. Enhance English language skills, communication skills and to practice soft skills.
3. Improve fluency and pronunciation intelligibility by providing an opportunity for practice in speaking.
4. Get trained in different interview and public speaking skills such as JAM, debate, role play, group discussion etc.
5. Instill confidence and make them competent enough to express fluently and neutralize their mother tongue influence.

COURSE OUTCOMES

By the end of the course students will be able to

1. Develop better perception of nuances of English language through audio- visual experience.
2. Acquire Neutralization of accent for intelligibility.
3. Participate in group activities.
4. Employ speaking skills with clarity and confidence which in turn enhances their employability.

English Language and Communication Skills Lab (ELCS) shall have two parts:

- a. **Computer Assisted Language Learning (CALL) Lab**
- b. **Interactive Communication Skills (ICS) Lab**

Listening Skills

Objectives

1. To enable students develop their listening skills to appreciate its role in the LSRW skills approach to language and improve their pronunciation.
2. To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and regions.

Students should be given practice in listening to the sounds of the language, to be able to recognize them and find the distinction between different sounds, to be able to mark stress and recognize and use the right intonation in sentences.

- Listening for general content
- Listening to fill up information
- Intensive listening
- Listening for specific information

<p>Speaking Skills</p> <p>Objectives</p> <ol style="list-style-type: none"> To involve students in speaking activities in various contexts To enable students express themselves fluently and appropriately in social and professional contexts <ul style="list-style-type: none"> Oral practice: Just A Minute (JAM) Sessions Describing objects/situations/people Role play – Individual/Group activities Group Discussions Debate 	
EXERCISE-I	
<p>CALL Lab: <i>Understand:</i> Listening Skill- Its importance – Purpose- Process- Types- Barriers of Listening. <i>Practice:</i> Introduction to Phonetics – Speech Sounds – Word Stress and Rhythm</p> <p>ICS Lab: <i>Understand:</i> Communication at Work Place- Spoken vs. Written language. <i>Practice:</i> Ice-Breaking Activity and JAM Session- Situational Dialogues – Introductions- Greetings – Taking Leave.</p>	
EXERCISE-II	
<p>CALL Lab: <i>Understand:</i> Structure of Syllables — Weak Forms and Strong Forms in Context. <i>Practice:</i> Basic Rules of Word Accent - Stress Shift - Weak Forms and Strong Forms in Context.</p> <p>ICS Lab: <i>Understand:</i> Features of Good Conversation – Non-verbal Communication. <i>Practice:</i> Situational Dialogues – Role-Play- Expressions in Various Situations –Making Requests and Seeking Permissions- Telephone Etiquette.</p>	
EXERCISE-III	
<p>CALL Lab: <i>Understand:</i> Intonation-Errors in Pronunciation-the Interference of Mother Tongue (MTI). <i>Practice:</i> Common Indian Variants in Pronunciation – Differences in British and American Pronunciation.</p> <p>ICS Lab: <i>Understand:</i> How to make Formal Presentations. <i>Practice:</i> Formal Presentations- Extempore</p>	
EXERCISE-IV	
<p>CALL Lab: <i>Understand:</i> Listening for General Details. <i>Practice:</i> Listening Comprehension Tests.</p> <p>ICS Lab: <i>Understand:</i> Public Speaking – Exposure to Structured Talks. <i>Practice:</i> Group Discussions, Debate</p>	
EXERCISE-V	

CALL Lab:

Understand: Listening for Specific Details.

Practice: Listening Comprehension Tests.

ICS Lab:

Understand: Introduction to Interview Skills.

Practice: Mock Interviews.

REFERENCE BOOKS:

1. Whitby, N. Business Benchmark. Cambridge University Press (with CD) 2nd Edition.
2. Kumar, S. & Lata, P. (2011). Communication Skills. Oxford University Press.
3. Balasubramanian, T. (2008). A Text book of English Phonetics for Indian Students, Macmillan.
4. Thorpe, E. (2006). Winning at Interviews, Pearson Education.
5. Sethi, J. et al. (2005). A Practical Course in English Pronunciation (with CD), Prentice Hall of India.

WEBSITES:

1. <https://www.britishcouncil.org>
2. <https://www.bbc.co.uk>
3. <https://www.grammarly.com>
4. <https://www.fluentu.com>
5. <https://www.cambridgeenglish.org/exams-and-tests/business-preliminary>
6. <https://www.cambridgeenglish.org/exams-and-tests/business-vantage>