COURSE STRUCTURE AND DETAILED SYLLABUS 2022-24

A22 Regulations

I to IV Years
Course Structure
and Syllabus

FOR

B.Tech – CSE – Data Science

(Applicable for the Batches admitted from 2022 onwards)

DEPARTMENT OF DATA SCIENCE
SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY
(An Autonomous Institution approved by UGC and affiliated to JNTUH)
Yamnampet, Ghatkesar, Hyderabad - 501 301

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B.Tech (Computer Science and Engineering- Data Science (CSE-DS))
Course Structure and Syllabus for I to IV year
Regulation: A22

I YEAR I SEMESTER COURSE STRUCTURE

S. No	Course Category	Subject Code	Course	L	T	P/D	C	Max Marks	
								CIE	**SEE**
1	BS	9HC04	Engineering Chemistry	2	1	0	3	40	60
2	ES	9FC01	Problem Solving using C	3	0	0	3	40	60
3	BS	9HC11	Matrix Algebra and Calculus	2	1	0	3	40	60
4	HS	9HC01	Essential English Language skills	2	0	0	2	40	60
5	HS	9HC61	Oral Communication Lab - I	0	0	2	1	40	60
6	BS	9HC64	Engineering Chemistry Lab	0	0	3	1.5	40	60
7	ES	9FC61	Problem Solving using C Lab	0	0	3	1.5	40	60
8	ES	9BC61	Workshop / Manufacturing Processes Lab	0	1	3	2.5	40	60
9	HS	9HC18	Induction Program	--	--	--	--	Satisfactory / Not Satisfactory	
			Total :	**9**	**3**	**11**	**17.5**	**320**	**480**

* a) Orientation Course for B. Tech I year I semester Students take place for 3 weeks duration covering first two Units
b) Orientation Course for B. Tech I year II semester Students take place for covering the remaining Four Units

I YEAR II SEMESTER COURSE STRUCTURE

S. No	Course Category	Subject Code	Course	L	T	P/D	C	Max Marks	
								CIE	**SEE**
1	BS	9HC07	Engineering Physics	2	1	0	3	40	60
2	ES	9EC01	Data Structures	3	0	0	3	40	60
3	BS	9HC12	Advanced Calculus	2	1	0	3	40	60
4	ES	9AC48	Basic Electrical and Electronics Engineering	3	0	0	3	40	60
5	ES	9BC01	Engineering Graphics	1	0	4	3	40	60
6	HS	9HC62	Oral Communications Lab – I	0	0	3	1.5	40	60
7	BS	9HC66	Engineering Physics Lab	0	0	3	1.5	40	60
8	ES	9EC61	Data Structures using C Lab	0	0	3	1.5	40	60
			Total :	**11**	**2**	**13**	**19.5**	**320**	**480**

* a) Orientation Course for B. Tech I year I semester Students take place for 3 weeks duration covering first two Units
b) Orientation Course for B. Tech I year II semester Students take place for covering the remaining Four Units

II YEAR I SEMESTER COURSE STRUCTURE

S.No	Course Category	Subject Code	Course	L	T	P/D	C	Max Marks	
								CIE	SEE
1	BS	9EC02	Object Oriented Programming through Java	2	1	0	3	40	60
2	HS	9HC15	Probability and Statistics	2	1	0	3	40	60
3	BS	9HC16	Quantitative Aptitude and Logical Reasoning	3	0	0	3	40	60
4	PC	9FC03	Discrete Mathematics	2	1	0	3	40	60
5	PC	9FC02	Python Programming	2	1	0	3	40	60
6	HS	9HC03	Universal Human Values	3	0	0	3	40	60
7	PC	9MC61	Java Programming Lab	0	0	2	1	40	60
8	PC	9FC62	Python Programming Lab	0	0	4	2	40	60
9	ES	9AC95	Basic Electrical and Electronics Engineering Lab	0	0	3	1.5	40	60
			Total :	**14**	**4**	**9**	**22.5**	**430**	**770**

II YEAR II SEMESTER COURSE STRUCTURE

S. No	Course Category	Subject Code	Course	L	T	P/D	C	Max Marks	
								CIE	SEE
1	PC	9EC16	Introduction to Data Science	3	0	0	3	40	60
2	ES	9CC54	Computer Organization	3	0	0	3	40	60
3	PC	9EC04	Design and Analysis of Algorithms	2	1	0	3	40	60
4	PC	9FC04	Database Management Systems	3	0	0	3	40	60
5	PC	9HC05	Environment Science	3	0	0	--	Pass / Fail	
6	HS	9HC63	Soft Skills Lab	0	1	2	2	40	60
7	BS	9ZC01	Business Economics and Financial Analysis	3	0	0	3	40	60
8	PC	9FC63	Database Management Systems Lab	0	0	3	1.5	40	60
9	PC	9MC63	Design and Analysis of Algorithms and Computer Organization Lab	0	0	2	1	40	60
10	PC	9MC64	IT Workshop and R Programming Lab	0	0	2	1	40	60
11	PS	9M485	Technical Seminar	0	1	0	1	100	--
			Total :	**15**	**3**	**9**	**21.5**	**430**	**770**

Note: Summer Break Internship- I is to be carried out during the summer vacation between 4th and 5th semesters.

III YEAR I SEMESTER COURSE STRUCTURE

S.No	Course Category	Subject Code	Course	L	T	P/D	C	Max Marks	
								CIE	SEE
1	PE		Professional Elective – I	3	0	0	3	40	60
2	PC	9EC03	Software Engineering	2	0	0	2	40	60
3	PC	9FC05	Data Warehousing and Data Mining	2	0	0	2	40	60
4	PC	9MC01	Data Visualization and Business Intelligence	2	0	0	2	40	60
5	PC	9EC06	Operating Systems	2	1	0	3	40	60
6	HS	9EC05	Computer Networks	3	0	0	3	40	60
7	PC	9FC65	Data Warehousing and Data Mining Lab	0	0	4	2	40	60
8	PC	9MC65	Computer Networks and Data Visualization Lab	0	0	4	2	40	60
9	PS	9M586	Summer Industry Internship -I	-	-	-	1	40	60
			Total :	**14**	**1**	**8**	**20**	**360**	**540**

III YEAR II SEMESTER COURSE STRUCTURE

S.No	Course Category	Subject Code	Course	L	T	P/D	C	Max Marks	
								CIE	SEE
1	OE		Open Elective – I	3	0	0	3	40	60
2	PE		Professional Elective – II	3	0	0	3	40	60
3	PC		Professional Elective – III	3	0	0	3	40	60
4	PC	9EC07	Automata Theory and Compiler Design	2	1	0	3	40	60
5	PC	9FC06	Web Technologies	2	1	0	3	40	60
6	PC	9LC03	Machine Learning	3	0	0	3	40	60
7	PC	9IC04	Intellectual Property Rights	2	0	0	-	40	60
8	PC	9LC65	Machine Learning and Compiler Design Lab	0	0	3	1.5	40	60
9	PC	9FC66	Web Technologies Lab	0	0	3	1.5	40	60
10	PC	9M687	Comprehensive Viva Voce	-	-	-	1	40	60
			Total :	**18**	**2**	**6**	**22**	**360**	**540**

Note: Summer Break Internship-II is to be carried out during summer vacation between 6th and 7th semesters.

IV YEAR I SEMESTER COURSE STRUCTURE

S.No	Course Category	Subject Code	Course	L	T	P/D	C	Max Marks	
								CIE	SEE
1	PE		Open Elective – II	3	0	0	3		
2	PE		Professional Elective – IV	3	0	0	3	40	60
3	PC		Professional Elective – V	3	0	0	3	40	60
4	PC	9FC17	Cloud Computing	2	1	0	3	40	60
	PC	9LC01	Introduction to Artificial Intelligence	3	0	0	3	40	60
5	PC	9FC15	Big Data Analytics	3	0	0	3	40	60
6	PC	9MC67	AI and Cloud ComputingLab	0	0	3	1.5	40	60
7	PC	9MC68	Big Data Analytics Lab	0	0	3	1.5	40	60
8	PS	9M788	Summer Industry Internship – II	-	-	-	1	40	60
			Total:	**16**	**2**	**6**	**22**	**360**	**540**

IV YEAR II SEMESTER COURSE STRUCTURE

S.No	Course Category	Subject Code	Course	L	T	P/D	C	Max Marks	
								CIE	SEE
1	OE		Open Elective – III	3	0	0	3	40	60
2	PC	9FC07	Cyber Security and Cyber Laws	2	0	0	2	40	60
3	PS	9M889	Project	0	0	20	10	40	60
			Total:	**5**	**0**	**20**	**15**	**90**	**210**

Note: All End Examinations (Theory and Practical) are of **Three** hours duration

T – Tutorial **L- Theory** **P/D – Practical/Drawing**

C- Credits **Int. - Internal Exam** **Ext. - External Exam**

Course code Definitions

BS- Basic Science Courses
ES- Engineering Science Courses
HS- Humanities and Social Sciences including Management Courses
PC- IT Professional core courses
PE - IT Professional Elective courses
OE- IT Open Elective courses
PS- Summer Industry Internship, Projects, Comprehensive Viva Voce, Technical Seminars

CIE: Continuous Internal Evaluation
SEE: Semester End Evaluation

Course Structure for Professional Electives (PE)

Professional Electives (PE)									
Code	**PE– I (3-1)**	**Code**	**PE – II (3-2)**	**Code**	**PE – III (3-2)**	**Code**	**PE – IV (4-1)**	**Code**	**PE – V (4-1)**
9MC11	Database Security	**9MC12**	Web Security	**9EC09**	Cryptography and Network Security	**9MC14**	Web and Social Media Analytics	**9MC17**	Spatial and Multimedia Databases
9FC08	Information Retrieval Systems	**9FC14**	Mobile Application Development	**9LC18**	Natural Language Processing	**9LC17**	Devops	**9MC18**	Exploratory Data Analysis
9FC13	Software Project Management	**9FC09**	Image Processing	**9EC12**	Software Requirements and Estimation	**9LC11**	Software Testing Methodologies	**9FC15**	Agile Software Development
9FC12	Computer Graphics	**9EC20**	Mobile Computing	**9MC13**	Robotics Process Automation	**9JC05**	Blockchain Technologies	**9IC45**	Introduction to Internet of Things

Course Structure for Open Electives (OE)

Open Electives (OE)						
OE Stream	**Code**	**OE – I (3-2)**	**Code**	**OE – II (4-1)**	**Code**	**OE – III (4-2)**
Entrepreneurship	**9ZC22**	Basics of Entrepreneurship	**9ZC23**	Advanced Entrepreneurship	**9ZC24**	Product and Services
Finance	**9ZC05**	Banking Operations and Insurance	**9ZC15**	Financial Markets and Services	**9ZC19**	Project and Risk Management
Innovation and Design Thinking	**9ZC08**	Design Literacy and Design Thinking	**9ZC09**	Co- Creation and Product Design	**9ZC10**	Entrepreneurship and Business Design
Mechanical	**9BC51**	Introduction to Additive Manufacturing Processes	**9BC52**	Principles of Operations Research	**9BC53**	Principles of Automation and Robotics
Electrical	**9AC44**	Fundamentals of Measurements and Instrumentation	**9AC45**	Fundamentals of Renewable Energy Sources	**9AC46**	Power Electronic Devices and Converters
ECE	**9CC36**	Fundamentals of Digital Circuits and Microprocessors	**9CC37**	Fundamentals of Communication	**9CC38**	Embedded Systems

Syllabus for B.Tech CSE-DS I year I Semester
ENGINEERING CHEMISTRY
(Common to all branches)

Course code: 9HC04

Course Objectives:

1. Tounderstandmicroscopicchemistryintermsofatomicandmolecularorbital's
2. Tolearnthepreparationandapplicationsofcommercialpolymersandlubricant materials
3. Tolearntheindustrialproblemscausedbywaterandmunicipalwatertreatment
4. Toacquireknowledgeaboutdifferenttypesofbatteriesandtheirworkingmechanism
5. Todeveloptheconceptsandtypesofcorrosion,controlmethodsandprotectivecoatings
6. Tolearnthechemicalreactionsthatareusedinthesynthesisofdrugmolecules

L	T	P	C
2	1	0	3

CourseOutcomes:

Aftercompletionofthecourse,thestudentwillbeableto:

1. Explain the fundamental aspects of atomic , molecular orbitals and metal complexes[L2]
2. List general properties of polymers, lubricants and engineering materials[L1]
3. Outline basic properties of water and its usage in domestic and industrial purposes[L2]
4. Summarize electrochemical procedures related to corrosion [L2]
5. Interpret potential applications of chemistry and practical utility of various organic reactions and drug molecules[L5]

UNIT - I

Atomic and molecular structure (6L)

Molecular orbitals of diatomic molecules and plots of the multicenter orbitals, Equations for atomic and molecular orbitals, Energy level diagrams of diatomic (F_2, Cl_2 CO, NO). Pi- molecular orbitals of butadiene and benzene and aromaticity, Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties, Band structure of solids and the role of doping on band structures.

UNIT – II

Plastics and Lubricants (8L)

Plastics: Polymerization-Addition and Condensation polymerization, Plastics – Thermosetting and Thermoplastics, preparation, properties and **engineering applications of plastics:** PVC, Teflon, Bakelite,Fibers: Nylon 6, 6 and Dacron. Rubbers – natural and artificial rubber, vulcanization of natural rubber, Buna-S, Buna-N and their **engineering applications.** Fabricated Reinforcing Polymers**- engineering applications.Lubricants:** Definition, classification and function of lubricants, Types of lubrication and mechanisms – Thick Film or Hydrodynamic Lubrication, Thin Film or Boundary Lubrication, Extreme Pressure Lubrication. Classification and properties of lubricants – Viscosity, flash and fire point, cloud and pour point and acid value.

Engineering applications

UNIT - III

Water Technology (8L)

(a) Introduction: - Hardness of water – types of hardness (temporary and permanent), calculation of hardness- Numerical problems. Estimation of hardness of water by EDTA Method.

(b) Water for Industrial purpose: Food, sugar, textile, paper and pharma industries, water for steam making characteristics of boiler feed water, boiler troubles- scale and sludge &Carry over (priming &foaming), boiler corrosion, caustic embrittlement.

(c) Water Treatment: Internal conditioning- phosphate, carbonate &calgon conditioning. External Treatment: Ion-exchange process. Desalination-reverse osmosis. Municipal water treatment-sedimentation, coagulation, filtration, disinfection-chlorination, ozonization. Engineering applications: Methodology and working of mineral water plant for drinking purpose.

UNIT - IV

Electrochemistry (8L)

Conductance – conductors (metallic and electrolytic), types of conductance – specific, equivalent and molar conductance – effect of dilution on conductance.

Free energy and emf, cell potentials, electrode potential (oxidation and reduction).Types of electrodes - redox electrode (quinhydrode electrode), metal – metal insoluble salt electrode and Ion selective electrode.Cell notation and cell reaction –Nernst equation and applications.**Engineering Applications.**

Batteries : Types of batteries

(a) Primary batteries – Lechalanche cell (dry cell), Lithiumcell

(b) Secondary batteries(Accumulators) – Lead acid battery, Lithium-ion battery

(c) Fuel cells- $H_2 – O_2$ fuel cell and MeOH-O_2 fuel cell-advantages and applications.

Engineering applications – future water powered car, Hydrogen production and storage.

UNIT - V

Corrosion and Surface treatment (8L)

Corrosion – basic concepts –types of corrosion, chemical, electrochemical corrosion(absorption of O_2 and evolution of H_2) -factors affecting the rate of corrosion.

Cathodic protection – sacrificial anodic protection and impressed current cathodic protection method.

Surface treatment

Mechanical surface treatment and coatings, casehardening and surface coating, thermal spraying, vapour deposition, Ion implantation, Diffusion coating.

Methods of metallic coatings-hot dipping (tinning and galvanizing), metal cladding (Al cladding), electroplating (copper plating) and electroless plating (nickel plating), electroforming, ceramic, organic and diamond coating.

UNIT-VI

Organic reactions and drug molecules (5L)

Introduction: reactions involving substitution (S_N1, S_N2) addition to double bond(C=C), elimination (E^1 and E^2), oxidation (using $KMnO_4$, CrO_3), reduction (Hydrogenation by Ni/H_2, Pd/C)

Drugs: Definition, classification structure and applications of commonly used drug molecules- paracetamol, aspirin, ibuprofen and diphenhydramine (Benadryl)

Principles of spectroscopy and selection rules: Electronic spectroscopy. Fluorescence and its applications in medicine. Vibrational and rotational spectroscopy of diatomic molecules- **Applications**.

TEXT BOOKS:

1. Engineering Chemistry: PK Jain & MK Jain, DhanapathraiPublications(2018)
2. Engineering Chemistry: by Thirumala Chary Laxminarayana &Shashikala,Pearson Publications(2020)

REFERENCE BOOKS:

1. Textbook of Engineering Chemistry: Jaya Shree Anireddy, Wiley Publications(2019)
2. Engineering Chemistry: by &B.Rama Devi, PrsantaRath& Ch. VenkataRamana Reddy, Cengage Publications(2018)
3. Engineering Chemistry: Shashi Chawla, DhanapathraiPublications(2019)
4. Textbook of Engineering Chemistry: SS Dara, SS Umare S. Chand Publications(2004)

Syllabus for B.Tech CSE-DS I year I Semester
Problem Solving using C
(Common to all branches)

Course Code: 9FC01

L	T	P/D	C
3	0	0	3

Course Objectives:

1. Toacquireproblemsolvingskills
2. Tobeabletodevelopflowcharts
3. Tounderstandstructuredprogrammingconcepts
4. TobeabletowriteprogramsinCLanguage

CourseOutcomes:

Aftercompletionofthecourse,thestudentwillbeable to:

1. Explain the basic computer concepts and Illustrate programming principles of C language. [L2,L4]
2. Develop C programs to solve simple mathematical and engineering problems using decision control, loop statements , arrays and strings.[L3,L4]
3. Apply modular programming using functions to develop reusable code.[L3,L4]
4. Analyzememory oriented concepts using pointers to implement inter function, function communication, pointer arithmetic. [L4]
5. Describe file handling concepts using C. [L2]

UNIT I

Problem solving Techniques – Algorithms, pseudo code, flowcharts with examples

Introduction to Computer Programming Languages – Machine Languages, Symbolic Languages, High-Level Languages,

Introduction to C language – Characteristics of C language, Structure of a C Program.Syntax and semantics.

Data Types, Variables – declarations and initialization, formatting input and output.

UNIT – II

C Tokens: Identifiers, Keywords, Constants, variables and operators

Expressions – Arithmetic expressions, Precedence and Associativity, evaluating expressions,

Decision control structures – if, Two-way selection – if else, nested if, dangling else, Multi-way selection – else if ladder and switch.

Repetitive control structures – Pre-test and post-test loops – initialization and updation, while, do while and for loop and nested loops.

Unconditional statements: break, continue and goto statements with examples.

UNIT III

Arrays – Definition and declaration, initialization, accessing elements of in arrays, storing values in arrays,

1-D arrays, 2-D arrays, character arrays and multidimensional arrays.

Function and arrays: passing individual elements to arrays, passing 1-D array, 2-D array to function.

Applications: Linear search, matrix addition, subtraction, multiplication and transpose

UNIT – IV

Functions – User – defined functions - Function definition, arguments, return value, prototype, arguments and parameters, inter-function communication. Standard functions – Math functions. Scope – local, global.

Parameter passing – Call by value and call by reference.

Recursive functions – Definition, examples, advantages and disadvantages.

Macros – Definition, examples, comparison with functions.

Storage Classes – auto, extern, static and Register

UNIT V

Introduction to Pointers – pointer constants, pointer values, pointer variables, accessing variables through pointers, pointer declaration and definition, declaration versus redirection, initialization of pointer variables, Pointer for inter function communication, pointer to pointers, pointer to function.

Arrays and pointers – Pointer arithmetic and arrays, array of pointers

Strings – Declaration, Initialization, Input and Output functions, strings and pointer, string handling functions.

UNIT VI

Files – Concept of a file, streams, text and binary files, stream file processing, system created steams, Standard library I/O functions, file open and close, formatting I/O functions, character I/O functions, Binary I/O, command line arguments, file status functions ,positioning functions.

Applications: Basic operations on files.

Text Books:

1. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill
2. Let Us C by Yashavant Kanetkar

Reference Books:

1. Programming in C (2nd Edition) by Ashok N Kamthane
2. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language
3. Prentice Hall of India

Syllabus for B.Tech CSE-DS I year I Semester
MATRIX ALGEBRA AND CALCULUS
(Common to all branches)

L	T	P	C
2	1	0	3

Pre Requisites: Mathematics Knowledge at Pre-University Level
Code: 9HC11
Course Objectives:

1. Basic operation of matrices and about the linear system and some analytical methods for solution.
2. Concept of Eigen value and Eigen vector and their properties and applications.
3. Quadratic form and its properties.
4. Mean value theorems and their applications to the given functions, series expansions of a function.
5. Various analytical methods to solve first order first degree and also the equations not of first degree ordinary differential equations.
6. Methods to solve higher order ordinary differential equations.

Course Outcomes:
After the course completion the students will be able to:

1. *Solve the linear system of equations (L3)*
2. *Determine the Eigenvalues and Eigenvectors of the matrix and apply Cayley Hamilton Theorem to obtain the higher powers of a matrix (L3, L5)*
3. *Identify the nature of the quadratic form and reduction of the quadratic form to its canonical form.(L2)*
4. *Apply appropriate mean value theorems to obtain the mean values and find the power series expansion of a function (L2, L3)*
5. *Solve the first order and higher order ordinary differential equations with constant coefficients (L3)*

UNIT-I
System of Linear Equations: Elementary row/column operations -Echelon form, Rank of a matrix, Inverse of a matrix by Gauss Jordan method, Non-Homogenous and Homogenous system of linear equations- consistency or inconsistency of a system, Gauss Elimination method, Rank method and problems, Symmetric, Skew-symmetric and Orthogonal matrices.

UNIT-II
Eigen values and Eigen vectors: Definitions and Properties (without proofs). Evaluation of Eigen values and Eigenvectors for a given matrix, Cayley-Hamilton Theorem (without proof) and its applications in finding higher powers & inverse of a matrix, Diagonalization of a matrix, Hermitian, Skew-Hermitian and Unitarymatrices.

UNIT-III
Quadratic forms: Quadratic forms, Nature, rank, index and signature of a quadratic form. Reduction of quadratic form to canonical form

UNIT-IV
Single Variable Calculus: Rolle's Theorem, Lagrange's and Cauchy's mean value theorems (without proof); Taylor's and Maclaurin's series (without proof) and their application for series expansions of standard functions.

UNIT-V
First order ODE: Exact differential equations, equations reduced to exact, Linear and Bernoulli's equations, Newton's law of cooling, Law of natural Growth/Decay.

UNIT-VI

Higher order ODE: Higher order linear differential equations with constant coefficients- Complementary function, Particular Integral, Method of variation of parameters.

Text Books:

1. R K Jain and S R K Iyengar Advanced Engineering Mathematics, Narosa Publications.
2. B.S. Grewal, Elementary Engineering Mathematics, Khanna Publishers
3. Alan Jeffery, Advanced Engineering Mathematics, Academic Press
4. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint,2010.
5. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons,2006.

Syllabus for B.Tech CSE-DS I year I Semester
ESSENTIAL ENGLISH LANGUAGE SKILLLS
(Common to all branches)

L	T	P/D	C
2	0	0	2

Course Code: 9HC01

Course Objectives:
Theory (2 per week)
To enable students to:

1. Recognize and distinguish between different parts of speech
2. Learn the correct usage of articles in sentences
3. Write sentences using tenses
4. Identify when each punctuation marks is needed and its correct usage
5. Recognize the difference between direct and indirect speech and form statements in them
6. Understand the appropriate use of active and passive voice in certain context

Course Outcomes:
After completion of the course, the student will be able to:

1. Understand and demonstrate the use of diverse forms of vocabulary in their communication. (L2 & L3)
2. Recognize different grammatical structures and use the appropriate ones in their communication. (L1 & L3)
3. Develop effective reading skills by applying strategies to comprehend different types of texts. (L4 & L3).

UNITS

1. Vocabulary-1
1.1 Root words
1.2 Synonyms and Antonyms
1.3 Homonyms, Homophones and Homographs
1.4 One word substitutes

2. Vocabulary-2
2.1 Idioms and Phrases
2.2 Confusables

3. Grammar-1
3.1 The Parts of Speech
3.2 Use of Articles
3.3 Omission of Articles

4. Grammar-2
4.1 Tenses
4.2 Prepositions
4.3 Concord

5. Reading & Writing
5.1 Techniques of Reading, Reading Comprehension
5.2 Kinds of Sentences
5.3 Punctuation

6. Writing-2
6.1 Voice – Active voice and Passive Voice
6.2 Speech-Direct & Reported Speech
6.3 Common errors in English

Suggested Reading & References:

1. Word Power Made Easy by Norman Lewis
2. English Grammar In Use: A Self Study Reference And Practice Book Intermediate Learners Book by Raymond Murphy
3. The Logic of English Words by Logophilia Education
4. English Vocabulary In Use Elementary Book With Ans And Cd-Rom by Felicity Odell (Second Edition)
5. Effective Technical Communicatioin by M. Ashraf Rizvi
6.Intermediate grammar usage and composition; M.L.Tickoo, A.E.Subramanian, P.R.Subramanyam; OBS
7. An Interactive Grammar to Modern English by Shivendra K. Verma and HemalathaNagarajan, Frank Bros. & Co.

Syllabus for B.Tech CSE-DS I year I Semester
ORAL COMMUNICATION LAB -1
(Common to all branches)

L	T	P/D	C
0	0	2	1

Course Code: 9HC61

Course Objectives:

1. Comprehend the basic tactics to communicate effectively and set a road map to achieve their communication goals.
2. Know the importance of pronunciation in effective communication and work on mitigating the MTI in their spoken English;
3. Communicate in proper tense with conviction and also frame and pose questions aptly.
4. Describe people, objects and situations, using appropriate vocabulary, phrases and sequencing of ideas.
5. Use the right English language expressions in varying real life contexts.
6. Develop skill of narration through listening and coordination of ideas.

Course Outcomes:

After completion of the course, the student will be able to:

1. Describe people, objects and situations using simple sentences with proper pronunciation. (L1)
2. Use apt expressions and narrate stories in simple sentences. (L3)

OC LAB (2 per week)

Unit 1: Communication Skills

Communication basics, essential elements of effective communication, barriers to communication, setting SMART communication goals.

Activities:

- Ice-breaking activities
- Personal Communication SWOT Analysis
- Communication Case Studies: The Terrible & The Terrific

Unit 2: Pronunciation Matters

Importance of pronunciation, neutralizing mother tongue interference (MTI).

Activities:

- Odd Word Out
- Minimal Pairs Masti
- Shadow reading

Unit 3: Use apt expressions in diverse situations

Self-introduction, Greetings, apologizing, complimenting, inviting, complaining etc.

Activity:

Role play in different contexts using the appropriate expressions

Unit 4:Mind your Tenses

Describing present and past habits, states, and events.
Talking about actions in progress, relating past to the present, talking about the future.
Framing questions. (confirmation/information questions)

Activities:

- Speaking activity on daily routine, how students spent their recent vacation, speaking about their childhood, speaking about future plans.
- Dumb Charades (Present/Past continuous - Present/ Past perfect)
- Guessing game (10/20 yes or no questions)

Unit 5: Hone your Describing skills
Describing people, objects, and situations

Activities:
- Picture descriptions.
- Guessing games - listening to the descriptions.
- Narrating memorable incidents from life.
- Describe your ideal world
- Once upon a time……

Unit 6: The Art of Storytelling
Story telling for career success, the basics of story telling
Activities:
- Building stories - chain activity.
- Story prompts activity.
- Narrate the story. (all the hints are given except linking words and tenses)

Suggested Reading & References:

1. "An Interactive Grammar of Modern English" by Shivendra K Verma and Hemalatha Nagarajan, Frank Bros. & Co.
2. "Skill Sutras" by Jayashree Mohanraj, Prism Books Pvt. Ltd.
3. "Better English pronunciation" by J.D. Connor.
4. "Effective Communication" John Adair, Pan Macmillan Ltd.
5. "Body Language", by Allan Pease, Sudha Publications.
6. "Communicative English", by Hariprasad M. and Prakasam V, Neel Kamal Publications.

Syllabus for B.Tech CSE-DS I year I Semester
ENGINEERING CHEMISTRY LAB

Code: 9HC64

L	T	P/D	C
0	0	3	1.5

Course Objectives:

1. Preparation of Inorganic compounds
2. Determination surface tension of a liquid
3. Determination viscosity of lubricant
4. Determination acid value of an oil
5. Estimation hardness of water
6. Analysis the amount of chloride content
7. Determination of cell constant and conductance of solutions
8. Determination of redox potential and emf of solutions
9. Determination of the rate constant of acid
10. Synthesis of a polymer (Thiakol rubber / Urea-Farmaldehyde resin)
11. Synthesis of a drug- Aspirin
12. Estimation of Mn^{+7} by Colorimetry method

Course Outcomes:

After completion of the course, the student will be able to:

1. Estimate the hardness and chloride in water. L5
2. Determine strength of acid by potentiomeric and conductometric methods. L5
3. Demonstrate preparation of polymer, aspirin and inorganic compound. L2

List of Experiments

1. Preparation of coordination complex NiDMGComplex
2. Determination of surfacetension
3. Determination ofviscosity
4. Saponification/acid value of anoil
5. Ion exchange column for removal of hardness of water / Estimation of Hardness of water by EDTAMethod
6. Determination of chloride content ofwater
7. Determination of cell constant and conductance of solutions (HCl Vs NaOH / Mixture of acid Vs Strongbase)
8. Potentiometry - determination of redox potential and emf ($FeSO_4$ Vs $KMNO_4$ / HCl Vs NaOH)
9. Determination of the rate constant of acid catalyzed hydrolysis ofmethylacetete
10. Synthesis of a polymer- Thiakol rubber / Urea-Farmaldehyderesin
11. Synthesis of a drug-Aspirin
12. Estimation of Mn^{+7} by Colorimetrymethod

Syllabus for B.Tech CSE-DS I year I Semester
PROBLEM SOLVINGUSING C LAB

L	T	P	C
0	3	3	1.5

Code: 9FC61

Course Objectives:

1. To be able to understand the fundamentals of programming in C Language
2. To be able to write, compile and debug programs in C
3. To be able to formulate problems and implement in C.
4. To be able to effectively choose programming components.
5. To solve computing problems in real-world.

Course Outcomes:

After completion of this course student will learn

1. Develop programs to solve simple mathematical and engineering applications usingC language [L3]
2. Illustrate various operations on files to develop programs using C language [L3]

[The laboratory should be preceded or followed by a tutorial to explain the approach or algorithm to be implemented for the problem given.]

1. Unit I (Cycle 1)

1. Write an algorithm for converting a given Celsius temperature to its equivalent Fahrenheit temperature and draw a flowchart.
2. Write an algorithm to find the largest of three given numbers and draw a flowchart.
3. Write an algorithm and draw a flowchart for finding the roots and nature of roots of a quadratic equation, given its coefficients.
4. Write an algorithm and flowchart for finding the first n Fibonacci numbers, give n.

2. Unit II (Cycle 2)

1. Write an algorithm, flowchart, and C program for:
2. Finding the area and circumference of a circle of given radius.
3. Finding the volume of a sphere of given radius.
4. Finding the lateral surface area of a right circular cone of given base radius and height.
5. Finding selling price of an item, given its cost price and profit percent.
6. Finding the interest on a given principal for a given period of time at a given rate of per year.
7. Write a C program to display all the sizes of data types in C.
8. Write a C program to display a given decimal integer into an equivalent octal number and hexadecimal number using %o and %x in printf function.

3. Unit II (Cycle 3)

1. Write a C program to find the roots and nature of the roots of a quadratic equation, given its coefficients.
2. Write a C program for finding the largest of three given numbers.
3. A salesman gets a commission of 5% on the sales he makes if his sales is below Rs.5000/- and a commission of 8% on the sales that exceeds Rs.5000/- together with Rs.250/-. Write an algorithm or a flowchart and develop C program for computing the commission of the salesman, given his sales.
4. Write a C Program to demonstrate Marcos.

4. Unit III (Cycle 4)

1. Write three C programs to print a multiplication table for a given number using while, do-while, and for loops.
2. Write a C program to compute the sum of:
3. $1+x+x^2+x^3+\ldots\ldots\ldots\ldots+x^n$, given x and n.
4. $1! + 2! + 3! + \ldots + n!$, given n.
5. $1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^{10}/10! + \ldots$ to n terms where the n^{th} term becomes less than 0.0001.

5. Unit III (Cycle 5)

1. Write a C program in the menu driven style to perform the operations +, -, *, /, % between two given integers.

2. Write a C program to find the largest and the least of some numbers given by the user.

3. Write a C program to find the sum of the digits of a positive integer.

6. Unit III (Cycle 6)

1. Write C functions for the following:
   a) A function that takes an integer n as argument and returns 1 if it is a prime number and 0 otherwise.
   b) A function that takes a real number x and a positive integer n as arguments and returns x^n.
   c) A function that takes a positive integer n as an argument and returns the n^{th} Fibonacci number.

2. Using recursion write C functions for the following:
   a) Factorial of a non-negative integer n.
   b) Number of combinations of n things taken r at a time.
   c) Greatest Common Divisor of two integers.
   d) Least Common Multiple of two integers.

7. Unit III (Cycle 7)

a) Write a menu driven style program to compute the above functions (cycle 6) on the choice of the function given by the user.

b) Define macros for the following and use them to find sum of the squares of the minimum and maximum of two given numbers.
   a) Larger of two numbers.
   b) Smaller of two numbers.
   c) Sum of the squares of two numbers.

c) Write a program to generate Pascal's triangle.

d) Write a program to count the number of letters, words, and lines in a given text.

8. Unit IV (Cycle 8)

1. Write a program to store the numbers given by the user in an array, and then to find the mean, deviations of the given values from the mean, and variance.
2. Write a C program to initially store user given numbers in an array, display them and then to insert a given number at a given location and to delete a number at a given location.
3. Write a program to store user given numbers in an array and find the locations of minimum and maximum values in the array and swap them and display the resulting array.

9. Unit IV (Cycle 9)

1. Write a C program to implement the operations of matrices – addition, subtraction, multiplication.
2. Write a program to find whether a given matrix is symmetric, lower triangular, upper triangular, diagonal, scalar, or unit matrix.

10. Unit V (Cycle 10)

1. Write a function to swap two numbers.
2. Write a function to compute area and circumference of a circle, having area and Circumference as pointer arguments and radius as an ordinary argument.

11. Unit VI (Cycle 12)

1. Write a program to:
   Create a file by the name given by the user or by command line argument and add the text given by the user to that file.

a) Open the file created above and display the contents of the file.
b) Copy a file into some other file, file names given by the user or by command line arguments.
c) Append a user mentioned file to another file.
d) Reverse the first n characters of a file.

12. Cycle 13:
Case study on Electricity Billing, Restaurant Billing System

Syllabus for B.Tech CSE-DS I year I Semester
WORKSHOP/MANUFACTURING PROCESSES LAB
(Common to all branches)

Course Code: 9BC61
Prerequisite: NIL

L	T	P	C
0	1	3	2.5

Course Objectives:

1. To know the different popular manufacturing process
2. To gain a good basic working knowledge required for the production of various engineering products
3. To provide hands on experience about use of different engineering materials, tools, equipment's and processes those are common in the engineering field
4. To identify and use marking out tools, hand tools, measuring equipment and to work to prescribed tolerances

Course Outcomes:

After completion of the course, the student will be able to:

1. CO-1: Demonstrate and make use of workshop tools for fitting, carpentry, welding, casting, and smithy, and moulding, glass cutting and electric connections.
2. CO-2: Design and fabricate products with wood, MS flat, GI sheet material.

LIST OF EXPERIMENTS

S.No	Trades	Experiment name
1	Fitting Shop	**1**. Preparation of T-Shape Work piece **2.** Preparation of U-Shape Work piece which contains: Filing, Sawing, Drilling, Grinding.
2	Carpentry	3. Cross Half Lap joint 4. Half Lap Dovetail joint
3	Electrical & Electronics	5. One lamp one switch 6. Stair case wiring
4	Welding (Arc& Gas) & Soldering	7. Practice of Lap and Butt joint by Arc welding Demonstration: Gas welding, Resistance welding & Soldering
5	Casting	8. Preparation of mould cavity using solid pattern 9. Preparation of mould cavity using split pattern Demonstration: pouring of molten metal
6	Tin Smithy	10. Preparation of Rectangular Tray 11. Preparation of Square box
7	Machine Shop	Turning, Drilling and grinding operations on Lathe, Drilling and grinding machines
8	Plastic moulding& Glass Cutting	12 a) Injection Moulding b) Glass Cutting with hand tools
9	Domestic Appliances	Study of internal components & circuit of appliances such as Fans, Mixers, Air blower, Iron box, Rice cooker, Emergency light etc.,

Syllabus for B.Tech CSE-DS I year II Semester

ENGINEERING PHYSICS

L	T	P	C
2	1	0	3

Code: 9HC07

Course Objectives:

1. Explain about the Quantum Mechanics to understand wave particle duality, necessity of quantum mechanics to explore the behavior of subatomic particles. Schroedinger's Time Independent Wave Equation, Physical Significance of the Wave Function – Application of Schroedinger wave equation.
2. To understand the basic concepts of normal light, Laser and its applications and to know about the fiber optics, principle (TIR), Numerical Aperture, Types of optical Fibers, Step index and graded index Fibers, attenuation in optical fibers. Applications: optical fiber communication system, fiber optic sensors, medical endoscopy.
3. To study the concepts of magnetism and superconductivity, Bohr magneton, Hysteresis nature, domain structure, Meissner effect, types of superconductors, BCS theory and applications of superconductors.
4. To understand the concepts of dielectrics, polarizations and its types, internal fields, Clausius-Mossitti equation, Frequency and temperature effect on dielectrics and its applications – Piezo-electricity, Pyro-electricity and ferro-electricity.
5. To know about the semiconductors, types, carrier concentration, Thermistor, Hall effect and also to understand the concept of PN-junction, I-V Characteristics, LED, Solar Cell and Photo diode.
6. To discuss about the nano-technology, preparation techniques and characterization (XRD, SEM & TEM), CNTs and to know about the fundamentals of radioactivity and its applications.

Course Outcomes:

After completion of the course, the student will be able to:

CO1	Interpret the concept of quantum mechanics, Schroedinger wave equation and its application for one dimensional potential box.	L2
CO2	Explain the principle, construction and working of lasers and fiber optics along with their applications.	L2
CO3	Summarize the phenomenon of magnetism and superconductivity.	L2
CO4	Outline the concepts of dielectrics, polarization and apply the same for Piezo, Ferro and Pyro-electricity.	L2, L3
CO5	Identify the nature of semiconductors and demonstrate the semiconductor devices.	L2, L3
CO6	Characterize the nano and bulk materialsfor various applications.	L3

UNIT:1

Wave nature of particles, Schrodinger equation and its application (8 Periods)

Waves and Particles, de-Broglie Hypothesis, Matter waves, Davisson and Germer's Experiment, G.P. Thomson Experiment, Heisenberg's Uncertainty Principle, Schrodinger's Time Independent Wave Equation – Physical Significance of the Wave

Function–Application of Schrodinger wave equation - Particle in One Dimensional Potential Box.

UNIT:2

Lasers and Fiber Optics (6+6 Periods)

Lasers:

Characteristics of LASER, Spontaneous and Stimulated Emission of Radiation, Einstein's Coefficients and their significance. Meta-stable State, Pumping, Population Inversion and Optical resonator. Ruby Laser, Helium-Neon Laser, Semiconductor Diode Laser, Applications of Lasers.

Fiber optics:

Principle and construction of optical fiber, Acceptance Angle and Numerical Aperture.Based on refractive index profile classification of Optical Fibers: Single mode & Multimode mode Step index fibers, Single mode & Multimode mode graded index fibers. Attenuation in Optical Fibers (scattering, absorption and bending losses), optical Fiber communication system, Fiber Optic Sensors-Temperature sensor, Pressure sensor and Medical Endoscopy.

UNIT:3
Magnetism and Superconductivity.(5+4 Periods)

Magnetic Materials:
Origin of Magnetic Moment-Bohr Magneton.Ferromagnetic domain, Magnetization process by using domain, B-H curve explanation based on Domain theory and important outcomes of the curve.Hard and Soft Magnetic Materials.

Super conducting Materials:
General properties of Superconductors.Effect of Magnetic Field, Critical current density, Meissner effect, Penetration depth.Type-I and Type-II superconductors, BCS theory, Magnetic levitation.

UNIT:4 (8 Periods)
Dielectric materials
Electric Dipole, Dipole Moment, Dielectric Constant, Electric Susceptibility. Electronic, Ionic polarizability (Quantitative) and Orientation Polarization (Qualitative). Internal fields in Solids, Clausius-Mossotti equation, Frequency and temperature effect on Dielectrics (Qualitative), Applications - Piezo-electricity, Pyro-electricity and Ferro-electricity.

UNIT:5 (5+5 Periods)
Semiconductors and Semiconductor devices
Semiconductors:
Fermi Level in Intrinsic and Extrinsic Semiconductors.Carrier concentration of Intrinsic and Extrinsic Semiconductor (qualitative).Direct& Indirect Band Gap Semiconductors, Hall Effect in semiconductors.

Semiconductor devices:
Formation of a PN Junction and working of a PN Junction diode, Energy band Diagram of open circuited PN Diode, I-V Characteristics of PN Junction diode. Applications: LED, Solar Cell and Photo diode.

UNIT:6
Nanomaterials and their fabrication: (7 Periods)
Origin of Nanotechnology, Nano Scale, Surface to Volume Ratio, Quantum Confinement, Bottom-up Fabrication, Sol-gel method, Chemical vapor Deposition technique (CVD); Top-down Fabrication; Ball Milling, Characterization of Nano materials (XRD & TEM), carbon Nano tubes (CNTs), Applications of Nano Materials.

TEXT BOOKS:
1.B.K. Pandey & S. Chaturvedi Engineering Physics, Cengage Learning

REFERENCE BOOKS:
1.P K Palanisamy, Engineering Physics, Sitech Publications
2. Charles Kittel, Introduction to Solid State Physics, John Wiley Publisher
3. A.S. Vasudeva , Modern engineering Physics, S. Chand
4. Dekker, Solid State Physics
5. Dr. M.N. Avadhanulu, Engineering Physics, S. Chand
6. Dekker, Solid State Physics
7. Halliday and Resnick, Physics
8. S.O. Pillai, Solid State Physics
9. A. Ghatak - Optics

Syllabus for B.Tech CSE-DS I year II Semester
DATA STRUCTURES
(Common to all Branches)

L	T	P	C
3	0	0	3

Prerequisites: Problem Solving using C
Course Code: 9EC01
Course Objectives:

1. To provide the knowledge of structures, unions, enum and typedef.
2. To understand and learn the applications of Abstract data Type, linear data structures such as stacks, queues and linked list.
3. To comprehend different nonlinear data structures.
4. To understand and analyze the concepts of various searching and sorting techniques.

Course Outcomes:
After completion of this course student will be able to:

1. Explain different data structure and select the appropriate data structure to develop applications. [L2,L3]
2. Illustrate various Linear,Non Linear data structure in developing applications.[L2,L3]
3. Demonstrate various hashing and collision resolution techniques for enhancing the performance of algorithms.[L3]
4. Asses the performance of various searching and sorting techniques. [L5]

UNIT I:
Structures: Introduction, types, initialization and accessing, Array of Structures, Nested Structures, Self-referential structures. Unions, enum, typedef, Dynamic Memory allocation.

UNIT II:
Introduction to data structures: Abstract data type (ADT), Stacks, Queues and Circular queues and their implementation with arrays.
Applications of Stack: infix to post fix conversion, postfix expression evaluation. Applications of Queues.

UNIT III:
Linked list: introduction, advantages of Linked list over Arrays.
Single linked list: creation, insertion, deletion and display operations
Double linked list: creation, insertion, deletion and display operations
Circular linked list: creation, insertion, deletion and display operations,
Implementation of Stacks and Queues with singly linked list.

UNIT IV:
Trees: Terminology, Binary Tree: types, representation and traversals (in-order, pre-order, post-order).
Binary Search Tree: introduction, operations (insertion, deletion, display)
AVL Trees: Definition, examples, and operations (insertion, deletion and searching).

UNIT V:
Graphs: terminology, representation, traversals (DFS and BFS).
Heaps: Introduction, Min Heap, Max Heap, Operations on Heaps, Heap Sort.
Hashing: Hash Table, Hash functions.
Collision resolution techniques: separate chaining, open addressing-linear probing, quadratic probing, double hashing.

UNIT VI:

Searching: linear and binary search methods.

Sorting: Bubble Sort, Insertion Sort, Selection Sort, Quick sort, Merge sort

Performance analysis of Searching and Sorting Algorithms.

TEXT BOOKS:

1. Data Structures Using C second edition by Reema Thareja Oxford university press
2. Data Structure through C by Yashavant Kanetkar

REFERENCES:

1. Alfred V. Aho, Jeffrey D. Ullman, John E. Hopcroft. Data Structures and Algorithms. Addison Wesley,1983 .
2. Data Structures using c Aaron M.Tenenbaum ,YedidyahLangsam,MosheJAugenstein.
3. Introduction to Data Structures in C ByKamtane
4. Data Structures, A pseudocode Approach with C by Richard F. Gilberg and Behrouz A. Forouzan.

Syllabus for B.Tech CSE-DS I year II Semester
ADVANCED CALCULUS
(Common to all branches)

L	T	P	C
2	1	0	3

Code: 9HC12
Pre Requisites: Mathematics Knowledge at Pre-University Level
Course Objectives:

1. Basic concepts of multivariable differential calculus.
2. Evaluation of double and triple integrals.
3. Solutions of first order linear and non-linear partial differential equations.
4. Series expansion of a given function in terms of sine and cosine terms.
5. Basic Concepts of vector differential calculus.
6. Concepts of vector integral calculus

Course Outcomes:
After the course completion the students will be able to

1. *Compute the Jacobian transformation, the extreme values of a multivariable function and solve the first order linear and non linear PDEs. (L2, L3)*
2. *Evaluate double integrals using change of order of integration and change of variables, triple integrals (L3, L5)*
3. *Determine Fourier series expansion of a function over the interval.(L5)*
4. *Find directional derivative and solve the problems on line, surface and volume integrals. (L1,L3)*

UNIT-I: Functions of several variables: Limits, Continuity and partial derivative, total derivative, Jacobian, Maxima and minima of two variable functions (without constraints).

UNIT-II: Multiple Integrals: Double integrals, change of order of integration, change of variables (Cartesian to polar), Triple integrals (Cartesian form).

UNIT-III: Partial Differential Equations: Formation of partial differential equations, solutions to first order linear and non-linear partial differential equations - standard Forms,

UNIT-IV: Fourier series: Dirichlet conditions, Fourier series of functions over the intervals of length 2l& 2π. Half range sine and cosine series, Problems on Parseval's theorem (without proof).

UNIT-V: Vector Differentiation: Vector and scalar point functions, gradient, directional derivatives; divergence and curl of a vector point function and problems.

UNIT-VI: Vector Integration: Line integrals, surface integrals, volume integrals, Green, Gauss divergence and Stokes theorems (without proofs) and problems.

TEXT BOOKS:

1. R K Jain and S R K Iyengar Advanced Engineering Mathematics, Narosa Publications.
2. B.S. Grewal, Elementary Engineering Mathematics, Khanna Publishers
3. Alan Jeffery, Advanced Engineering Mathematics, Academic Press
4. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint,2010.
5. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons,2006.

Syllabus for B.Tech CSE-DS I year II Semester
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Code: 9AC48

L	T	P	C
3	0	0	3

Course Objective:

To understand the basics of Electrical engineering concepts and applications

Course Outcomes:

After studying this course, the student will be able to

1. ApplytheprinciplesofelectricalcircuitsandDCgenerationwithbasicequations.[L3]
2. IllustratetheworkingprinciplesofDCandthreephaseACmotors.[L3]
3. Analysetheconstructionandworkingprinciplesofdiode,varioustransistorswithapplications.[L4]
4. UsenumberingsystemstosolveBoolean expressions.[L3]

Unit – I: Fundamentals of Electrical Engineering and DC Machines:

Ohm's Law, Kirchhoff's Laws, types of sources, passive elements. Series parallel circuits, mesh and nodal analysis. Superposition, Reciprocity theorem.

DC Machines: Principle of operation of D.C generators, types, E.M.F equation. Principle of operation of D.C motors, Types motors, Torque equation, Losses and efficiency, simple problems on D.C Generators and motors.

Unit – II: Fundamentals of AC circuits:

AC voltage wave form and basic definitions: Peak Value, R.M.S. value, Average values, Form factor and Peak factor, 'j' operator, Analysis of single phase AC circuits series and parallel (Simple circuits). Three phase circuits – Star - delta connection, Relation between line and phase voltages / currents in a 3-phase Star-Delta balanced system.

Unit – III: Induction Motors and Instruments:

Concept of Faraday's laws, 3- phase induction motor working principle, operation and construction details.

Instruments: Introduction, classification of instruments, operating principles, essential features of measuring instruments, permanent magnet moving coil (PMMC) instruments, moving iron (MI) instruments.

UNIT IV-DIODE: Overview of Semiconductors, PN junction diode and Zener diode –Diode circuits: rectifiers (bridge type only), filters, clippers and clampers.

UNIT V- TRANSISTOR: BJT construction, operation, characteristics (CB, CE and CC configurations) and uses – JFET and MOSFET construction, operation, characteristics (CS configuration) and uses.

UNIT VI-DIGITAL ELECTRONICS: Number systems – binary codes –binary arithmetic - Boolean algebra, laws & theorems - simplification of Boolean expression using K maps - logic gates - implementation of Boolean expressions is using logic gates - standard forms of Boolean expression.

TEXT BOOKS:

1. Basic Electrical Engineering –T.K. Nagesarkar and M.S. Sukhja, Oxford University Press.2nd edition.
2. Basic electrical Engineering – M.S. Naidu and S. Kamakshiah – TataMcGraw-Hill, 2005 edition.
3. Principles of Electronics - V.K.Mehta, S.Chand Publications, 2nd edition.

REFERENCES:

1. Theory and problems of Basic electrical Engineering- D.P.Kotahari&I.J.Nagrath PHI.
Electronic Devices and Circuits, Millman & Halkias, TMH publications.

Syllabus for B.Tech CSE-DS I year II Semester
ENGINEERING GRAPHICS
(Common to all branches)

Code :9BC01
Pre Requisites: Nil

L	T	P	C
1	0	4	3

Course objectives:
1. To teach students the basic principles of Engineering graphics and instruments used and construct curves.
2. To introduce the concept of projections in drawing and its applications for simple drawing entities i.e., points and lines.
3. To impart the knowledge of various types of planes and solids and their projections in different position with respect toprinciple planes
4. To teach the concept of sections of solids and their developments.
5. To develop a clear understanding of the basic principles involved in three dimensional Engineering drawings.
6. To teach conversion from three dimensional drawing to two dimensional drawing and introduce the concepts of CAD.

Course outcomes:
After completing this course, the student will able to:
1. Outline the basics of engineering graphics, engineering curves and Auto CAD
2. Interpret the orthographic and isometric projections of points, lines and solids.
3. Draw the Sections of Solids and development surfaces including Cylinders, cones, prisms and pyramids
4. Develop orthographic views from isometric views and vice versa.

UNIT – I
Introduction to Engineering Drawing: Drawing Instruments and their uses, types of lines, Lettering, Dimensioning-Terms & notations, placing of dimensions, general rules of dimensioning **Scales**(concepts).**:**RF,Reducing, Enlarging and Full Scales
Curves: Conic Sections including Rectangular Hyperbola - General method, Cycloid and Involutes of circle.
UNIT – II
Orthographic Projection: Principles of Projection – Methods of projection, First angle and third angle projections.
Projections : Projections of Points, Projections of straight lines –line inclined to one plane and line inclined to both reference planes.
UNIT –III
Projections of regular Planes: types of planes, plane inclined to one reference plane, Oblique planes
Projections of regular Solids: types of solids, Projections of: Prisms, Cylinders, Pyramids, Cones – simple position and axis inclined to one plane only
UNIT –IV
Sections and sectional views of Solids: Sections and Sectional views of Right Regular Solids – Prism, Cylinder, Pyramid – Auxiliary views.
Development of Surfaces: Methods of development, Development of lateral Surfaces of Right Regular Solids – Prisms, Cylinders, Pyramids, Cones and their sections.
UNIT – V
Isometric Projection: Introduction, Isometric axes, lines and planes, Isometric Scale – Isometric drawing or View – Isometric drawing of planes and simple solids such as prisms, pyramids, cylinder, cone.
UNIT –VI
Conversion of isometric views to orthographic views of simple objects.
Introduction to CAD : Benefits of CAD, Graphic input and output devices - Function performed by CAD Software, AUTOCAD-Drawing Entities, Editing commands.

TEXT BOOKS:
Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House (In First-angle Projection Method)

REFERENCE BOOKS:

1. Shah, M.B. &Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education
2. Agrawal B. &Agrawal C. M. (2012), Engineering Graphics, TMH Publication
3. AUTOCAD Software Theory and User Manuals

Syllabus for B.Tech CSE-DS I year II Semester
ORAL COMMUNICATION LAB – II
(Common for all Branches)

L	T	P	C
0	0	3	1.5

Lab Code: 9HC62 **Maximum Marks: 100 (Internal – 30 / External – 70)**

Course Objectives:

1. To enable students to enhance oral communication skills
2. Develop the skill of speaking effectively
3. Get introduced basics of soft skills and enhance their confidence levels and etiquette
4. Learn to make formal presentations both online and offline.
5. Improve their reading skills by applying different strategies of reading
6. Understand the nuances and learn the art of group discussion

Course Outcomes:

After completion of the course, the student will be able to

1. Use appropriate language in varied real- world scenarios. (L3)
2. Develop a winning presentation and present themselves with ease in various competitive situations.(L4)

Unit	OC Lab (2 hrs. per week)	No. of periods (32 hrs.)
Unit 1	**Small talk and conversational techniques** Tips on enhancing conversation skills. Conversation starters, small talk questions, how to talk to strangers andpractice activities on initiating informal conversations. • Talk about your favourite things. • Interview each other.	6
Unit 2	**Role Play/skit/one act play** • Role play assuming fictional characters and non-fictional characters. • One Act plays • Ad' Venture: Advertisement creation and enacting.	4
Unit 3	**Just a minute (JAM)** One-minute speaking activity on topics of students' choice and Extempore.	6
Unit 4	**Presentation skills** Introduction to structural talk.Techniques of making effective presentations. • Five minute PowerPoint presentations.	6
Unit 5	**Group Discussions** Tips on Dos and Don'ts of Group Discussion (GD).Discussion on evaluation pattern during GD. • Practice sessions: GDs on different topics.	4
Unit 6	**Facing questions: Mock Interviews** Strategies of handling Question and Answer sessions after Presentations/seminars. • Question Toss: Practice on asking and answering questions.	6

Suggested Reading:

1. "Effective Technical Communication" by M. Ashraf Rizvi, McGraw Hill.
2. "Skill Sutras" by JayashreeMohanraj, Prism Books Pvt. Ltd.
3. "Technical Communication: Principles and Practice" by Meenakshi Raman, OUP.
4. "Effective Communication" John Adair, Pan Macmillan Ltd.
5. "Body Language", by Allan Pease, Sudha Publications.
6. "Business Communication: From Principles to Practice" MM Monippally, TataMcGraw Hill.

Syllabus for B.Tech CSE-DS I year II Semester
ENGINEERING PHYSICS LAB

Code: 9HC66

L	T	P	C
0	0	3	1.5

Course Objectives:

1. Understand the concept of photo electric effect using photo voltaic cell.
2. Discuss the dispersive power of prism-Minimum deviation method.
3. Discussion of diffraction pattern using the grating – LASER.
4. To study the concepts (numerical aperture) of an optical fiber.
5. To explain about magnetic induction, Biot-Savart principle.
6. Study the frequency of AC mains using Sonometer.
7. Explaining about the electrical resonance by using the LCR circuit.
8. To understand the rigidity modulus & periodicity.
9. To discuss the energy gap (E_g) of a semiconductor diode.
10. To study the LED characteristics and forward resistance.
11. To know the time constant of RC circuit.

Course Outcomes:
After completing the experiments, students are able to

CO1	Demonstrate the concepts of photo electric effect, total internal reflection, diffraction & dispersion of light.	L2
CO2	Demonstrate the concepts of rigidity modulus, periodicity and oscillations.	L2
CO3	Compare and contrast the Biot-Savart law with Oersted law and explain the concept of Magnetostriction.	L4, L3
CO4	Analyze the electrical resonance, time constant, band gap and forward resistance of a semiconductor diode.	L4

List of Experiments

1. **Photo voltaic cell:**
   -Determination of Planck's constant by using photo voltaic cell.
2. **Dispersive power:**
   -Calculation of dispersive power of a given material of prism by using Spectrometer.
3. **Diffraction Grating:**
   -Determination of wavelength of a given laser source of light by using diffraction grating.
4. **Numerical Aperture:**
   -Determination of a Numerical Aperture (NA) of an optical fiber.
5. **Stewart-Gee's Experiment:**
   -Determination of magnetic induction flux density along the axis of a current carrying circular coil using Stewart and Gee's experiment.
6. **Sonometer:**
   -Calculating the frequency of AC supply by using the Sonometer.
7. **LCR Circuit:**
   -Study of series and parallel resonance of an LCR circuit.
8. **Torsional pendulum:**
   -Determination of rigidity modulus of a given wire material using the Torsional pendulum.
9. **Energy Gap:**
   -Determination of the energy gap (E_g) of a given semiconductor.

10. **Light Emitting Diode:**
    -Studying the LED characteristics and calculating the forward resistance of it.
11. **RC Circuit:**
    -Determination of time constant of an RC-circuit.

NOTE: Any **TEN** of the above experiments are to be conducted.

Syllabus for B.Tech CSE-DS I year II Semester
DATA STRUCTURES Using C LAB
(Common to all Branches)

Course Code:9EC61

L	T	P/D	C
0	0	3	1.5

Prerequisites: Problem Solving using C Lab

Course objectives:

1. Create programs on structures and unions
2. Develop the programs on Linear and Non-Linear data structures
3. Write programs on various searching and sorting algorithms.

Course Outcomes:

After completion of the course, the student will be able to

1. Develop programs to illustrate various linear and nonlinear data structures using C language [L3]
2. Develop programs to assess the performance of various searching and sorting techniques using C language [L3,L5]

Note: Lab Projects will be allocated to the students at the beginning of the semester.

Cycle 1:

1. Define a structure for complex number. Write functions on complex numbers (addition, subtraction, absolute value, multiplication, division, complex conjugate) and implement them in a menu driven style.
2. Define a structure student having members roll no., name, class, section, marks.
   Create an array of 10 students give the data and find the average marks, section-wise.

Cycle 2:

3. Write a C program that implement stack and its operations using arrays
4. Write a C program that implement Queue and its operations using arrays.
5. Write a C program that implement Circular Queue and its operations using arrays.

Cycle 3:

6. Write a C program that uses Stack operations to perform the following:
   i) Converting infix expression into postfix expression
   ii) Evaluating the postfix expression

Cycle 4:

7. Write a C program that uses functions to perform the following operations on
   Single linked list:
   i) Creation ii) Insertion iii) Deletion iv) Traversal

Cycle 5:

8. Write a C program that uses functions to perform the following operations on
   Doubly linked list:
   i) Creation ii) Insertion iii) Deletion iv) Traversal in both ways

Cycle 6:

9. Write a C program using functions to perform the following operations on
   Circular linked list:
   i) Creation ii) Insertion iii) Deletion iv) Traversal

Cycle 7:

10. Write a C program to implement operations on the following Data Structures
    Using Singly linked list:
    i) Stack ii) Queue

Cycle 8:

11. Write a C program that uses functions to perform the following:
    i) Creating a Binary Search Tree.
    ii) Traversing the above binary tree in pre-order, in-order and post-order.

Cycle 9:

12. Write C programs that use both recursive and non-recursive functions to perform the following searching operations for a Key value in a given list of integers:
    i) Linear Search ii) Binary Search

Cycle 10:

13. Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
    i) Bubble Sort ii) Insertion Sort iii) Selection Sort

Cycle 11:

14. Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
    i) Quick sort ii) Merge sort iii) Heap Sort

Cycle 12:

15 Lab Projects- Design and Develop Case Studies such as,Graph Traversal Techniques, Collision Resolution Techniques

Syllabus for B.Tech CSE-DS II year I Semester
OBJECT ORIENTED PROGRAMMING THROUGH JAVA
(Common to CSE, IT and ECM)

L	T	P/D	C
2	1	0	3

Code: 9EC02

Course Objective:

1. Understand the concepts of Object oriented programming principles of Java.
2. Write the programs and execute using OOP Principles such as garbage collection, overloading methods, constructors, recursion, string handling, String Tokenizer, inheritance and its types, packages, multithreading and threads.

Course Outcomes:

After completion of the course, the student will be able to:

1 Comprehend the fundamentals of Java, Classes, Objects and design the java programs using constructors and String handling methods.
2 Design the programs using inheritance, polymorphism and interface.
3 Develop programs using Packages, I/O Streams and collections.
4 Apply the concepts of Exception handling and Multithreading for various scenarios.
5 Create programs using AWT, Swings and develop applications using event handling.
6 Develop applications using Applets and client server programs using networking concepts.

UNIT I

History of Java, Java buzzwords, datatypes, variables, simple java program, scope and life time of variables, operators, expressions, control statements, type conversion and costing, arrays,, classes and objects – concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, recursion, string handling, StringTokenizer.

Applications: Basic operations on the bank account of a customer.

UNIT II

Inheritance –Definition, single inheritance, benefits of inheritance, Member access rules, super class, polymorphism- method overriding, Dynamic method dispatch, using final with inheritance, abstract classes, Base class object.

Interfaces: definition, variables and methods in interfaces, differences between classes and interfaces, usage of implements and extends keyword, interfaces, uses of interfaces, packages Applications: Extending the banking operations to the loan applicants.

UNIT III

Packages: Definition, types of packages, Creating and importing a user defined package. Introduction to I/O programming: DataInputStream, DataOutputStream, FileInputStream,FileOutputStream, BufferedReader.

Collections: Interfaces, Implementation classes, and Algorithms (such as sorting and searching).

Applications: Searching for a string in the text. PNR status check, students' result sorting.

UNIT IV

Exception handling -exception definition, benefits of exception handling, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes.

Multi-Threading: Thread definition, types of multitasking, uses of multitasking, thread life cycle, creating threads using Thread class and Runnable interface, synchronizing threads, daemon thread.

Applications: Illegal entry handling in the registration form. (Example: entering incorrect intermediate hall-ticket number in EAMCET Registration form)

UNIT V

Advantages of GUI over CUI ,The AWT class hierarchy, Introduction to Swings, Swings Elements:- JComponent, JFrame, user interface components- JLabels, JButton, JScrollbars, text components, check box, check box groups, choices, lists panels – scrollpane, menubar, graphics, layout, managers –boarder, grid, flow, card and grid bag.

Event handling: Delegation event model, closing a Frame, mouse and keyboard events, Adapter classes.

Applications: developing calculator, developing feedback form, developing bio data.

UNIT VI

Applets – Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.

Applications: Developing of simple advertisements.

Networking – Basics of network programming, addresses, ports, sockets, simple client server program, multiple clients, sending file from server to client.

Applications: One to one Chat application

TEXT BOOKS:

1. Java; the complete reference, 6th edition, Herbert Schildt,TMH.
2. Introduction to Java programming 6th edition, Y. Daniel Liang, Pearson education.

REFERENCES:

1. Core Java 2, Vol 1, Fundamentals, Cay. S. Horstmann and Gary Cornell, seventh Edition, Pearson Education.
2. Core Java 2, Vol 2, Advanced Features, Cay. S. Horstmann and Gary Cornell, Seventh Edition, Pearson Education

Syllabus for B.Tech CSE-DS II year I Semester
PROBABILITY and STATISTICS

Code: 9HC15
Pre Requisites: Mathematics Knowledge at Pre-University Level

L	T	P/D	C
2	1	0	3

Course Objectives:

1. Concept of random variables and probability distributions.
2. Sampling distributions and their properties and the concepts on estimation.
3. Concepts on testing the hypothesis concerning to large samples.
4. Topics concerned to small size samples and goodness of fit and independence of attributes.
5. Contents of correlation.
6. Method of least squares and regression.

Course Outcomes:

After the course completion the students will able to

1. Solve the random variable problems and probability distributions.
2. Solve the problems on sampling distribution, estimate the parameters using central limit theorem.
3. Solve problems on test the hypothesis related to large size samples
4. Apply and solve the problems using t-test, Chi-square test.
5. Solve the problems on correlation.
6. Solve the problems on curve fitting using least square method and can solve problems on regression.

UNIT-I: Random Variables and Probability Distributions: Random variables – Discrete and Continuous, probability mass and density functions, expectation and variance. Binomial, Poisson and Normal Distributions.

UNIT-II: Sampling Distributions and Estimation: Sampling distribution of the mean (σ - known and unknown), sums and differences, Central limit theorem. Estimation: Point estimation and Interval estimation concerning means for large samples.

UNIT-III: Tests of Hypothesis for Large Samples: Tests of Hypothesis, Type–I and Type-II Errors, Hypothesis testing concerning one mean and two means and test of hypothesis concerning to one Proportion and difference of proportions.

UNIT-IV: Tests of Hypothesis for Small Samples: Student t-test, Hypothesis testing concerning one mean and two Means, F-test and χ^2 test-Goodness of fit, Independence of Attributes.

UNIT-V: Correlation: Types of correlation, coefficient of correlation, Properties. Methods of finding the coefficient of correlation, Scatter diagram, direct method - Karl Pearson's formula Spearman's rank correlation,

UNIT-VI: Curve fitting and Regression: Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and more general curves. Types of Regression- linear regression, multiple regressions.

Suggested Readings:

1. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
2. Miller and Freund's, Probability and Statistics for Engineers, 8th Edition, Pearson Educations
3. S C Gupta and V K Kapoor, Fundamentals of Mathematical statistics, Khanna publications.

Syllabus for B.Tech CSE-DS II year I Semester
QUANTITATIVE APTITUDE and LOGICAL REASONING

Code: 9HC16

L	T	P /D	C
3	0	0	3

Pre Requisites: Nil

Course objectives:

To answer general problems in his everyday life within in short time and to improves the certain skills of a student such as numerical and logical ability, mental capacity and also in sharpening minds.

Course outcomes:

After completion of the course, the student will be able to:

1. Apply Number system, HCF and LCM, Averages, Ages and ratio and proportion.
2. Understand various important topics of quantative aptitude.
3. Understand Mensuration and data interpretation topics.
4. Illustrate Series Completion, analogy, classification and coding and decoding topics.
5. Illustrate Various topics of logical reasoning.
6. Apply Venn-diagrams, cubes and dice and also on clocks and calendar problems.

Unit I: Number System: Test for Divisibility, Test of prime number, Division and Remainders – HCF and LCM of Numbers–Fractions and Decimals -Average-Problems on Ages- Problems on Numbers- Ratio and Proportion.

Unit II: Percentage – Profit, Loss and Discount – Partnership and Share-Simple Interest - Compound Interest. Time and Work- Pipes and Cisterns-Time and Distance- Problems on Trains- Boats and Streams.

Unit III: Allegation or Mixtures, Clocks &Calendar.Mensuration : Area of Plane Figures, Volume and Surface Area of Solid Figures. Data Interpretation: Tabulation, Bar Graphs, Pie Charts, Line Graphs.

Unit–IV: Series Completion: Number Series, Alphabet Series, Alpha – Numeric Series.
Analogy: Completing the Analogous Pair, Simple Analogy, Choosing the Analogous pair, Double Analogy, Word Analogy, and Number Analogy.
Classification: Word Classification, Number Classification and Letter Classification.
Coding & Decoding: Letter Coding, Number Coding, Matrix Coding, Substitution, Deciphering Message Word Codes, Jumbled Coding. Crypt arithmetic-Inequalities-Input Output Tracing

Unit–V: Blood Relations– Direction sense test- Number, Ranking & Time Sequence Test –Mathematical Operations-Arithmetical Reasoning. Puzzle Test: Classification Type Questions, Seating Arrangements, Comparison Type Questions, Sequential Order of Things, Selection Based on Given Conditions, Family Based Puzzles, Jumbled Problems.

Unit –VI: Logical Venn Diagrams –Cubes and Dice – Analytical Reasoning-Assertions and Reason–Logical Deductions-Syllogism -Statement and Arguments-Statement and Conclusions- -Data Sufficiency.

Text Books:

1. Quantitative Aptitude by R.S.Agarwal
2. Verbal and Non Verbal Reasoning by R.S.Agarwal.

Syllabus for B.Tech CSE-DS II year I Semester
Discrete Mathematics

L	T	P /D	C
2	1	0	3

Code: 9FC03

Prerequisites: Mathematics- I and II

Course Objectives:

1. Define the syntax and semantics of propositional logic.
2. Translate statements from a natural language into its symbolic structures in logic.
3. Prove elementary properties of modular arithmetic and explain their applications in Computer Science, for example, in cryptography and hashing algorithms.
4. Apply the notion of relations on some finite structures, like strings and databases.
5. Analyze algorithms using the concept of functions and function complexity.
6. Apply graph theory models of data structures and state machines to solve problems of connectivity and constraint satisfaction, for example, scheduling.

Course Outcomes:

After completion of the course, the student will be able to:

1. Evaluate elementary mathematical arguments and identify fallacious reasoning (not just fallacious conclusions).
2. Reasoning about arguments represented in Predicate logic.
3. Perform operations on sets, functions, relations.
4. Solve problems that involve: computing permutations and combinations, Binomial and Multinomial theorems
5. Analyze and deduce problems involving recurrence relations and generating functions
6. Apply graph theory Spanning trees, planar graphs, Isomorphism and connectivity

UNIT – I

Propositional Logic: Statement and notations, Connectives, Well-formed Formulas, Truth Tables, Tautology, Equivalence, Implication, Rules of inference, Arguments, Proof by contradiction, Conditional Proof Normal forms, and Automatic theorem proving.

Objective: student will be able to understand statements, ,their truth value, constructing truth tables and will be able to prove them using different laws such as associative and commutative etc…

UNIT-II

First order logic: Predicates, Quantifiers, Free and Bound variables, Rules of inference, Consistency, Automatic Theorem Proving.

Objective: student will be able to use universal and existential quantifiers to describe predicates and effectively use automatic theorem proving

UNIT – III

Relations: Properties of Binary Relations, Equivalence, transitive closure, Compatibility & Partial Ordering Relations, Hasse Diagrams, Lattice and its properties.

Algebraic structures: Algebraic systems, Examples and general properties, Semi groups and Monoids. Groups, Subgroups, Ring, Homomorphism, Isomorphism.

Objective: student will be able to learn different relations and their properties. use of different algebraic structures and their use in mathematics.

UNIT –IV

Elementary Combinatorics:

Basics of counting, Combinations and Permutations with and without repetitions, Constrained repetitions. Binomial coefficients, Binomial and Multinomial theorems, Euler function, Derangemants, Principle of inclusion and exclusion, Pigeon hole principle and its applications.

Objective: student will be able to apply permutations and combinations to solve problems. use of pigeonhole principle and inclusion exclusion principles to solve problems.

UNIT V

Recurrence relations: Generating functions. Function of sequences. Recurrence relations, Solving recurrence relations by substitution and generating functions. Characteristic roots. Solution of Inhomogeneous recurrence relations.

Objective: student will learn to solve various recurrence relations by using different techniques.

Unit VI

Graph Theory: Basic concepts**,** Representation of Graph, DFS, BFS, Spanning trees, Planar graphs, coloring, Isomorphism and subgraphs, Multi graphs andconnected graphs, Euler Circuits, Hamiltonian graphs, Chromatic numbers,.

Objective: student will learn the basics of graph theory, different ways of traversing the graph and different types of graphs and circuits which has important applications in further subjects.

TEXT BOOKS :

1. Discrete Mathematics for Computer Scientists & Mathematicians, J.L. Mott, A. Kandel, T.P. Baker, PHI.
2. Discrete mathematics with applications to computer science, J.P.Tremblay and R.Manohar, TMH
3. Elements of Discrete mathematics – A computer Oriented Approach- C L Liu, D P Mohapatra. Third Edition, Tata MacGraw Hill.

REFERENCES:

1. Discrete and Combinational Mathematics- An Applied Introduction-5th Edition – Ralph. P.Grimaldi.Pearson Education.
2. Discrete Mathematics and its Applications, Kenneth H. Rosen, Fifth Edition.TMH.
3. Discrete Mathematical structures Theory and application-Malik & Sen, Cengage.

Syllabus for B.Tech CSE-DS II year I Semester
Computer Science and Engineering Data Science
PYTHON PROGRAMMING

Code: 9FC02

L	T	P/D	C
2	1	0	3

Prerequisite: Problem Solving using C Lab

Course Objectives:-

Use Python interactively, execute a Python script at the shell prompt, use Python types, expressions, and None, use string literals and string type, use Python statements (if...elif..else, for, pass, continue, . . .), understand the difference between expressions and statements, understand assignment semantics, write and call a simple function., utilize high-level data types such as lists and dictionaries, understand the difference between mutable and immutable types, write a simple class and access methods and attributes, import and utilize a module, read from and write to a text file.

Course Outcomes:

After taking this course, you should be able to:

1. Gains exposure towards Python versions and their specifications.
2. Build programs using primitive data types.
3. Write applications that include functions, modules, packages along with respective exceptional handling mechanism.
4. Writes applications using OO features of Python
5. Write applications using Files.
6. Experience Hands on exposure on NumPy/Tkinter/Plotpy modules.

Unit -I:

Introduction to Python: History, Features, Modes of Execution, Setting up path, working with Python Basic Syntax, Variable and Data Types, Operators. Conditional Statements (If, If- else, Nested if-else) Looping (for, While Nested loops) Control Statements (Break, Continue, Pass).

Input-Output: Printing on screen, Reading data from keyboard, Opening and closing file

Unit-II:

Functions: Defining a function, calling a function, Types of functions, Function Arguments, Anonymous functions, Global and local variables

String Manipulation: Accessing Strings, Basic Operations, String slices, Function and Methods

Lists: Accessing list, Operations, Working with lists Function and Methods

Tuple: Accessing tuples, Operations, Working.

Dictionaries: Accessing values in dictionaries, working with dictionaries, Properties Functions and Methods.

Unit-III:

Modules: Importing module, Math module, Random module, Packages

Exception Handling: Exception, Exception Handling, Except clause, Try? Finally clause User Defined Exceptions

Unit-IV:

Python- OOPs concept: Class and object, Attributes, Inheritance, Overloading Overriding, Data hiding.

Regular expressions: Match function, Search function, Matching VS Searching, Modifiers Patterns.

Unit -V:

Introduction to Files, File Handling, Working with File Structure, Directories, Handling Directories

Unit -VI:

Case Study with NumPy/PlotPy/SciPy/GUI Programming, Introduction, Tkinter programming, Tkinter widgets

TEXT BOOK:

1. [Apress]-Beginning Python. From Novice to Professional, 2nd ed. - [Hetland] (2008)

Reference books:

1. Introduction to Computation and Programming using Python, Revised and Expanded Edition, John V. Guttag, The MIT Press.
2. Programming Python, Fourth Edition by Mark Lutz, O'Relly
3. Python Programming using problem solving approach, Reema Thareja, Oxford Higher Education.

Syllabus for B.Tech CSE-DS II year I Semester
UNIVERSAL HUMAN VALUES
(Common to All Branches)

Code: 9HC03

L	T	P/D	C
3	0	0	3

Human Values Courses: This course also discusses their role in their family. It, very briefly, touches issues related to their role in the society and the nature, which needs to be discussed at length in one more semester for which the foundation course named as "H-102 Universal Human Values 2: Understanding Harmony"is designed which may be covered in their III or IV semester. During the Induction Program, students would get an initial exposure to human values through Universal Human Values – I. This exposure is to be augmented by this compulsory full semester foundation course.

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

Course Outcomes:
After completion of the course, the student will be able to:
1.This course also discusses their role in their family. It, very briefly, touches issues related to their role in the society and the nature, which needs to be discussed at length in one more semester for which the foundation course named as "H-102 Universal Human Values
2. Understanding Harmony is designed which may be covered in their III or IV semester. During the Induction Program, students would get an initial exposure to human values through Universal Human Values – I. This exposure is to be augmented by this compulsory full semester foundation course.
COURSE TOPICS: The course has 28 lectures and 14 practice sessions in 6 modules:

Module 1: Course Introduction - Need, Basic Guidelines, Content and Process for Value Education

1. Purpose and motivation for the course, recapitulation from Universal Human Values-I
2. Self-Exploration–what is it? - Its content and process; 'Natural Acceptance' and Experiential Validation- as the process for self-exploration
3. Continuous Happiness and Prosperity- A look at basic Human Aspirations
4. Right understanding, Relationship and Physical Facility- the basic requirements for fulfillment of aspirations of every
human being with their correct priority
5. Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
6. 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.

Module 2: Understanding Harmony in the Human Being - Harmony in Myself!

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

12. Programs to ensureSanyam 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.

Module 3: Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship

13. Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfillment to ensure mutual happiness; Trust and Respect as the foundational values of relationship
14. Understanding the meaning of Trust; Difference between intention and competence
15. Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship
16. Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals
17. 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.

Module 4: Understanding Harmony in the Nature and Existence - Whole existence as Coexistence

18. Understanding the harmony in the Nature
19. Interconnectedness and mutual fulfillment among the four orders of nature- recyclability and self-regulation in nature
20. Understanding Existence as Co-existence of mutually interacting units in all-pervasive space
21. 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.

Module 5: Implications of the above Holistic Understanding

22. Natural acceptance of human values
23. Definitiveness of Ethical Human Conduct
24. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order

Module 6:Harmony on Professional Ethics

25. 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.
26. Case studies of typical holistic technologies, management models and production systems
27. 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
28. 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.Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010 3.
REFERENCE BOOKS:

1.JeevanVidya: EkParichaya, A Nagaraj, Jeevan VidyaPrakashan, Amarkantak, 1999.
2.Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.

3.The Story of Stuff (Book).
4.The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi
5.Small is Beautiful - E. F Schumacher.
6.Slow is Beautiful - Cecile Andrews
7.Economy of Permanence - J C Kumarappa
8.Bharat Mein Angreji Raj - PanditSunderlal
9.Rediscovering India - by Dharampal
10.Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
11.India Wins Freedom - Maulana Abdul Kalam Azad
12.Vivekananda - Romain Rolland (English)
13.Gandhi - Romain Rolland (English)

PO's	1	2	3	4	5	6	7	8	9	10	11	12
Level	M	M	M						M			H

Syllabus for B.Tech CSE-DS II year I Semester
JAVA PROGRAMMINGLAB
(Common to CSE, IT and ECM)

L	T	P/D	C
0	0	4	2

Code: 9MC61

Course objective:

Understand, design and execute the programs involving concepts of Java and object-oriented programming principles.

Course Outcomes:

After completion of the course, the student will be able to:

1. Implement programs to generate Prime numbers, Roots of a quadratic equation and Fibonacci series.
2. Develop applications such as the banking system.
3. Design and develop operator, function overloading, and dynamic method dispatch.
4. Implement applications using interface and packages.
5. Create applications by using threads to remove inconsistencies on sharable resources.
6. Develop programs by applying the concepts of applets and event handling.
7. Write and execute applications to implement client and server scenarios.

List of Programs:

1. A) Write a program to print prime numbers up to a given number.
   B) Write a program to print roots of a quadratic equationax2+bx+c=0.
   C) Write a program to print Fibonacci sequence up to a given number.

2. A) Define a class to represent a bank account and include the following members
   Instance variables:
   (i) Name of depositor (ii) Account No (iii)Type of account
   (iv) Balance amount in the account

   Instance Methods:

   To assign instance variables (Constructors-Zero argument and parameterized)

   1. To deposit an amount
   2. To withdraw amount after checking the balance
      To display name and address
      Define Execute Account class in which define main method to test above class.

   B) In the above account class, maintain the total no. of account holders present in the bank and also define a method to display it. Change the main method appropriately.
   C) In main method of Execute Account class, define an array to handle five accounts.
   D) In Account class constructor, demonstrate the use of "this" keyword.
   E) Modify the constructor to read data from keyboard.
   F) Overload the method deposit() method (one with argument and another without argument)
   G) In Account class, define set and get methods for each instance variable.

Example:

For account no variable, define the methods get Account No() and set Account No (intaccno) In each and every method of Account class, reading data from and writing data to instance variables should be done through these variables.

3. A) Define Resister class in which we define the following members: Instance variables: resistance Instance Methods: give Data():To assign data to the resistance variable display Data(): To display data in the resistance variable constructors

Define subclasses for the Resistor class called Series Circuit and Parallel Circuit in which define methods: calculate Series Resistance ( ) and calculate Parallel Resistance () respectively. Both the methods should take two Resistor objects as arguments and return Resistor object as result. In main method, define another class called Resistor Execute to test the above class.

B) Modify the above two methods which should accept array of Resistor objects as argument and return Resistor object as result.

4. A) Write a program to demonstrate method overriding.
   B) Write a program to demonstrate the uses of "super" keyword (three uses)
   C) Write a program to demonstrate dynamic method dispatch (i.e .Dynamic polymorphism).

5. A) Write a program to check whether the given string is palindrome or not.
   B) Write a program for sorting a given list of names in ascending order.
   C) Write a program to count the no. of words in a given text.

6. A) Define an interface "Geometric Shape" with methods area( ) and perimeter( ) (Both method's return type and parameter list should be void and empty respectively.

Define classes like Triangle, Rectangle and Circle implementing the "Geometric Shape" interface and also define "Execute Main" class in which include main method to test the above class

B) Define a package with name "sortapp" in which declare an interface "SortInterface" with method sort( ) whose return type and parameter list should be void and empty. Define "subsortapp" as subpackage of "sortapp" package in which define class "SortImpl" implementing "SortInterface" in which sort() method should print a message linear sort is used. Define a package "searchingapp" in which declare an interface "SearchInterface" with search( ) method whose return type and parameter list should be void and empty respectively. Define "searchingimpl" package in which define a "SearchImpl" class implementing "SearchInterface" defined in "searchingapp" package in which define a search( ) method which should print a message linear search issued.

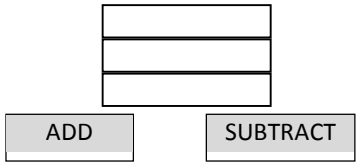
Define a class ExecutePackage with main method using the above packages (classes and its methods).

Use Array List class of Collections Framework to and use algorithms to search and sort the element of an array.

7) Modify the withdraw() method of Account class such that this method should throw "Insufficient Fund Exception" if the account holder tries to withdraw an amount that leads to condition where current balance becomes less than minimum balance otherwise allow the account holder to withdraw and update the balance accordingly.

8.A) Define two threads such that one thread should print even numbers and another thread should print odd numbers.
   B) Define more than one thread to print tables using synchronization concept.
   C) Define two threads such that one thread should read a line of text from text file and another thread should write that line of text to another file. (Thread communication example).

9) Design the user screen as follows and handle the events appropriately.



10) Write a Java program for handling mouse events and key events.

11) a) Write a program for handling window events.
    b) Develop an applet that displays a simple message.

12) Develop a client that sends data to the server and also develop a server that sends data to the client (two-way communication)

13, 14) Develop Lab projects (such as banking application, simple gaming application, scientific calculator, Client-Server Communication in corporating file handling mechanisms, etc.)

Syllabus for B.Tech CSE-DS II year I Semester
Python Programming Lab

Code: 9FC62

L	T	P/D	C
0	0	4	2

Prerequisite: Problem Solving using C Lab

Course Objectives

1. Basics of Python programming, Decision Making and Functions in Python, Object Oriented Programming using Python.
2. To introduce to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows, Linux and the required device drivers.

Course Outcomes

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

1. Apply knowledge for computer assembling and software installation and ability to solve the trouble shooting problems.
2. Apply the tools for preparation of PPT, Documentation and budget sheet etc.
3. Install and run the Python interpreter ,Create and execute Python programs.
4. Apply the best features of mathematics, engineering and natural sciences to program real life problems.
5. Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python, Express different Decision Making statements and Functions, Interpret Object oriented programming in Python.
6. Understand and summarize different File handling operations, explain how to design GUI Applications in Python.

Week -1:

1. Use a web browser to go to the Python website http://python.org. This page contains information about Python and links to Python-related pages, and it gives you the ability to search the Python documentation.
2. Start the Python interpreter and type help() to start the online help utility.
3. Start Python interpreter and use it as Calculator.

Week -2:

4. If you run a 10 kilometer race in 43 minutes 30 seconds, what is your average time per mile? What is your average speed in miles per hour? (Hint: there are 1.61 kilometers in a mile).
5. The volume of a sphere with radius r is 5? (Use Sphere volume formula)
6. Suppose the cover price of a book is $24.95, but bookstores get a 40% discount.

Shipping costs $3 for the first copy and 75 cents for each additional copy. What isthe total wholesale cost for 60 copies?

Week -3:

7. A function object is a value you can assign to a variable or pass as an argument. For example, do_twice is a function that takes a function object as an argument and calls it twice:

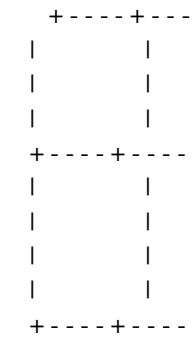
```
def do_twice(f):
f()
f()
```

Here's an example that uses do_twice to call a function named print_spam twice.

```
def print_spam():
print 'spam'
do_twice(print_spam)
```

a. Type this example into a script and test it.
b. Modify do_twice so that it takes two arguments, a function object and a value, and calls the function twice, passing the value as an argument.
c. Write a more general version of print_spam, called print_twice, that takes a string as a parameter and prints it twice.
d. Use the modified version of do_twice to call print_twice twice, passing 'spam' as an argument.

8. Write a function that draws a grid like the following:



Hint: to print more than one value on a line, you can print a comma-separatedsequence.

9. Write a function called gcd that takes parameters a and b and returns theirgreatest common divisor.

10. Write a function called is_palindrome that takes a string argument and returnsTrue if it is a palindrome and False otherwise. Remember that you can use thebuilt-in function len to check the length of a string.

Week-4:

11. Write a function called is_sorted that takes a list as a parameter and returns True if the list is sorted in ascending order and False otherwise.
12. Write a function called has_duplicates that takes a list and returns True if there is any element that appears more than once. It should not modify the original list.

Week-5:

12. Write a function called remove_duplicates that takes a list and returns a new list with only the unique elements from the original. Hint: they don't have to be in the same order.
13. The wordlist I provided, words.txt, doesn't contain single letter words. So you might want to add "I", "a", and the empty string.
14. Write a python code to read a dictionary values from the user. Construct a function to invert its content. i.e., keys should be values and values should be keys.
15. If there are 23 students in your class, what are the chances that two of you have the same birthday? You can estimate this probability by generating random samples of 23 birthdays and checking for matches.
    Hint: you can generate random birthdays with the randint function in the random module
16. How does a module source code file become a module object?

Week-6:

17. Why might you have to set your PYTHONPATH environment variable?
18. What is a namespace, and what does a module's namespace contain?
19. How do you make a module? Give an example of construction of a module using different geometrical shapes and operations on them as its functions.
20. What is the purpose of a _ _init_ _.py file in a module package directory? Explain with a suitable example.
21. Use the structure of exception handling all general purpose exceptions.

Week-7:

22. a. Write a function called draw_rectangle that takes a Canvas and a Rectangle as arguments and draws a representation of the Rectangle on the Canvas.

    b. Add an attribute named color to your Rectangle objects and modify draw_rectangleso that it uses the color attribute as the fill color.

    c. Write a function called draw_point that takes a Canvas and a Point as arguments an draws a representation of the Point on the Canvas.

    d. Define a new class called Circle with appropriate attributes and instantiate a few Circle objects. Write a function called draw_circle that draws circles on the canvas.

Week-8:

23. Write a Python program to demonstrate the usage of MRO in multiple levels of

Inheritances.

24. Write a python code to read a phone number and email-id from the user and validate it for correctness.

Week-9:

25. Write a Python code to merge two given file contents into third file.
26. Write a Python code to open a given file and construct a function to check for given words present in it and display on found.

Week-10:

27. Import numpy, Plotpy and Scipy and explore their functionalities.
28. Write a GUI program to create a window wizard having two text labels, two text fields and two buttons as Submit and Reset.

Week -11: Case Study on Mario Game, Hangman game

Syllabus for B.Tech CSE-DS II year I Semester
BASIC ELECTRICAL and ELECTRONICS ENIGINEERING LAB

L	T	P/D	C
0	0	3	1.5

Code: 9AC96
Prerequisite: NIL

Electrical Experiments

1. Brake test on 3-phase induction motor (performance characteristics).
2. Speed control of DC shunt motor by
    a) Armature Voltage Control .
    b) Field flux control method.
3. Brake test on DC shunt motor.
4. Swinburne's test on DC shunt machine.
5. OCC characteristics of DC shunt generator.
6. Verification of superposition and Reciprocity Theorems.

Electronics Experiments

1. PN Junction diode characteristics A. Forward bias B. Reverse bias.
2. Zener diode characteristics
3. Half wave Rectifier with and without filters.
4. Full wave Rectifier (Centre tapped and Bridge)with and without filters
5. Transistor CE characteristics (Input and Output)
6. Verification of Logic gates

Syllabus for B. Tech. II Year II semester
INTRODUCTION TO DATA SCIENCE

Code: 9EC16

L	T	P /D	C
2	0	0	2

Course Objective:

To know the fundamental concepts of Data Science. To explore tools and practices for working with Data Science. To learn about Principle component analysis and understand about Predictive Analytics.

Course Outcomes:

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

1. Learn about various data types, types of data sets a data quality
2. Implementation of R fundamentals and perform factors and data frames.
3. Implementation of data structures iterative programming & function concepts using R
4. Learn about data visualization techniques and apply suitable visualization techniques
5. Learn about dimensionality reduction based on examples illustrations
6. Perform predictive data analysis on variety of data along with appropriate statistical tests using R.

UNIT-I

DATA TYPES & COLLECTION

Types of Data: Attributes and Measurement, What is an Attribute?, The Type of an Attribute, The Different Types of Attributes, Describing Attributes by the Number of Values, Asymmetric Attributes, Binary Attribute (Pg.No:22-29, Text Book-1), Nominal Attributes, Binary Attributes, Ordinal Attributes, Numeric Attributes, Discrete versus Continuous Attributes (Pg. No. 39-44, Text-2), Types of Data Sets, General Characteristics of Data Sets, Record Data, Transaction or Market Basket Data, The Data Matrix, The Sparse Data Matrix, Graph Based Data, Graph-Based Data, Ordered Data. Handling Non-Record Data, Data Quality, Measurement and Data Collection Issues, Precision, Bias and Accuracy. (Pg. No. 29-39, Text-1)

UNIT-II

Basics of R: Introduction, R-Environment Setup, Programming with R, Basic Data Types, Vectors: Creating and Naming Vectors, Vector Arithmetic, Vector Subsetting, Matrices: Creating and Naming Matrices, Matrix Subsetting, Arrays, Class.

Factors and Data Frames: Introduction to Factors: Factor Levels, Summarizing a Factor, Ordered Factors, Comparing Ordered Factors, Introduction to Data Frame, Subsetting of Data Frames, Extending Data Frames, Sorting Data Frames. (Text Book-3)

UNIT-III

Lists: Introduction, Creating a List: Creating a Named List, Accessing List Elements, Manipulating List Elements, Merging Lists, Converting Lists to Vectors, Conditionals and

Control Flow: Relational Operators, Relational Operators and Vectors, Logical Operators, Logical Operators and Vectors, Conditional Statements.

Iterative Programming in R: Introduction, While Loop, For Loop, Looping Over List.

Functions in R: Introduction, Writing a Function in R, Nested Functions, Function Scoping, Recursion, Loading an R Package, Mathematical Functions in R.(Text Book -4)

UNIT-IV:

DATA VISUALIZATION

Data Visualization

Pixel-Oriented Visualization Techniques, Geometric Projection Visualization Techniques, Icon-Based Visualization Techniques, Hierarchical Visualization Techniques, Visualizing Complex Data and Relations. (Pg. No. 56-64, Text-2)

Charts and Graphs : Introduction, Pie Chart: Chart Legend, Bar Chart, Box Plot, Histogram, Line Graph: Multiple Lines in Line Graph, Scatter Plot.(Text Book-4)

UNIT-V:

DIMENSIONALITY REDUCTION

Eigen values and Eigenvectors of Symmetric Matrices, Definitions, Computing Eigen values and Eigenvectors, The Matrix of Eigenvectors, Principal-Component Analysis, An Illustrative Example, Using Eigenvectors for Dimensionality Reduction, Singular-Value Decomposition, Definition of SVD, Interpretation of SVD, Dimensionality Reduction Using SVD (Pg. No.405-422, Text Book-3)

UNIT VI

PREDICTIVE ANALYTICS

Data Interfaces: Introduction, CSV Files: Syntax, Importing a CSV File

Statistical Applications: Introduction, Basic Statistical Operations, Linear Regression Analysis, Chi-Squared Goodness of Fit Test, Chi-Squared Test of Independence, Multiple Regression. (Text Book-4)

TEXT BOOKS:

1.Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson Education Inc.
2. Han, Jiawei, Jian Pei, and Micheline Kamber, "Data mining: concepts and techniques", 3 rd Edition, Elsevier, 2011.
3. Jure Leskovec, Anand Rajaraman, Jeffrey D. Ullman, Mining of Massive Datasets, Cambridge University Press
4. K G Srinivas ,G M Siddesh "Statistical programming in R", Oxford Publications.

REFERENCE BOOKS:

1. Brain S. Everitt, "A Handbook of Statistical Analysis Using R", Second Edition, 4 LLC, 2014.
2. Dalgaard, Peter, "Introductory statistics with R", Springer Science & Business Media, 2008.
3. Samir Madhavan, "Mastering Python for Data Science", Packt, 2015.
4. Paul Teetor, "R Cookbook, O'Reilly, 2011.

PO's	1	2	3	4	5	6	7	8	9	10	11	12
Level	M	M	M									

Syllabus for B.Tech CSE-DS II year II Semester

COMPUTER ORGANIZATION

L	T	P/D	C
3	0	0	3

Code: 9CC54

COURSE OBJECTIVES

Learn about basic structure of computer, different data representations and Instruction sets; 8086 architecture, addressing modes and instruction set also write efficient programs to interface devices with 8086 processor.

COURSE OUTCOMES:

After completing this course, student should be able to

1. Perceive basic operational concept of computer and data processing.
2. Use data types with instruction set of specified architecture
3. Justify different control unit design and algorithms for various operations.
4. Elaborate basic architecture of 8086 processor
5. Write assembly language programming and debug to 8086
6. Interface devices to 8086 processor.

UNIT-I

Basic Structure of Computer: Computer Types, Functional units, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers.

Data Representation: Fixed Point and Floating – Point Representation

UNIT-II

Register Transfer Language and Micro-operations: Register Transfer language. Arithmetic Micro-operations, logic micro-operations, shift micro operations, Arithmetic logic shift unit. Instruction codes.Computer instructions – Instruction cycle. Memory – Reference instructions. Input – Output and Interrupt; STACK organization; Instruction formats.

UNIT-III

Control Unit Design: Control memory, Address sequencing, micro-program example, design of control unit-Hard wired control, Micro-programmed control.

Computer Arithmetic Operations: Addition and subtraction, multiplication Algorithms, Division Algorithms, Fixed point Arithmetic operations.

UNIT-IV

Architecture of 8086 Microprocessor. Special functions of General purpose registers. 8086 flag register and function of 8086 Flags, Addressing modes of 8086, Instruction set of 8086.

UNIT-V

Assembler directives, simple programs, procedures, and macros. Assembly language programs involving logical, Branch & Call instructions, sorting, evaluation of arithmetic expressions, string manipulation.

UNIT-VI

Pin diagram of 8086-Minimum mode and maximum mode of operation. Timing diagram. Memory interfacing to 8086 (Static RAM&EPROM).8255 PPI-Various modes of operation and interfacing to 8086. Stepper motor Interface to 8086. Interrupt structure of 8086. Vector interrupt table. Interrupt service routines.

TEXT BOOKS:

1. Computer Systems Architecture – M.Moris Mano, IIIrd Edition, Pearson
2. Microprocessors and interfacing – Douglas V.Hall, TMH, 2nd Edition, 1999.

REFERENCES:

1. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson
2. Microcomputer systems, The 8086/8088 Family Architecture, Programming and Design – Y.Liu and G.A. Gibson, PHI, 2nd Edition.
3. Advanced microprocessor and Peripherals – A.K.Ray and K.M.Bhurchandi, TMH, 2000.

Syllabus for B.TechCSE-DS II YEAR II SEM
DESIGN AND ANALYSIS OF ALGORITHMS

Code: 9EC04

Prerequisite : Data structures

Course Objectives:

1. To provide a solid foundation in algorithm design and analysis, specifically, the student learning outcomes include: Basic knowledge of graph and matching algorithms.
2. Ability to understand and design algorithms using greedy strategy, divide and conquer approach, dynamic programming, backtracking and branch and bound.

Course Outcomes:

After completion of the course, the student will be able to

1. Analyze worst-case running times of algorithms using asymptotic analysis.
2. Synthesize divide and-conquer algorithms. Derive and solve recurrences describing the performance of divide-and-conquer algorithms.
3. Describe the greedy paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize greedy algorithms, and analyze them.
4. Comprehend the concept of dynamic programming algorithms, their applications and analyze them.
5. AnalyzetheBacktrackingandBranchandBoundalgorithmsandalsoidentifythescenariosforits applicability.Comprehend the concept of P and NP Problems and its usage in the applications.

UNIT I

Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Probabilistic Analysis, Connected and Bi-connected Components..

Applications: Designing optimal solution with respect to time for a problem.

UNIT II

Divide and conquer: General method, Applications-Binary search, Quick sort, Merge sort, Strassen‘s matrix multiplication.

Applications: PNR number Search, sorting the google search results.

UNIT III

Greedy method: General method, Applications-Job sequencing with deadlines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

Applications: Allocation of funds/resources based on the priority in the computer systems.

UNIT IV

Dynamic Programming: General method, Applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem.

Applications: Routing Algorithms in the computer networking

UNIT V

Backtracking: General method, Applications-n-queen‘s problem, sum of subsets problem, graph coloring, Hamiltonian cycles, Maze generation Problem

Applications: Undo in MS-Word, Games

UNIT VI

Branch and Bound: General method, Applications - Travelling sales person problem,0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.

Introduction to NP-Hard and NP-Complete problems: Basic concepts of non deterministic algorithms, Definitions of NP-Hard and NP-Complete classes. Modular Arithmetic Applications: Performance evaluation in the dynamic systems.

TEXT BOOKS:

1. Fundamentals of Computer Algorithms, Ellis Horowitz,SatrajSahni and Rajasekharam,Galgotia publications pvt. Ltd.
2. Algorithm Design: Foundations, Analysis and Internet examples, M.T.Goodrich and R.Tomassia,Johnwiley and sons.

PO's	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	H	M	M								

Syllabus for B.Tech CSE-DS II year II Semester
DATABASE MANAGEMENT SYSTEMS
(Common to CSE, IT & ECM)

L	T	P/D	C
3	0	0	3

Code: 9FC04
Prerequisite: NIL
Course Objectives:

1. Understand the different issues involved in the design and implementation of a database system.
2. Learn the physical and logical database designs, database modeling, relational, hierarchical, and network models and to understand and use data manipulation language to query, update, and manage a database.
3. Develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency and design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

Course Outcomes:
After completion of this course student will learn to:

1. Comprehend importance, significance, models, Database languages, architecture and design of DataBase Systems.
2. Design Relational Models and apply Integrity Constraints, Querying fundamentals, Logical data base design and Views of databases along with application of Relational Algebra.
3. Apply queries in SQL Query using Nested Queries Set, Comparison Operators, Aggregative Operators, Logical connectivity's with Joins statements and develop applications.
4. Learn to eliminate data redundancy through normal forms.
5. Understand ACID properties and Serializability in Transaction management and Database Recovery.
6. Use different External Storage Organization techniques and apply Indexing in databases to enhance system performance.

UNIT I
Data Base Systems: Data Vs Information, Data base System Applications, data base System VS file System – View of Data – Data Abstraction –Instances and Schemas – data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Storage Manager – the Query Processor.
Data base design and ER diagrams – Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model – Data Modeling checklist.
Application- ER diagram for a college

UNIT II
Introduction to the Relational Model – Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying /altering Tables and Views.
Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple relational Calculus – Domain relational calculus.
Application - Student database design.

UNIT III
Form of Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Comparison using Null values – Logical connectivity's – AND, OR and NOT – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL Triggers, Embedded SQL.
Application - working with Aviation company database.

UNIT IV

Schema refinement – Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Multi valued Dependencies – FORTH Normal Form.

Application - Faculty Evaluation Report.

UNIT V

Transaction Concept- Transaction State- Implementation of Atomicity and Durability – Concurrent – Executions – Serializability- Recoverability – Implementation of Isolation – Testing for serializability- Lock –Based Protocols – Timestamp Based Protocols- Validation- Based Protocols – Multiple Granularity, Recovery and Atomicity – Log – Based Recovery – Recovery with Concurrent Transactions – Buffer Management – Failure with loss of nonvolatile storage.

Application - Production Management System.

UNIT VI

Data on External Storage – File Organization and Indexing – Cluster Indexes, Primary and Secondary Indexes – Index data Structures – Hash Based Indexing – Tree base Indexing – Comparison of File Organizations – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic IndexStructure.

Application – Creating B+ tree on InstructorFile.

TEXT BOOKS:

1. Data base System Concepts, Silberschatz, Korth, McGraw hill, Vedition.
2. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATAMcGrawHill 3rdEdition
3. Database Management Systems, Peter Rob, A.AnandaRao,Carlos Coronel ,CENGAGE Learning

REFERENCES:

1. Data base Systems design, Implementation, and Management, Peter Rob and Carlos Coronel 7thEdition.
2. Fundamentals of Database Systems, Elmasri Navrate Pearson Education
3. Introduction to Database Systems, C.J.Date Pearson Education

Syllabus for B.Tech CSE-DS II year II Semester
ENIVORNMENTAL SCIENCE

Code: 9HC05

L	T	P/D	C
3	0	0	--

Course Objectives:
1. To understand structure and function of ecosystem
2. To learn classification and uses of natural resources
3. To learn about Understanding the impacts of developmental activities and mitigation measures.
4. To know the source, causes and preventive methods of pollution
5. To understand the importance of ecological balance for sustainable development.
6. To understand the environmental policies and regulations

Course Outcomes
After completion of the course, the student will be able to:
1. Understand about ecosystem and energy flow among the organisms.
2. Know the resources available, use of them and overexploitation of the resources in the nature.
3. Learn the value, use and value of biodiversity.
4. Understand the causes and effect of pollution and implement measures in control of pollution.
5. Understand the sustainable development and implement green technology for sustainable development.
6. Learn and implement policy to protect the environment.

UNIT-I Ecosystems: Definition, Scope, and Importance of ecosystem. Classification, structure, and function of an ecosystem, Food chains, food webs, and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Biomagnification, ecosystem value, services and carrying capacity.

UNIT-II Natural Resources: Classification of Resources: Living and Non-Living resources, water resources: use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems. Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources, Land Energy resources: growing energy needs, renewable and non renewable energy sources, use of alternate energy source.

UNIT-III Biodiversity and Biotic Resources: Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation.

UNIT-IV Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, Air Pollution: Primary and secondary pollutants. Acid rain-Threshold limit values of chemicals present in environment, Global warming, Ozone layer depletion, Water pollution: Sources and types of pollution. Soil Pollution: Sources and types, Impacts of modern agriculture, degradation of soil. Noise Pollution: Sources and Health hazards, standards, Solid waste: Municipal Solid Waste management, composition and characteristics of e-Waste and its management. Pollution control technologies: Sewage water Treatment, Kyoto protocol, and Montréal Protocol.

UNIT-V Sustainable development and Green Technology: Concept of sustainable development, threats to sustainability population and its explosion, Crazy consumerism, over- exploitation of resources, strategies for achieving sustainable development environmental education, conservation of resources, urban sprawl sustainable cities and sustainable communities, human health , role of IT in Environment, Environmental Ethics, Environmental Economic – Concept of Green Building, Clean Development Mechanism (CDM).

UNIT-VI Environmental Policy, Legislation & Environment Impact Assessment: Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. EIA:

EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio-economical aspects.Strategies for risk assessment, Concepts of Environmental Management Plan (EMP).

TEXT BOOKS:

1. Perspectives in ***Environmental Studies***: ***Kaushik*** A. and ***Kaushik***, C.P. New Age International (P) Ltd. (2008)

REFERENCE BOOKS:

1. Environmental Studies by ErachBharucha, 2005 University Press.
2. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
3. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela. 2008 PHI Learning Pvt. Ltd.
4. Environmental Science by Daniel B. Botkin& Edward A. Keller, Wiley INDIA edition.
5. Environmental Studies by Anubha Kaushik, 4th Edition, New age international publishers.
6. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.

Syllabus for B.Tech CSE-DS II year II Semester
BUSINESS ECONOMICS AND FINANCIAL ANALYSIS

L	T	P/D	C
3	0	0	3

Code: 9ZC01

Course Outcomes:

1. TounderstandthenuancesofBusinessanditsrelationtoeconomics
2. Tounderstandtheproductionfunctionandcostconcepts
3. Tolearnthebasicmarketstructuresandtheirrelevancetobusiness
4. Tolearnthefundamentalsoffinancialaccounting concepts
5. Toapplythefundamentalconceptsoffinancialaccountinginpreparationoffinancialstatements.
6. Tounderstandthefinancialratiosthatareusedtoanalyzethefinancialperformanceofthecompany.

UNITI
INTRODUCTIONTOBUSINESSECONOMICS:
Definition, Nature and Scope of Business Economics, Micro and Macro Economics concepts- National Income, Gross domestic product (GDP), Per capita income, Demand Analysis: Demand Determinants,Law of Demand and its exceptions, Elasticity of Demand, Types of Elasticity of Demand andDemandForecasting– StatisticalandNon-Statisticaltechniques.

UNITII
THEORYOFPRODUCTIONANDCOSTANALYSIS:
Production Function – Isoquants and Isocosts, Internal and External Economies of Scale, Law ofReturns Cost Analysis: Cost concepts, different types of costs,Break-even Analysis (BEA)-DeterminationofBreak-EvenPoint(simpleproblems).

UNITIII
INTRODUCTIONTOMARKETS
Marketstructures:Typesofcompetition,FeaturesofPerfectcompetition,MonopolyandMonopolisticCompetition,PricingMethods andstrategies.

UNITIV
FINANCIALACCOUNTING-I:
Accounting concepts and Conventions, Double-Entry system of Accounting, Accounting Cycle,RulesformaintainingBooks of Accounts,Journal, PostingtoLedger,Preparation of TrialBalance.

UNITV
FINANCIAL ACCOUNTING –II:
IntroductiontoFinalaccounts,RevenueandCapitalExpenditure,elementsof FinancialStatements,PreparationofFinalAccountswithsimpleadjustments (simpleproblems)

UNIT-VI
FINANCIALANALYSISTHROUGHRATIOS:
Conceptof Ratio Analysis, Various Types ofRatios:Liquidity Ratios (short term solvencyratios), Leverage Ratios (long term solvency ratios), TurnoverRatios and Profitability Ratios(simpleproblems).

TEXTBOOKS:

1. Aryasri:ManagerialEconomicsandFinancialAnalysis,2/e,TMH,2005.

REFERENCES:

1. AmbrishGupta,FinancialAccountingforManagement,PearsonEducation,NewDelhi.
2. H.CraigPeterson&W.CrisLewis,ManagerialEconomics,PHI,4thEd.
3. SumaDamodaran,ManagerialEconomics,OxfordUniversityPress.

Syllabus for B.Tech CSE-DS II year II Semester
Soft Skills Lab

L	T	P/D	C
0	1	2	2

Code: 9HC63

Course objectives:

1. To enable students to make self-assessment and know the importance of certain soft skills and team spirit
2. Know their emotional quotient which guides their thinking, behavior and helps them manage stress efficiently.
3. Equip themselves with the prerequisites, and relevant techniques to effectively attend corporate interviews.

Course Outcomes:

After completion of the course, the student will be able to:

1. Assess themselves using SWOT analysis.
2. Appraise the importance of certain soft skills like time management and goal setting.
3. Improve their verbal ability to handle the competitive exams.
4. Enhance their team skills and design thinking capabilities for effective problem solving and decision making.
5. Know their emotional quotient which guides their thinking, behavior and helps them manage stress efficiently.
6. Equip themselves with the prerequisites, and relevant techniques to effectively attend corporate interviews.

Tutorial (1 per week)

Unit-1

1.1 Introduction to soft skills
1.2 SWOT / SWOC Analysis
1.3 SWOT / SWOC Grid
1.4 Johari window

Unit-2

2.1 Emotional intelligence
2.2 Time management
2.3 Goal Setting

Unit-3

3.1 Attitude
3.2 Professional etiquette & Grooming

Unit-4

4.1 Styles of Communication
4.2 **Inter-personal Skills**
4.3 Team work, Team building
4.4 Leadership Skills

Unit-5

5.1 Problem Solving & Decision making
5.2 Critical & Creative thinking

Unit-6

6.1 Values : Personal, Social & Cultural

Lab (2 per week)

Unit-1

- Activities based on Soft skills
- Self-Analysis
- Questionnaire,
- SWOT Practice

Unit-2

Activities :

- big picture challenge
- Goal setting charts

Unit-3

Practice activities on

- Attitude
- Professional etiquette & Grooming

Unit-4

- Activities on social skills
- Role Plays
- Team building activities

Unit-5

Practice activities on

- Problem solving situations
- Games and puzzles
- Case Studies and Group Discussions on decision making and problem solving, creativity and innovation.

Unit-6

Practice activities

- Role Plays

Text Book:

SOFT SKILLS – Dr. K. Alex, S. Chand publications

Suggested Readings:

1. SOFT SKILLS – MeenakshiRaman ; * Step Ahead with Soft Skills - Oxford University Press ; * Skill Sutras- JayashreeMohanraj * The Power of Soft Skills – Robert A. Johnson ; * Soft Skills for Everyone – Jeff Butterfield

Syllabus for B.Tech CSE-DS II year II Semester
DATABASE MANAGEMENT SYSTEMS LAB

Code: 9FC63

L	T	P/D	C
0	0	3	1.5

Prerequisite: NIL

Course objective:

Design the optimal queries using structured and unstructured query languages like SQL and PL/SQL by making use of control structures, cursors, triggers and functions/procedures.

Course Outcomes:

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

1 Create tables for a database and apply Queries using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints.
2 Learn and write Queries using Aggregate functions such as [COUNT, SUM, AVG, MAX, MIN, GROUP BY, HAVING], Conversion functions and use string functions for a given application.
3 Implement programs using PL/SQL programs using exceptions, COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.
4 Design programs using WHILE LOOPS, FOR LOOPS, nested loops using BUILT–IN Exceptions and write Procedures.
5 Learn to write Programs for stored functions invoke functions in SQL Statement and write Programs for packages specification.
6 Apply and write programs using features of CURSORs and its variables.
7 Develop Programs implementing Triggers.

Exercises:

1. Creation, altering and dropping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.
2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints.
   Example: - Select the roll number and name of the student who secured fourth rank in the class.
3. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping ofViews.
4. Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char,to_date)
5. i)Creation of simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)
   ii)Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQLblock.
6. Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.
7. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, RAISE-APPLICATION ERROR.
8. Programs development using creation of procedures, passing parameters IN and OUT Of PROCEDURES.
9. Program development using creation of stored functions, invoke functions in SQL Statement and write complex functions.
10. Program development using creation of package specification, package bodies,

private objects, package variables and cursors and calling stored packages.

11. Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.
12. Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers.
13. Queries using SQL-INJECTION: AND/OR Attack, Comments Attack, String Concatenation Attack, UNION Injection Attack

TEXT BOOKS:

1) ORACLE PL/SQL by example. Benjamin Rosenzweig, Elena Silvestrova, Pearson Education 3Edition
2) ORACLE DATA BASE LOG PL/SQL Programming SCOTT URMAN, Tata Mc-Graw Hill.
3) SQL and PL/SQL for Oracle 10g, Black Book, Dr. P. S.Deshpande.

Syllabus for B.Tech CSE-DS II year II Semester
Design and Analysis of Algorithms and Computer Organization Lab

L	T	P/D	C
0	0	4	2

Code: 9MC63
Prerequisite: Problem Solving using C Lab

Prerequisite: Data Structures (C/C++) Lab
Course Objectives:

1. To write programs in java to solve problems using divide and conquer strategy.
2. To write programs in java to solve problems using backtracking strategy.
3. To write programs in java to solve problems using greedy and dynamic programming techniques.

Course Outcomes:

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

1. Implement Merge sort algorithm for sorting a list of integers in ascending order, Dijkstra's algorithm for the single source shortest path problem.
2. Implement Prim's algorithm to generate minimum cost spanning tree.
3. Solve the job sequencing with deadlines problem using greedy algorithm.
4. Design the solution for the 0/1 knapsack problem using implement Dynamic Programming and implement.
5. Using Dynamic programming approach solve the Optimal Binary search Tree problem.
6. Design and implement n-queens problem using backtracking approach.

Design and Analysis of Algorithms Lab

List of Programs for Lab

1. Write a C program to implement Merge sort algorithm for sorting a list of integers in Ascending order.
2. Write a C program to implement Character sorting.
3. Write a C program to implement Dijkstra's algorithm for the single source shortest path problem.
4. Write a C program that implements Prim's algorithm to generate minimum cost spanning tree.
5. Write a C program to implement greedy algorithm for job sequencing with deadlines.
6. Write a C program to implement Dynamic Programming algorithm for the0/1 Knapsack problem.
7. Write a C program to implement Dynamic programming algorithm for the Optimal Binary search Tree problem.
8. Write a C program to implement backtracking algorithm for n-queens problems.

Computer Organization lab

PART – A
Introduction to MASM/TASM Assembler
Familiarization with 8086 Kit

Experiment I, II

Write ALP and execute the program to

1. Add two 8-bit numbers
2. Add two 16-bit numbers
3. Add two 32-bit numbers
4. Subtract two 8-bit numbers
5. Subtract two 16-bit numbers
6. Subtract two 32-bit numbers
7. Multiply two 8-bit numbers
8. Multiply two 16-bit numbers
9. Perform 8-bit division
10. Perform 16-bit division
11. Find square of a number

12. Find cube of a number
13. Exchange two numbers
14. Find factorial of a given number

Experiment IIIWrite ALP and execute the program to

15. Add a given series of numbers
16. Find average of a given series of numbers
17. Find sum of squares of a given series of numbers
18. Find sum of cubes of a given series of numbers

Experiment IV

Write ALP and execute the program to

19. Find largest number from a given series of numbers
20. Find smallest number from a given series of numbers
21. Sort a series of given numbers in ascending order
22. Sort a series of given numbers in descending order

Experiment V

Write ALP and execute the program to

23. Display Fibonacci series
24. Move a string of data bytes from one location to another
25. Concatenate two strings
26. Reverse a given string

Experiment V1

Write ALP and execute the program to

27. Compare two strings
28. Find length of a given string
29. Find whether the given byte is in the string or not

PART-B

Write ALP and interface with 8086

1. Interface a stepper motor
2. Generate a triangular wave, square wave and saw tooth waves, Interface keyboard

TEXT BOOKS:

1. Computer Systems Architecture – M.Moris Mano, IIIrd Edition, Pearson
2. Microprocessors and interfacing – Douglas V.Hall, TMH, 2nd Edition, 1999.

REFERENCES:

1. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson
2. Microcomputer systems, The 8086/8088 Family Architecture, Programming and Design – Y.Liu and G.A. Gibson, PHI, 2nd Edition.
3. Advanced microprocessor and Peripherals – A.K.Ray and K.M.Bhurchandi, TMH, 2000.

Syllabus for B.Tech CSE-DS II year II Semester
IT WORKSHOP and R PROGRAMMING LAB

Code:9MC64

L	T	P/D	C
0	0	4	2

Course Objectives

Students will try to learn

- To introduce to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like Windows, Linux and the required device drivers.
- Basics of R programming, Decision Making and Functions in R.

MS

Course Outcomes

Students will be able to

7. Apply knowledge for computer assembling and software installation and ability to solve the trouble shooting problems.
8. Apply the tools for preparation of PPT, Documentation and budget sheet etc.
9. Install and run the Python interpreter ,Create and execute Python programs.
10. Apply the best features of mathematics, engineering and natural sciences to program real life problems.
11. Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python, Express different Decision Making statements and Functions, Interpret Object oriented programming in Python.
12. Understand and summarize different File handling operations, explain how to design GUI Applications in Python.

IT WORKSHOP

Week 1:
Introduction to Computer: Identify the peripherals of a computer, components/peripherals in a CPU & its functions. Introduction to the types of Operating System, Assembling and disassembling demonstration.

Week 2:
Install computer with dual boot operating system (Windows, Linux with PowerPoint presentation). Comparison of types of OS in different platform

Week3:
Introduction to S/W's, difference b/w hardware and software. Introduction to MS-Office and its importance.

Ms Word
Ms Power Point Presentation

Week4:
Introduction to Excel
Features: Accessing, Overview at toolbars, saving excel files, Gridlines, Format cells, Summation, Auto fill, formatting text.
Formula in excel – Average, Standard Deviation, Charts, Roaming & Inserting worksheets, Hyper linking, count function, lookup / Vlookup, sorting, Conditional formatting.

R PROGRAMMING LAB

1. R Environment setup: Installation of R and RStudio in Windows
2. Write R commands for i) Variable declaration and Retrieving the value of the stored variables, ii) Write an R script with comments, iii)Type of a variable using class() Function.
3. Write R command to i) illustrate summation, subtraction, multiplication, and division operations on vectors using vectors. ii) Enumerate multiplication and division operations between matrices and vectors in R console

4. Write R command to i) illustrates the usage of Vector subsetting& Matrix subsetting
   ii) Write a program to create an array of 3×3 matrixes with 3 rows and 3 columns.
   iii) Write a program to create a class, object, and function
5. Write a command in R console i)to create a tshirt_factor, which is ordered with levels 'S', 'M', and 'L'. Is it possible to identify from the examples discussed earlier, if blood type 'O' is greater or less than blood type 'A'?
   ii) Write the command in R console to create a new data frame containing the 'age' parameter from the existing data frame. Check if the result is a data frame or not. Also R commands for data frame functions *cbind*(), rbind(), sort()
6. Write R command for i) Create a list containing strings, numbers, vectors and logical values
   ii) To create a list containing a vector, a matrix, and a list. Also give names to the elements in the list and display the list also access the list elements
   iii) To add a new element at the end of the list and delete the element from the middle display the same
   iv) To create two lists, merge two lists. Convert the lists into vectors and perform addition on the two vectors. Display the resultant vector.
7. Write R command for i) logical operators—AND (&), OR (|) and NOT (!).
   ii) Conditional Statements
   iii) Create four vectors namely patientid, age, diabetes, and status. Put these four vectors into a data frame patientdata and print the values using a for loop & While loop
   iv) Create a user-defined function to compute the square of an integer in R
   v) Create a user-defined function to compute the square of an integer in R
   vi) Recursion function for a) factorial of a number b) find nth Fibonacci number
8. Write R code for i) Illustrate Quick Sort
   ii) Illustrate Binary Search Tree
9. Write R command to i) illustrate Mathematical functions & I/O functions
   ii) Illustrate Naming of functions and sapply(), lapply(), tapply() &mapply()
10. Write R command for i) Pie chart & 3D Pie Chart, Bar Chart to demonstrate the percentage conveyance of various ways for traveling to office such as walking, car, bus, cycle, and train
    ii)Using a chart legend, show the percentage conveyance of various ways for traveling to office such as walking, car, bus, cycle, and train.
    (a) Walking is assigned red color, car – blue color, bus – yellow color, cycle – green color, and train – white color; all these values are assigned through *cols and lbls variables and the legend function.*
    (b) *The fill parameter is used to assign colors to the legend.*
    (c) Legend is added to the top-right side of the chart, by assigning
    iii) Using box plots, Histogram, Line Graph, Multiple line graphs and scatter plot to demonstrate the relation between the cars speed and the distance taken to stop, Consider the parameters data and *x* Display the *speed and dist parameter of Cars data set using x and data parameters*

TEXT BOOK:

K G Srinivas, G M Siddesh, "Statistical programming in R", Oxford Publications.

Syllabus for B.Tech CSE-DS II year II Semester
Technical Seminar

L	T	P/D	C
0	1	0	1

Code: 9M485
Prerequisite: NIL
Course objective
Develop an ability to understand and present the latest technological developments in computer science. Identify one of them, understand its impact on the event/method/society as a whole and present the seminar on the same which enhances oratory and interview facing skills.
Course Outcomes :
At the end of this course, the student will be able to:

1. Identify topics related to Computer Scienec and Engineering domain or disruptive technologies
2. Collect, survey and organize content in PPT form
3. Present seminar in an effective manner

Procedure:

1. Seminar in-charges shall highlight the significance of Technical Seminar in the first two sessions and enlighten the students on the utility of these seminars.
2. The slots, titles shall be decided upfront and seminar In-charge shall take signatures from students.
3. The same sheet shall be affixed in the respective classrooms and seminar register.
4. If any student fails to present his/her seminar on the given slot, to genuine reasons, they may be asked to present in the subsequent slot / week.
5. Progress of the seminars needs to be reviewed by the concerned HOD once in 15 days.
6. The evaluation for Technical Seminars has to be informed to students and displayed in the classrooms.
7. Report and presentation must contain topic, introduction, explanation, diagrams, tables, applications and conclusions.

There shall be a technical seminar evaluated for 100 marks. The evaluation is purely internal and will be as follows:

Sl.No	Description	Marks
1	Literature survey, topic and content	10
2	Presentation including PPT	10
3	Seminar Notes	05
4	Interaction with audience after presentation	05
5	Final Report 3 copies	10
6	Class room participation	05
7	Punctuality in giving seminar as per Scheduled time and date	10
8	Mid Semester Viva (on the seminar topics completed up to the end of 9th week	15
9	End Semester Viva	30
	Total	**100 Marks**

Student must secure 40% i.e. 40 marks to be successful in sum total (Hundred Marks) in Technical Seminar.