Scheme & Syllabus

For

B Tech in CSE

(Specialization in Cloud Technology & Information Security)

(Implemented from Academic Session 2019-20)

Version						
Applicable for Back	NIL					
Examination(Session)						
Date of BOS/BOF/AC	AC					
Page No. Where Major/Minor Changes have been done	First version (Not applicable)					
Implemented from (Session)	Session					
Scheme and Syllabus Page Number						

Total Credit of the Program

							<u> </u>		
Sem	I	II	111	IV	V	VI	VII	VIII	Total
Credits	24	25	22	23	22	22	21	10	169

June 2019

FACULTY OF ENGINEERING & TECHNOLOGY B Tech in CSE

(Specialization in Cloud Technology & Information Security)

Evaluation Scheme

Marks	Theory	Practical	Dissertation/Thesis
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[Type here]

Maximum	100	100	100
Marks			
Internal Marks	40%	60%	20%
External Marks	60%	40%	80%

Practical and theory courses are mentioned in the form of L-T-P, Where

- **L-Lecture**
- **T- Tutorial**
- **P- Practical**
- Elective courses are clearly Mentioned as "Elective" if more than one than "Elective-I, II..."
- **4** Any zero Credit courses are Treated as Pass/Audit Cours

TEACHING AND EXAMINATION SCHEME FOR B. TECH CSE

(Common for CTIS and DS)

SEMESTER I

Course	Course	Course Nome	Tea	ching S	Scheme	Total	Credit
code	Туре	Course Name	L*	T*	P*	Hour	Crean
ENG 105	Ability Enhancement	English	2	1	-	3	3
MAT 102	Science	Engineering Mathematics-I	3	1	-	4	4
PHY 105	Science	Physics for Engineers –I	3	1	-	4	4
BEE 101	Engineering	Basic Electrical and Electronics	3	1	-	4	4
BCSI101	Engineering	Problem Solving and Programming in C	3	-	-	3	3
PHY 106	Science	Physics for Engineers Lab –I	-	-	2	2	1
BEE 102	Engineering	Basic Electrical and Electronics Lab	-	-	2	2	1
BCSI102	Engineering	Problem Solving and Programming in C Lab	-	-	2	2	1
BME 101	Engineering	Workshop Practice	-	-	2	2	1
BCSI103	Engineering	IT Workshop	-	-	2	2	1
ENG 113	Skill Enhancement	Soft Skills and Self Awareness	-	-	2	2	1
TOTAL			14	4	12	30	24

CTIS - Cloud Technology & Information Security, DS - Data Science

Theory- 2 Midterm Exams & course work(40%) and End Term Exam (60%)

Practical- 2 Midterm Exams & course work(60%) and End Term Exam (40%)

Class work includes: Quiz, Assignment, Seminars, Presentations, Attendance, Case study, Surprise class test, lab. record, Viva, Projects, and Observation Book.

CTPL ACADEMY

TEACHING AND EXAMINATION SCHEME FOR B.TECH CSE (Common for CTIS and DS)

SEMESTER II

Course	Course	Course Course Name			Scheme	Total	Creadit
code	Туре	Course Name	L*	T*	P*	Hour	Credit
ENG 106	Ability Enhancement	Professional English	2	1	-	3	3
MAT 103	Science	Engineering Mathematics-II	3	1	-	4	4
PHY 107	Science	Physics for Engineers –II	3	1	-	4	4
CHY 103	Science	Environmental Science	2	-	-	2	2
BCSI201	Engineering	Design Thinking	3	-	-	3	3
BCSI202	Engineering	Web Designing	3	-	-	3	3
ENG 107	Ability Enhancement	Communication Techniques Lab	-	-	2	2	1
PHY 108	Science	Physics for Engineers Lab-II	-	-	2	2	1
BCSI203	Engineering	Web Designing Lab	-	-	2	2	1
BCSI204	Engineering	Computer Aided Graphics	-	-	2	2	1
ENG 114	Skill Enhancement	Soft skills and Communication	-	-	2	2	1
SEP 200	Skill Enhancement	Extra-curricular Activity (NSS/NCC/Scouting/Club activity)	-	-	2	2	1
TOTAL			16	3	12	31	25

CTIS - Cloud Technology & Information Security, DS - Data Science

Theory- 2 Midterm Exams & course work (40%) and End Term Exam (60%)

Practical- 2 Midterm Exams & course work (60%) and End Term Exam (40%)

Class work includes: Quiz, Assignment, Seminars, Presentations, Attendance, Case study, Surprise class test, lab. record, Viva, Projects, and Observation Book.

TEACHING AND EXAMINATION SCHEME FOR B.TECH CSE (Specialization in CTIS)

Course	Course	Course Nome	Tea	ching S	Scheme	Total	
code	type	Course Name	L*	T *	P*	Hour	Credit
BCSI301	BS	Statistics and Probability	3	1	-	4	4
BCSI302	ES	Digital Electronics	3	1	-	4	4
BCSI303	PC	Data Structures using C	3	-	-	3	3
BCSI304	PC	Object Oriented Programming with Java	3	-	-	3	3
BCSI305	PC	Database Management System	3	-	-	3	3
BCSI306	HSM	Communication Skills	-	-	2	2	1
BCSI307	PC	Data Structures using C Lab	-	-	2	2	1
BCSI308	PC	Object Oriented Programming with Java Lab			2	2	1
BCSI309	PC	Database Management Systems Lab	-	-	2	2	1
BCSI310	ST	Summer Project Seminar-I	-	-	2	2	1
		Total	15	2	10	27	22

SEMESTER-III

CTIS - Cloud Technology & Information Security

L*-Lecture*, T*-Tutorial, P*-Practical

TEACHING AND EXAMINATION SCHEME FOR B.TECH CSE

(Specialization in CTIS)

SEMESTER	-IV

	Course		Tea	aching S	cheme	Total	
Course code	type	Course Name	L*	T *	P*	Hour	Credit
BCSI401	РС	Design and Analysis of Algorithms	3	-	-	3	3
BCSI402	PC	Operating System	3	-	-	3	3
BCSI403	РС	Computer Organization and Architecture	3	-	-	3	3
BCSI404	РС	Computer Networks	3	-	-	3	3
BCSICT401	РС	Information Security	3	-	-	3	3
BCSICT402	РС	Storage and Datacenter	3	-	-	3	3
BCSI405	РС	Design and Analysis of Algorithms Lab	-	-	2	2	1
BCSI406	HSM	Employability Skills	-	-	2	2	1
BCSI407	РС	Computer Network Lab	-	-	2	2	1
BCSI408	РС	Operating System Lab	-	-	2	2	1
BCSICT403	РС	Storage and Datacenter Lab	-	-	2	2	1
		Total	18	0	10	28	23

CTIS - Cloud Technology & Information Security

L*-Lecture*,T*-Tutorial, P*-Practical

TEACHING AND EXAMINATION SCHEME FOR B.TECH CSE (Specialization in CTIS)

	Course			aching S	cheme	Total	a u
Course code	type	Course Name	L*	T *	P*	Hour	Credit
BCSI501	РС	Theory of Computation	3	1	-	4	4
BCSICT501	РС	Cloud Computing	3	-	-	3	3
BCSICT502	РС	Network Security	3	-	-	3	3
BCSICT503	РС	Principles of Virtualization	3	-	-	3	3
BCSICT504	HSM	Humanities II	3	-	-	3	3
	PE	Elective-I	3	-	-	3	3
BCSICT508	РС	Network Security Lab	-	-	2	2	1
BCSICT509	РС	Principle of Virtualization Lab	-	-	2	2	1
BCSI502	ST	Summer Project Seminar-II	-	-	2	2	1
		Total	18	1	6	25	22

SEMESTER-V

CTIS - Cloud Technology & Information Security

L*-Lecture*, T*-Tutorial, P*-Practical

COURSE CODE	Elective - I
BCSICT505	Security Architecture
BCSICT506	Database Security
BCSICT507	Server security

CTPL ACADEMY TEACHING AND EXAMINATION SCHEME FOR B. TECH CSE

(Specialization in CTIS)

SEMESTER-VI

	Course	Course Name	Te	aching S	Scheme	Total	
Course code	type		L*	T *	P*	Hour	Credit
BCSI601	PC	Artificial Intelligence	3	-	-	3	3
BCSICT601	PC	Linux Administration	3	-	-	3	3
BCSICT602	PC	Ethical Hacking	3	-	-	3	3
	PE	Elective-II	3	-	-	3	3
	PE	Elective-III	2	-	-	2	2
	OE	Open Elective-I	3	-	-	3	3
	PR.	Elective -II Lab		-	2	2	1
BCSICT615	PC	Linux Administration Lab		-	2	2	1
BCSICT616	PC	Ethical Hacking Lab		-	2	2	1
BCSICT617	PE	Project-I		-	4	4	2
		Total	17	0	10	27	22

CTIS - Cloud Technology & Information Security

Course code	Elective – II
BCSICT603	Exploring Software as a Service (SaaS)
BCSICT604	Cloud Migration
BCSICT605	Cloud Scripting using PaaS

Course code	Open Elective - I
BCSICT609	UI/UX Fundamentals
BCSICT610	Mobile Application Development
BCSICT611	Business Intelligence

Course code	Elective - III
BCSICT606	Security Standards and Framework
BCSICT607	IT Governance and Risk Management
BCSICT608	Incident Response Management

Course code	Elective – II lab
BCSICT612	Exploring Software as a Service (SaaS) Lab
BCSICT613	Cloud Migration Lab
BCSICT614	Cloud Scripting using PaaS Lab

TEACHING AND EXAMINATION SCHEME FOR B. TECH CSE

(Specialization in CTIS)

~ .	Course		Teaching Scheme			Total	a b
Course code	type	Course Name		T *	P*	Hour	Credit
	PE	Elective-IV	2	-		2	2
	PE	Elective-V	3	-	-	3	3
	PE	Elective-VI	3	-	-	3	3
	OE	Open Elective-II	3	-	-	3	3
BCSI701	HSM	Economics for Engineers	3	-	-	3	3
	PR	Elective-IV Lab	-	-	2	2	1
BCSI702	PR	Project-II		-	10	10	5
BCSI703	ST	Summer Project Seminar-III	-	-	2	2	1
		Total	14	0	14	28	21

SEMESTER-VII

CTIS - Cloud Technology & Information Security

Course code	Elective – IV	C	Course code	Elective - V
BCSICT701	Cyber Forensics	В	BCSICT704	Hybrid Cloud Computing
BCSICT702	Web Security and SDLC	В	BCSICT705	Cloud Web Services
BCSICT703	Cloud Security	В	BCSICT706	Cloud Computing Solutions

Course code	Elective – VI	Course code	Open Elective - II	Course code	Elective – IV Lab
BCSICT707	Cloud Architectural Patterns	BCSICT710	Artificial Intelligence	BCSICT713	Cyber Forensics Lab
BCSICT708	Automation and Configuration Management	BCSICT711	Big Data Analytics	BCSICT714	Web Security and SDLC Lab
BCSICT709	Infrastructure Containers	BCSICT712	Data Science	BCSICT715	Cloud Security Lab

TEACHING AND EXAMINATION SCHEME FOR B. TECH CSE (Specialization in CTIS)

SEMESTER-VIII Course **Teaching Scheme** Total **Course code Course Name** Credit type L* T* P* Hour Project-III / Internship 10 -**BCSI801** ST 20 20 _ 20 20 10 --Total

CTIS - Cloud Technology & Information Security

Syllabus 1st Semester

Semester I

B. Tech CSE (Common for CTIS and DS)

ENG 105: ENGLISH

 $\mathbf{2L} + \mathbf{1T} + \mathbf{0P} + \mathbf{3C}$

MM 100

Unit 1: Prose- A Cup of Tea by Katherine Mansfield, The Piece of String by Guy De Maupassant, Text of Steve Jobs' Commencement address -2005.

Poems: Ode to the skylark – by P B Shelley, Where the Mind Is Without Fear – by Rabindranath Tagore, The Road Not Taken- Robert Frost.

Unit 2: **Grammar & Vocabulary-** Tenses and the concept of time, Verb Types, Active and Passive Voice, Narration, Prepositions, Conditionals, Modal Auxiliaries, Conjunctions, One-word substitutions, Synonyms and Antonyms.

Unit 3: Writing Skills- Writing Paragraph, Essay, Writing Articles for Newspapers & Magazines, Writing Applications, Resumé Writing.

Unit 4: Reading Skills- Reading Comprehension, Summarizing and Note making.

Unit 5: Speaking Skills- Conversations- Introduction, Purpose, Features, Delivering Speeches-Welcome, Introductory, Vote of Thanks, Farewell Speech, Indianism.

- 1. Communication Skills, Pushp Lata & Sanjay Kumar, Oxford Higher Education/Oxford University Press.
- 2. Technical Communication; Principles and Practice, Meenakshi Raman & Sangita Sharma, Oxford University Press.
- 3. Effective Technical Communication, M Ashraf Rizvi, Tata Mcgraw Hill.

Semester I

B. Tech CSE (Common for CTIS and DS)

MAT 102: ENGINEERING MATHEMATICS-I

3L + 1T + 0P + 4C

MM 100

Unit 1: Differential Equation I- Differential equations of first order and first degree - Linear differential equations, Reducible to linear form, Exact Form, Reducible to Exact Form, Linear Differential Equations of Higher Order with Constant Coefficients Only.

Unit 2: Differential Equation II- Second order ordinary differential equations with variable coefficients- Homogeneous form, Exact form, Change of Dependent Variable, Change of Independent Variable, Normal form, Variation of Parameters.

Unit 3: Differential Calculus I- Partial Differentiation, Euler's Theorem on Homogeneous Functions, Approximate Calculations, Maxima and Minima of two and more independent variables, Lagrange's Method of Multipliers.

Unit 4: Differential Calculus II- Asymptotes (Cartesian co-ordinates only), Curvature, Concavity, Convexity and Point of Inflexion (Cartesian co-ordinates only), Curve Tracing (Cartesian and Standard Polar Curves).

Unit 5: Integral Calculus- Area of Curves, Rectification, Surface and Volume of Solids of Revolution, Double and Triple Integrals, Double Integral by changing into polar form, Area and Volume by Double Integration, Change of Order of Integration, Beta Function and Gamma Function (Simple Properties).

- 1. Higher Engineering Mathematics, B.V. Ramana, Tata McGraw Hill.
- 2. Advanced Engineering Mathematics, Erwin Kreyszig, Wiley 9th Edition
- 3. Calculus and Analytical Geometry, Thomas and Finney, Narosa Publishing House(New Delhi)
- 4. Integral Calculus, Shanti Narayan, S. Chand.
- 5. Differential Calculus, Shanti Narayan, S. Chand.
- 6. Ordinary and Partial differential equations, M. D. Raisinghania, S. Chand.
- 7. Calculus, Thomas & Finney, Narosa Publishing House(New Delhi).

Semester I

B. Tech CSE (Common for CTIS and DS)

PHY 105: PHYSICS FOR ENGINEERS –I

3L + 1T + 0P + 4C

MM 100

Unit I: Basic Optics: Reflection of light, Refraction of light, total internal reflection and its applications, Refraction and dispersion of light through a prism. Wave front and Huygens's principle, reflection and refraction of plane wave at a plane surface using wave fronts. Young's double slit experiment and expression for fringe width, coherent sources. Optical fiber as optical wave-guide. Numerical aperture and maximum angle of acceptance.

Unit II: Interference of Light: Michelson's Interferometer: Production of circular & straight-line fringes, Determination of wavelength of light. Determination of wavelength. Newton's rings and measurement of wavelength of light. Elementary idea of anti-reflection coating.

Unit III: Polarization of Light: Plane circular and elliptically polarized light on the basis of electric (light) vector, Malus law. Double Refraction: Qualitative description of double refraction phase retardation plates, quarter and half wave plates, construction, working and use of these in production and detection of circular and elliptically polarized light. Optical Activity: Optical activity and law of optical rotation, specific rotation and its measurement using the bi-quartz device.

Unit IV: Diffraction of Light: Single slit diffraction: Quantitative description of single slit, position of maxima / minima and width of central maximum, intensity variation. Diffraction Grating: Construction and theory. Determination of wavelength of light using plane transmission grating. Resolving power: Geometrical & Spectral, Raleigh criterion, Resolving power of diffraction grating.

Unit V: Coherence & Laser: Spatial and temporal coherence, Coherence length, Coherence time and 'Q' factor for light. Temporal coherence and spectral purity, Theory of laser action: Einstein's coefficients, Components of a laser. Theory, Design and applications of He-Ne and semiconductor lasers.

- 1. Optics, Ajay Ghatak, Tata McGraw Hill(Noida).
- 2. Optics, N. Subrahnmanyam & Brij Lal, S. Chand (New Delhi).
- 3. Feynman Lectures on Physics, Volume I, II & III, Perseus Books Group California Institute of Technology.
- 4. Fundamental of optics, white & jenkins, Tata McGraw Hil.
- 5. Optics, Eugene Heceht, Schaum series.

Semester I

B. Tech CSE (Common for CTIS and DS)

BEE 101: BASIC ELECTRICAL AND ELECTRONICS

3L + 1T + 0P + 4C

MM 100

Unit 1: Basic Electrical Quantities: -Basic concept of charge, current, voltage, resistance, power, energy and their units, Conversion of units of work, power and energy from one form to another. Electrical Energy: Difference between ac and dc and their applications, Classification of two terminal elements, Energy Sources, Source Transformation, ideal independent two terminal electrical sources.

DC Networks: Ohm's law, resistances, capacitances & inductors in series and parallel, Kirchhoff's laws and their applications in solving electrical network problems, Node Voltage and Mesh Current Analysis, Star-delta transformation.

Unit 2: Network theorems: Thevenin Theorem, Norton Theorem and Superposition Theorem, Statement and applications including dependent sources.

Transformer: Faraday's Law of Electromagnetic Induction, Construction and Operation of Single-Phase Transformer, EMF Equation, Voltage & Current Relationship and Phasor Diagram of Ideal Transformer.

Unit 3: AC Fundamentals: Concept of alternating current and voltage, Generation of Single-Phase AC Voltage, EMF Equation, Average, RMS and Effective Values Representation of alternating sinusoidal quantities by vectors, Phasor algebra (addition, subtraction, multiplication and division of complex quantities). RL, RC & RLC Series-Parallel Circuits, Complex Representation of Impedances, Reactance, Phasor Diagram, Power and Power Factor.

Unit 4: Review of Semiconductors: Semiconductors, conductors and insulators, intrinsic and extrinsic semiconductors and conduction in semiconductors.

Semiconductor Physics: Basic material properties of semi-conductors, governing factors for Fermilevel, carrier concentration and carrier mobility, recombination and carrier lifetime, carrier drift, diffusion, Hall effect and continuity equation.

Unit 5: Junction Diodes: Introduction, forward and reverse biasing of diode, voltage current characteristic of diode, diode models, half wave rectifier, full wave rectifier, Zener diode and its application.

Bipolar Transistor: Transistor structure, basic transistor operation, common base configuration and its characteristics, transistor amplifying action, common emitter configuration and its characteristics, common collector configuration, limit of operation, the dc operating point and biasing techniques (fixed bias, voltage divide bias, voltage feedback type, current feedback type, and combination of voltage and current feedback types)

- 1. Integrated Electronics Analog and Digital Circuits & Systems, J. Millman & C.C. Halkias, McGraw Hill.
- 2 Electronic Devices and Integrated Circuits, B. P. Singh & Rekha Singh, Pearson Education.
- 3 Theory and problems of Basic Electrical Engineering, D.P. Kothari & I. J. Nagrath, PHI.
- 4 Basic Electrical Engineering, V.N. Mittal & A. Mittal, TMH.
- 5 Solutions of problems in Electrical Engineering, Smith Parker, CBS Publisher.
- 6 Electronics Devices & Circuit Theory, Boylestad & Nashelskey, Prentice Hall of India.

Semester I

B. Tech CSE (Common for CTIS and DS)

BCSI101: Problem Solving and Programming in C

3L + 0T + 0P + 3C

MM 100

Unit 1: Introduction: -What is a program? What is a programming language? Steps in Programming, Skills needed to do programming, A little introduction to C, writing a Program, Fundamentals of a Programming Language, Different Programming Techniques, Procedural Programming, Modular Programming, Object Oriented Programming, Getting started with compiler. Words and Sentences in C Language: Alphabets in C, Keywords in C, Rules of forming Words in C language, Data Variables, Data Types and Rules for naming and declaring data, variables, Basic Data Types in C, Constants, Comments in C.

Unit 2: Instructions and Rules for Writing: -Types of instructions, Data Manipulation Instructions, Input/output Instructions, Flow Control Instructions: Decision Control Instructions, If, if-else, If-else-if, Nested if-else, Loop Control Instructions, For Loop, While Loop, Do While, Selection Instructions.

Unit 3: Functions: -Why use Functions, Components of Function, Name of a function, Body of a function, Local variables of a function, Parameters or Arguments to a function, Return Values, Prototype of a function. Arrays: What is an array? Array Declaration, Array Initialization, accessing individual elements of an array, Two Dimensional Arrays, passing an array element to a function, Rules of using an array.

Unit 4: Pointers: -What is a pointer? Declaring a Pointer variable, initializing a pointer variable, Using a Pointer Variable, Pointer Arithmetic, Pointers and array, passing an entire array to a function. Strings: What are strings? String I/O, String Manipulation Functions.

Unit 5: Structures: -Declaring and Accessing Structure, variables Uses of Structures, Unions Storage Classes and Scoping: Automatic, Register, External, Static, Scope of a Variable File Input/Output: Command-line arguments, File Input and Output, Combining Command-line Arguments and File I/O.

- 1. The C Programming Language, Brian W. Kernighan, Dennis M. Ritchie, Prentice-Hall (New Delhi).
- 2. C Programming: A Modern Approach, K. N. King, Prentice-Hall (New Delhi).
- 3. C Primer Plus, Stephen Prata, Sams.
- 4. Practical C Programming, Steve Oualline, O'Reilly Media.
- 5. Let us C, Yashwant Kanetkar, BPB Publications.
- 6. Pointers in C, Yashwant Kanetkar, BPB Publications.

Semester I

B. Tech CSE (Common for CTIS and DS)

PHY106: PHYSICS FOR ENGINEERS LAB-I

0L + 0T + 2P + 1C

MM 100

- 1. To determine the wavelength of sodium light by Newton's Ring.
- 2. To determine the wavelength of sodium light by Michelson Interferometer.
- 3. To determine coherent length and coherent time of laser using He-Ne Laser
- 4. To determine the specific rotation of Glucose (Sugar) solution using a Polari meter.
- 5. To determine the dispersive power of material of a prism for violet, red and yellow Color of Mercury light with the help of a spectrometer
- 6. To determine the wave length of prominent lines of mercury by plane diffraction grating with the help of spectrometer.
- 7. To determine and verify the dispersive power of the plane transmission grating
- 8. To measure the Numerical Aperture of an Optical Fiber
- 9. To study the production of PPL, CPL and EPL light
- 10. Verification of resolving power of a telescope.

Semester I

B. Tech CSE (Common for CTIS and DS)

BEE 102: BASIC ELECTRICAL AND ELECTRONICS LAB

 $\mathbf{0L} + \mathbf{0T} + \mathbf{2P} + \mathbf{1C}$

MM 100

Electrical Lab:

- 1. To verify Ohm's Law
- 2. Verification of Kirchoff's Law applied to the DC circuits.
 - (a) Parallel and Series combination
 - (b) Identification of node points
 - (c) Algebraic sum of current at node points
 - (d) Algebraic sum of e.m.f.s and voltage drops.

3. To construct a RLC series circuit and measure its impedance, inductive (X_L) and capacitive reactance (X_C) , measure phase angle between voltage and current.

4. Make house wiring including earthing for 1-phase energy meter, MCB, ceiling fan, tube light, three pin socket and a lamp operated from two different positions.

5. Study the construction & basic working of ceiling fan. Connect ceiling fan along with regulator through auto-transformer to run and vary speed.

6. Study the construction and connection of single-phase transformer and auto-transformer. Measure input and output voltage and fin turn ratio.

7. Study the construction, circuit, working and application of the following lamps.

(a) Fluorescent Lamp, (b) Sodium Vapour Lamp (c) Mercury vapour lamp (d) Halogen Lamp

Electronics Lab:

1. Study the following devices:

(a) Analog & digital multimeters (b) Function/ Signal generators

(c) Regulated d. c. power supplies (constant voltage and constant current operations)

(d) Study of analog CRO, measurement of time period, amplitude, frequency & phase angle using Lissajous figures.

2. Identification, testing and applications of Resistors, Inductors, Capacitors, PN-diode, SCR,TRAIC, Photo Diode, Zener diode, LED, LCD, BJT, Photo Transistor.

3. Plot V-I characteristic of P-N junction diode & Zener diode & calculate cut-in voltage, reverse Saturation current and static & dynamic resistances. Application of Diode as clipper & clamper.

4. Plot input and output characteristics of BJT in CE configurations. Find its h parameters. Plot gainfrequency characteristic of emitter follower & find out its input and output resistances.

5. Study half wave rectifier and bridge rectifier and effect of filters on wave. Also calculate theoretical & practical ripple factor.

B. Tech CSE (Common for CTIS and DS)

BCSI102: Problem Solving and Programming in C

$\mathbf{0L} + \mathbf{0T} + \mathbf{2P} + \mathbf{1C}$

MM 100

Basic Calculation:

- 1. Write a c program to display your Name, address and city in different lines.
- 2. Write a c program to perform all arithmetic operations.
- 3. Write a c program to convert the Fahrenheit into centigrade. Formula c = (F-32)/1.8
- 4. Write a c program to calculate the simple interest.
- 5. Write a c program to calculate the compound interest.
- 6. Write a program in C to display sum of first N natural numbers.
- 7. Write a c program to find the roots of the quadratic equation.

Conditional Statements

- Write a C program which used to determine type of triangle based on sides. Measure of sides input by the user. To check whether the triangle is isosceles, scalene or equilateral triangle. Hint: If all the sides are equal than equilateral, If any two sides are equal than isosceles otherwise scalene.
- 2. Write a program in C to which allow user to enter any arithmetic operator (+ * /) and two integer values and display result according to selection of operator.
- 3. Write a program in C to calculate gross salary of employee using : 1. Gross Salary = Basic Pay + DA + HRA PF. 2. DA = 30% If Basic Pay < 5000 otherwise DA = 45% of the Basic Pay. 3. HRA = 15% of Basic Pay. 4. PF = 12% of Basic Pay. Only basic pay will input by the user. Display Gross salary DA HRA PF and basic salary</p>
- 4. Student should fulfill the following criteria for admission: Mathematics >= 50 Physics >= 45 Chemistry >= 60 Total of all subject >= 170 OR Total of Mathematics + Physics >= 120 Accept the marks of all the three subjects from the user and check if the student is eligible for admission.
- 5. Write a program in C for grade calculation using if...else if ladder and switch Statement. Accept marks of 3 subjects calculate total and based on it calculate Grade.

Loop Programs

- 1. Program to display first N prime numbers. N is input by the user.
- 2. Program to display A to Z in upper case or lower case according to user selection.
- 3. Program which used to print A to Z and Z to A.
- 4. Program which ask for party to user until the user say yes
- 5. Program which ask for party to user until the user say yes
- 6. Program which check that whether the given number is palindrome or not.
- 7. Program to check that the given number is Armstrong or not.
- 8. Program which will display next nearest prime number of given integer number. For example next nearest prime of 5 is 7, for 8 is 11, for 7 is 11 (Using Do while)

B. Tech CSE (Common for CTIS and DS)

BME 101: WORKSHOP PRACTICE

0L + 0T + 2P + 1C

MM 100

Carpentry Shop

- 1. T Lap joint
- 2. Cross lap joint

Welding Shop

- 1. Gas welding practice by students on mild steel flat
- 2. Lap joint by gas welding
- 3. Arc welding practice by students
- 4. Square butt joint by Arc welding

Machine Shop Practice

- 1. Job on lathe with one step turning and chamfering operations
- 2. Job on lathe with Facing and knurling operations
- 3. Drilling two holes of size 5 and 12 mm diameter on job used / to be used for shaping
- 4. Grinding a corner of above job on bench grinder

Fitting Shop

- 1. Finishing of two sides of a square piece by filing
- 2. To cut a square notch using hacksaw and to drill three holes on PCD and tapping

- 1. Workshop Practice, K. C. JOHN, PHI Learning Pvt. Ltd.
- 2. Modern Workshop Technology, Henry Wright, BAKER Cleaver-Hume Press.
- 3. Workshop Technology, Hajra, Chaudhary, Media promotors & publishers pvt. Ltd.
- 4. Workshop Technology, B.S. Raghhuwanshi, Dhanpat Rai & Company (p) Limited.
- 5. Workshop Technology, Virendra Narula, Kataria & sons publications.
- 6. Comprehensive Workshop Technology, S.K. Garg, Laxmi Publications.

B. Tech CSE (Common for CTIS and DS)

BCSI103: IT WORKSHOP

$\mathbf{0L} + \mathbf{0T} + \mathbf{2P} + \mathbf{1C}$

MM 100

List of Practical

- 1. Given a PC, name its various components and list their functions
- 2. Identification of various parts of a computer and peripherals
- 3. DOS Basic Commands
- 4. Exercises on entering text and data (Typing Practice)
- 5. Installation of Windows Operating System using pen- drive, CD & Virtual Machine
- 6. MS-WORD
 - a. File Management: Opening, creating and saving a document, locating files, copying contents in some different file(s), protecting files, giving password protection for a file
 - b. Page set up: Setting margins, tab setting, ruler, indenting
 - c. Editing a document: Entering text, Cut, copy, paste using tool- bars
- 7. Work books:
 - a. Managing workbooks (create, open, close, save), working in work books, selecting the cells, choosing commands, data entry techniques, formula, creation and links, controlling calculations, working with arrays
 - b. Editing a worksheet, copying, moving cells, pasting, inserting, deletion cells, rows, columns, find and replace text, numbers of cells, formatting worksheet.
 - c. Creating a chart: -Working with chart types, changing data in chart, formatting a chart, use chart to analyze data
- 8. MS-Excel:
 - a. How to change view of worksheet, outlining a worksheet, customize workspace, using templates to create default workbooks, protecting work book
 - b. Exchange data with other application: linking and embedding, embedding objects, linking to other applications, import, and export document.
 - c.
- 9. Internet and its Applications
 - (a) Log-in to internet
 - (b) Navigation for information seeking on internet
 - (c) Browsing and down loading of information from internet
 - (d) Sending and receiving e-mail

- Working with more than one window in MS Word,

- How to change the version of the document from one window OS to another Conversion between different text editors, software and MS word

8. MS-EXCEL

- Starting excel, open worksheet, enter, edit, data, formulas to calculate values, format data, create chart, printing chart, save worksheet, switching from another spread sheet

- Menu commands- create, format charts, organize, manage data, solving problem by analyzing

Semester I

B. Tech CSE (Common for CTIS and DS)

ENG 113: Soft skills and Self Awareness

$\mathbf{0L} + \mathbf{0T} + \mathbf{2P} + \mathbf{1C}$

MM 100

1. Self-Awareness

What is Self-Awareness? Introspection, Guide to Self-Awareness and Self Analysis, SWOT Analysis on self

2. Confidence Building

What is Confidence? Important of Confidence Building, 6-steps guide on building Self - Confidence

3. Goal Setting

Purpose of Goal Setting, Importance of Goal Setting, SMART Goals, Performance Goals and Result Goals

4. Professional Grooming and Basic Etiquette

First Impressions, Importance of Professional Grooming, Grooming Guide – Men/ Women, Introduction to Basic Etiquette, Classroom Etiquette/Restroom Etiquette/Telephone Etiquette, General Etiquette

1. Sentence Formation

Using Noun/Types of Noun, Verbs & its usage, Tense chart using Verbs, Subject-Verb Agreement

2. Paragraph Writing

Three Essential Elements, Illustration & Application of the Three Elements, how to write an effective paragraph

3. Rapid Reading

What is Rapid Reading? Importance of Rapid Reading, Simplifying Rapid Reading, Rapid Reading Passages

4. Public Speaking

Why is Public Speaking important? Three parts to Public Speaking explained, Guide to successful Public Speaking

5. Time Management

What is Time Management? Importance of Time Management, Managing Time Effectively, Blocks to Effective Time Management

6. Stress Management

Stress and its Causes, Symptoms of Unmanaged Stress, Managing Stress, Benefits of Stress Management

7. Presentation Skills

Types of Presentation Communication, A Beginner's Guide to PowerPoint 2013, 4 P's, Delivering Effective Presentation

8. The Colorful World of Adjectives

Types of Adjectives, Use of Adjective in Sentences, Descriptive Adjective for You.

Text/Reference Books

- 1. Business communication Design, Angell, Pamela, Mcgraw-Hill, New York.
- 2. Grammar Finder, Eastwood, John, Oxford university press.
- 3. Effective technical communication, Mitra, K. Barun, Oxford university press.
- 4. Communicate to conquer: A handbook of group discussion and interviews, PHI learning, New Delhi.

Semester II Syllabus

Semester II

B. Tech CSE (Common for CTIS and DS)

ENG 106: PROFESSIONAL ENGLISH

 $\mathbf{2L} + \mathbf{1T} + \mathbf{0P} + \mathbf{3C}$

MM 100

Unit 1: Fundamentals of Communication- Introduction, Definition, Process, Importance, Different Forms and Purpose of Communication, Barriers to Communication, Organizational and Interpersonal Communication

Unit 2: Group Discussion- Introduction to Group Discussion, Types, Roles and Functions in Group Discussion, Difference between GD and Debate, Preparation Strategy, Tips for a good GD.

Unit 3: Presentation- Fundamentals of Presentation, Audience Analysis, Organizing Material, Visual Aids and Nuances of Delivery, Body language and Effective Presentation, Question- Answer Session

Unit 4: Professional Writing- Official Correspondence – Drafting E- mails, Memorandum, Notice, Agenda, Minutes, Circulars, Business Correspondence-Business letter writing- Sales letters, Enquiry letters and replies to enquiry (enquiry about a product, service or information, asking for a quotation, placing an order and replies to the same) letters of Claim and Adjustment

Unit 5: Technical Writing- Report Writing- General and Technical report, Definition, Types, structure, Technical proposals- Definitions, Types and Format

- 1. Communication Skills, Pushp Lata & Sanjay Kumar.Oxford Higher Education/Oxford University Press.
- 2. Technical Communication; Principles and Practice, Meenakshi Raman & Sangita Sharma,Oxford University Press.
- 3. Effective Technical Communication, M Ashraf Rizvi, Tata McGraw-Hill Education
- 4. Basic Communication Skills for Technology, Andrea J. Rutherford, Peerson Education Asia

Semester II

B. Tech CSE (Common for CTIS and DS)

MAT 103: ENGINEERING MATHEMATICS II

3L + 1T + 0P + 4C

MM 100

Unit 1: Matrices- Rank of a matrix, Rank of matrix by reducing to normal forms, Consistency and redundancy of systems of simultaneous linear equations and its solution, Eigen values and Eigen vectors, Cayley- Hamilton theorem (without proof), Diagonalization of matrix.

Unit 2: Differential Equations- Series Solutions of Second Order Linear Differential Equations with Variable Coefficients (complementary functions only), Partial Differential Equations of First Order: Lagrange's Form, Standard Forms, Charpit's Method.

Unit 3: Coordinate Geometry of Three Dimensions- Equation of a sphere, Intersection of a sphere and a plane, tangent plane, Intersection of two spheres, orthogonality of two spheres, Right circular cone, Right circular cylinder.

Unit 4: Vector Calculus- Scalar and vector fields, Differentiation and Integration of vector functions, Directional derivatives, Gradient, Divergence and Curl.Line, Surface and volume Integrals. Green's theorem in a plane, Gauss's and Stoke's theorem (without proof) and their applications

Unit 5: Statistics and Probability- Elementary theory of probability, Baye's theorem with simple applications, theoretical probability distributions: Binomial, Poisson and Normal.

- 1: Analytic Solid Geometry, Shanti Narayan (S.Chand).
- 2: Advanced Engineering Mathematics, Erwin Kreyszig, Wiley 9th Edition.
- 3: Mathematics for Engineers, Chandrika Prasad, Prasad Mudranalaya Allahabad.
- 4: Advanced Mathematics for Engineers, Chandrika Prasad, Prasad Mudranalaya.
- 5: Vector Analysis, M.D.Raisinghania (S.Chand).
- 6: Advanced Engineering Mathematics, Jain and Iyenger, Narosa.
- 8: Probability, Statistics and Queueing theory: Allen.
- 9: Statistical Methods (Vol. I & II), N.G.Das, TMH.
- 10: Schaum's Outline Series for Vector Calculus.
- 11: Schaum's Outline Series for Matrices.
- 12: Engineering Mathematics-II by C.B. Gupta and A.K. Malik, New Age International Pvt. Ltd.

13: Higher Engineering Mathematics, B.V.Ramana, Tata McGraw Hill.14: Probability, Statistics and Queueing theory, V.Sundrapandian, PHI.

Semester II

B. Tech CSE (Common for CTIS and DS)

PHY 107: PHYSICS FOR ENGINEERS -II

3L + 1T + 0P + 4C

MM 100

Unit I: Special Theory of Relativity: Postulates of special theory of relativity, Lorentz transformations, Relativity of length, mass and time. Relativistic velocity addition, mass-energy relation. Relativistic Energy and momentum.

Unit II: Quantum Mechanics: Compton Effect & quantum nature of light. Schrodinger's Wave Equation: Time dependent and time independent cases. Physical interpretation of wave function and its properties, boundary conditions.

Applications of Schrodinger's Equation: Particle in one-dimensional box. Particle in three-dimensional boxes. Degeneracy, Barrier penetration and tunnel effect, Alpha Decay.

Unit III: Metals and Superconductors: Summerfield's Free electron gas model: Postulates, Density of energy states, Fermi energy level, Band Theory of solids.

Superconductivity: Qualitative study of the phenomenon-meissner's effect-Josephson effect Type I & II super conductor.

Unit IV: Electro Dynamics: Scalar and Vector fields, Definitions of gradient Divergence and curl, Maxwell's Equations.

Unit V: Nuclear Radiations Detector: - Nuclear radiations detector: Principle of Gas filled detector. Proposnal counter, G M counter, Scintillation counter.

- 1. Concept of Modern Physics, Arthur Beiser, Tata McGraw Hill (Noida).
- 2. Introduction to Solid State Physics, C. Kittel, Wiley Editions(New Delhi).
- 3. Introduction to Electrodynamics, John D. Griffith, Tata McGraw Hill(Noida).
- 4. Electromagnetics, Sadiku, Oxford university Press(New Delhi).
- 5. QuantumMechanics, Ghatak & Loknathan, Tata McGraw Hill (Noida).

B. Tech CSE (Common for CTIS and DS)

MM 100

CHY 103: ENVIRONMENTAL SCIENCE

$\mathbf{2L} + \mathbf{0T} + \mathbf{0P} + \mathbf{2C}$

Unit 1: Introduction and natural resources: Multidisciplinary nature and public awareness, renewable and nonrenewable resources and associated problems, forest, water, mineral, food, energy and land resources. Introduction to natural resources, conservation of natural resources and human role.

Unit 2: Ecosystem: Ecological concepts, concept of ecosystems, types of ecosystems, ecosystem structure and functioning, energy flow, food chains and food webs, ecological pyramids.

Unit 3: Biodiversity and Conservation: Definition, genetic species and ecosystem diversity biogeographically, classification of Indian value of biodiversity at national and local levels, India as a mega-diversity nation, treats to biodiversity and endangered and endemic species of India, need for conservation of biodiversity.

Unit 4: Environmental pollution: Definition, causes, effect and control of air pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution, electromagnetic pollution, nuclear hazards, human role in prevention of pollution, solid waste management, disaster management, floods, earthquake, cyclone, and landslide

Firework Safety: Combustion of firework and pollution (noise, smoke, fireworks fallout and residue pollution), heavy metal toxicity due to fireworks and associated health effects.

Unit 5: Social Issue and Environment: Unsuitable to suitable development, urban problem related to energy and water conservation, environment protection act, wild life protection act, forest conservation act, environmental issues, population explosion, and family welfare programme. Environmental and human health HIV, women and child welfare, role of information technology on environment and human health.

Corruption: definition and reasons, details of organizations/agencies working against corruption, role of individual against corruption and mode of action.

Ethics : Meaning , nature, determinants and objectives of ethics, ethics and its relation to values norms and morals, Indian ethos, Swami Vivekananda and ethics.

- 1. Fundamentals of Environmental Biology, K. C. Agrawal, Nidhi Publishers(Bikaner).
- 2. Fundamentals of Ecology, E.P. Odum, W.B. Saunders Co. (USA).
- 3. Fundamentals of Ecology, E. P. Odum, Natraj Publisher (Dehradun).
- 4. Ecology: Principles and Applications, J. L. Chapman & , M. J. Reiss, Cambridge University Press.
- 5. Atmospheric pollution, W. Buch , Tata McGraw Hill(TMH)
- 6. Professional Ethics and Human Values, M. Govindarajan, PHI Learning Private Limited (Delhi).
- 7. Corruption and Reform in India, Jennifer Bussell, Cambridge University Press.

Semester II

B. Tech CSE (Common for CTIS and DS)

MM 100

BCSI201: DESIGN THINKING

3L + 0T + 0P + 3C

Course Objectives:

- The human centered design process focuses on understanding and empathizing with the users and the context, and then on defining the users' needs in an actionable way.
- After developing a design paradigm, the process engages the first of many cycles of rapid experimentation, prototyping, and testing with users to drive the evolution of a solution that most effectively satisfies user's needs.

Course Outcomes:

Understand how teaching and learning occurs in the design process

- Recognize the ethical and social dilemmas and obligations of the practice of design
- Diagnose common adoption barriers in individuals, groups and organizations.
- Develop a design theory from independent and qualitative research and observations.
- Participate in and lead innovation in creative and collaborative settings
- Undertake complex and unstructured problem-solving challenges in unfamiliar domains

Unit I: Design Thinking

Foundations of Human Centered Design, Barriers to Innovation and Adoption, Learning by Doing, Understanding Needs in Context.

Unit II: Design Needs and Interventions

The Ethics of Design Interventions, Design Needs in Education, Engineering and Health & Society.

Unit III: Empathy in Design

Discovering Explicit and Latent Needs, Qualitative Research: Watching and Listening, Point of View & Problem Reframing, Developing Grounded Theory, Design for Usability

Unit IV: Ideation, Experimentation and Evolution

Generating and Developing Ideas, Creativity as Teaching and Learning, Prototyping and testing Learning Through Things & Interactions, Express, Test, Cycle

Unit V: Design Documentation

Representing Design Knowledge, Diffusion of Innovation, Design as research

Textbooks:

- 1. Design Thinking: Integrating Innovation, Customer Experience, and Brand Value, by <u>Thomas</u> <u>Lockwood</u>, Allworth Press, 2010.
- 2. 101 Design Methods: A Structured Approach for Driving Innovation in Your Organization Book by Vijay Kumar.

Reference Books:

1. Design Thinking: Understand – Improve – Applyedited by Hasso Plattner, Christoph Meinel, Larry Leifer, Springer Science & Business Media, 2010

*Latest editions of all the suggested books are recommended.

Semester II

B. Tech CSE (Common for CTIS and DS)

BCSI202: Web Designing

3L + 0T + 0P + 3C

MM 100

UNIT I

Introduction to the Internet and the World Wide Web

Introduction, History of internet, Internet Design Principles, Internet Protocols - FTP, TCP/IP, SMTP, Telnet, etc., Client Server Communication, Web System architecture

Evolution of the Web, Web architectures, Web clients and servers, Static and Dynamic Web Applications, Front end and back end web development. HTML, CSS, JS, XML; HTTP, secure HTTP, etc; URL, Web Services – SOAP, REST.

UNIT II HTML & CSS

Introduction to Html, Html Document structure, Html Editors, Html element/tag & attributes, Designing simple page - Html tag, Head tag, Body tag; More Html tags - Anchor tag, Image tag, Table tag, List tag, Frame tag, Div tag; Html forms - Input type, Text area, Select, Button, Images.

Introduction to CSS, Syntax, Selectors, Embedding CSS to Html, Formatting fonts, Text & background colour, Inline styles, External and Internal Style Sheets, Borders & boxing.

UNIT III XML and HTML5, CSS3

Introduction to XML, Difference b/w Html & XML, XML editors, XML Elements & Attributes XML DTD, XML Schema, XML Parser, Document Object Model (DOM), XML DOM.

UNIT IV

Introduction to HTML5, New features, Local storage, Web Sockets, Server events, Canvas, Audio & Video, Geolocation, Microdata, Drag and Drop. Browser life cycle and browser rendering stages. Service workers.

UNIT V PHP Server side scripting

Introduction to PHP, Basic Syntax, Variables, constants and operators, Loops, Arrays and Strings, Environment & environment variables, responding to HTTP requests, Files, Cookies, Sessions, Examples.

Books:

- 1. Practical Web Design for Absolute Beginners, Adrian W. West. Apress 2016
- 2. Introducing Web Development, Jorg Krause. Apress 2017.
- 3. HTML & CSS: The Complete Reference, Thomas Powell. McGraw Hill, Fifth Edition, 2010
- 4. Creating a Website: The Missing Manual, 3rd Edition, Mathew Macdonald. O'Reilly
- 5. Web Technologies HTML, JavaScript, PHP, Java, JSP, ASP.NET, XML and Ajax Black, Kogen Learning Systems (Dreamtech Press), 5th Edition 2009.
- 6. HTML, XHTML & CSS Bible, Brian Pfaffenberger, Steven M.Schafer, Charles White, Bill Karow- Wiley Publishing Inc, 2010
- HTML5 & CSS3 for the Real World, 2 Edition, <u>Alexis Goldstein</u>, <u>Estelle Weyl</u>, <u>Louis Lazaris</u>. Apress 2015.
- 8. HTML5 & CSS3 for Dummies, Andy Harris. Wiley 2014.
- 9. Learning PHP A Gentle Introduction to the Web's Most Popular Language, David Sklar. O'Reilly 2016.
- Build Your Own Database Driven Web Site Using PHP & MySQL, Kevin Yank. Sitepoint, 4th Edition, 2009.

B. Tech CSE (Common for CTIS and DS)

ENG 107: COMMUNICATION TECHNIQUES LAB

0L + 0T + 2P + 1C

MM 100

- 1. Phonetic Symbols and Transcriptions
- 2. Methods of Word Formation
- 3. Reading, Listening and Speaking Skills
- 4. Seminar Presentation
- 5. Group Discussion
- 6. Job Interview

- 1. Advanced Manual for Communication Laboratories and Technical Report Writing, D.Sudha Rani, Pearson, (New Delhi)
- 2. A Course in Phonetics and Spoken English, J. Sethi & P.V. Dhamija, PHI Learning Pvt. Ltd.
- 3. English Language Laboratories: A Comprehensive Manual, Nira Konar, PHI Learning Pvt. Ltd.
- 4. Oxford English Learning Package (with CDs: Headway Series)
- 5. Tata McGraw Hills English Learning Package (with CDs)
- 6. Oxford Advanced Learners' Dictionary, Oxford University Press (New Delhi)

B. Tech CSE (Common for CTIS and DS)

MM 100

PHY 108: PHYSICS FOR ENGINEERS LAB–II

 $\mathbf{0L} + \mathbf{0T} + \mathbf{2P} + \mathbf{1C}$

- 1. To study the charging and discharging of a condenser and hence determine time Constant (both current and voltage graphs are to be plotted).
- 2. To determine the high resistance by method of leakage, using a Ballistic Galvanometer.
- 3. To study the variation of semiconductor resistance with temperature and hence determine the band gap of semiconductor in the form of reverse biased P-N junction diode.
- 4. To determine the ferromagnetic constants retaintivity, coercivity, permeability, susceptibility by tracing I.H. curve using C.R.O.
- 5. Frequency Determination Melde's Method.
- 6. To determine the specific resistance of the material by Carey Foster Bridge.
- 7. To convert a Galvanometer in to an ammeter of given range and calibrate it.
- 8. To convert a Galvanometer in to a voltmeter of given range and calibrate it.

B. Tech CSE (Common for CTIS and DS)

BCSI203: WEB DESIGNING LAB

0L + 0T + 2P + 1C

MM 100

Practical website development

- 1. Design a simple web page with head, body and footer, with heading tags, image tag
- 2. Design a web site for book information, home page should contain books list, when particular book is clicked, information of the books should display in the next page.
- 3. Design a page to display the product information such as name, brand, price and etc with table tag
- 4. Design a web site for book information using frames, home page should contain two parts, left part should contain books list, and right part should contain book information.
- 5. Design a web page to capture the user information such as name, gender, mobile number, mail id, city, state, and country using form elements.
- 6. Design a web page with nice formatting like background image, text colors and border for text using external CSS.
- 7. Design a web page to perform mathematical calculations such as addition, subtraction, multiplication, and division using form elements and Java Script.
- 8. Design a web page to capture the user information such as name, gender, mobile number, mail id, city, state, and country using form elements and display them into other pages using Java Script.
- 9. Design a web page to display timer in the left side of the web page using Java Script.
- 10. Design a web page to capture the student details such as student number, name, age, marks using Java Script Object.
- 11. Design a web page to read data from an XML file and display the data in tabular format, take the data as employee information.
- 12. Design a web site for online purchase using CSS, JS and XML, web site should contain the following web pages.
 - Home page
 - Login page

- Signup page
- Product details page
- 13. Design a web site for Student details using PHP, web site should contain the following web pages.
 - Home page
 - Login page
 - Signup page
 - Student details page

Semester II

B. Tech CSE (Common for CTIS and DS)

BCSI204: COMPUTER AIDED GRAPHICS

$\mathbf{0L} + \mathbf{0T} + \mathbf{2P} + \mathbf{1C}$

MM 100

Introduction: Principles of drawing, conventional representation of machine components and materials, lines, types of lines, dimensioning types, rules of dimensioning, Computer aided drafting: Introduction to computer aided drafting, advantages and applications of CAD, concepts of computer aided drafting using AutoCAD, basic drawing and modify commands.

[Discuss on AutoCAD software and to draw in Sketch book]

Isometric Projections: Isometric projection of planes and solids. [At least 3 Problems in AutoCAD and 3 problems in Sketch book]

Orthographic Projection: Introduction to orthographic projection, concept of first angle and third angle projection, drawing of simple machine elements in first angle projection. [At 4 problems on AutoCAD and 4problems in sketch book]

Section of solids: Introduction to sectional views, Section of right solids by normal and inclined planes. [At least 2 problems on AutoCAD and 2problems in sketch book]

Conventional representation of materials: Common features, Springs, Gear Assemblies, Materials, Interrupted views and Braking of Shaft, Pipe, Bar, Surface finishing & Machining Symbols [At least 2 problems on AutoCAD and 2 problems in sketch book]

Miscellaneous: Welded joints, riveted joints, Belt and pulleys, screw fasteners, Bearings; Ball, roller, needle, foot step bearing Belt and pulleys, pipe joints.

[At least one problem from each on AutoCAD and sketch book preparation of all topics]

Text/Reference Books

- 1. N.D. Bhatt, Elementary Engg. Drawing, Chartor Pub. House, Anand, India.
- 2. D. N. Johle, Engineering Drawing, Tata Mcgraw-hill Publishing Co. Ltd..
- 3. P.S. Gill, Engineering Graphics.
- 4. N.D. Bhatt, Machine Drawing, Chartor Publishing house, Anand, India.
- 5. Warren J. Luzzader, Fundamentals of Engineering Drawing, Prentice Hall of India, New Delhi.
- 6. Fredderock E. Giesecke, Alva Mitchell & others, Principles of Engineering Graphics, Maxwell McMillan Publishing.

Semester II

B. Tech CSE (Common for CTIS and DS)

ENG 114: SOFT SKILLS AND COMMUNICATION

0L + 0T + 2P + 1C

MM 100

1. Communication for Impact

Importance and Types of Communication, 6 Steps Model of Communication, Guide to Effective Communication – Listening Skills, Successful Communication at Workplace.

2. Interpersonal Relationship Management

Importance of Interpersonal Relationship (IPR), Benefits of IPR, Developing Interpersonal Abilities.

3. Team Building

Definition and Types, Team work skills, Qualities of a Team Player.

4. Leadership

Understanding the qualities of a Good Leader, 4 Factors of Leadership, Bring out the Leader in You.

5. Resume Writing

Concepts of Resume, Curriculum Vitae and Bio-data, Resume – Information and Details, Sample Resume and Template.

6. Cover Letter

Cover letter Writing, Sample Cover letter and Template.

7. Personal Grooming and Interview Etiquette

Basic Personal Hygiene, Professional Attire – Men, Professional Attire – Women, Interview Etiquette Guide.

8. Telephonic Interview

Importance and Preparation, Advantages and Disadvantages, Things to Remember.

9. Video Interview

Preparation and Practice, Guide to a Successful Video Interview.

10. Group Discussion

Group Discussion Guide, Topics for Group Discussion, Mock GD.
11. Personal Interview

Importance and Types of Personal Interviews, FAQs with Answers.

12. Extempore

Guide to a Successful Extempore, Extempore Topics.

Text/Reference Books

- 1. Business communication Design, Angell, Pamela, Mcgraw-Hill, New York.
- 2. Grammar Finder, Eastwood, John, Oxford university press.
- 3. Effective technical communication, Mitra, K. Barun, Oxford university press.
- 4. Communicate to conquer: A handbook of group discussion and interviews, PHI learning, New Delhi.

Semester III Syllabus

Semester III

B. Tech CSE (CTIS)

MM 100

BCSI301: STATISTICS AND PROBABILITY

3L + 1T + 0P + 4C

Course Objective:

- To understand the basic concepts of statistics and probability.
- To understand the description of data using statistical techniques
- To understand the statistical methods involved in hypothesis testing
- To understand the difference between parametric and non-parametric tests
- To understand the random variables, statistical expectation and its statistical and mathematical properties.
- To understand the concepts of regression and correlation analysis.

Unit I: Introduction to Statistics and Probability

History and evolution of statistics, types of data, important terminologies, contingency table, frequency and cross table, graphs, histogram and frequency polygon, Random variables, statistical properties of random variables, Expectation, , jointly distributed random variables, moment generating function, characteristic function, limit theorems, probability, trial, events, types of events, apriori probability, limitations of classical probability, statistical or empirical probability, axiomatic approach to probability, probability function, theorems on probabilities of events, law of probability theory, Bayes theorem, application of Bayes Theorem.

Unit II: Measures of Central Tendency and Dispersion

Descriptive Statistics, Mean: Arithmetic, Geometric and Harmonic means, mathematical relationship among different means, median for raw data and grouped data, mode for raw data and grouped data, relationship among

mean, median and mode, measure of dispersion – standard deviation, variance, covariance and its properties, coefficient of variation, quartiles, quartile deviation and mean deviation, Mean absolute deviation.

Unit III: Testing of Hypothesis:

Introduction to testing of hypothesis, Statistical assumptions, Level of significance, confidence level, Type I Error, Type II error, Critical value, power of the test, Application of small sample test – t and F test, Large Sample test – Z test in Data Science Industry with small use cases (application oriented).

Unit IV: Analysis of Variance (ANOVA):

Introduction to general linear model, assumptions of ANOVA, factors and levels in ANOVA, layout of one way ANOVA, skeleton of one way ANOVA, multiple comparison of sample means, one way analysis of variance with unequal sample sizes, two factor analysis of variance – introduction and parameter estimation, two way analysis of variance with interaction, Post ANOVA: testing of hypothesis for significance of mean using Fishers Least Significance Difference test (lsd), Tukeys test, Dunnet test, Duncan Multiple Rangetest.

Unit V: Regression and Correlation:

Introduction to linear model, concepts of factor, effect, residuals, dependency, independency, assumptions of linear model, estimation of parameters using OLS, properties of regression coefficients, Spurious regression concepts, significance of regression coefficients using t test and F test, concepts of auto correlation, multiple linear regression analysis, multi collinearity, heteroscedasticity, significance of estimated parameters in multiple linear regression, partial test for the individual significance, correlation analysis, properties of correlation coefficients, significance of single correlation coefficient, significance of multiple correlation coefficients, concepts of multiple correlation and partial correlation.

Text Book:

1. Fundamentals of mathematical statistics – SC Gupta and VK Kapoor, Sultan Chand & Sons Publication, New Delhi

Reference Book:

- 1. Introduction to probability Models, Ninth Edition Sheldon M. Ross, Elsevier Publication, Academic Press, UK
- 2. Introduction to Probability and Statistics for Engineers and Scientists, Third Edition Sheldon M. Ross, Elsevier Publication, Academic Press, UK.
- 3. An introduction to Probability and Statistical Inference George Roussas, Academic Press.

Course Outcome:

- Understand the importance of statistics in different research areas.
- Understand the basic concepts of Statistics and its evolution.
- Understand the suitable statistical measures to describe and summarize the data
- Understand the application of statistical test to appropriate research environment

- Understand the basic concepts of probability and its applications
- Understand the application of regression analysis in finding the expected values

Semester III

BCSI302: Digital Electronics

3L + 1T + 0P + 4C

Course Objective:

- Understand concepts of combinational and sequential circuits.
- Analyze the synchronous and asynchronous logic circuits.
- Understand concepts of memory, programmable logic and digital integrated circuits.
- Design Combinational and sequential systems.

Unit I: Basic Concepts, Boolean algebra, Theorems and Functions

Number Systems: Decimal number system, binary number system, octal number system, hexadecimal number system, BCD number system, Excess-3 code, Gray code, Alpha numeric code, error detecting and error correcting codes. Arithmetic: Arithmetic number representation, Binary arithmetic, Hexadecimal arithmetic, BCD arithmetic. Boolean algebra and Theorems: Logic gates and logic operations, Boolean theorems and postulates, SOP's & POS's, Minterms and Maxterms. Minimization of Boolean Functions: Algebraic simplification, Karnaugh map simplification, Quine-Mc Cluskey or Tabulation method.

Unit II: Logic Gates

Logic Families: Metal Oxide Semiconductor logic families- switching properties of NMOS and PMOS transistors, static NMOS, dynamic NMOS, Static CMOS and dynamic CMOS logic families, CMOS Transmission gate circuits, Bipolar logic families- switching properties of NPN and PNP transistors, TTL, Schottkey TTL, Comparison of MOS logic circuits(CMOS) with that of a TTL digital circuit, Tristate gates. Electrical

B. Tech CSE (CTIS)

MM 100

characteristics: Meanings of speed, propagation delay, operating frequency, and power dissipated per gate, supply voltage levels, operational voltage levels of various logic families.

Unit III: Combinational Systems

Binary arithmetic units (Adder, Subtractor, n-bit parallel adder & Subtractor, look ahead carry generator), decoder, encoder, multiplexer, Demultiplexer, code converters, Magnitude comparators, parity generators. Implementation of combinational logic by standard IC's.

Unit IV: Sequential Systems

Flip-flop and Latch: SR latch, JK flip-flop, T flip-flop, D flip-flop and latch, Master-slave RS flip-flop, Masterslave JK flip-flop, asynchronous inputs. Registers & Counters: Shift registers (SISO, SIPO, PISO, PIPO), universal shift register. Counters Asynchronous/Ripple counters, Synchronous counters, Modulus-n Counter, Ring counter, Johnson counter, Up-Down counter, asynchronous clear, preset and load in a counter, synchronous clear, preset and load in a counter, typical IC's for counters. Synchronous (Clocked) sequential circuits: Moore and Mealey state machine circuits, Analysis & design of synchronous sequential circuits – State machine design with SM charts

Unit V: Memory and Programmable Logic

RAM, memory decoding, ROM, PROMs, PAL & PLA, Sequential Programmable Devices (discuss three major devices without going into their detailed construction).

Text Book:

- 1. Morris Mano M, Michael D. Ciletti, "Digital Design", Pearson Education, 4th Edition, 2007.
- 2. Charles H Roth (Jr), Larry L. Kinney, "Fundamentals of Logic Design", Cengage Learning India Edition, 5th Edition, 2010.
- 3. Floyd and Jain, "Digital Fundamentals", Pearson Education, 8th Edition, 2007.

Reference Book:

- 1. Ronald J. Tocci, "Digital Systems: Principles and Applications", Pearson Education, 10th Edition, 2009.
- 2. Donald P Leach, Albert Paul Malvino, Goutam Saha, "Digital Principles and Applications", Tata McGraw Hill, 6th Edition, 2008

Course Outcome:

- Understand different number systems and its inter-conversions.
- Understand the concept of Boolean algebra and its different theorems, properties etc.
- Understand simplification of Boolean functions.
- Understand the construction and working of different combinational circuits etc.
- Understand different flip-flops and its applications.
- Understand different sequential logic circuits and basic design of sequential circuits and counters.
- Understand different types of memories and its applications.

Semester III

BCSI303: Data Structures using C

3L + 0T + 0P + 3C

Course Objective:

- A data structure is a particular way of storing and organizing data in a computer so that it can be used efficiently.
- Different kinds of data structures are suited to different kinds of applications and some are highly specialized to specific tasks.
- This course covers the basic concepts of different data structures which are the basic building blocks of Programming and problem solving.

Unit I: Introduction to Data structures

Definition, Classification of data structures: primitive and non-primitive, Elementary data organization, Time and space complexity of an algorithm (Examples), String processing. Dynamic memory allocation and pointers: Definition of dynamic memory allocation, Accessing the address of a variable, Declaring and initializing pointers, Accessing a variable through its pointer, Meaning of static and dynamic memory allocation, Memory allocation functions: Malloc(), Calloc(), free() and realloc(). Recursion: Definition, Recursion in C (advantages), Writing Recursive programs – Binomial coefficient, Fibonacci, GCD.

Unit II: Searching and Sorting

B. Tech CSE (CTIS)

MM 100

Basic Search Techniques: Sequential search: Iterative and Recursive methods, Binary search: Iterative and Recursive methods, Comparison between sequential and binary search. Sort: General background and definition, Bubble sort, Selection sort, Insertion sort, Merge sort, Quick sort.

Unit III: Stack and Queue

Stack – Definition, Array representation of stack, Operations on stack: Infix, prefix and postfix notations, Conversion of an arithmetic expression from Infix to postfix, Applications of stacks. Queue: Definition, Array representation of queue, Types of queue: Simple queue, Circular queue, Double ended queue (deque), Priority queue, Operations on all types of Queues.

Unit IV: Linked List

Definition, Components of linked list, Representation of linked list, Advantages and Disadvantages of linked list. Types of linked list: Singly linked list, doubly linked list, Circular linked list, Operations on singly linked list: creation, insertion, deletion, search and display.

Unit V: Tree Graphs and their Applications:

Definition: Tree, Binary tree, Complete binary tree, Binary search tree, Heap Tree terminology: Root, Node, Degree of a node and tree, Terminal nodes, Non-terminal nodes, Siblings, Level, Edge, Path, depth, Parent node, ancestors of a node. Binary tree: Array representation of tree, Creation of binary tree. Traversal of Binary Tree: Preorder, Inorder and postorder. Graphs, Application of Graphs, Depth First search, Breadth First search.

Text Books:

- 1. Weiss, Data Structures and Algorithm Analysis in C, II Edition, Pearson Education, 2001
- 2. Lipschutz: Schaum's outline series Data structures Tata McGraw-Hill
- 3. Robert Kruse Data Structures and program designing using 'C'
- 4. Trembley and Sorenson Data Structures

Reference Books:

- 1. E. Balaguruswamy Programming in ANSI C.
- 2. Bandyopadhyay, Data Structures Using C Pearson Education, 1999
- 3. Tenenbaum, Data Structures Using C. Pearson Education, 200
- 4. Kamthane: Introduction to Data Structures in C. Pearson Education 2005.
- 5. Hanumanthappa M., Practical approach to Data Structures, Laxmi Publications, Fire Wall media 2006
- 6. Langsam, Ausenstein Maoshe & M.Tanenbaum Aaron Data Structures using C and C++ Pearson Education

Course Outcome:

- Students will benefit from the knowledge of Data Structures and different operating one can perform on these like searching, sorting, stacking and etc.
- This forms a very strong foundation for programming in different languages that the students will take up in subsequent semesters or in any other course.

Semester III

B. Tech CSE (CTIS)

BCSI304: Object Oriented Programming using Java

3L + 0T + 0P + 3C

MM 100

Course Objective:

- Object oriented programming is the most efficient and proven technique for developing reliable software. It provides features such as increased productivity, reusability of code, decrease in the development time, and reduces cost of production to an extent.
- There are many languages which used the object-oriented concepts and techniques to develop real time software. Such programming languages are C++, Java, Smalltalk, Objective-C, etc.
- Java is a purely object-oriented programming language. Systems/applications created using java programming language reduces the need for developing and maintain complex and space consuming applications. Java can be found in the micro controller, automated machines and mobile phones.
- Java became so popular, because of its neutral code, which means code can run on any operating systems without rewriting the same code.
- This course provides students with an understanding of the object-oriented concepts which helps in the field of programming, management of data, etc.

Unit: I

Introduction to Java

Introduction, installing java, JRE and JDK, Byte Code, JVM; Simple Java program. Creating Objects, Data types, Operators: Arithmetic Operators, Bitwise operators, Relational operators, Logical Operators, The Assignment Operator, ternary operator; Operator Precedence, Access specifiers. Type casting; Strings. Control Statements: conditional statements, looping statements, jumping statements, methods, static methods, and static block, Arrays

Unit: II

Classes, Inheritance, package and Interface

Classes: Classes in Java; declaring a class; constructors, method overloading, Object Class.

Inheritance: Simple Inheritance, Super class and sub class, super keyword multiple, and multilevel inheritance; Overriding.

Packages and Interfaces: Packages, Defining Packages, access protection, Importing Packages. Abstract Methods, Abstract Classes, Defining Abstract Classes, Extending Abstract Classes, Defining Interfaces, Implementing Interfaces

Lambda Expressions

Introducing Lambda Expressions, Lambda Expression Fundamentals, Functional Interfaces, Some Lambda Expression Examples, Block Lambda Expressions, Generic Functional Interfaces, Passing Lambda Expressions as Arguments

Unit: III

Thread Programming, Exceptions and I/O

Thread Programming: What are threads? Thread life cycle, Extending Thread class, implementing runnable interface, Synchronization, Deadlock, Manipulation Thread states.

Exception Handling: Fundamentals, Exception Types, try and catch, multiple catch clauses, nested try statements, throw, and throws, finally, built in exceptions, user defined exceptions and chained exceptions.

I/O: Introduction, stream classes, Byte Streams, Character Streams, Reading Data from Keyboard, Folders and Folder Operations, Files and File Operations, Serialization and Deserialization

Unit: IV

Networking and JDBC

Networking: Introduction, Socket, Client/Server architecture, Reserved Sockets, Proxy Servers, Internet Addressing, Factory Methods, Instance Methods, TCP/IP Client Sockets : URL,URL Connection, TCP/IP Server Sockets, Datagrams, Datagram Sockets, Inet4Address and Inet6Address, RMI: Stub, Skelton

Database connectivity – JDBC architecture and Drivers. JDBC API - loading a driver, connecting to a database, creating and executing JDBC statements, handling SQL exceptions. Accessing result sets: types and methods. An example - JDBC application to query a database

Unit: V

GUI Programming with AWT and JavaFX

AWT: GUI Programming, AWT Basics, AWT package: Layouts, Label, TextField, Button, Events, TextArea, CheckBox, CheckBoxGroup, List, Canvas, Menus, Pop Menus, Panel, And Dialog. Listeners: ActionListener, MouseListener, ItemListener, KeyListener, WindowListener

JavaFX: Basic Concepts, JavaFX Packages, Stage and Scene Classes, Nodes and Scene Graphs, Layouts, Application Class and the Lifecycle Methods, Compiling and Running a JavaFX Program, JavaFX Control: Label, Buttons and Events, Event Handling, Button, ToggleButton, RadioButton, Image, ImageView, ListView, ComboBox, Menus, Toolbar, Case Study.

Text Book:

- 1. Herbert Schildt: Java The Complete Reference, 7th Edition, Tata McGraw Hill, 2007
- 2. Jim Keogh: J2EE The Complete Reference, Tata McGraw Hill, 2007

Reference Book:

1. Y. Daniel Liang: Introduction to JAVA Programming, 6th Edition, Pearson Education, 2007

2. Stephanie Bodoff et al: The J2EE Tutorial, 2nd Edition, Pearson Education, 2006

Course Outcome:

- Read and understand Java-based software code of medium-to-high complexity.
- Use standard and third party Java's API's when writing applications.
- Understand the basic principles of creating Java applications with graphical user interface (GUI).
- Understand the fundamental concepts of computer science: structure of the computational process, algorithms and complexity of computation.
- Understand the basic approaches to the design of software applications.
- Apply the above to design, implement, appropriately document and test a Java application of medium complexity, consisting of multiple classes.

Semester III

BCSI305: Database Management System

3L + 0T + 0P + 3C

MM 100

B. Tech CSE (CTIS)

Course Objective:

- A database management system (DBMS) is collection of software meant to manage a Database. Many popular databases currently in use are based on the relational database model.
- RDBMSs have become a predominant choice for the storage of information in new databases used for financial records, manufacturing and logistical information, personnel data and much more.
- The course covers the basic concepts of databases in general with an emphasis on relational databases, modeling techniques and writing queries. Normalization techniques, Transaction processing, Concurrency Control techniques and Recovery of databases against crashes are also covered.

Purpose of Database System -- Views of data - Data Models -- Database Languages -- Database System Architecture -- Database users and Administrator -- Entity-- Relationship model (E-R model) -- E-R Diagrams -- Introduction to relational databases.

Unit II: Relational Model-I

The relational Model – The catalog- Types– Keys - Relational Algebra – Domain Relational Calculus – Tuple Relational Calculus - Fundamental operations – Additional Operations- SQL fundamentals. Oracle data types, Data Constraints, Column level & table Level Constraints, working with Tables. Defining different constraints on the table, Defining Integrity Constraints in the ALTER TABLE Command, Select Command, Logical Operator, Range Searching, Pattern Matching, Oracle Function, Grouping data from Tables in SQL, Manipulation Data in SQL

Unit III: Relational Model-II

Joining Multiple Tables (Equi Joins), Joining a Table to itself (self Joins), Sub queries Union, intersect & Minus Clause, Creating view, Renaming the Column of a view, Granting Permissions, - Updating, Selection, Destroying view Creating Indexes, Creating and managing User Integrity – Triggers - Security – Advanced SQL features – Embedded SQL– Dynamic SQL- Missing Information– Views – Introduction to Distributed Databases and Client/Server Databases.

Unit IV: Database Design

Functional Dependencies – Non-loss Decomposition – Functional Dependencies – First, Second, Third Normal Forms, Dependency Preservation – Boyce/Codd Normal Form-Multi-valued Dependencies and Fourth Normal Form – Join Dependencies and Fifth Normal Form

Unit V: Transactions

Transaction Concepts - Transaction Recovery – ACID Properties – System Recovery – Media Recovery – Two Phase Commit - Save Points – SQL Facilities for recovery –Concurrency – Need for Concurrency – Locking Protocols – Two Phase Locking – Intent Locking – Deadlock- Serializability – Recovery Isolation Levels – SQL Facilities for Concurrency.

Text Books:

- 1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, "Database System Concepts", Fifth Edition, Tata McGraw Hill, 2006
- 2. Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", Fourth Edition, Pearson/Addision Wesley, 2007.

Reference Books:

1. Raghu Ramakrishnan, "Database Management Systems", Third Edition, McGraw Hill, 2003.

Course Outcome:

• Students will learn how to write queries, transactions and different modelling techniques in a relational database.

Semester III

B. Tech CSE (CTIS)

BCSI306: Communication Skills

0L + 0T + 2P + 1C List of Activities:

MM 100

SI.	Particulars	Purpose
No.		
01	Work on Vocabulary	To have the knowledge of essential vocabulary
02	Correct Grammar	To practice the use of correct Grammar
03	Communication Circles	To highlight that there are different levels of sharing information and that you need to decide which level is the most appropriate for any given situation.
04	Circle, Square, Triangle or Z	To allow students to share a little about themselves with the group as part of the introductions to one another.
05	Colour Block	To emphasize what happens when we are presented with too many contradictory messages at the same time.

06	Power of Body Language	To enhance the importance of Non-verbal communication
07	Repeat the Question	To illustrate how our expectations concerning communications can sometimes cause us to say the wrong things
08	Quick Answers	To illustrate how we sometimes jump to incorrect conclusions because of the way that information is presented to us
09	Creative Fairy Tale	To challenge the creativity of students to come up with a solution that would be acceptableto each person involved in the issue
10	Communication Shutdowns	To emphasize how certain statements can have a negative effect on any discussion or further meaningful communications that may have otherwise followed
11	Drafting a Memo/Notice	Identify the need for good writing skills for effective communication at the workplace
12	Report Writing	Identify the need for good writing skills for effective communication at the workplace
13	Resume Writing	What and how to create an effective resume
14	Correspondence for job	How and what to write while doing correspondence related to job

Semester III

BCSI307: Data structures using C Lab

0L + 0T + 2P + 1C

List of Experiments:

Part A

- 1. Use a recursive function to find GCD of two numbers.
- 2. Use a recursive function to find the Fibonacci series.
- 3. Use pointers to find the length of a string and to concatenate two strings.
- 4. Use pointers to copy a string and to extract a substring from a given a string.
- 5. Use a recursive function for the towers of Hanoi with three discs.

B. Tech CSE (CTIS)

MM 100

- 6. Insert an integer into a given position in an array.
- 7. Deleting an integer from an array.
- 8. Write a program to create a linked list and to display it.
- 9. Write a program to sort N numbers using insertion sort.
- 10. Write a program to sort N numbers using selection sort.

Part B

- 1. Inserting a node into a singly linked list.
- 2. Deleting a node from a singly linked list.
- 3. Pointer implementation of stacks.
- 4. Pointer implementation of queues.
- 5. Creating a binary search tree and traversing it using in order, preorder and post order.
- 6. Sort N numbers using merge sort.

Semester III

B. Tech CSE (CTIS)

BCSI308: Object Oriented Programming with Java Lab

0L + 0T + 2P + 1C

MM 100

List of Experiments:

Part A

- 1. Write a program to check whether two strings are equal or not.
- 2. Write a program to display reverse string.
- 3. Write a program to find the sum of digits of a given number.

- 4. Write a program to display a multiplication table.
- 5. Write a program to display all prime numbers between 1 to 1000.
- 6. Write a program to insert element in existing array.
- 7. Write a program to sort existing array.
- 8. Write a program to create object for Tree Set and Stack and use all methods.
- 9. Write a program to check all math class functions.
- 10. Write a program to execute any Windows 95 application (Like notepad, calculator etc)
- 11. Write a program to find out total memory, free memory and free memory after executing garbage Collector (gc).

Part B

- 1. Write a program to copy a file to another file using Java to package classes. Get the file names at run time and if the target file is existed then ask confirmation to overwrite and take necessary actions.
- 2. Write a program to get file name at runtime and display number f lines and words in that file.
- 3. Write a program to list files in the current working directory depending upon a given pattern.
- 4. Create a textfield that allows only numeric value and in specified length.
- 5. Create a Frame with 2 labels, at runtime display x and y command-ordinate of mouse pointer in the labels.

Semester III

B. Tech CSE (CTIS)

MM 100

BCSI309: Database Management Systems Lab

0L + 0T + 2P + 1C

List of Experiments:

- 1. Perform following actions using SQL statements
 - a. Create a new user with name "shiva" and password "kumar@1"
 - b. Assign the following privileges
 - i. Create and drop tables
 - ii. Create and drop users

- iii. Allow to assign above privileges to new users
- iv. List all tables in the database
- v. List all users in the database
- vi. Logout from current user and log in as "shiva"
- 2. Create following tables and insert minimum 10 rows in to each table
 - a. Department table with following columns with appropriate data types
 - i. DeptId
 - ii. DeptName
 - iii. DeptLoc
 - b. Employee table with following columns with appropriate data types
 - i. EmpId
 - ii. EmpName
 - iii. DOB
 - iv. DOJ
 - v. Job
 - vi. Salary
 - c. Product table with following columns with appropriate data types
 - i. ProdId
 - ii. ProdName
 - iii. Price
 - d. Sales table with following columns with appropriate data types
 - i. SalesId
 - ii. Date
 - iii. Quantity
- 3. Update above tables with following features using SQL statements
 - a. Make DeptId in Department table as Primary Key
 - b. Make EmpId in Employee table as Primary Key
 - c. Add DeptId column to the Employee table and make it foreign key from Department table and update the values
 - d. Add EmpId and ProdId to the Sales table and make them foreign key from Employee and Product table and update the values
 - e. Update all columns in all tables with appropriate constraint such as not null, check and so on
- 4. Perform the following SQL statements
 - a. Create a view "EmpDeptView" from Employee and Department table which contains following columns

- i. EmpName
- ii. DOB
- iii. Salary
- iv. DeptId
- v. DeptName
- vi. Loc
- b. Retrieve all employees whose salary between 25,000 to 30,000
- c. Retrieve all employees who is working in Accounts department (If it is not there add this row to Department table)
- d. Retrieve all employees who is working other than Accounts department
- e. Retrieve all employee who is working in Sales department and Bangalore location
- f. Retrieve all employees who completed minimum 5 years
- g. Retrieve all employees who completed minimum 5 years and salary less than 30,000
- 5. Perform the following SQL statements
 - a. Retrieve all employees whose salary more than 30,000
 - b. Retrieve employee details who is getting maximum salary
 - c. Retrieve employee details who is getting minimum salary
 - d. Retrieve employee details who is getting 3rd maximum salary
 - e. Retrieve employee details who is getting 5th minimum salary
 - f. Retrieve total number of employees in each department in Bangalore location
 - g. Retrieve total number of employees in each location
 - h. Retrieve total number of employees in each location in Accounts department
 - i. Retrieve total number of employees who complete more than 10 years in each department
- 6. Write a PL/SQL Procedure to find prime number from 1 to n, n is a user input or parameter
- 7. Write a PL/SQL Functions to return number of days an employee working using EmpId
- 8. Write a PL/SQL Procedure to find sum of salaries of all employee working in a particular location
- 9. Write a PL/SQL Function to return sum of sales by ProdId
- 10. Write a PL/SQL Function to return sum of sales by EmpId
- 11. Write a PL/SQL Procedure to generate Employee Report department wise as follows

DeptName

EmpName Job Location Salary Cumulative_Salary

12. Write a PL/SQL Trigger to insert row into OldEmployee table when a employee deleted from Employee table (Create OldEmployee table)

- 13. Write a PL/SQL Trigger not to delete more than 2 employees at a time
- 14. Write a PL/SQL Trigger not to update employee salary if it cross 67000
- 15. Write a PL/SQL Package with following procedures and functions
 - a. Procedures
 - i. Print Total Quantity Sales Summary Report(SalesId, Date, Quantity and Total Quantity)
 - ii. Print Total Quantity Sales Summary Report by Date wise
 - b. Functions
 - i. Return employee name who made maximum sales till date
 - ii. Return product name soled maximum quantity till date

B. Tech CSE (CTIS)

MM 100

BCSI310: Summer Project Seminar-I

0L + 0T + 2P + 1C

Course Objective:

The objective of Summer Project is to enable the student to take up investigative study in field of Computer application with emphasis on their specialization. This is expected to provide a good initiation for the student(s) in Industry practices. The students are expected to investigate, model and present their work either individually or in groups (to be decided by the department) to the departmental committee.

4th Semester Syllabus

Semester IV

B. Tech CSE (CTIS)

BCSI401: Design and Analysis of Algorithms

3L + 0T + 0P + 3C

MM 100

Objectives of the course

- Algorithms are core or fundamentals for design and develop any kind of software(program), algorithms gives clear picture of the program about running time and complexity of the program, these helps us to find the performance of the program
- Algorithms basically contains steps to run the program and calculate time to run the program

• This subject covers various design and analysis paradigms of algorithms and data structures to improve the performance of a program

UNIT 1:

Introduction: Characteristics of algorithm. Analysis of algorithm: Asymptotic analysis of complexity bounds – best, average and worst-case behavior; Performance measurements of Algorithm, Time and space trade-offs, Analysis of recursive algorithms through recurrence relations: Substitution method, Recursion tree method and Masters' theorem.

UNIT II:

Fundamental Algorithmic Strategies: Brute-Force, Greedy,Dynamic Programming, Branch- and-Bound and Backtracking methodologies for the design of algorithms; Illustrations of these techniques for Problem-Solving , Bin Packing, Knap Sack TSP. Heuristics – characteristics and their application domains.

UNIT III:

Graph and Tree Algorithms: Traversal algorithms: Depth First Search (DFS) and Breadth First Search (BFS); Shortest path algorithms, Transitive closure, Minimum Spanning Tree, Topological sorting, Network Flow Algorithm.

UNIT IV:

Tractable and Intractable Problems: Computability of Algorithms, Computability classes – P, NP, NP-complete and NP-hard. Cook's theorem, Standard NP-complete problems and Reduction techniques.

UNIT V:

Advanced Topics: Approximation algorithms, Randomized algorithms, Class of problems beyond NP – P SPACE

Suggested books:

- 1. Introduction to Algorithms, 4TH Edition, Thomas H Cormen, Charles E Lieserson, Ronald L Rivest and Clifford Stein, MIT Press/McGraw-Hill.
- 2. Fundamentals of Algorithms E. Horowitz et al.

Suggested reference books

- 1. Algorithm Design, 1ST Edition, Jon Kleinberg and ÉvaTardos, Pearson.
- 2. Algorithm Design: Foundations, Analysis, and Internet Examples, Second Edition, Michael T Goodrich and Roberto Tamassia, Wiley.
- 3. Algorithms—A Creative Approach, 3RD Edition, UdiManber, Addison-Wesley, Reading, MA.

Course Outcomes

- 1. For a given algorithms analyze worst-case running times of algorithms based on asymptotic analysis and justify the correctness of algorithms.
- 2. Describe the greedy paradigm and explain when an algorithmic design situation calls for it. For a given problem develop the greedy algorithms.
- 3. Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Synthesize divide-and-conquer algorithms. Derive and solve recurrence relation.
- 4. Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. For a given problems of dynamic-programming and develop the dynamic programming algorithms, and analyze it to determine its computational complexity.
- 5. For a given model engineering problem model it using graph and write the corresponding algorithm to solve the problems.
- 6. Explain the ways to analyze randomized algorithms (expected running time, probability of error).
- 7. Explain what an approximation algorithm is. Compute the approximation factor of an approximation algorithm (PTAS and FPTAS).

Semester IV

B. Tech CSE (CTIS)

BCSI402: Operating Systems

3L + 0T + 0P + 3C

MM 100

Course Objective:

- The operating system is the most important program that runs on a computer. Every generalpurpose computer must have an operating system to run other programs.
- Operating systems perform basic tasks, such as recognizing input from the keyboard, sending output to the display screen, keeping track of files and directories on the disk, and controlling peripheral devices such as disk drives and printers.
- This course covers the concept of operating system and its applications

Unit I: Introduction to Operating System

Introduction, Objectives and Functions of OS, Evolution of OS, OS Structures, OS Components, OS Services, System calls, System programs, Virtual Machines.

Unit II: Process Management

Processes: Process concept, Process scheduling, Co-operating processes, Operations on processes, Inter process communication, Communication in client-server systems. **Threads:** Introduction to Threads, Single and Multi-threaded processes and its benefits, User and Kernel threads, Multithreading models, threading issues. **CPU Scheduling:** Basic concepts, Scheduling criteria, Scheduling Algorithms, Multiple Processor Scheduling, Real-time Scheduling, Algorithm Evaluation, Process Scheduling Models. **Process Synchronization:** Mutual Exclusion, Critical – section problem, Synchronization hardware, Semaphores, Classic problems of synchronization, Critical Regions, Monitors, OS Synchronization, Atomic Transactions **Deadlocks:** System Model, Deadlock characterization, Methods for handling Deadlocks, Deadlock prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.

Unit III: Storage Management

Memory Management: Logical and physical Address Space, Swapping, Contiguous Memory Allocation, Paging, Segmentation with Paging. **Virtual Management**: Demand paging, Process creation, Page Replacement Algorithms, Allocation of Frames, Thrashing, Operating System Examples, Page size and other considerations, Demand segmentation **File-System Interface**: File concept, Access Methods, Directory structure, File- system Mounting, File sharing, Protection and consistency semantics.

Unit IV: File-System Implementation:

File-System structure, File-System Implementations, Directory Implementation, Allocation Methods, Free-space Management, Efficiency and Performance, Recovery **Disk Management**: Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, Disk Attachment, stable-storage Implementation

Unit V: Protection and Security

Protection: Goals of Protection, Domain of Protection, Access Matrix, and Implementation of Access Matrix, Revocation of Access Rights, Capability- Based Systems, and Language – Based Protection. **Security:** Security Problem, User Authentication, One – Time Password, Program Threats, System Threats, Cryptography, Computer – Security Classifications.

Text Books:

- 1. Milan Milonkovic, Operating System Concepts and design, II Edition, McGraw Hill 1992.
- 2. Tanenbaum, Operation System Concepts, 2nd Edition, Pearson Education.
- 3. Silberschatz / Galvin / Gagne, Operating System, 6thEdition, WSE (WILEY Publication)

Reference Books:

- 1. William Stallings, Operating System, 4th Edition, Pearson Education.
- 2. H.M.Deitel, Operating systems, 2nd Edition, Pearson Education
- 3. Nutt: Operating Systems, 3/e Pearson Education 2004.

Course Outcome:

- After learning the fundamental concepts in Operating system including how OS has evolved over the years and different components of OS, students will continue to more significant functions of OS like Process management, storage and memory management etc.
- This will provide the necessary information for students to extract maximum benefits out of the OS while developing programs, working with applications and etc.

Semester IV

B. Tech CSE (CTIS)

BCSI403: Computer Organization and Architecture

3L + 0T + 0P + 3C

MM 100

Course Objective:

• To understand the fundamentals of computer organization and architecture and to relate these to contemporary design issues. Understanding the performance characteristics of computer system.

Unit I: Register Transfer and Micro-operation

Register Transfer Language, Register Transfer, Bus and Memory Transfer: Three state bus buffers, Memory Transfer. Arithmetic Micro-operations: Binary Adder, Binary Adder-Subtrator, Binary Incrementor, Logic Micro-operations: List of Logic micro operations, Shift Micro-operations (excluding H/W implementation), Arithmetic Logic Shift Unit.

Unit II: Basic Computer Organization

Instruction Codes, Computer Registers: Common bus system, Computer Instructions: Instruction formats, Instruction Cycle: Fetch and Decode, Flowchart for Instruction cycle, Register reference instructions

Unit III: Micro Programmed Control Unit

Control Memory, Address Sequencing, Conditional branching, Mapping of instruction, Subroutines, Design of Control Unit, Central Processing Unit: Introduction, General Register Organization, Stack Organization: Register stack, Memory stack; Instruction Formats, Addressing Modes

Unit IV: Computer Arithmetic

Introduction, Addition and Subtraction, Multiplication Algorithms (Booth algorithm), Division Algorithms, Input – Output Organization: Peripheral devices, Input – Output interface, Introduction of Multiprocessors: Characteristics of multi-processors

Unit V: Modes of Data Transfer and Memory Organization

Modes of Data Transfer: Priority Interrupt, Direct Memory Access, Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory

Text Books:

- 1. Computer System Architecture by Morris Mano, PHI
- 2. Computer Organization and Architecture by William Stallings, PHI

Reference Books:

1. Digital Computer Electronics: An Introduction to Microcomputers by Malvino, TMH

- PC Hardware in a Nutshell by Barbara Fritchman Thompson, Robert Bruce Thompson, O'Reilly, 2nd Edition, 2010
- 3. Fundamentals of Computer Organization and Architecture by Mostafa AB-EL-BARR and Hesham EL-REWNI, John Wiley and Sons
- 4. Fundamental Of computer Organization by Albert Zomaya, 2010

Course Outcome:

- Explain the use of basic concepts of Computer components.
- Discuss the Register Transfer and different Micro-operations
- Illustrate the flowchart for Instruction cycle
- Describe the function of Control Unit and Central Processing Unit
- Explain the characteristics of multi-processors.
- Discuss the modes of Data transfer and Memory organization

Semester IV

BCSI404: Computer Networks

3L + 0T + 0P + 3C

Course Objective:

To understand the basics of networking and its underlying principles. This course enables learners to understand computer networking concepts, how they work, operate, communicate with ports and Protocols. Standards and models associated with networking technology and their troubleshooting mechanisms.

Unit I: Networking Fundamentals

Basics of Network & Networking, Advantages of Networking, Types of Networks, Types of Network Architecture, Workgroup Vs. Domain. Network Topologies, Types of Topologies, Logical and physical topologies, selecting the Right Topology, Types of Transmission Media, Communication Modes, Wiring Standards and Cabling, media connectors, Introduction of OSI model, Functions of the seven layers, Introduction of TCP/IP Model, Comparison between OSI model & TCP/IP model.

Unit II: Basics of Network Devices

Network Devices- NIC- functions of NIC, installing NIC, Hub, Switch, Bridge, Router, Gateways, And Other Networking Devices, Repeater, CSU/DSU, Modem, Ethernet standards, Ethernet Components, Point-to-Point Protocol, Address Resolution Protocol, Message format, transactions, Benefits of Wireless Technology, Types of Wireless Networks, Wireless network Components, wireless LAN standards, wireless security Protocols.

Unit III: Basics of Network, Transport and Application Layers

Network Layer: Internet Protocol (IP), IP standards, versions, functions, The IPv4 and IPv6 Datagram Format, IPv4 addressing, IPv4 Subnetting, CIDR and VLSM, IPv6 Addressing, , Internet Control Message Protocol , Internet Group Management Protocol ,Introduction to Routing and Switching concepts, Transport Layer: Transmission Control Protocol(TCP), User Datagram Protocol (UDP), Overview of Ports & Sockets, Application Layer Protocols

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Unit IV: WAN Technology

Introduction to WAN, WAN Switching techniques, connecting to the Internet, Satellite-Based Services, Cellular Technologies, Technologies used for Connecting LANs, Remote Access Connections and technologies, Authentication and Authorization, Tunnelling and Encryption Protocols, Security Appliances and Security Threats.

Unit V: Troubleshooting Network

Trouble Shooting Networks: Command-Line Interface Tools, Network and Internet Troubleshooting, Troubleshooting Model, identify the affected area, probable cause, implement a solution, test the result, recognize the potential effects of the solution, document the solution, Using Network Utilities: ping, traceroute, tracert, ipconfig, arp, nslookup, netstat, nbtstat, Hardware trouble shooting tools, system monitoring tools.

Text Book:

- 1. CCNA Cisco Certified Network Associate: Study Guide (With CD) 7th Edition (Paperback), Wiley India, 2011
- 2. CCENT/CCNA ICND1 640-822 Official Cert Guide 3 Edition (Paperback), Pearson, 2013

Reference Books:

- 1. Routing Protocols and Concepts CCNA Exploration Companion Guide (With CD) (Paperback), Pearson, 2008
- 2. CCNA Exploration Course Booklet: Routing Protocols and Concepts, Version 4.0 (Paperback), Pearson, 2010

Course Outcome:

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

- Explain the types of Network and its architecture
- Identify the function of each layer in OSI and TCP/IP Models
- Describe the Ethernet and wireless standards
- Discuss the functionality of Networking devices
- Demonstrate the IPv4 and IPv6 addressing types
- List the WAN Technologies
- Practice Network troubleshooting.

Semester IV

B. Tech CSE (CTIS)

BCSICT401: Information Security

3L + 0T + 0P + 3C

Course Objective:

- To help students understand foundational concepts of information security
- To make it possible for students to appreciate the need for securing information from threats and risks
- To facilitate students to gain knowledge on how network infrastructure and connectivity can be secured

Unit I: Introduction to Information Security

Overview of Information security, Threats, Type of Vulnerabilities and Risk, Business Requirements, Information Security Definitions – Security Policies – Tier 1 (origination Level), Tier 2 (Functional Level), Tier 3 (Application or Device Level), Procedures, Standards, Guidance. Role of Governance in Information Security, Develop a Risk Management Program, Risk Management Process, Best Practices for IT Governance, Case study.

Unit II: Information Asset Classification

Classification of Information, Information Assets – Owner, Custodian, User, Information Classification in terms of Secret, Confidential, Private and Public, Declassification. Retention and Disposal of Information Assets. Provide Authorization for Access – Owner, Custodian and User, Case study.

Unit III: Access Control

User Identity and Access Management- Account Authorization, Access and Privilege Management, System and Network Access Control. Operating Systems Access Controls, Monitoring Systems Access Controls, Intrusion Detection System, Event logging, Cryptography. Physical Security: Identify Assets to be Protected, Perimeter Security, Firewalls, Prevention and Detection Systems, Safe Disposal of Physical Assets. Email Security: PGP, MIME, IP Security: IP security overview, Case study.

Unit IV: Introduction to Cryptography

Introduction to Advanced Cryptography and Cryptanalysis, Classical Encryption Techniques – Substitution Techniques, Transposition Techniques, Permutation Method. Advanced Encryption Techniques and Security Issues – RC4, One-time Pad, RSA, DES, Triple DES, AES and Diffie Hellman, Case study.

Unit V: Conventional Encryption

Confidentiality using conventional encryption – Placement of Encryption, Traffic Confidentiality, Key Distribution and Random Number Generation. Key management – Generating Keys, Nonlinear Keyspaces, Transferring Keys, Verifying Keys, Using Keys, Updating Keys, Storing keys, Backup keys, Compromised Keys, Lifetime of Keys, Destroying Keys and Public-Key Management, Case study.

MM 100

Text Book:

- 1. Mark Stamp's Information Security: Principles and Practice (WIND) Paperback 2009 by Deven N. Shah, Wiley (2009)
- 2. Cryptography and Information Security by V. K. Pachghare, Prentice-Hall of India Pvt.Ltd; 2nd Revised edition edition (30 March 2015)
- 3. Information Security Risk Analysis Thomas R. Peltier, Third Edition, Pub: Auerbach, 2012
- 4. Cryptography and Network Security Principles and Practices, by William Stallings, Pearson Education; Seventh edition (30 June 2017)
- 5. Information Systems Security: Security Management, Metrics, Frameworks and Best Practices by Nina Godbole, Wiley, 1st ed; 2008
- 6. Information Security: The Complete Reference by Mark Rhodes-Ousley, McGraw Hill Education; Second edition (1 May 2013)
- 7. Principles of Information Security by Michael E. Whitman, Cengage Learning India Private Limited; 5 edition (2015)

Reference Book:

- 1. Applied Cryptanalysis Breaking Ciphers in the Real World Stamp, Richard M.Low
- 2. Serious Cryptography: A Practical Introduction to Modern Encryption Kindle Edition by Jean-Philippe Aumasson.

Course Outcome:

- Explain basic concepts and importance of information security
- Identify threats to information security, analyse their impact and propose suitable countermeasures
- Describe various aspects of securing network infrastructure and importance of classifying information.

Semester IV

BCSICT402: Storage & Datacenter

3L + 0T + 0P + 3C

Course Objective:

- To impart the basic concepts of Storage systems and Datacenter environment.
- To understand concepts about RAID techniques.
- To understand basic concepts about NAS and SAN.
- To understanding about taking backup and restoring the data with the help of Business Continuity and Disaster Recovery concepts and tools.
- To understand about Data Center Consolidation and Clustering.

Unit I: Introduction to Storage System

Introduction to Information Storage: Information Storage, Evolution of Storage Architecture, Data Center Infrastructure, Virtualization and Cloud Computing

Data Center Environment: Application, Database Management System (DBMS), Host (Compute), Connectivity, Storage, Host Access to Data, Direct-Attached Storage, Storage Design Based on Application

Data Protection (RAID): RAID Implementation Methods, RAID Array Components, RAID Techniques, RAID Levels, RAID Impact on Disk Performance, RAID Comparison

Unit II: Storage Networking Technologies

Network-Attached Storage: General-Purpose Servers versus NAS Devices, Benefits of NAS, File Systems and Network File Sharing, Components of NAS, NAS I/O Operation, NAS Implementations, NAS File-Sharing Protocols, Factors Affecting NAS Performance, File-Level Virtualization.

Fibre Channel Storage Area Networks: Fibre Channel Overview, The SAN and Its Evolution, Components of FC SAN, FC Connectivity, Switched Fabric Ports, Fibre Channel Architecture, Fabric Services, Switched Fabric Login Types, Zoning, FC SAN Topologies, Virtualization in SAN.

IP SAN and FCoE: iSCSI, FCIP, FCoE

Unit III: Backup and Disaster Recovery

Introduction to Business Continuity: Information Availability, BC Terminology, BC Planning Life Cycle, Failure Analysis, Business Impact Analysis, BC Technology Solutions.

Backup and Archive: Backup Purpose, Backup Considerations, Backup Granularity, Recovery Considerations, Backup Methods, Backup Architecture, Backup and Restore Operations, Backup

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Topologies, Backup in NAS Environments, Backup Targets, Data Deduplication for Backup, Backup in Virtualized Environments, Data Archive, Archiving Solution Architecture.

Unit IV: Data Center Consolidation

Reasons for Data Center Consolidation: Reasons for Data Center Consolidation, Consolidation Opportunities.

Data Center Consolidation Phases: Phase 1: Study and Document the Current Environment, Phase 2: Architect the Target Consolidated Environment, Phase 3: Implement the New Architecture, Phase 4: Control and Administer the Consolidated.

Best Practices in IT: Defining Best Practices, Deploying Best Practices, Benefits of Best Practices, Systems Management Best Practices, Server Cluster Best Practices, Data Storage Best Practices, Network Management Best Practices, Documentation Best Practices, Network Diagram Documentation, Documentation Formats.

Unit V: Data Center Clusters

Cluster Architecture: Asymmetric Two-Node Clusters, Symmetric Two-Node Clusters, Complex Cluster Configurations, Failover Policies, Best Practices.

Cluster Requirements: Required Hardware Cluster Components, Cluster Software Requirements, What Happens During Service Failover, Cluster Installation Checklist.

Designing Cluster-Friendly Applications: Automating Operations, Controlling Application Failover Time, Reducing Data Loss During Failover, Minimizing Application Failures, Designing Node-Independent Applications, Minimizing Planned Downtime, Restoring Client Connections.

Text Books:

- 1. Information Storage and Management (Storing Managing, and Protecting Digital Information in Classic, Virtualized, and Cloud Environments) 2nd Edition by Somasundaram Gnanasundaram Alok Shrivastava.
- 2. Administering Data Centers: Servers, Storage, and Voice over IP By Kailash Jayaswal ISBN-13: 978-0471771838

Reference Books:

- 1. Storage Networks Explained: Basics and Application of Fibre Channel SAN, NAS, ISCSI, INFINIB and FOCE by Ulf Troppens.
- 2. Storage Management in Data Centers: Understanding, Exploiting, Tuning, and Troubleshooting Veritas Storage Foundation by Volker Herminghaus and Albrecht Scriba.

Blade Servers and Virtualization: Transforming Enterprise Computing While Cutting Costs by Barb Goldworm and Anne Skamarock.

Semester IV

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BCSI405: Design and Analysis of Algorithms Lab

0L + 0T + 2P + 1C

LIST OF EXPERIMENTS:

- 1. Write a program to sort a set of elements by implementing Merge sort.
- 2. Write a program to sort the array elements recursively using the quick sort.
- **3.** Create a Graph class to implement an adjacency list representation of a graph. Devise an appropriate input method for populating the Graph. Also implement the following method for Graph:
 - **a.** BFSPath(s,t) finds a path from node s to the node t using BFS.
- **4.** Create a Graph class to implement an adjacency list representation of a graph. Devise an appropriate input method for populating the Graph. Also implement the following method for Graph:
 - **a.** DFSPath(s,t) same as BFS Path except that it uses DFS to look for a path.
- **5.** Implement a program for prim's algorithm to find out the minimum cost spanning tree
- **6.** Implement a program for kruskal's algorithm to find out the minimum cost spanning tree.
- 7. Write a program to implement greedy topological sorting algorithm to find a topological sequence for the completion of a set of given tasks.
- 8. Implement a Roadster package that has a network of nodes (locations) and edges (roads) between pairs of nodes with the distances between the end nodes as the weights. I should be able to query Roadster with any pair of nodes and it should return the shortest path between the two (Dijkstra's)
- 9. Write a program to implement Radix sort.
- **10.** Implement a program for Floyds all pair shortest path algorithm and wars hall's all pair shortest path algorithm.
- **11.** Implement a non-recursive version of the Euclid's GCD algorithm.
- **12.** Implement Binomial co –efficient problem using the by dynamic programming.
- 13. Implement a program to solve knapsack problem by dynamic programming.

Course Outcome:

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

- Know the running time of algorithm.
- Know the implementation and comparison of problem like kruskal and prim, recursive algorithm.
- Able to understand the working of various problem

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BCSI406: Employability Skills

0L + 0T + 2P + 1C

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List of Activities:

Speaking Skills	a) Group Discussion
	b) Panel Discussion
	c) Debate
	d) Personal Interview
Etiquette and	a) Professional etiquette- Etiquette at meetings, Dining, Involuntary Awkward
Mannerism	Actions
	b) Technology Etiquette- Phone, Email, Social Media, Video Conferencing,
	Web Interview
Professional	a) Nature of Oral Presentation
Presentations	b) Planning a Presentation
	c) Preparing the Presentation
	d) Delivering the Presentation
Resume & Job	a) Resume Vs CV
Application	b) What is a scannable resume;
	c) How to develop an impressive resume;
	d) Different formats of Resume;
	e) Job application or cover letter
Job Interviews	a) Definition of interview, Background information, Types of
	interviews;
	b) Preparatory steps for Job interviews:
	c) Interview Skill tins:
	d) Changes in the interview process
	a) Frequently asked questions during interviews
	c) rrequently asked questions during interviews

Semester IV

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BCSI407: Computer Networks Lab

0L + 0T + 2P + 1C

List of Experiments:

- 1. Switch Configuration Basic Commands and Switch Port Security.
- 2. Router Configuration and Setting up of Passwords.
- 3. PPP Encapsulation, PPP PAP Authentication, PPP CHAP Authentication.
- 4. A configuration of default, Static and Dynamic Routing.
- 5. VLAN Configuration.
- 6. Configuration of Access-lists Standard and Extended ACLs.
- 7. DHCP, DHCP Relay and DHCP Exclusions.
- 8. Configuring Logging to a Remote Syslog Server.
- 9. Design and analyse network with a router, Switch and Hub to find the number of broadcast domains and collision domain using packet tracer.
- 10. Configure a wireless network for ad-hoc and infrastructure mode.
- 11. Configure point to site and site to site VPN.
- 12. Perform network troubleshooting using ping, traceroute, tracert, ipconfig, arp, nslookup, netstat, nbtstat.

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Semester IV

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BCSI408: Operating System Lab

0L + 0T + 2P + 1C

List of Experiments:

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- 1. Installing Linux Operating System
 - a. Boot, reboot, and shut down a system normally.
 - b. Boot systems into different run levels manually.
- 2. Login to OS and monitoring the performance
 - a. Use single-user mode to gain access to a system.
 - b. Identify CPU and memory-intensive processes, adjust process priority with renice, and kill processes.
 - c. Locate and interpret system log files
- 3. Manage Users and Groups
 - a. Create, delete, and modify local user accounts.
 - b. Change passwords and adjust password aging for local user accounts.
 - c. Create, delete, and modify local groups and group memberships.
- 4. Working with files
 - a. Archive, compress, unpack, and uncompress files using tar, star, gzip, and bzip2.
 - b. Create and edit text files.
 - c. Create, delete, copy, and move files and directories.
 - d. Create hard and soft links.
 - e. List, set, and change standard ugo/rwx permissions.
 - f. Locate, read, and use system documentation including man, info, and files in /usr/share/doc.
- 5. List, create, delete, and set partition types for primary, extended, and logical partitions.
- 6. Create and remove physical volumes, assign physical volumes to volumes groups, and create and delete logical volumes
- 7. Create; mount; unmount; and use ext2, ext3, and ext4 file systems.
- 8. Create and manage access control lists (ACLs).
- 9. Diagnose and correct file permission problems.

Configure network and hostname resolution statically or dynamically

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Semester IV

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BCSICT403: STORAGE AND DATA CENTER LAB

 $\mathbf{0L} + \mathbf{0T} + \mathbf{2P} + \mathbf{1C}$

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List of Experiments:

- 1. Configuring the Directly Attached Disks for Basic and Dynamic Disks
- 2. Creating and configuring the disk partitions and volumes for the disk in Windows/Linux System
- 3. Creating and Configuring the RAID 0, 1 and RAID5 in windows server 2012 R2
- 4. Configuring the Network Share using Windows Server 2012 R2
- 5. Configuring the File Server in Windows Server 2012 R2
- 6. Configuring NFS in Linux Server
- 7. Configuring the iSCSI in Windows Server 2012 R2
- 8. Configuring FCOE in Windows Server 2012 R2
- 9. Creating a System Backup and Restoring in Windows Server and Linux System
- 10. Creating and Restoring the Snapshot for Virtual Machines in Hyper-V
- 11. Installing and configuring the NLB in Windows Server 2012 R2
- 12. Installing and configuring Failover Clustering in Windows Server 2012 R2