MAHARAJAH'S COLLEGE (AUTONOMOUS)::VIZIANAGARAM

I B.Sc. Computer Science Major

R23	**SEMESTER II**		**L**	**T**	**P**	**C**
	Major/ Minor	**C3-PROBLEM SOLVING USING C** (w.e.f.2023-24Admitted Batch)	**5**	**3**	**2**	**4 (3+1)**
	Total Hours -45					

Course Objectives:

1. To explore basic knowledge on computers
2. Learn how to solve common types of computing problems.
3. Learn to map problems to programming features of C.
4. Learn to write good portable C programs.

UNIT-I **9 hrs**

Introduction to computer and programming:

Introduction, Basic block diagram and functions of various components of computer, Concepts of Hardwareandsoftware,Typesofsoftware,Compilerandinterpreter,ConceptsofMachinelevel,Assembly level and high-level programming, Flowcharts and Algorithms.

Fundamentals of C: History of C, Features of C, C Tokens-variables and keywords and identifiers, constants and Data types, Rules for constructing variable names, Operators, Structure of C program, Input/output statements in C-Formatted and Unformatted I/O.

UNIT-II **9 hrs**

Control statements:

Decision making statements: if, if else, else if ladder, switch statements. Loop control statements: while loop, for loop and do-while loop. Jump Control statements: break, continue and go to.

UNIT-III **9 hrs**

Derived data types in C:

Arrays: One Dimensional arrays-Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation.

Strings: Declaring& initializing string variables; String handling functions, Character handling functions

.

UNIT-IV 9 hrs

Functions: Function Prototype, definition and calling, **return** statement, nesting of functions. Categories of functions. Recursion, Parameter Passing by address & by value. Local and Global variables.

Storage classes: automatic, external, static and register.

Pointers: Pointer data type, Pointer declaration, initialization, accessing values using pointers. Pointer arithmetic. Pointers and arrays, pointers and functions.

UNIT-V 9 hrs

Dynamic Memory Management: Introduction, Functions: malloc, calloc, realloc, free.

Structures: Basics of structure, structure members, accessing structure members, nested structures, array of structures, structure and functions, structures and pointers.

Unions: Union definition; difference between Structures and Unions.

Course Outcomes:

Upon successful completion of the course, a student will be able to:

CO1:Understand the working of a digital computer and Fundamental constructs of Programming

CO2:Analyze and develop a solution to a given problem with suitable control structures

CO3:Apply the derived data types in program solutions

CO4:Use the "C" language constructs in the right way

CO5:Apply the Dynamic Memory Management for effective memory utilization

Text Books:

1. E. Balagurusamy ―"Programming in ANSIC", Tata Mc Graw Hill, 6thEdn, ISBN-13:978- 1-25-90046-2
2. HerbertSchildt,―CompleteReferencewithC,TataMcGrawHill,4thEdn.,ISBN-13:9780070411838, 2000
3. ComputerfundamentalsandprogramminginC,REEMATHAREJA,OXFORDUNIVERSITYPRESS

Reference Books

1. E.Balagurusamy, COMPUTING FUNDAMENTALS & C PROGRAMMING–TataMcGrawHill, Second reprint 2008, ISBN 978-0-07-066909-3.
2. Ashok NK amthane, Programming with ANSI and Turbo C, Pearson Edition Publ, 2002.
3. Henry Mullish & HuubertL.Cooper: The Spirit of C An Introduction to modern Programming, Jaico Pub.House, 1996.
4. Y.kanithkar, letus C BPB,13th edition-2013,ISBN:978-8183331630,656pages.

Web links:

www.w3schools.com
www.greeksforgreeks.com
www.javatpoint.com
www.programmiz.com
https://onlinecourses.nptel.ac.in/noc24_cs42/preview

C3P-Problem solving using C Lab

(Hours/Week:02 Total Hours: 30 Credits:01)

List of Experiments:

1. A. Write a program to calculate simple & compound interest.

   B. Write a C program to interchange two numbers.

2. Find the biggest of three numbers using C.
3. Write a C program to find the sum of individual digits of a positive integer.
4. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in these sequence.
5. Write a C program to check whether a number is Armstrong or not.
6. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
7. Write a C program that implements searching of given item in given list.
8. Write a c program that uses functions to perform the following: Addition of two matrices. Multiplication of two matrices.
9. Write a program for length of a string with and without String Handling functions.
10. Write a program to demonstrate Call by Value and Call by Reference mechanism.

Lab Outcomes:

- Apply and practice logical ability to solve the problems.
- Understand C programming development environment, compiling, debugging, and linking and • executing a program using the development environment
- Analyzing the complexity of problems, Modularize the problems into small modules and then • convert them into programs
- Understand and apply the in-built functions and customized functions for solving the problems.
- Understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems.
- Document and present the algorithms, flowcharts and programs in form of user-manuals

MAHARAJAH'S COLLEGE (AUTONOMOUS)::VIZIANAGARAM
I B.Sc. Computer Science Major

R23	**SEMESTER II**		**L**	**T**	**P**	**C**
	Major	**C4–DIGITAL LOGIC DESIGN** (W.e.f.2023-24AdmittedBatch)	**5**	**3**	**2**	**4 (3+1)**
	Total Hours-45					

Course Objectives:

To familiarizes with the concepts of designing the digital logical circuits.

UNIT–I 9 hrs

Number Systems: Binary, octal, decimal, hexa decimal,Number systems, conversion of numbers from on eradix to another radix, r's, (r-1)'s complements, signed binary numbers, addition and subtraction of unsigned and signed numbers, weighted and un-weighted codes.

UNIT–II 9 hrs

Logic Gates and Boolean Algebra: NOT, AND, OR, universal gates, X-OR and X-NOR gates, Boolean laws and theorems, complement and dual of a logic function, canonical and standard forms, two levelrealizationoflogicfunctionsusinguniversalgates,minimizationsoflogicfunctions(POSandSOP)usingBooleantheorems, K-map (up to four variables), don't care conditions.

UNIT–III 9 hrs

CombinationalLogicCircuits–1: Design of half-adder, full-adder, half-subtractor, full-subtractor, ripple adders and sub-tractors, ripple adder / subtractor.

UNIT–IV 9 hrs

Combinational Logic Circuits–2: Design of decoders, encoders, priority encoder, multiplexers, de-multiplexers, higher order decoders, de-multiplexers and multiplexers, realization of Boolean functions using decoders, multiplexers.

UNIT–V 9 hrs

Sequential Logic Circuits: Classification of sequential circuits, latch and flip-flop, RS-latch using NAND and NOR Gates, truth tables, RS, JK, T and D flip-flops, truth and excitation tables, conversion of flip-flops,flip-flopswithasynchronousinputs(presetandclear).Designofregisters,shiftregisters,bidirectional shift registers, universal shift register, design of ripple counters, synchronous counters and variable modulus counters.

Course Outcomes:

Upon successful completion of the course, the students will be able to

1. Understand how to convert numbers from one radix to other radix and perform arithmetic operations.
2. Simplify Boolean functions using Boolean algebra and k-maps.
3. Design adders and sub-tractors circuits.
4. Design combinational logic circuits such as decoders, encoders, multiplexers and de-multiplexers.
5. Use flip flops to design registers and counters.

Text Books:

1. M.MorrisMano,MichaelDeloitte,―DigitalDesign‖,5thedition,PEA.

Reference Books:

1. Kohavi,Jha, -Switchingand Finite Automata Theory‖, 3rd edition, Cambridge.
2. Leach, Malvino, Saha,-Digital Principles and Applications‖, 7thedition,TMH.
3. Roth, ―FundamentalsofLogicDesign‖,5thedition,Cengage.

Web links:

www.w3schools.com

www.greeksforgreeks.com

www.javatpoint.com

www.programmiz.com

C4P–Digital Logic Design Lab

(Hours/Week:02 Total Hours: 30 Credits:01)

List of Experiments:

The laboratory work can be done by using physical gates and necessary equipment or simulators.

Simulators: https://sourceforge.net/projects/gatesim/ or https://circuitverse.org/ Oranyfreeopen-Source simulator.

1. Introduction to digital electronics lab- nomenclature of digital ICs, specifications, study of the data sheet, concept of Vcc and ground, verification of the truth tables of logic gates using TTLICs.
2. ImplementationofthegivenBooleanfunctionsusinglogicgatesinbothSOPandPOSforms
3. Realization of basic gates using universal gates.
4. Design and implementation of half and full adder circuits using logic gates.
5. Design andimplementationofhalfandfullsub-tractorcircuitsusinglogicgates.
6. Verification of state tables of RS, JK, T and D flip-flops using NAND gates.
7. Implementation and verification of Decoder and encoder using logic gates.
8. Implementationof4X1 MUX and De-MUX using logic gates.
9. Implementationof7-segmentdecodercircuit.
10. Implementationof4-bitparalleladder.
11. Design andverificationof4-bitsynchronouscounter.

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R -23	SEMESTER – II	T	P	C
	READING & WRITING SKILLS **English Praxis Course-II** **(w.e.f 2023 -24 Admitted Batch)**	**4**	**0**	**3**

COURSE OBJECTIVES:

The objectives of this course are to make the students:
To get an overall idea about the topics from literature with reference to Tennyson, Robert Frost, Abrar Mohsin, Ruskin Bond, A. J. Cronin, Nissam Ezekiel and R.K.Narayan.

- To Acquire with Vocabulary: Conversion of words, one word substitutes and collocations.
- To Familiarize with reading comprehension and Note making / taking.
- To acquire the knowledge about preparation of Notices, Agendas and Minutes.
- To learn how to write Curriculum Vitae and Resume, Letters, E-Correspondence.

SYLLABUS:

UNIT – I: **(10Hrs)**

Poetry : Ulysses – Alfred Lord Tennyson
Skills : 1.Vocabulary: Conversion of Words.
2. One Word Substitutes.
3. Collocations.

UNIT – II **(8Hrs)**

Prose	: The Best Investment I Ever Made –A.J. Cronin	
Poetry	: Ode to the West Wind	PB Shelley.
Non-Detailed Text	: Florence Nightingale	Abrar Mohsin.
Skills	: Skimming and Scanning.	

UNIT – III **(11Hrs)**

Prose	:1.TheNightTrain at Deoli	Ruskin Bond.
Poetry	:2.Stopping by Woods on a Snowy Evening	Robert Frost
Skills :	1. Reading Comprehension (Top Down, Bottom Up &Scheme Theory)	
	: 2. Note Making/Taking.	

UNIT – IV **(9hrs)**

Poetry

:Night of the Scorpion Nissim Ezekiel

Skills : 1.Expansion of Ideas.
: 2.Notice, Agendas and Minutes.

UNIT – V: **(12Hrs)**

Non-Detailed Text : An Astrologer's Day RK Narayan.

Skills : 1.CurriculumVitae and Resume.
2. Letters.
3. E-Correspondence.

LEARNING OUT COMES:

By the end of the course the learner will be able to**:**

- Use reading skills effectively.
- Comprehend different texts.
- Build up a repository of active vocabulary.
- Improve writing skills independently for future needs.
- Enhance communicative competence through Reading and Writing Skills

ACTIVITIES:

-- Asking the students to prepare a model resume.
-- Quiz on one word substitutes.
-- Pair activity on collocations.
-- Asking the students to read news's paper clippings and make notes.

CO-CURRICULAR ACTIVITIES:

- Class Room Seminars.
- Student Projects.
- JAM Sessions.
- Assignments.

TEXT BOOKS:

- English Praxis Course-II by Maruthi Publications.

- English Praxis Course-II by A Course on Communication and Soft skills by Vivanta Press.

REFERENCE BOOKS:

- Black book of English Vocabulary by Nikhil Gupta.
- Advanced Writing skills for Skill Builders by D.S.Paul.
- Improving Reading Comprehension and Speed, Skimming and scanning- Reading for Pleasure by Marcia J. Coman and Kanthy L. Heavers.

LMS ACCESS:

1. **https://www.goodreads.com/author/show/1305302.R_K_Narayan**

2. ESL Gold (https://www.eslgold.com/) - ESL Gold offers a range of resources for learners of English, including grammar lessons, vocabulary exercises, and conversation practice.

3. Breaking News English (https://breakingnewsenglish.com/) - Breaking News English offers news articles and related exercises for learners of English, with a focus on vocabulary and comprehension.

4. My Language Exchange (https://www.mylanguageexchange.com/) - My Language Exchange is a language exchange platform that allows you to connect with native English speakers for conversation practice.

5. https://www.studocu.com/in/z/37601931?sid=01734585498 [proverbs]

R23TELT231

COURSE INFORMATION SHEET

Program : **General Telugu**
Year and semester : **II Semester**
Course : **Srujanaatmaka Rachana (సృజనాత్మక రచన)**
Course Name : **TELUGU**
Course Coordinator :
Total Number of hours : **60**
Internal Marks : **40**
External Marks : **60**

Lecture	Tutorial	Practical	No. Of Hrs per week	Credits
4	0	0	4	4

Course Objectives (అభ్యాసన లక్ష్యాలు):

1. Develop proficiency in reading, writing, and speaking skills
2. Introduce students to classical Telugu literature, including epics, poetry, drama, and philosophical texts.
3. Enhance knowledge of Telugu grammar (Vyakaranam).
4. Provide insights into Indian culture, philosophy, and heritage as reflected in Telugu texts.
5. Encourage the use of Telugu in modern contexts, including employability in education, research, and technology.

Course Outcomes (అభ్యాసన ఫలితాలు);

1. Demonstrate proficiency in Telugu through effective communication, both oral and written.
2. Analyze and interpret classical texts and apply their teachings to contemporary life.
3. Exhibit a clear understanding of Telugu grammar and its application in constructing verses and prose.
4. Develop skills for translation and interpretation of Telugu texts into modern languages.
5. Identify career opportunities in areas like teaching, translation, research, and cultural tourism.

I-BA, BSC, BCOM డిగ్రీ జనరల్ తెలుగు సెమిస్టర్ -II

పాఠ్యప్రణాళిక - 2021-2022

మహారాజా కళాశాల (స్వయంప్రతిపత్తి). విజయనగరం

క్రమ సంఖ్య	యూనిట్-I : ఆధునిక కవిత్వం	బోధన సమయం 9 గంటలు
1.	ఆధునిక కవిత్వం- పరిచయం	3 గంటలు
2.	కొండవీడు - దువ్వూరి రామిరెడ్డి	2 గంటలు
3.	మాతృసంగీతం - అనిసెట్టి సుబ్బారావు	2 గంటలు
4.	'తాతకో నూలుపోగు' - బండారు ప్రసాదమూర్తి	2 గంటలు

క్రమ సంఖ్య	యూనిట్-II : కథానిక	బోధన సమయం 9 గంటలు
1.	తెలుగు కథానిక – పరిచయం	4 గంటలు
2.	భయం (కథ) – కాళీపట్నం రామారావు	3 గంటలు
3.	స్వేదం ఖరీదు....? – రెంటాల నాగేశ్వరరావు	2 గంటలు

క్రమ సంఖ్య	యూనిట్-III : నవల	బోధన సమయం 13 గంటలు
1.	తెలుగు 'నవల' పరిచయం	4 గంటలు
2.	రథచక్రాలు (నవల) - మహీధర రామ్మోహన రావు	5 గంటలు
3.	రథచక్రాలు (సమీక్షా వ్యాసం) - డా॥ యల్లాప్రగడ మల్లికార్జునరావు	2 గంటలు

క్రమ సంఖ్య	యూనిట్-IV : నాటకం	బోధన సమయం 12 గంటలు
1.	తెలుగు 'నాటకం' - పరిచయం	4 గంటలు
2.	యక్షగానము (నాటిక) - ఎం.వి.ఎస్. హరనాధరావు,	5 గంటలు
3.	"అపురూప కళారూపాల విధ్వంసదృశ్యం 'యక్షగానము' (సమీక్షా వ్యాసం)" - డా॥ కందిమళ్ళ సాంబశివరావు	3 గంటలు

క్రమ సంఖ్య	యూనిట్-V: విమర్శ	బోధన సమయం 8 గంటలు
1.	తెలుగు సాహిత్య విమర్శ- పరిచయం	3 గంటలు
2.	విమర్శ-స్వరూప స్వభావాలు; ఉత్తమ విమర్శకుడు-లక్షణాలు	5 గంటలు

క్రమ సంఖ్య	అటానమస్ లో భాగంగా అదనపు సమాచారం - జర్నలిజం	బోధన సమయం 5 గంటలు
1.	ఏది వార్త ?	1 గంట
2.	వార్తా ఆధారాలు	1 గంట
3.	వార్తా భేదాలు	1 గంట
4.	వార్తా సేకరణ పద్ధతులు	2 గంటలు

	పునశ్చరణ	4 గంటలు

అంశాలు	బోధన సమయం
యూనిట్ – I	9 గంటలు
యూనిట్ – II	9 గంటలు
యూనిట్ – III	13 గంటలు
యూనిట్ – IV	12 గంటలు
యూనిట్ – V	8 గంటలు
యూనిట్ – VI	5 గంటలు
పునశ్చరణ	4 గంటలు
మొత్తం	**60 గంటలు**

COURSE INFORMATION SHEET

GENERAL INFORMATION

R23	Lecture	Tutorial	Practical	Credits
	4	0	0	4

Program **: General Sanskrit**

Year and Semester **: II Semester**

Course **: POETRY, PROSE & GRAMMER -II**

Course Name **: SANSKRIT**

Course Coordinator **:**

Total Number of hours **: 60**

Internal Marks **: 40**

External Marks **: 60**

Course 2: POETRY, PROSE & GRAMMER -II

Course Objectives

1. Develop proficiency in reading, writing, and speaking skills

2. Introduce students to classical Sanskrit literature, including epics, poetry, drama, and philosophical texts.

3. Enhance knowledge of Sanskrit grammar (Vyakarana).

4. Provide insights into Indian culture, philosophy, and heritage as reflected in Sanskrit texts.

5. Encourage the use of Sanskrit in modern contexts, including employability in education, research, and technology.

Course Outcomes;

1. Demonstrate proficiency in Sanskrit through effective communication, both oral and written.

2. Analyze and interpret classical texts and apply their teachings to contemporary life.

3. Exhibit a clear understanding of Sanskrit grammar and its application in constructing verses and prose.

4. Develop skills for translation and interpretation of Sanskrit texts into modern languages.

5. Identify career opportunities in areas like teaching, translation, research, and cultural tourism.

I. Learning Outcomes:

1. संè कृ त पत् कॅ वĤ योग माधुयान[ुभूितः भवित ।
2. संè कृ त गत् कॅ वĤ योग माधुयान[ुभूितः भवित ।
3. åयाकरण£ ानात्लखे नशॅ०ु ः भवित ।

II. Syllabus: (Teaching Hours: 60)

Unit - 1: Ĥाचीन पत् साŎ ह× यम (12h)

1. पाŭ णĒ हणम - रघुवà शमहाकाå ये 7 सगः [
2. पğ ाचान[म - नानाĒÛ थेß यः

.Unit - 2: आधुिनक पत् साŎ ह× यम (12h)

1. पÛ नाधाğ ी –]ीम×Ĥ तापरणायनेमेवाडकाÖ डे 13 सगः [
2. सुखवगः [– धà मपदम **(Sanskrit Version of Prof. P.Sriramachandrudu)**

Unit - 3: गत् साŎ ह× यम (12h)

1. अमोघदशन[म - बाणè य कादंबर४ तः
2. चाæ चेॅ०ंतम - कॅ वकोपकलापतः

Unit - 4: åयाकरणम (12h)

1. अजÛ त शÞ दाः (नद४ ,तनु, वधू, मातृ, वन, फल, वाॉ र, मधु)
2. धातवः (इष, िलख, कृञ, Ðàञ, चरु, रमु, वÛƷ ,युध)

Unit - 5: åयाकरणम (12h)

1. सÛ धयः (हल सŭÛधः – ŏ वसगस[ŭÛधः)
2. समासाः (अå यायीभावः, बहुॉ ीŎ हः)

III Skill Outcomes:

On successful completion of this course, student shall be able to:

1. संè कृ तकवीनां पदवाÈ यĤ योगसरणेरवगितः भवित ।
2. संè कृतकवीनां भावगà भीय प[ाॅ र£ ानम भवित ।
3. वाÈ यरचनायाम दोषराŎ ह× यĤ ाU ः भवित ।

IV References:

1. Prescribed Sanskrit **Text Book II**

V. Co-Curricular Activities: (Hours for Activity: 15h)

1. Assignments
2. Seminars, Group discussions, Quiz, Debates etc.
3. Invited lectures and presentations on related topics by experts.

R-23	SEMESTER – II LIFE SKILLS COURSE	T	P	C
	COURSE: BUSINESS WRITING (w.e.f 2023-24 Admitted Batch)	2	0	2

SYLLABUS

UNIT-I **10hrs**

Introduction to Business Writing: Importance and purpose of effective business writing; Characteristics of good business writing; Common challenges and misconceptions. Writing Clear and Concise Emails: Appropriate email etiquette in the professional environment, organizing email content and using effective subject lines, Understanding tone and formality in email communication.

UNIT-II **10hrs**

Memos and Interoffice Communication: Formatting and structure of memos, writing memos for various purposes like updates, announcements, requests. Ensuring clarity and coherence in interoffice communication. Business Letters and Formal Correspondence: Structure and components of a business letter, writing persuasive and professional business letters, responding to inquiries and complaints effectively.

UNIT III **10hrs**

Business Proposals and Reports: Crafting business proposals for projects and initiatives, Formal report writing - format, sections, and organization, Analyzing data and presenting findings in reports. Writing for Digital Platforms: Business writing for websites, social media, and online communication, Leveraging technology for efficient and impactful

COURSE OUT COMES:

By the end of this course, students will be able to:

1. Understand the fundamentals of business writing, including style, tone, and language.
2. Produce well-structured and concise business documents, such as emails, memos, and reports.
3. Apply principles of effective communication in business letters and interoffice correspondence.
4. Craft persuasive and well-organized business proposals and formal reports.
5. Cultivate a professional and ethical approach to business writing.

Text Books:

1. Business Writing Basics by Jane Watson (Author) Publisher: Self Counsel Press Inc; 2nd edition (1 August 2002) ISBN-10: 1551803860 ISBN-13: 978-1551803869

2. Successful Business Writing - How to Write Business Letters, Emails, Reports, Minutes and for Social Media - Improve Your English Writing and Grammar: of Exercises and Free Downloadable Workbook by Heather Baker Publisher: Universe of Learning Ltd; Illustrated edition (1 March 2012) ISBN-10 : 1849370745 ISBN-13 : 978-1849370745

3. Business Correspondence and Report Writing, 6th Edition by R C Sharma, Krishna Mohan, Virendra Singh Nirban. Publisher: McGraw Hill Education (India) Private Limited. ISBN-10: 9390113008 ISBN-13: 978-9390113002

Reference Books:

1. "The Essential Business Handbook: The Nuts & Bolts of Getting Up and Running Fast" by John Storey and Amelia Storey (Indian Edition)

2. "The AMA Handbook of Business Writing: The Ultimate Guide to Style, Grammar, Punctuation, Usage, Construction, and Formatting" by Kevin Wilson and Jennifer Wauso

1.Business communication for success

- Free online textbook covering oral and written business communications

2.Effective email communication

- The University of North Carolina's Writing Center guide to help you communicate more effectively using e-mail.

STRUCTURE OF THE PROGRAMME
(INSTRUCTION&EXAMINATION)
I Degree - LIFE SKILLS COURSES

			L	T	P	C
R23		SEMESTER II				
	Major/ Minor	DIGITAL LITERACY (w.e.f.2023-24AdmittedBatch)	2	2	0	2
	Total Hours -30					

SYLLABUS

UNIT-I

Operate the elements of a computer and performing operations on the computer 10hrs

Operate the elements of a computer including power cord, power switch, network connecting cable, USB ports, Mouse operations, Keyboard operations, interface icons, GUI elements, Editing options, perform operations including switching on the computer, logging in, locating a file, opening a file, printing a document, storing a file with proper extension, creating a folder/ sub folder in a volume on hard disk and desktop, shifting files from one folder to another, shutting off the computer

UNIT-II

Access the Internet to browse information and E-mail operation 10hrs

Access the Internet, use a search engine, find information on the topic of interest, register for a web-based E-mail account, access E-mail with attachments, reply to an E-mail, forward an E-mail and delete an E-mail message

UNIT-III

Make bill payments, other applications using Internet and word processing

10hrs

Make utility bill payments, booking bus/train tickets, bank transactions, personal transactions, job search through employment portals, mobile/DTH recharge, word processing basics, creating, editing and formatting of text, saving and printing of word document

Prescribed readings:

1. Appreciation of Digital Literacy Handbook published by Department of Electronics & Information Technology, Ministry of Communications & Information Technology, Government of India

COURSE OUTCOMES:

By undergoing the Digital Literacy course, one should acquire basic knowledge on Computer and he/she is able to

CO1: Perform operations on the computer

CO2: Access the Internet and finding information of interest

CO3: Register for an E-mail account and operating it

CO4: Make bill payments and use other applications of Internet

CO5: Create, edit and format documents using a word processor

Web Resources:

1. https://youtu.be/b2X_j5Bz-VM
2. https://youtu.be/jln3-P6L2ro
3. https://youtu.be/cfDisqUMIvw
4. https://youtu.be/3h_PyURcdrc
5. https://youtu.be/EqN0LBcydBg

PHASE-1: COMMUNITY SERVICE PROJECT

S. No.	Paper Title	Course type	Instruction period	External Marks	Internal Marks	Total Marks	Credits
1	**Community Service Project**	Theory	4 Weeks	100	-	100	4

II B.Sc. Computer Science Major

R23	SEMESTER III		L	T	P	C
	Major /Minor	C5 – OBJECT ORIENTED PROGRAMMING USING JAVA (W.e.f.2023-24AdmittedBatch)	5	3	2	4 (3+1)
	Total Hours-45					

Course Objectives:

To introduce the fundamental concepts of Object-Oriented programming.

To design and implement object-oriented programming concepts in Java.

SYLLABUS

UNIT-I 9hrs

OOPs Concepts and Java Programming: Introduction to Object-Oriented concepts, procedural and object-oriented programming paradigm

Java programming: An Overview of Java, Java Environment, Data types, Variables, constants, scope and life time of variables, operators, type conversion and casting, Accepting Input from the Keyboard, Reading Input with Java.util.Scanner Class, Displaying Output with System.out.printf(), Displaying Formatted Output with String.format(), Control Statements

UNIT-II 9hrs

Arrays, Command Line Arguments, Strings-String Class Methods

Classes & Objects: Creating Classes, declaring objects, Methods, parameter passing, static fields and methods, Constructors, and 'this' keyword, overloading methods and access

Inheritance: Inheritance hierarchies, super and subclasses, member access rules, 'super' keyword, preventing inheritance: final classes and methods, the object class and its methods; **Polymorphism**: Dynamic binding, method overriding, abstract classes and methods;

UNIT-III 9hrs

Interface: Interfaces VS Abstract classes, defining an interface, implement interfaces, accessing implementations through interface references, extending interface;

Packages: Defining, creating and accessing a package, understanding CLASSPATH, importing packages.

Exception Handling: Benefits of exception handling, the classification of exceptions, exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, rethrowing exceptions, exception specification, built in exceptions, creating own exception sub classes.

UNIT-IV 9 hrs

Multithreading: Differences between multiple processes and multiple threads, thread states, thread life cycle, creating threads, interrupting threads, thread priorities, synchronizing threads, inter thread communication.

Stream based I/O (java.io) – The Stream classes-Byte streams and Character streams, Reading console Input and Writing Console Output, File class, Reading and writing Files, The Console class, Serialization

UNIT-V 9hrs

GUI Programming with Swing- Introduction, MVC architecture, components, containers. Understanding Layout Managers - Flow Layout, Border Layout, Grid Layout, Card Layout, Grid Bag Layout.

Event Handling- The Delegation event model- Events, Event sources, Event Listeners, Event classes, Handling mouse and keyboard events, Adapter classes, Inner classes, Anonymous Inner classes.

Course Outcomes:

Upon successful completion of the course, a student will be able to:

CO1: Understand the basic concepts of Object-Oriented Programming and Java Program Constructs.

CO2: Implement classes and objects and analyze Inheritance and Dynamic Method Dispatch.

CO3: Demonstrate various classes in different packages and can design own packages.

CO4: Manage Exceptions and Apply Threads.

CO5: Create GUI screens along with event handling.

Text Books:

1. Java The complete reference, 9th edition, Herbert Schildt, McGraw Hill.

2. Understanding Object-Oriented Programming with Java, updated edition, T. Budd, Pearson Education.

Reference Books

1. Cay S. Horstmann, “Core Java Fundamentals”, Volume 1, 11 th Edition, Prentice Hall, 2018.

2. Paul Deitel, Harvey Deitel, “Java SE 8 for programmers”, 3rd Edition, Pearson, 2015.

3. S. Malhotra, S. Chudhary, Programming in Java, 2nd edition, Oxford Univ. Press.

Web links:

www.w3schools.com
www.greeksforgreeks.com
www.javatpoint.com
www.programmiz.com
www.programmig.com.https://onlinecourses.nptel.ac.in/noc25_cs57/preview

C5P–OBJECT ORIENTED PROGRAMMING USING JAVA

(Hours/Week: 02 Total Hours: 30 Credits:01)

List of Experiments:

1. Write a Java program to print Fibonacci series using for loop.
2. WriteaJavaprogramtocalculatemultiplicationof2matrices.
3. Create a class Rectangle. The class has attributes length and width. It should have methods that calculate the perimeter and area of the rectangle. It should have read Attributes method to read length and width from user.
4. Write a Java program that implements method overloading and overriding.
5. Write a Java program to implement various types of inheritance.
   i. Single ii. Multi-Level iii. Hierarchical iv. Hybrid
6. Write a Java program which accepts with draw amount from the user and throws an exception –InSufficient Funds ‖ when withdraw amount more than available amount.
7. Write a Java program to create three threads and that displays–good morning ‖, for every one second,–hello‖ for every 2 seconds and–welcome‖ for every 3seconds by using extending Thread class.
8. Implement a Java program for handling mouse events when the mouse entered, exited, clicked, pressed, released, dragged and moved in the client area.
9. Implement a Java program for handling key events when the keyboard is pressed, released, typed.
10. Write a Java swing program that reads two numbers from two separate text fields and display sum of two numbers in third text field when button–add is pressed.

Lab Outcomes:

Upon successful completion of this course, the students will be able to:

- Able to analyze the necessity for Object Oriented Programming paradigm and• over structured programming and become familiar with the fundamental concepts in OOP.
- Demonstrate an ability to design and develop java programs, analyze, and• interpret object oriented data and report results.
- Demonstrate an ability to design an object oriented system, AWT components or multithreaded process as per needs and specifications.
- Demonstrate an ability to visualize and work on laboratory and multidisciplinary tasks like console and windows applications both for standalone and Applets programs

MAHARAJAH'S COLLEGE (AUTONOMOUS)::VIZIANAGARAM
II B.Sc. Computer Science Major

R23	**SEMESTER III**		**L**	**T**	**P**	**C**
	Major	**C6–DATA STRUTURES USING C** **(W.e.f.2023-24Admitted Batch)**	**5**	**3**	**2**	**4 (3+1)**
	Total Hours-45					

Course Objectives

To introduce the fundamental concept of data structures and to emphasize the importance of various data structures in developing and implementing efficient algorithms.

UNIT-I 9hrs

Basic Concepts: Pointers and dynamic memory allocation, Algorithm-Definition and characteristics, Algorithm Analysis-Space Complexity, Time Complexity, Asymptotic Notation **Introduction to Data structures:** Definition**,** Types of Data structure, Abstract Data Types (ADT), Difference between Abstract Data Types, Data Types, and Data Structures.

Arrays-Concept of Arrays, Single dimensional array, Two dimensional array, Operations on arrays with Algorithms (searching, traversing, inserting, deleting)

UNIT-II 9hrs

Linked List: Concept of Linked Lists, Representation of linked lists in Memory, Comparison between Linked List and Array, Types of Linked Lists - Singly Linked list, Doubly Linked list, Circularly Singly Linked list, Circularly Doubly Linked list;

Implementation of Linked List ADT: Creating a List, Traversing a linked list, Searching linked list, Insertion and deletion into linked list (At first Node, Specified Position, Last node), Application of linked lists

UNIT-III 9hrs

Stacks: Introduction to stack ADT, Representation of stacks with array and Linked List, Implementation of stacks, Application of stacks - Polish Notations - Converting Infix to Post Fix Notation - Evaluation of Post Fix Notation - Tower of Hanoi, Recursion: Concept and Comparison between recursion and Iteration

Queues: Introduction to Queue ADT, Representation of Queues with array and Linked List, Implementation of Queues, Application of Queues Types of Queues- Circular Queues, De-queues, Priority Queue

UNIT-IV 9hrs

Searching: Linear or Sequential Search, Binary Search and Indexed Sequential Search

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

UNIT-V 9hrs

Binary Trees: Concept of Non- Linear Data Structures, Introduction Binary Trees, Types of Trees, Basic Definition of Binary Trees, Properties of Binary Trees, Representation of Binary Trees, Operations on a Binary Search Tree, Binary Tree Traversal, Applications of Binary Tree. **Graphs:** Introduction to Graphs, Terms Associated with Graphs, Sequential Representation of Graphs, Linked Representation of Graphs, Traversal of Graphs (DFS, BFS), Application of Graphs.

Course Outcomes

Upon successful completion of the course, a student will be able to:

CO1: Understand various Data Structures for data storage and processing.

CO2: Realize Linked List Data Structure for various operations

CO3: Analyze step by step and develop algorithms to solve real world problems by implementing Stacks, Queues data structures.

CO4: Understand and implement various searching & sorting techniques.

CO5: Understand the Non-Linear Data Structures such as Binary Trees and Graphs

Text Books:

1. Horowitz and Sahani, “Fundamentals of Data Structures”, Galgotia Publications Pvt Ltd Delhi India.

2. A.K. Sharma ,Data Structure Using C, Pearson Education India.

3. “Data Structures Using C” Balagurusamy E. TMH

Reference Books

1. “Data Structures through C”, Yashavant Kanetkar, BPB Publications

2. Rajesh K. Shukla, “Data Structure Using C and C++” Wiley Dreamtech Publication.

3. Lipschutz, “Data Structures” Schaum’s Outline Series, Tata Mcgraw-hill Education (India) Pvt. Ltd .

4. Michael T. Goodrich, Roberto Tamassia, David M. Mount “Data Structures and Algorithms in C++”, Wiley India.

Web links:

www.w3schools.com
www.greeksforgreeks.com
www.javatpoint.com
www.programmiz.com
https://archive.nptel.ac.in/courses/106/105/106105085/#

C6P–DATA STRUCTURES USING C

(Hours/Week:02 Total Hours:30 Credits:01)

List of Experiments:

1. Write a program to read ‘N‘ numbers of elements into an array and also perform the following operation on an array:
    a. Add an element at the beginning of an array.
    b. Insert an element at given index of array.
    c. Update an element using a values and index.
    d. Delete an existing element.
2. Write a Program to implement Single Linked List with insertion, deletion and traversal operations.
3. Write Programs to implement the Stack operations using an array.
4. Write a program using stacks to convert a given infix expression to postfix.
5. Write Programs to implement the Stack operations using Liked List.
6. Write Programs to implement the Queue operations using an array.
7. Write Programs to implement the Queue operations using Liked List.

8. Write a program for Binary Search Tree Traversals.
9. Write a program to search an item in a given list using the following Searching Algorithms
   a.) Linear Search b.) Binary Search.
10. Write a program for implementation of the following Sorting Algorithms
   a.)Bubble Sort b.) Insertion Sort c.)Quick Sort

Lab Outcomes:

- **CO1**: Ability to understand a systematic approach to organizing, writing and debugging C programs
- **CO2**: Ability to implement linear and non-linear data structure operations using C programs
- **CO3**: Ability to solve problems implementing appropriate data structures like Stacks, Queues, Graphs & Trees.
- **CO4**: Ability to implement sorting and searching algorithms using relevant data structures.

MAHARAJAH'S COLLEGE (AUTONOMOUS):: VIZIANAGARAM
II B.Sc. Computer Science Major

R23	**SEMESTER III**		**L**	**T**	**P**	**C**
	Major	**C7–COMPUTER ORGANIZATION** (W.e.f.2023-24AdmittedBatch)	**5**	**3**	**2**	**4 (3+1)**
	Total Hours-45					

Course Objectives:

To familiarize with the organizational aspects of memory, processor and I/O.

UNIT–I 9hrs

Register Transfer Language and Micro Operations: Introduction- Functional units, computer registers, register transfer language, register transfer, bus and memory transfers, arithmetic, logic and shift micro-operations, arithmetic logic shift unit.

Basic Computer Organization and Design: Instruction codes, instruction cycle. Register reference instructions, Memory–reference instructions, input–output and interrupt.

UNIT–II 9hrs

CPU and Micro Programmed Control: Central Processing unit: Introduction, instruction formats, addressing modes. Control memory; address sequencing, design of control unit-hardwired control, micro programmed control.

UNIT–III 9hrs

Memory Organization: Memory hierarchy, main memory, auxiliary memory, associative memory, cache Memory and mappings.

UNIT–IV 9hrs

Input-Output Organization: Peripheral Devices, input-output interface, asynchronous data transfer, modes of transfer-programmed I/O, priority interrupt, direct memory access, Input–Output Processor(IOP).

UNIT–V 9hrs

Computer Arithmetic and Parallel Processing: Data representation-fixed point, floating point, addition and subtraction, multiplication and division algorithms.

Parallel Processing-Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline.

Course Outcomes

Upon successful completion of the course, the students will be able to

CO1: Identify different types of instructions.

CO2: Differentiate between micro-programmed and hard-wired control units.

CO3: Analyze the performance of hierarchical organization of memory.

CO4: Summarize different data transfer techniques.

CO5: Demonstrate arithmetic operations on fixed-and floating-point numbers and illustrate concepts of parallel processing.

Text Books:

1. M. MorisMano ‐Computer Systems Architecture‖, 3rd edition, Pearson/ PHI.

Reference Books:

1. CarlHamacher, Zvonks Vranesic, SafeaZaky,‐Computer Organization‖, 5th edition, McGraw Hill.
2. WilliamStallings,―ComputerOrganizationandArchitecture‖,8th edition,Pearson/PHI.

Web links:

www.w3schools.com
www.greeksforgreeks.com
www.javatpoint.com
www.programmiz.com
https://onlinecourses.nptel.ac.in/noc21_cs61/preview

CP–COMPUTER ORGANIZATION LAB

(Hours/Week:02 Total Hours: 30 Credits:01)

List of Experiments:

1. Implement a C program to convert a Hexadecimal, octal, and binary number to decimal number vice versa.
2. Implement a C program to perform Binary Addition &Subtraction.
3. Implement a C program to perform Multiplication of two binary numbers.
4. Implement arithmetic micro-operations using logic gates.
5. Implement logic and Shift micro-operations using logic gates.
6. Implement a C program to perform Multiplication of two binary numbers(signed)using Booth‘s Algorithms.
7. Implement a C program to perform division of two binary numbers (Unsigned) using restoring division algorithm.
8. Implement a C program to perform division of two binary numbers(Unsigned) using non-restoring division algorithm.
9. Write assembly language code for A+B*(C-D) using various instruction formats in MAS Morany open-source assembler.
10. Write assembly language code for A+B*C using various addressing modes in MASMorany open-source assembler.

Lab Outcomes:

- Understand CPU architecture, memory organization, and data representation,
- Apply these concepts to design and implement C programs simulating computer system components and algorithms.

MAHARAJAH'S COLLEGE (AUTONOMOUS)::VIZIANAGARAM
II B.Sc. Computer Science Major

			L	T	P	C
	SEMESTER III					
R23	Major	**C8–OPERATING SYSTEMS** (W.e.f.2023-24Admitted Batch)	**5**	**3**	**2**	**4 (3+1)**
	Total Hours-45					

Course Objectives

To gain knowledge about various functions of an operating system like memory management, process management, device management, etc.

UNIT- I 9hrs

What is Operating System? History and Evolution of OS, Basic OS functions, Resource Abstraction, Types of Operating Systems– Multiprogramming Systems, Batch Systems, Time Sharing Systems; Operating Systems for Personal Computers, Workstations and Hand-held Devices, Process Control & Real time Systems.

UNIT- II 9hrs

Processor and User Modes, Kernels, System Calls and System Programs, System View of the Process and Resources, Process Abstraction, Process Hierarchy, Threads, Threading Issues, Thread Libraries; Process Scheduling- Non-Preemptive and Preemptive Scheduling Algorithms.

UNIT- III 9hrs

Process Management: Deadlock, Deadlock Characterization, Necessary and Sufficient Conditions for Deadlock, Deadlock Handling Approaches: Deadlock Prevention, Deadlock Avoidance and Deadlock Detection and Recovery.

Concurrent and Dependent Processes, Critical Section, Semaphores, Methods for Inter process Communication; Process Synchronization, Classical Process Synchronization Problems: Producer-Consumer, Reader-Writer.

UNIT- IV 9hrs

Memory Management: Physical and Virtual Address Space; Memory Allocation Strategies–Fixed and -Variable Partitions, Paging, Segmentation, Virtual Memory.

UNIT- V 9hrs

File and I/O Management, OS security: Directory Structure, File Operations, File Allocation Methods, Device Management, Pipes, Buffer, Shared Memory, Disk Scheduling algorithms.

Course Outcomes:

Upon successful completion of the course, a student will be able to:

CO1: Demonstrate knowledge and comprehension of operating system functions.

CO2: Analyze different process scheduling algorithms and apply them to manage processes and threads effectively

CO3: Create strategies to prevent, detect, and recover from deadlocks, and design solutions for inter-process communication and synchronization problems.

CO4: Compare and contrast different memory allocation strategies and evaluate their effectiveness

CO5: Evaluate disk scheduling algorithms while implementing OS security measures

Text Books:

Operating System Principles by Abraham Silbers chatz, Peter Baer Galvin and Greg Gagne (7th Edition) Wiley India Edition.

Reference Books

1. Operating Systems: Internals and Design Principles by Stallings (Pearson)
2. Operating Systems by J. Archer Harris (Author), Jyoti Singh (Author) (TMH)

Web links:

www.w3schools.com
www.greeksforgreeks.com
www.javatpoint.com
www.programmiz.com
https://onlinecourses.nptel.ac.in/noc20_cs04/preview

C304P–OPERATING SYSTEM LAB

(Hours/Week:02 Total Hours: 30 Credits:01)

List of Experiments:

1. Illustrate the following LINUX commands
    a. pwd
    b. mkdir
    c. rmdir
    d. grep
    e. chmod
    f. ls
    g. rm
    h. cp
2. Write a program to calculate average waiting time and turnaround time of each process using the following CPU Scheduling algorithm for the given process schedules.
    a) FCFS
    b) SJF
    c) Priority
    d) Round Robin
3. Simulate MVT and MFT memory management techniques.
4. Write a program for Bankers Algorithm for Deadlock Avoidance.
5. Implement Bankers Algorithm Deadlock Prevention.
6. Write a program to simulate Producer-Consumer problem.
7. Simulate all Page replacement algorithms.
    a) FIFO
    b) LRU
    c) LFU
    d) Optimal
8. Simulate Paging Techniques of memory management.

9. Simulate the following disk scheduling algorithms.
    a) FCFS
    b) SSTF
    c) SCAN
    d) CSCAN

LAB OUTCOMES:

1. To provide an understanding of the design aspects of operating system concepts through simulation
2. Introduce basic Linux commands, system call interface for process management, inter process communication and I/O in Unix.
3. Student will learn various process and CPU scheduling Algorithms through simulation programs
4. Student will have exposure to System calls and simulate them.
5. Student will learn deadlocks and process management & Inter Process communication and simulate them

MAHARAJAH'S COLLEGE (AUTONOMOUS) ::VIZIANAGARAM
II Degree-LIFESKILLS COURSES

R23	**SEMESTER III**		**L**	**T**	**P**	**C**
	Major/ Minor	**INFORMATION AND COMMUNICATION TECHNOLOGY (w.e.f.2023-24 Admitted Batch)**	**2**	**2**	**0**	**2**
	TotalHours-30					

Objectives:

This course aims at acquainting the students with basic ICT tools which help them in their day today and life as well as in office and research.

SYLLABUS

UNIT-I 10hrs

Fundamentals of Internet: What is Internet?, Internet applications, Internet Addressing– Entering a WebSite Address, URL–Components of URL, Searching the Internet, Browser –Types of Browsers, Introduction to Social Networking: Twitter, Tumblr, LinkedIn, Facebook, flickr, Skype, yahoo, YouTube, WhatsApp.

UNIT-II 10hrs

E-mail: Definition of E-mail -Advantages and Disadvantages –User Ids, Passwords, Email Addresses, Domain Names, Mailers, Message Components, Message Composition, Mail Management.

G-Suite: Google drive, Google documents, Google spread sheets, Google Slides and Google forms.

UNIT-III 10hrs

Overview of Internet security, E-mail threats and secure E-mail, Viruses and antivirus software, Firewalls, Cryptography, Digital signatures, Copyright issues.

What are GOI digital initiatives in higher education? (SWAYAM, Swayam Prabha, National Academic Depository, National Digital Library of India, E-Sodh-Sindhu, Virtual labs, e-acharya, e-Yantra and NPTEL).

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

CO1: Understand the literature of social networks and their properties.

CO2: Explain which network is suitable for whom.

CO3: Develop skills to use various social networking sites like twitter, flickr, etc.

CO4: Learn few GOI digital initiatives in higher education.

CO5: Apply skills to use online forums, docs, spreadsheets, etc for communication, collaboration and research.

CO5: Get acquainted with internet threats and security mechanisms.

Reference Books:

1. In-line/On-line :Fundamentals of the Internet and the World Wide Web, 2/e–by Raymond Green law and Ellen Hepp, Publishers : TMH
2. Internet technology and Web design, ISRD group, TMH.
3. Information Technology–The breaking wave, DennisP. Curtin, Kim Foley, KunaiSen and Cathleen Morin, TMH.

Web links:

www.w3schools.com

www.greeksforgreeks.com

R23	**SEMESTER III**		**L**	**T**	**P**	**C**
	Major/ Minor	**Paper- INTRODUCTION TO PUBLIC ADMINISTRATION** (w.e.f.2023-24AdmittedBatch)	**2**	**2**	**0**	**2**
	Total Hours -30					

Course Objectives:

1. Understand the concept and scope and evolution of public administration.
2. Understand the relationship between public administration and public policy.
3. Develop critical thinking and analytical skills to evaluate public administration practices.

SYLLABUS

UNIT: I **10 hrs**

Introduction to public administration –Woodrow-Wilson-Definition and nature and scope of Public Administration –Significance – Distinction between public and private administration.

UNIT: II **10 hrs**

All Indian Services- Central Services –State Services – Importance of All Services UPSC&SPSCs Powers and Functions –NITI Aayog

UNIT: III **10 hrs**

Accountability of Administration in India –Legislative –Executive –Judiciary Judicial Activism –e-Governance in India –Good Governance initiatives –Functions and roles of Administrators.

Learning Outcomes:

Students at the successful completion of the course will be able to;

CO1: Awareness about the evolution and growth of the discipline of public administration.

CO2: Familiarity with the constitutional framework on which Indian Administration is based.

CO3:Understanding the in-built control mechanism over constitutional bodies and administration in general..

Activities:

1. Class participation and discussions
2. Field trips to Government offices
3. Individual or group assignments
4. Student's projects – Individual and group
5. Quizzes or Slip tests.
6. Presentations
7. Research papers

References:

1. Public Administration by Awasthi & Maheswari
2. Indian Administration by Maheswari
3. Administration Theories by Mohit Bhattacharya
4. Comparative Administration by i Mohit Bhattacharya
5. Indian Government & Politics by B.L.Fadia

R23	SEMESTER IV		L	T	P	C
	Major/ Minor	**C9–DATA BASE MANAGEMENT SYSTEM** (W.e.f.2023-24AdmittedBatch)	**5**	**3**	**2**	**4 (3+1)**
	Total Hours -45					

Learning Objectives:

To familiarize with concepts of database design.

UNIT-I 9 hrs

Overview of Database Management System: Introduction to data, information, database, database managementsystems,file-basedsystem,Drawbacksoffile-BasedSystem,databaseapproach,Classificationof Database Management Systems, advantages of database approach, Various Data Models, Components of Database Management System, three schema architecture of data base, costs and risks of database approach.

UNIT-II 9 hrs

Entity-Relationship Model: Introduction, the building blocks of an entity relationship diagram, classification of entity sets, attribute classification, relationship degree, relationship classification, reducing ER diagram to tables, enhanced entity-relationship model (EER model), generalization and specialization, **IS A** relationship and attribute inheritance, multiple inheritance, constraints on specialization and generalization, advantages of ER modeling.

UNIT-III 9 hrs

Relational Model: Introduction, CODD Rules, relational data model, concept of key, relational integrity, relational algebra, relational algebra operations, advantages of relational algebra,
Limitations of relational algebra, relational calculus, tuple relational calculus, and domain relational Calculus (DRC), Functional dependencies and normal forms up to 3rdNormal form.

UNIT-IV 9 hrs

Structured Query Language: Introduction, Commands in SQL, Data Types in SQL, Data Definition Language, Selection Operation, Projection Operation, Aggregate functions, Data Manipulation Language, Table Modification Commands, Join Operation, Set Operations, View, Sub Query.

UNIT-V 9 hrs

PL / SQL: Introduction, Short comings of SQL, Structure of PL/SQL, PL/SQL Language Elements, Data Types, Operators Precedence, Control Structure, Steps to Create a PL/SQL,Program, Iterative Control, Procedure, Function, Database Triggers, Types of Triggers.

Course Outcomes:

On successful completion of the course, students will be able to

CO1: Differentiate between database systems and file based systems.

CO2: Design a database using ER model.

CO3: Use relational model in database design.

CO4: Use SQL commands for creating and manipulating data stored in databases.

CO5: Write PL/SQL programs to work with databases.

Text Books:

1. Operating SystemPrinciplesbyAbrahamSilberschatz,PeterBaerGalvinandGregGagne (7^{th} Edition)Wiley India Edition.

Reference Books:

1. Database Management Systems by Raghu rama krishnan, McGraw hill
2. Principles of Database Systems by J. D. Ullman
3. Fundamentals of Database Systems by R.ElmasriandS. Navathe
4. SQL: The Ultimate Beginners Guide by Steve Tale.

Web links:

www.w3schools.com
www.greeksforgreeks.com
www.javatpoint.com
www.programmiz.com
https://onlinecourses.nptel.ac.in/noc22_cs91/preview

C9P–DATA BASE MANAGEMENT SYSTEM LAB

(Hours/Week: 02 Total Hours:30 Credits:01)

List of Experiments:

1. Draw ER diagram for hospital administration.
2. Creation of college database and establish relationships between tables.

Questions to be performed on DDL and DML

1. Create employeetablewithPrimaryKeyotherconstraints.AndPopulatethetables with data.
2. Display all the details of all employees working in the company.
3. Display ssn, lname, fname, address of employees who work in department no7.
4. Retrieve the Birth date and Address of the employee whose name is 'Franklin T.Wong.'
5. Retrieve the name and salary of every employee.
6. Retrieve all distinct salary values.
7. Retrieve all employee names whose address is in_Bellaire‘
8. Retrieveallemployeesindepartment5whosesalaryisbetween50,000and 60,000 (inclusive).
9. Retrieve the name and address of all employees who work for the 'Research' department.
10. Increase the salary of all employees working on the 'ProductX' project by 15%. Retrieve employee name and increased salary of these employees.
11. Retrieve a list of employees and the project name each works in, ordered by the employee's department, and within each department ordered alphabetically by employee first name.
12. Select the names of employees whose salary does not match with salary of any employee in department 10.
13. Retrieve the employee numbers of all employees who work on project located in Bellaire, Houston, or Stafford.
14. Find the sum of the salaries of all employees, the maximum salary, the minimum salary, and the average salary. Display with proper headings.
15. Select the names of employees whose salary is greater than the average salary of all employees in department 10.

Questions to be performed on DDL and DML

1. Write a PL/SQL program to check the given number is palindrome or not.
2. Write a PL/SQL program to display the table of the given number.
3. Write a PL/SQL program to display the employee table using cursor.

Lab Outcomes:

- Students get practical knowledge on designing and creating relational database systems.
- Understand various advanced queries execution such as relational constraints, joins, set operations, aggregate functions, trigger views and embedded SQL.
- Use of various software to design and build ER Diagrams, UML, Flow chart for related database systems.

- Students will be able to design and implement database applications on their own

MAHARAJAH'S COLLEGE (AUTONOMOUS)::VIZIANAGARAM

II B.Sc. Computer Science Major

R23	**SEMESTER IV**		**L**	**T**	**P**	**C**
	Major/ Minor	**C10–OBJECT ORIENTED SOFTWARE ENGINEERING** (W.e.f.2023-24AdmittedBatch)	**5**	**3**	**2**	**4 (3+1)**
	Total Hours -45					

Course Objectives:

To introduce Object Oriented Software Engineering (OOSE) – which is a popular technical approach to analyzing, designing an application, system, or business by applying the object- oriented paradigm and visual modeling.

SYLLABUS

UNIT-I 9hrs

Introduction to Object-Oriented Programming: Overview of software engineering, Introductionto Object-Oriented Programming (OOP) concepts (classes, objects, inheritance, polymorphism), Unified Modeling Language (UML) basics, Introduction to software development process and software development lifecycle (SDLC).

UNIT-II 9hrs

Requirements Analysis and Design: Requirements analysis and specification, Use cases and scenarios, Object-oriented analysis and design (OOAD), Design patterns, UML modeling techniques (class diagrams, sequence diagrams, state machine diagrams, activity diagrams).

UNIT-III 9hrs

Software Construction and Testing: Software construction basics, Object-oriented design principles, Object-oriented programming languages (Java, C++,Python),Software testing basics(unit testing, integration testing, system testing),Test-driven development (TDD).

UNIT-IV 9hrs

Software Maintenance and Evolution: Software maintenance basics, refactoring techniques Software version control, Code review and inspection, Software evolution and reengineering.

UNIT-V 9hrs

Advanced Topics in Object-Oriented Software Engineering: Model-driven engineering (MDE), Aspect-

oriented programming (AOP), Component-based software engineering (CBSE), Service- oriented architecture (SOA), Agile software development and Scrum methodologies.

Course Outcomes:

Upon successful completion of the course, a student will be able to:

CO1: Understand and apply the fundamental principles of Object-Oriented Programming (OOP) concepts and Unified Modeling Language (UML) basics, in the development of software solutions.

CO2: Analyze and specify software requirements, develop use cases and scenarios, apply object-oriented analysis and design (OOAD) principles.

CO3: Familiar with the concept of test-driven development (TDD) and its practical implementation.

CO4: Analyze and Evaluate Software Maintenance and Evolution Strategies.

CO5: Apply Advanced Object-Oriented Software Engineering Concepts.

Text Book(s)

1. AnIntroductiontoObject-OrientedAnalysisandDesignandtheUnifiedProcess, 3rdEdition, Craig Larman, Prentice-Hall.
2. Programming in Java by Sachin Malhotra, Oxford University Press

Reference Books

1. Requirements engineering: processes and techniques, G.Kotonya and ,I. Sommerville, 1998, Wiley
2. Design Patterns, E.Gamma, R.Helm,R. Johnson,andJ. Vlissides.
3. The Unified Modeling Language Reference Manual, J.Rumbaugh, I.Jacobson and G.Booch, Addison Wesley

Web links:

www.w3schools.com
www.greeksforgreeks.com
www.javatpoint.com
www.programmiz.com
https://onlinecourses.nptel.ac.in/noc25_cs34/preview

C10P–OBJECT ORIENTED SOFTWARE ENGINEERING LAB

(Hours/Week: 02 Total Hours:30 Credits:01)

List of Experiments:

Suggested Software Tools: StarUML/ UMLGraph / Topcased / Umberollo / Argo UML/ EclipseIDE,Visual Paradigm for UML/Rational Software Architect/Any other Open Source Tool.

List of Experiments:

Select domain of interest (e.g. College Management System) and identify multi-tier software application to work on (e.g. Online Fee Collection). Analyze, design and develop this application using OOSE approach:

1. DevelopanIEEEstandardSRSdocument.Alsodeveloprisk managementandproject plan (Gantt chart).
2. Understanding of System modeling: Data model i.e.ER–Diagram and draw the ER diagram with generalization, specialization and aggregation of specified problem statement.
3. Understanding of System modeling: Functional modeling: DFD level 0 i.e. Context Diagram and draw it.
4. Understanding of System modeling: Functional modeling: DFD level1 and DFD level2 and draw it.
5. Identify use cases and develop the use case model.
6. Identify the business activities and develop an UML Activity diagram.
7. Identity the conceptual classes and develop a domain model with UML Class diagram.
8. Using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.
9. Draw the state chart diagram.
10. Identify the user interface, domain objects, and technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
11. Implement the technical services layer.
12. Implement the domain objects layer.
13. Implement the user interface layer.
14. Draw component and deployment diagrams.

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II B.Sc. Computer Science Major

	SEMESTER IV		L	T	P	C
R23	Major	**C11–DATA COMMUNICATIONS AND COMPUTER NETWORKS** (W.e.f.2023-24AdmittedBatch)	**5**	**3**	**2**	**4 (3+1)**
	Total Hours -45					

Course Objectives:

To provide students with a comprehensive understanding of networking principles, protocols, and technologies, enabling them to design, analyze, and evaluate efficient and reliable network solutions.

SYLLABUS

UNIT-I 9hrs

INTRODUCTION: Network applications, network hardware, network software, reference models: OSI, TCP/IP, Internet, Connection oriented network-X.25, frame relay.

THE PHYSICAL LAYER: Theoretical basis for communication, guided transmission media, wireless transmission, the public switched telephone networks, mobile telephone system.

UNIT-II 9hrs

THE DATA LINKLAYER: Design issues, error detection and correction, elementary data link protocols, sliding window protocols, example data link protocols - HDLC, the data link layer on the internet.

THEMEDIUMACCESSSUBLAYER: Channel allocations problem ,multiple access protocols, Ethernet, Data Link Layer switching, Wireless LAN, Broadband Wireless, Bluetooth.

UNIT-III 9hrs

THE NETWORK LAYER: Network layer design issues, routing algorithms, Congestion control algorithms, Internet working, the network layer in the internet(IPv4andIPv6),Quality of Service.

UNIT-IV 9hrs

THE TRANSPORT LAYER: Transport service ,elements of transport protocol, Simple Transport Protocol, Internet transport layer protocols: UDP and TCP.

UNIT-V 9hrs

THE APPLICATION LAYER: Domain name system, electronic mail, World Wide Web: architectural overview, dynamic web document and http.

APPLICATION LAYER PROTOCOLS: Simple Network Management Protocol, File Transfer Protocol, Simple Mail Transfer Protocol, Telnet.

Course Outcomes:

Upon successful completion of the course, a student will be able to:

CO1: Understand and apply network applications, hardware, software, and reference models for network communication.

CO2: Design and analyze data link layer protocols, multiple access protocols,and wireless LAN technologies.

CO3: Design routing algorithms, congestion control algorithms, and evaluate network layer protocols for internet working.

CO4: Analyze transport service, transport protocols, and evaluate UDP and TCP in the internet.

CO5: Understand and evaluate application layer protocols, including DNS, email, WWW, and network management protocols.

Text Book(s)

1. S.Tanenbaum(2003),ComputerNetworks,4thedition,PearsonEducation/PHI,NewDelhi, India

Reference Books:

1. BehrouzA.Forouzan(2006),DatacommunicationandNetworking,4thEdition,McGraw- Hill,India.
2. Kurose, Ross (2010), Computer Networking: A top down approach, Pearson Education, India.

Web links:

www.w3schools.com
www.greeksforgreeks.com
www.javatpoint.com
www.programmiz.com

https://archive.nptel.ac.in/courses/106/105/106105082/

C11P–DATA COMMUNICATIONS AND COMPUTER NETWORKING LAB

(Hours/Week:02 Total Hours:30 Credits:01)

List of Experiments:

1. Understanding various network tools in Windows and Linux.
2. Study different types of Network devices and Cables.
3. Building a Local Area Network.
4. Concept of Network IP Address.
5. Introduction to Network Simulator–Packet Tracer (PT)
6. Configuration of a Router using Packet Tracer.
7. Implementation of a Network using Packet Tracer.
8. Implementation of Static Routing using Packet Tracer.
9. Implementation of RIP using Packet Tracer.
10. Implementation of OSPF using Packet Tracer.
11. Implement DNS using packet tracer.
12. Implementation of a VLAN using Packet Tracer.

Lab Outcomes:

Upon successful completion of the lab course, a student will be able to:

1. Enhance their knowledge on Understand and apply various network tools, types of Network devices and cables to build the Local Area Networks.
2. Able to understand about the IP addresses, Network Configurations, Wired and Wireless technologies through the learning of different Protocols.
3. Understand and analyze the Application layer protocols: DNS, E-mail, WWW, and Packet Tracer.

R 23	SEMESTER-IV	L	P	T	C
	INDIAN PHILOSOPHY	**2**	**---**	**---**	**2**
TOTAL CONTACT HOURS – 30					

Learning Objectives:

1. The student should understand and appreciate the diverse philosophical theories of ancient India.
2. The student should develop rational perspectives on pertinent questions of the world and human life, as viewed by ancient thinkers.
3. The student should comprehend the intellectual heritage and legacy of free thinking in India.

SYLLABUS:

UNIT-I **10 hrs**

Introduction to Philosophy – Metaphysics, Epistemology and Ethics - Indian Philosophical Tradition – Vedas – Philosophical Speculations of Upanishads – Darsanas – Orthodox and Unorthodox Systems of Philosophy – Metaphysical Diversity – Overview.

UNIT –II **10 hrs**

Indian Epistemology – Knowledge – Sources of Knowledge (Pramanas) – Perception

(Pratyaksha) – Inference (Anumana) – Sabda (Testimony) – Other Pramanas – Theories of Error – Nyaya Philosophy

UNIT –III **10hrs**

Ethics – Morality and Ethics – Significance of Ethics in Indian Philosophy - Rita – Hedonism of Materialists - Dharma – Karma – Moksha - Ethics of Renunciation – Nirvana – Pamcha Vratas – Purusharthas - Duties of a Student - Varna and Asrama - Ethics of Bhagavad-Gita – Nishkama Karma – Sthithaprajna

Learning Outcomes:

On successful completion of the course, the student

1. Understands what Philosophy is and its significance in human life.
2. Gains knowledge of Indian philosophical tradition and intellectual heritage.
3. Develops a critical understanding of philosophical theories of ancient systems.
4. Examines the rational character of Indian theories of knowledge.
5. Appreciates the ethical insights of ancient thinkers.

Activities:

Group Discussions

Debates

Assignments

Essay Writing

PPT Presentation

Charts/Poster presentation

Reference Books:

- An Introduction to Indian Philosophy by Satishchandra Chatterjee and DM Dutta, Motilal Banarsidass Publishers, 2016

- The Essentials of Indian philosophy by M. Hiriyanna, Motilal Banarsidass Publishers, 1995

- A Source Book in Indian Philosophy by Dr. Sarvepalli Radhakrishnan, Princeton

University Press, 2014

- A History of Indian Philosophy by Surendranath Dasgupta, the University of California, 1922

- A Critical Survey of Indian Philosophy by Chandradhar Sarma, Motilal Banarsidass Publishers, 2000.

- The Six Ways of Knowing by D. M. Datta, Open Source, 1960

MAHARAJAH'S COLLEGE (AUTONOMOUS)::VIZIANAGARAM
IV B.Sc. Computer Science Major

LIFE SKILLS COURSES

R23	**SEMESTER IV**		**L**	**T**	**P**	**C**
	SEC	**SC4-1-CYBER SECURITY**	**2**	**-**	**-**	**2**

		(w.e.f.2023-24AdmittedBatch)				
	Total Hours – 30					

UNIT– I **10 hrs**

Introduction to Cybercrime: Introduction, Cybercrime: Definition and origins of the word, Cybercrime and Information Security, who are cyber criminals? Classifications of cybercrimes, cybercrime: the legal perspectives, an Indian perspective, cybercrime and the Indian IT Act 2000, a Global perspective on Cybercrimes.

UNIT– II **10 hrs**

Cybercrime-Mobile and Wireless Devices: Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit Card Frauds in Mobile and WirelessComputing Era, Authentication Service Security, Attacks on Mobile/Cell Phones.

Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile Devices-Related Security Issues, Organizational Security Policies and Measures in Mobile Computing Era, Laptops.

UNIT– III **10hrs**

Tools and Methods Used in Cybercrime: Password Cracking, key loggers and Spywares, virus and worms, Trojan Horses and Backdoors, Steganography, attacks onwireless networks, Phishing and Identity Theft: Introduction, Phishing, Identity Theft (ID Theft).

Learning Outcomes:

Upon successful completion of the course,the students will be able to

CO1:Develop an understanding of cyber crimes and various legal perspectives involved.

CO2: Develop a security model to handle mobile,wireless devices and related security issues

of an organization.

CO3: Use the cyber crime to olsand methods in solving real world problems

Text Books:

1. MarkRhodes,Ousley,InformationSecurity,1stEdition,MGH,2013.
2. Nina Godbole and Sunit Belpure ¯ Cyber SecurityUnderstanding Cyber Crimes, Computer Forensics and Legal Perspectives, 1stEditionPublicationWiley, 2011.

Activities to be planned:

1. Identify a user of internet, label him as a cyber criminal or not.
2. Check list for reporting cyber crime at Cybercrime Police Station.
3. Check list for reporting cyber crime online.
4. Reporting phishing emails.
5. Demonstration of email phishing attack and preventive measures.
6. Check list for secure net banking.

Web links:

www.w3schools.com

www.greeksforgreeks.com

PHASE-2 SHORT INTERNSSHIP

S.No.	Paper Title	Course type	Instructio nperiod	External Marks	Internal Marks	Total Marks	Credits
1	Short term Internship	Theory	6 Weeks	100	-	100	4

R23	SEMESTER-V	L	T	P	C
	Course 12: Web Interface Designing Technologies (w.e.f. 2023-24 Admitted Batch)	**5**	**3**	**2**	**4 (3+1)**
	Total Hours - 45				

Learning Objectives:

To enable students to understand web architecture, develop aesthetic websites, create static and dynamic web pages, implement user interactivity, and gain proficiency in installing and utilizing Word Press and plugins

UNIT – I **9hrs**

HTML: Introduction to web designing, difference between web applications and desktop applications, introduction to HTML, HTML structure, elements, attributes, headings, paragraphs, images, tables, lists, blocks, symbols, embedding multi-media components in HTML, HTML forms

UNIT – II **9hrs**

CSS: CSS home, introduction, syntax, CSS combinatory, colors, background, borders, margins, padding, height/width, text, fonts, tables, lists, position, overflow, float, pseudo class, pseudo elements, opacity, tool tips, image gallery, CSS forms, CSS counters.

UNIT – III **9hrs**

Java Script: What is DHTML, JavaScript, basics, variables, operators, statements, string manipulations, mathematical functions, arrays, functions. objects, regular expressions, exceptionhandling.

UNIT-IV **9hrs**

Client-Side Scripting: Accessing HTML form elements using Java Script object model, basic data validations, data format validations, generating responsive messages, opening windows using java script, different kinds of dialog boxes, accessing status bar using java script, embedding basic animative features using different keyboard and mouse events.

UNIT – V **9hrs**

Word press: Introduction to word press, features, and advantages, installing and configuring word press and understanding its admin panel (demonstration only), working with posts, managing pages, working with media - Adding, editing, deleting media elements, working with widgets, using menus, working with themes, defining users, roles and profiles, adding external links, extending word press with plug-ins.

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

CO1:Understand and appreciate the web architecture and services along with its basic buildingblocks

CO2:Gain knowledge about various components of a website related to looking good

CO3: Demonstrate skills regarding creation of a static website and addition of dynamic behavior to a website

CO4: Get experience on making user-interactive web pages.

CO5: Learn how to install word press and gain the knowledge of installing various plugins to use intheir websites.

Text Book(s)

1. Chris Bates, Web Programming Building Internet Applications, Second Edition, Wiley (2007)
2. Paul S.WangSanda S. Katila, an Introduction to Web Design plus Programming, Thomson (2007).

Reference Books

1. Head First HTML and CSS, Elisabeth Robson, Eric Freeman, O'Reilly Media Inc.
2. An Introduction to HTML and JavaScript: for Scientists and Engineers, David R. Brooks. Springer, 2007
3. Schaum's Easy Outline HTML, David Mercer, Mcgraw Hill Professional.
4. Word press for Beginners, Dr.Andy Williams.
5. Professional word press, Brad Williams, David damstra, Hanstern.

Web links:

www.w3schools.com
www.greeksforgreeks.com
www.javatpoint.com
www.programmiz.com
https://onlinecourses.swayam2.ac.in/ntr25_ed64/preview

V Semester

Course 12: Web Interface Designing Technologies

LIST OF PRACTICAL EXPERIMENTS

1. Create an HTML document with the following formatting options:

   (a) Bold, (b) Italics, (c) Underline, (d) Headings (Using H1 to H6 heading styles), (e) Font (Type, Size and Color), (f) Background (Colored background/Image in background), (g) Paragraph, (h) Line Break, (i) Horizontal Rule, (j) Pre tag

2. Create an HTML document which consists of:

   (a) Ordered List (b) Unordered List (c) Nested List (d) Image

3. Create a Table with four rows and five columns. Place an image in one column.

4. Using "table" tag, align the images as follows:

5. Create a menu form using html.

6. Style the menu buttons using CSS.

7. Create a form using HTML which has the following types of controls:

   (a) Text Box (b) Option/radio buttons (c) Check boxes (d) Reset and Submit buttons

8. Embed a calendar object in your web page.

9. Create a form that accepts the information from the subscriber of a mailing system.

Word press:

10. Installation and configuration of word press
11. Access admin panel and manage posts
12. Access admin panel and manage pages
13. Add widgets and menus
14. Create users and assign roles
15. Create a site and add a theme to it

Lab Outcomes:

The students will be able to: ·

- Design and implement dynamic websites with good aesthetic sense of designing and latest technical know-how's.
- Create web pages using HTML and Cascading Styles sheets
- Analyze a web page and identify its elements and attributes.
- Create web pages using XHTML and Cascading Style Sheets.
- Build dynamic web pages using JavaScript (Client side programming).
- Create XML documents and Schemas.
- Understand, analyze and apply the role of languages like HTML, CSS, XML, JavaScript, PHP, SERVLETS, JSP and protocols in the workings of the web and web applications

R23	SEMESTER-V	L	T	P	C
	Course 13: Web Applications Development using PHP & MYSQL (w.e.f. 2023-24 Admitted Batch)	5	3	2	4 (3+1)
	Total Hours - 45				

Learning Objectives:

To enable students to understand open-source tools to create dynamic web pages, implement user interactivity, and gain proficiency in developing web sites

UNIT-I (9 hrs)

The building blocks of PHP: Variables, Data Types, Operators and Expressions, Constant.**Flow Control Functions in PHP**: Switching Flow, Loops, Code Blocks and Browser Output.**Working with Functions:** Creating functions, Calling functions, Returning the values from User- Defined Functions, Variable Scope, Saving state between Function calls with the static statement,arguments offunctions

UNIT-II (9 hrs)

Working with Arrays: Creating Arrays, Some Array-Related Functions.

Working with Objects: Creating Objects, Accessing Object Instances, **Working with Strings**,**Dates and Time:** Formatting strings with PHP, Manipulating Strings with PHP, Using Date and Time Functions in PHP.

UNIT-III (9 hrs)

Working with Forms: Creating Forms, Accessing Form Input with User defined Arrays, Combining HTML and PHP code on a single Page, Using Hidden Fields to save state, Redirecting the user, Sending Mail on Form Submission, and **Working with File Uploads**, Managing files on server,**Exception handling.**

UNIT-IV (9 hrs)

Working with Cookies and User Sessions: Introducing Cookies, setting a Cookie with PHP, Session Function Overview, starting a Session, working with session variables, passing session IDs in the Query String, Destroying Sessions and Unsetting Variables, Using Sessions in an Environment with Registered Users.

UNIT-V (9 hrs)

Interacting with MySQL using PHP: MySQL Versus MySQLi Functions, connecting to MySQL with PHP, Working with MySQL Data. Planning and Creating Database Tables, Creating Menu, Creating

Record Addition Mechanism, Viewing Records, Creating the Record Deletion Mechanism.

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

CO1: Write simple programs in PHP.

CO2: Understand how to use regular expressions, handle exceptions, and validate data usingPHP.

CO3: Apply In-Built functions and Create User defined functions in PHP programming.

CO4: Write PHP scripts to handle HTML forms.

CO5: Know how to use PHP with a MySQL database and can write database driven web pages.

Text Book(s)

1. Julie C. Meloni, SAMS Teach yourself PHP MySQL and Apache, Pearson Education (2007).
2. Steven Holzner , PHP: The Complete Reference, McGraw-Hill

Reference Books

1. Robin Nixon, Learning PHP, MySQL, JavaScript, CSS & HTML5, Third Edition O'reilly,2014
2. Xue Bai Michael Ekedahl, The web warrior guide to Web Programming, Thomson (2006).

Web links:

www.w3schools.com
www.greeksforgreeks.com
www.javatpoint.com
www.programmiz.com
https://onlinecourses.swayam2.ac.in/aic20_sp32/preview

V Semester

Course 13: Web Applications Development using PHP & MYSQL

LIST OF PRACTICAL EXPERIMENTS

1. Write a PHP program to Display “Hello”
2. Write a PHP Program to display the today’s date.
3. Write a PHP program to display Fibonacci series.
4. Write a PHP Program to read the employee details.
5. Write a PHP program to prepare the student marks list.
6. Create student registration form using text box, check box, radio button, select, submit button.And display user inserted value in new PHP page.
7. Create Website Registration Form using text box, check box, radio button, select, submitbutton. And display user inserted value in new PHP page.
8. Write PHP script to demonstrate passing variables with cookies.
9. Write a PHP script to connect My SQL server from your website.
10. Write a program to keep track of how many times a visitor has loaded the page.
11. Write a PHP application to perform CRUD (Create, Read, Update and Delete) operations on a database table.
12. Create a web site using any open-source framework built on PHP and MySQL – It is a team activity wherein students are divided into multiple groups and each group comes up with theirown website with basic features.

Lab Outcomes:

- Develop program using control statement
- Perform operation based on arrays and graphics
- Develop programs by applying various object oriented concepts.
- Use form controls with validation to collect user's input.
- Perform database operations in PHP.

R23	SEMESTER-V	L	T	P	C
	Course 14 B: Foundations of Data Science (w.e.f. 2023-24 Admitted Batch)	5	3	2	4 (3+1)
	Total Hours -45				

Learning Objectives:

To enable students to develop IoT solutions for real-world problems

UNIT-I 9 hrs

Introduction to Data Science: Need for Data Science – What is Data Science - Evolution of Data Science, Data Science Process – Business Intelligence and Data Science – Prerequisites for a Data Scientist – Tools and Skills required. Applications of Data Science in various fields – Data Security Issues.

Data Collection Strategies, Data Pre-Processing Overview, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization, Data Munging, Filtering

UNIT-II 9 hrs

Descriptive Statistics – Mean, Standard Deviation, Skewness and Kurtosis; Box Plots – Pivot Table – Heat Map – Correlation Statistics –ANOVA.

No-SQL: Document Databases, Wide-column Databases and Graphical Databases.

UNIT-III 9 hrs

Python for Data Science –Python Libraries, Python integrated Development Environments (IDE)for Data Science, **NumPy Basics:** Arrays and Vectorized Computation- The NumPy ndarray-

Creating ndarrays- Data Types for ndarrays- Arithmetic with NumPy Arrays- Basic Indexing and Slicing - Boolean Indexing-Transposing Arrays and Swapping Axes.

Universal Functions: Fast Element-Wise Array Functions- Mathematical and Statistical Methods- Sorting- Unique and Other Set Logic.

UNIT-IV 9 hrs

Introduction to pandas Data Structures: Series, Data Frame and Essential Functionality: Dropping Entries- Indexing, Selection, and Filtering- Function Application and Mapping- Sortingand Ranking.

Summarizing and Computing Descriptive Statistics- Unique Values, Value Counts, and Membership. Reading and Writing Data in Text Format.

UNIT-V 9 hrs

Data Cleaning and Preparation: Handling Missing Data - Data Transformation: Removing Duplicates, Transforming Data Using a Function or Mapping, Replacing Values, Detecting andFiltering Outliers-

Plotting with pandas: Line Plots, Bar Plots, Histograms and Density Plots, Scatter or Point Plots.

Learning Outcomes:

On successful completion of the course, students will be able to

CO1: Identify the need for data science and understand various data collection strategies

CO2: Understand about NoSQL and Descriptive Statistics

CO3: Apply Numpy methods to process the data in an array.

CO4: Summarize and Compute Descriptive Statistics using Pandas.

CO5: Apply powerful data manipulations visualization using Pandas

Text Book(s)

1. Y. Daniel Liang, "Introduction to Programming using Python", Pearson, 2012.
2. Wes McKinney, "Python for Data Analysis: Data Wrangling with Pandas, NumPy,andIPython", O'Reilly, 2nd Edition, 2018.

Reference Books

1. Sanjeev Wagh, Manisha Bhende, Anuradha Thakare, 'Fundamentals of Data Science, CRCPress, 1st Edition, 2022
2. Jake VanderPlas, "Python Data Science Handbook: Essential Tools for Working withData",O'Reilly, 2017.

Web links:

www.w3schools.com
www.greeksforgreeks.com
www.javatpoint.com
www.programmiz.com

V Semester
Course 14 B: Foundations of Data Science

LIST OF PRACTICAL EXPERIMENTS

1. Study on various python IDEs for Data Science
2. Create NumPy arrays from Python Data Structures, Intrinsic NumPy objects and Random Functions.
3. Manipulation of NumPy arrays- Indexing, Slicing, Reshaping, Joining and Splitting.
4. Computation on NumPy arrays using Universal Functions and Mathematical methods.
5. Create Pandas Series and Data Frame from various inputs.
6. Import any CSV file to Pandas Data Frame and perform the following:
    a. Visualize the first and last 10 records
    b. Get the shape, index and column details
    c. Select/Delete the records (rows)/columns based on conditions.
    d. Perform ranking and sorting operations.
    e. Do required statistical operations on the given column
7. Import any CSV file to Pandas Data Frame and perform the following:
    a. Handle missing data by detecting and dropping/ filling missing values.
    b. Transform data using apply () and map() method.
    c. Detect and filter outliers.
    d. Perform Vectorized String operations on Pandas Series.
    e. Visualize data using Line Plots, Bar Plots, Histograms, Density Plots and ScatterPlots.

Lab Outcomes:

- Perform basic statistical analysis, utilize computational tools for data analysis, apply these tools to real-world problems, and effectively communicate their findings.

R23	SEMESTER-V	L	T	P	C
	Course 15 B : Application Development using Python (w.e.f. 2023-24 Admitted Batch)	**5**	**3**	**2**	**4 (3+1)**
	Total Hours - 45				

Learning Objectives:

To enable students to develop IoT solutions for real-world problems

UNIT-I 9 hrs

Python basics, Objects- Python Objects, Standard Types, Other Built-in Types, Internal Types, Standard Type Operators, Standard Type Built-in Functions, Categorizing the Standard Types, Unsupported Types

Numbers - Introduction to Numbers, Integers, Floating Point Real Numbers, Complex Numbers, Operators, Built-in Functions, Related Modules

Sequences - Strings, Lists, and Tuples, Dictionaries and Set Types

Control Flow, Truthiness, Sorting, List Comprehensions, Generators and Iterators

UNIT-II 9 hrs

Files: File Objects, File Built-in Function [open()], File Built-in Methods, File Built-in Attributes, Standard Files, Command-line Arguments, File System, File Execution

Exceptions: Exceptions in Python, Detecting and Handling Exceptions, Context Management, Exceptions as Strings, Raising Exceptions, Assertions, Standard Exceptions, Creating Exceptions, Why Exceptions (Now)?, Why Exceptions at All?, Exceptions and the sys Module, Related Modules

Modules: Modules and Files, Namespaces, Importing Modules, Importing Module Attributes, Module Built-in Functions, Packages, Other Features of Modules

UNIT-III 9 hrs

Regular Expressions: Introduction, Special Symbols and Characters, Res and Python **Multithreaded Programming**: Introduction, Threads and Processes, Python, Threads, and the Global Interpreter Lock, Thread Module, Threading Module, Related Modules

UNIT-IV 9 hrs

GUI Programming: Introduction, Tkinter and Python Programming, Brief Tour of Other GUIs, Related Modules and Other GUIs

Web Programming: Introduction, Wed Surfing with Python, Creating Simple Web Clients, Advanced Web Clients, CGI-Helping Servers Process Client Data, Building CGI Application, Advanced CGI, Web (HTTP) Servers

UNIT-V 9 hrs

Database Programming: Introduction, Python Database Application Programmer's Interface (DBAPI), Object Relational Managers (ORMs), Related Modules

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

CO1: Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.

CO2: Demonstrate proficiency in handling Strings and File Systems.

CO3: Create, run and manipulate Python Programs using core data structures like Lists,Dictionariesand use Regular Expressions.

CO4: Interpret the concepts of Web Programming and GUI in Python

CO5: Apply concepts of Python programming in various fields related to IOT, Web Services and Databases in Python.

Text Book(s)

1. Core Python Programming, Wesley J. Chun, Second Edition, Pearson.
2. Think Python, Allen Downey, Green Tea Press.

Reference Books

1. Introduction to Python, Kenneth A. Lambert, Cengage.
2. Python Programming: A Modern Approach, Vamsi Kurama, Pearson.
3. Learning Python, Mark Lutz, O' Really.

Web links:

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www.javatpoint.com
www.programmiz.com

V Semester

Course 15 B: Application Development using Python

LIST OF PRACTICAL EXPERIMENTS

1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsiusand vice versa depending upon user's choice.
2. Write a python program to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria :

   Grade A: Percentage >=80 Grade B: Percentage>=70 and 80

   Grade C: Percentage>=60 and <70 Grade D: Percentage>=40 and <60 Grade E:Percentage<40

3. Demonstrate various methods of Sequence Data Types
4. Write a python program to display the first n terms of Fibonacci series.
5. Write a python program to calculate the sum and product of two compatible matrices.
6. Write a function that takes a character and returns True if it is a vowel and False otherwise.
7. Write a program to implement exception handling.
8. Write a program to implement Multithreading
9. Develop a Python GUI calculator using Tkinter
10. Write a Python program to read last 5 lines of a file.
11. Design a simple database application that stores the records and retrieve the same
    Design a database application to search the specified record from the database.
12. Design a database application to that allows the user to add, delete and modify the records.

Lab Outcomes:

- Upon completion of the course, students will be able to
- Write, test, and debug simple Python programs.
- Implement Python programs with conditionals and loops.
- Develop Python programs step-wise by defining functions and calling them.
- Use Python lists, tuples, dictionaries for representing compound data.
- Read and write data from/to files in Python

SEMESTER-VI

PHASE-3 LONG INTERNSHIP

S.No.	Paper Title	Course type	Instructio nperiod	External Marks	Internal Marks	Total Marks	Credits
1	Long term Internship	Theory	12 Weeks	150	50	200	12

R23	SEMESTER-VII	L	T	P	C
	Course 16 A: Advanced Data Structures (w.e.f. 2023-24 Admitted Batch)	5	3	2	4 (3+1)
	Total Hours - 45				

Learning Objective:

To familiarize with the organization of data so as to optimize the searching time

UNIT-I (9 hrs)

Hashing – General Idea, Hash Function, Separate Chaining, Hash Tables without linked lists: Linear Probing, Quadratic Probing, Double Hashing, Rehashing, Hash Tables in the Standard Library, Universal Hashing, Extendible Hashing.

UNIT-II (9 hrs)

Priority Queues (Heaps) – Model, Simple implementations, Binary Heap: Structure Property, Heap Order Property, Basic Heap Operations: insert, delete, Percolate down, other Heap Operations.

Binomial Queues: Binomial Queue Structure, Binomial Queue Operations, Implementation of Binomial Queue, Priority Queues in the Standard Library.

UNIT-III (9 hrs)

Trees – **AVL**: Single Rotation, Double Rotation, B-Trees, B^+ Trees

Multi-way Search Trees – 2-3 Trees: Searching for an element in a 2-3 Tree, inserting a new element in a 2-3 Tree, deleting an element from a 2-3 Tree.

Red-Black Trees – Properties of red-black trees, rotations, insertion, deletion.

UNIT-IV (9 hrs)

Graph Algorithms – Elementary Graph Algorithms: Topological sort, Single Source ShortestPath Algorithms: Dijkstra's, Bellman-Ford, All-Pairs Shortest Paths: Floyd-Warshall's Algorithm.

UNIT-V (9 hrs)

Disjoint Sets – Equivalence relation, Basic Data Structure, Simple Union and Find algorithms, Smart Union and Path compression algorithm.

Learning Outcomes: Upon completion of the course, students will be able to:

1. Apply appropriate hashing techniques for a given problem.
2. Simulate the operations of Heap trees.
3. Provide solutions using multi-way search trees.
4. Choose appropriate algorithm while establishing a network.
5. Apply the knowledge of disjoint sets for solving a given problem.

Text Books:

1. Fundamentals of Computer Algorithms, Ellis Horowitz, SatrajSahani and Rajasekharam, 2nd Edition, 2009, University Press Pvt. Ltd.
2. Advanced Data Structures, Reema Thareja, S. Rama Sree, Oxford University Press, 2018.

Reference Books:

1. Data Structures and Algorithm Analysis in C++, Mark Allen Weiss, 4 th Edition, 2014, Pearson.
2. Introduction to Algorithms, Thomas H Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, 3 rd Edition, 2009, The MIT Press.

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VII Semester

Course 16 A: Advanced Data Structures

LIST OF PRACTICAL EXPERIMENTS

1. Implement Linear probing Hashing Technique.
2. Implement Quadratic probing Hashing Technique.
3. Implement Binary Heap and its operations.
4. Implement AVL Trees and its operations.
5. Implement the operations on B Trees
6. Implement 2-3 Trees and its operations.
7. Implement the operations of Red-Black trees
8. Implement Dijkstra's shortest path algorithm.
9. Implement Bellman-Ford shortest path algorithm.
10. Implement Floyd-Warshall's Algorithm.
11. Implement disjoint sets and its operations.
12. Implement Union and Find algorithms

R23	SEMESTER-VII	L	T	P	C
	Course 17 B : Design and Analysis of Algorithms (w.e.f. 2023-24 Admitted Batch)	5	3	2	4 (3+1)
	Total Hours - 45				

Learning Objective:

To design, develop and analyze algorithms to provide optimal solutions.

UNIT-I (9 hrs)

Introduction: Notion of Algorithm, Fundamentals of Algorithmic Problem Solving.

Fundamentals of the Analysis of Algorithm Efficiency: Analysis framework and Asymptotic Notations and Basic Efficiency Classes, Amortized Analysis. Introduction to Brute Force Technique, Exhaustive Search.

UNIT-II (9 hrs)

Divide and Conquer: Introduction, Merge sort, Quick sort, Binary Search, Finding Maximum and Minimum, Strassen's Matrix Multiplication

UNIT-III (9 hrs)

The Greedy Method: Introduction, Huffman Trees and codes, Minimum Coin Change problem, Knapsack problem, Job sequencing with deadlines, Minimum Cost Spanning Trees, Single Source Shortest paths.

UNIT-IV (9 hrs)

Dynamic Programming: Introduction, 0/1 Knapsack problem, All pairs shortest paths, Optimal Binary search trees, Travelling salesman problem.

UNIT-V (9 hrs)

Back Tracking: Introduction, n-Queens problem, Sum of subsets, Hamiltonian cycle.

Branch and Bound: Introduction, Assignment problem, Travelling Salesman problem.

Introduction to Complexity classes: P and NP Problems, NP Complete Problems.

Learning Outcomes: Upon successful completion of the course, students will be able to:

1. Understand the fundamental concepts of algorithm analysis and design techniques.
2. Apply divide and conquer design techniques for solving problems
3. Analyze the performance of given problem using greedy approach.
4. Analyze the given problem and provide the feasible solution using dynamic programming.
5. Analyze the complexity of a given problem.

Text Books:

1. Fundamentals of computer algorithms, Ellis Horowitz, Sartaj Sahni, S. Rajasekharan,Second Edition, 2008, Universities Press.

Reference Books:

1. Introduction to the Design & Analysis of Algorithms, Anany Levitin, Third Edition, 2011, Pearson Education.
2. Data Structures and Algorithm Analysis in C, Mark Allen Weiss, 2002, Pearson.

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VII Semester

Course 17 B : Design and Analysis of Algorithms using Java / Python C

LIST OF PRACTICAL EXPERIMENTS

1. Write a program to implement Merge Sort and analyze its performance.
2. Write a program to implement Quick Sort and analyze its performance.
3. Write a program to find the minimum and maximum in a list of elements and analyze it's performance.
4. Write a program to implement Minimum Cost Spanning Trees and analyze its performance.
5. Write a program to implement Single source shortest path algorithm and analyze its performance.
6. Write a program to implement All pairs shortest path algorithm and analyze its performance.
7. Write a program to implement 0/1 knapscak problem and analyze its performance.
8. Write a program to implement n-Queens problem and analyze its performance.
9. Write a program to implement sum of subsets problem and analyze its performance.
10. Write a program to implement Travelling Sales man problem using Branch and Bound approach and analyze its performance.

R23	SEMESTER-VII	L	T	P	C
	Course 18 B: Software Testing (w.e.f. 2023-24 Admitted Batch)	5	3	2	4 (3+1)
	Total Hours - 45				

Learning Objectives:

To provide students with a comprehensive understanding of software testing principles, methodologies, and tools, enabling them to effectively design and execute various levels of testing, automate testing processes using Selenium and automation frameworks.

UNIT-I (9hrs)

Fundamentals: Software Testing Principals – Tester Role in Software Development Manual Testing and Automation Testing

Introduction to testing design strategies: Test case design strategies – Using black box approachto test case design – Random testing – Equivalence class partitioning – Boundary value analysis –Using white box approach to test design – Test adequacy criteria – Coverage and control flow graphs – Covering code logic – Paths – Their role in white box-based test design

UNIT-II (9hrs)

Levels of Testing: The need for levels of testing – Unit test – Unit test planning – Designing the unit tests – The class as a testable unit – The test harness – Running the unit tests and recording results – Integration tests – Designing integration tests – Integration test planning – System test –The different types – Regression testing – Alpha, beta and acceptance tests

UNIT-III (9hrs)

Selenium Basics: Automation Testing, Introduction to Selenium and its Components, Selenium IDE Features, Selenium Download and Installation, Creating Scripts using Firebug and Its Installation, Locator Types

Selenium WebDriver: Selenium WebDriver Installation with Eclipse, Handling Dropdowns, Explicit and Implicit Wait, Handling Alerts/Pop-ups, Handling Web Tables, Frames, Dynamic Elements, Robot API, AutoIT

UNIT-IV (9hrs)

Selenium Framework: Test Automation Framework: Introduction, Benefits of Automation Framework, Types of Automation framework

UNIT-V (9hrs)

Introduction to TestNG: TestNG Framework, TestNG installation, TestNG Annotations and Listeners, TestNG Example, TestNG Process Execution: Batch, Controlled Batch & Parallel

Learning Outcomes: Upon successful completion of the course, students will be able to:

1. Understand software testing principles and apply effective test case design strategies.
2. Implement and execute different levels of testing
3. Utilize Selenium for automation testing, including handling web elements and utilizing advanced features.
4. Implement and leverage automation testing frameworks for efficient test automation.
5. Apply TestNG framework for advanced test execution, management, and parallel processing.

Text Books:

1. Ilene Burnstein, "Practical Software Testing", Springer International Edition, 2003.
2. Srinivasan Desikan and Gopalaswamy Ramesh, "Software Testing – Principles and Practices", Pearson education, 2009.
3. Test Automation using Selenium WebDriver with Java: Step by Step Guide by NavneeshGarg
4. Absolute Beginner Java 4 Selenium Webdriver: Come Learn How to Program for Automation Testing by Rex Allen Jones II

Reference Books:

1. Elfriede Dustin, "Effective Software Testing", Pearson Education.
2. Aditya P. Mathur, "Foundations of Software Testing – Fundamental algorithms and techniques", Dorling Kindersley (India) Pvt. Ltd., Pearson Education

Weblinks:

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VII Semester

Course 18 B: Software Testing Lab using Selenium

LIST OF PRACTICAL EXPERIMENTS

1. Study of software testing tools such as Rational Rose Test Suite, Selenium Tool
2. Installation and exploring the Selenium IDE
3. Write a script to open google.com and verify that title is Google and verify that it is redirected to google.co.in
4. Write a script to open google.co.in using chrome browser (ChromeDriver)
5. Write a script to open google.co.in using internet explorer (InternetExplorerDriver)
6. Write a script to create browser instance based on browser name
7. Write a script to search for specified option in the listbox
8. Write a script to print the content of list in sorted order.
9. Write a script to print all the options. For duplicates add entry only once. Use HashSet.
10. Write a script to close all the browsers without using quit() method.
11. Write generic method in selenium to handle all locators and return web element for any locator.
12. Write generic method in selenium to handle all locators containing dynamic wait and returnweb element for any locator.

R23	SEMESTER-VII	L	T	P	C
	Skill based Course 19 A: Advanced Java Programming (w.e.f. 2023-24 Admitted Batch)	5	3	2	4 (3+1)
	Total Hours - 45				

Learning Objectives:

To provide students with a comprehensive understanding of Java Enterprise Edition (J2EE) and its associated technologies for developing robust and scalable web applications.

UNIT –I (9 hrs)

J2EE Overview & Multi-tier Architecture: Overview of J2SE, J2EE, Advantages of Java, Birth of J2EE, Why J2EE; Distributed Systems, The Tier, J2EE Multi-tier architecture, Implementation of Client-tier, Web-tier, EJB-tier, and EIS-tier, Challenges; J2EE best practices: Enterprise Application Strategy, The Enterprise Application - Client, Session Management, Web-tier and JSPs, EJB-tier, MVC, The Myth of Using Inheritance, Maintainable Classes, Performance Enhancement, Power of Interfaces, Threads, and Notification

UNIT –II (9 hrs)

Java Servlets & JDBC: Overview of HTML, XML, and XHTML, Java and XML, Parsing XML,Java Servlets and CGI Programming, A Simple Java Servlet, Anatomy of Servlet, Life Cycle of the Servlet, Deployment Descriptor, Reading data from client, reading HTTP requestheaders, working with cookies, Tracking sessions. Overview of JDBC, JDBC Drivers, JDBC Packages, JDBC Process, Database Connection, Statement, ResultSet, Transaction Processing, Servlet program with JDBC.

UNIT –III (9hrs)

Java Server Pages: Overview of JSP, JSP versus Servlet, JSP Tags: Variables and Objects, Directives, Scripting Elements, Standard Actions, Implicit Objects, Scope, Java Server Pages with Beans, Tomcat, User Sessions, Cookies, Session Objects, JSP with JDBC, Creating Custom JSP Tag Libraries.

UNIT –IV (9hrs)

Enterprise Java Beans: The EJB Container, EJB Classes, EJB Interfaces and Deployment Descriptions: Anatomy, Environment elements, referencing EJB, Sharing resources, Security elements, Query elements, Relationship elements, Assembly elements. Session Java Beans - stateless vs stateful, Entity Java Beans - Container-managed persistence, Bean-managed persistence. Message-driven Beans, JAR, WAR, EAR Files.

UNIT –V (9hrs)

JavaMail, CORBA and RMI: JavaMail API and Java Activation Framework, Protocols, Exceptions, Send Email Message, Retrieving Email Messages, Deleting Email Message. CORBA : The Concept of Object Request Brokerage, Java IDL and CORBA, The IDL Interface. Java RMI: Remote Method Invocation Concept, Server Side, and Client Side

Learning Outcomes: Upon successful completion of the course, students will be able to:

1. Understand the multi-tier architecture of J2EE and its implementation in enterprise applications.
2. Develop web applications using Java Servlets and establish database connectivity with JDBC.
3. Create dynamic and interactive web pages using Java Server Pages (JSP) and implementJSP with beans and custom tag libraries.
4. Build enterprise applications using Enterprise Java Beans (EJB) and understand their deployment and configuration.
5. Utilize various Java technologies such as JavaMail, CORBA, and Java RMI for effective communication and distributed computing.

Text Books:

1. Jim Keogh: J2EE : The Complete Reference. Mc Graw Hill
2. H. Schildt: Java 2: The Complete Reference. Mc Graw Hill

Reference Books:

1. Kogent Solutions Inc.: Java Server Programming Java EE 7 (J2EE 1.7), Black Book, Dreamtech Press
2. Subrahmanyam Allaramaju et al.: Professional JSP J2EE 1.3 Edition. Wrox Press
3. K. Qian et al.: Java Web Development Illuminated. Narosa
4. Robert W. Sebesta: Programming the World Wide Web. Pearson

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VII Semester
Skill Based Course 19 A: Advanced Java Programming

LIST OF PRACTICAL EXPERIMENTS

1. Study of software testing tools such as Rational Rose Test Suite, Selenium Tool
2. Write a Java program to retrieve the information from the given URL?
3. Write a java Program to create a servlet to read information from client Registration page
4. Write a java Program to create a JSP page to display a simple message along with currentDate
5. Write a java Program to create a User request page in JSP
6. Write the following (JDBC)
    a. Connect database to Java program
    b. Program to create database table using Java
    c. Program to insert, update, delete & select records
    d. Program to delete record from database
    e. Program to execute batch of SQL statements
    f. Program to execute SQL select query
7. Write the following (EJB)
    a. Create stateless bean component
    b. Create stateless bean client
8. Java Mail Example - Send Mail in Java using SMTP
9. Java RMI - Create and execute the server application program

R23	SEMESTER-VII	L	T	P	C
	Skill based Course 20 B: R Programming **(w.e.f. 2023-24 Admitted Batch)**	**5**	**3**	**2**	**4 (3+1)**
	Total Hours - 45				

Learning Objectives:

To equip students with the knowledge and skills to effectively use R programming language for data analysis, including data manipulation, visualization, and statistical modeling, enabling them to make data-driven decisions and insights.

UNIT-I (9 hrs)

Introduction to R- Features of R - Environment - R Studio. Basics of R-Assignment - Modes - Operators - special numbers - Logical values - Basic Functions - R help functions - R Data Structures - Control Structures.

Vectors: Definition- Declaration - Generating - Indexing - Naming - Adding &Removing elements
- Operations on Vectors - Recycling - Special Operators - Vectorized if- then else-Vector Equality Functions for vectors - Missing values - NULL values - Filtering & Subsetting.

UNIT-II (9 hrs)

Matrices - Creating Matrices - Adding or Removing rows/columns - Reshaping - Operations –Special functions on Matrices.

Lists - Creating List – General List Operations - Special Functions - Recursive Lists.
Data Frames -Creating Data Frames - Naming - Accessing - Adding - Removing - ApplyingSpecial functions to Data Frames - Merging Data Frames- Factors and Tables.

UNIT-III (9 hrs)

Functions - Creating User-defined functions - Functions on Function Object - Scope of Variables
- Accessing Global, Environment -Closures - Recursion.
Input / Output – Reading and Writing datasets in various formats

Exploratory Data Analysis - Data Preprocessing - Descriptive Statistics - Central Tendency - Variability - Mean - Median - Range - Variance - Summary - Handling Missing values and Outliers

- Normalization

UNIT-IV (9 hrs)

Data Visualization in R: Types of visualizations - packages for visualizations - Basic Visualizations, **Advanced Visualizations and Creating 3D plots.**

UNIT-V (9 hrs)

Inferential Statistics with R - Types of Learning - Linear Regression- Simple Linear Regression

- Implementation in R - functions on lm() - predict() - plotting and fitting regression line.

Multiple Linear Regression - Introduction -comparison with simple linear regression - Correlation Matrix - F- Statistic - Target variables Vs Predictors - Identification of significantfeatures - Implementation of Multiple Linear Regression in R.

Learning Outcomes: Upon successful completion of the course, students will be able to:

1. Gain a solid understanding of R programming language
2. Acquire knowledge and skills in manipulating matrices, lists, and data frames, includingperforming operations and applying functions.
3. Develop the ability to create user-defined functions, handle variable scope, and performexploratory data analysis, including data preprocessing and descriptive statistics.
4. Learn various data visualization techniques in R, including basic and advancedvisualizations, as well as creating 3D plots.
5. Gain proficiency in inferential statistics and regression analysis using R, including simplelinear regression and multiple linear regression.

Text Books:

1. Nina Zumel, John Mount, “Practical Data Science with R”, Manning Publications, 2014.
2. Mark Gardener, “Beginning R - The Statistical Programming Language”, John Wiley &Sons, Inc., 2012.
3. W. N. Venables, D. M. Smith and the R Core Team, “An Introduction to R”, 2013.

Reference Books:

1. Jure Leskovec, Anand Rajaraman, Jeffrey D.Ullman, “Mining of MassiveDatasets”,Cambridge University Press, 2014.

2. Nathan Yau, “Visualize This: The Flowing Data Guide to Design, Visualization, andStatistics”, Wiley, 2011.

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VII Semester

Skill based Course 20 B: R Programming

LIST OF PRACTICAL EXPERIMENTS

1. Installing R and R studio
2. Installing the "ggplot2", "caTools", "CART" packages and load the packages "ggplot2","caTools".
3. Basic operations in R
4. Working with Vectors:
    a. Create a vector v1 with elements 1 to 20.
    b. Add 2 to every element of the vector v1.
    c. Divide every element in v1 by 5
    d. Create a vector v2 with elements from 21 to 30. Now add v1 to v2.
5. Getting data into R, Basic data manipulation
6. Using the data present in the table given below, create a Matrix “M” also Find the pairs ofcities with shortest distance.

	C1	C2	C3	C4	C5
C1	0	12	13	8	20
C2	12	0	15	28	88
C3	13	15	0	6	9
C4	8	28	6	0	33
C5	20	88	9	33	0

7. Consider the following marks scored by the 6 students

Section	Student no	M1	M2	M3
A	1	45	54	45
A	2	34	55	55
A	3	56	66	64
B	1	43	44	45
B	2	67	76	78
B	3	76	68	37

   a. Create a data structure for the above data and store in proper positions with propernames
   b. Display the marks and totals for all students
   c. Display the highest total marks in each section.
   d. Add a new subject and fill it with marks for 2 sections.

8. Loops and functions - Find the factorial of a given number
9. Implementation of Data Frame and its corresponding operators and functions
10. Implementation of Reading data from the files and writing output back to the specified file
11. Treatment of NAs, outliers, Scaling the data, etc
12. Applying summary() to find the mean, median, standard deviation, etc
13. Implementation of Visualizations - Bar, Histogram, Box, Line, scatter plot, etc.
14. Implementation of Linear and multiple Linear Regression
15. Fitting regression line

R23	SEMESTER-VIII	L	T	P	C
	Course 21 A: Big Data Technologies (w.e.f. 2023-24 Admitted Batch)	5	3	2	4 (3+1)
	Total Hours - 45				

Learning Objectives:

To provide students with a comprehensive understanding of Big Data technologies, including Apache Hadoop, Hive, HBase, and Zookeeper, and develop practical skills in data processing, querying, and analytics for large-scale datasets.

UNIT- I (9hrs)

INTRODUCTION TO BIG DATA: Introduction – Classification of digital data: Structured, Semi structured and unstructured data, Big Data and its importance, Four V's in Big data, Driversfor Big data, Challenges of Big data, Big data analytics and Big data applications.

UNIT- II (9hrs)

INTRODUCTION HADOOP: Big Data – Apache Hadoop & Hadoop Ecosystem – Moving Datain and out of Hadoop – Understanding inputs and outputs of MapReduce - Algorithms using mapreduce, Matrix-Vector Multiplication by Map Reduce, Data Serialization.

UNIT- III (9hrs)

HADOOP ARCHITECTURE: Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell commands, Anatomy of File Write and Read., NameNode, Secondary NameNode, and

DataNode, Hadoop MapReduce paradigm, Map and Reduce tasks, Job, TaskTrackers - Cluster Setup – SSH & Hadoop Configuration – HDFS Administering – Monitoring & Maintenance.

UNIT-IV (9hrs)

HIVE AND HIVEQL: Hive Architecture and Installation, Comparison with Traditional Database, HiveQL - Querying Data - Sorting and Aggregating, Map Reduce Scripts, Joins & Subqueries

UNIT-V (9hrs)

HBase concepts- Advanced Usage, Schema Design, Advance Indexing - Zookeeper - how it helpsin monitoring a cluster, HBase uses Zookeeper and how to Build Applications with Zookeeper.

Learning Outcomes: Upon successful completion of the course, students will be able to:

1. Understand the importance and challenges of Big Data, including its classification and applications.
2. Familiarize with Apache Hadoop and learn data movement and MapReduce algorithms.
3. Explore Hadoop architecture, including HDFS, MapReduce tasks, and cluster setup.
4. Develop skills in Hive and HiveQL for querying and analyzing data in Hadoop.
5. Gain proficiency in HBase, including schema design, advanced indexing, and working with Zookeeper for cluster monitoring.

Text Books:

1. Big Data Black Book (Covers Hadoop 2, Map Reduce, Hive, Yarn, Pig & Data Visualization) - Dream Tech Publications
2. Big data and Analytics - Seema Acharya and Subhashini Chellappan - Wiley publications.

Reference Books:

1. "Understanding Big data", Chris Eaton, Dirk deroos et al., McGraw Hill, 2012.
2. "Big Data Analytics", G. Sudha Sadasivam and R. Thirumahal, Oxford University Press 2020.
3. "HADOOP: The definitive Guide" , Tom White, O Reilly 2012.
4. "Big Data Analytics with R and Haoop", Vignesh Prajapati, Packet Publishing 2013.
5. "Oracle Big Data Handbook", Tom Plunkett, Brian Macdonald et al, Oracle Press, 2014.

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VIII Semester

Course 21A: Big Data Technologies

LIST OF PRACTICAL EXPERIMENTS

1. HDFS: Setup a hdfs in a single node to multi node cluster, perform basic file system operation on it using commands provided, monitor cluster performance
2. Write various Map Reduce programs to count the number of times a single word has occurred in a given paragraph.
3. Implement the following file management tasks in Hadoop:
    a. Adding files and directories, List the files and directories
    b. Retrieving files Deleting files
    c. Copying files from one folder to another in HDFS
    d. Copying files from Local File System to HDFS
4. Write a Map Reduce program to add two matrices.
5. Write a Map Reduce program to multiply a matrix with a Vector.
6. Run a basic Word Count Map Reduce program to understand Map Reduce Paradigm
7. Write a Map Reduce program that mines weather data (NCDC). Weather sensors collectingdata every hour at many locations across the globe gather a large volume of log data, whichis a good candidate for analysis with MapReduce, since it is semi structured and record- oriented. (Data available at: ftp://ftp.ncdc.noaa.gov/pub/data/noaa/.)
8. Find average, max and min temperature for each year in NCDC data set
9. Stop word elimination problem:

    Input: 1. A large textual file containing one sentence per line

    2. A small file containing a set of stop words (One stop word per line) **Output**: 1. A textual file containing the same sentences of the large input file without the words appearing in the small file.
10. Write a MapReduce Application to implement Combiners
11. Write a MapReduce Application to implement Reduce-side Join
12. Write a MapReduce Application to implement Map-side Join
13. Hbase: Setup of Hbase in single node and distributed mode, write program to write somedata into hbase and query it

R23	SEMESTER-VIII	L	T	P	C
	Course 22 A: Data Mining Concepts and Techniques (w.e.f. 2023-24 Admitted Batch)	5	3	2	4 (3+1)
	Total Hours - 45				

Learning Objectives:

To provide students with a thorough understanding of data warehousing and data mining concepts, techniques, and applications.

UNIT – I (9hrs)

Data Warehousing: Introduction, What is Data Warehouse? Definition, Multidimensional Data Model, **OLAP** Operations, Warehouse Schema, Data Warehouse Architecture, Warehouse Server, Metadata, OLAP Engine, Data Warehouse Backend Process, Other Features

Data Pre-processing, Descriptive Data Summarization, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization and Concept Hierarchy Generation

UNIT – II (9hrs)

Data Mining: What is Data Mining? Data Mining: Definitions, KDD vs Data Mining, DBMS vs DM, Other Related Areas, DM Techniques, Other Mining Techniques, Issues and Challenges in DM, DM Applications- Case Studies

Association Rules: What is an Association Rule? Methods to Discover Association Rules, A Priori Algorithm, Partition Algorithm, Pincer-Search Algorithm, Dynamic Itemset Counting Algorithms,FP-Tree Growth Algorithm, Discussion on Different Algorithms, Incremental Algorithms, Border Algorithms, Generalized Association Rule, Association Rules with Item Constraints

UNIT – III (9hrs)

Clustering Techniques: Clustering Paradigms, Partitioning Algorithms, k-Medoid Algorithms, CLARA, CLARANS, Hierarchical Clustering, DBSCAN, BIRCH, CURE, Categorical Clustering Algorithms, STIRR, ROCK, CACTUS

UNIT – IV (9hrs)

Decision Trees: What is a Decision Tree? Tree Construction Principle, Best Split, Splitting Indices, Splitting Criteria, Decision Tree Construction Algorithms, CART, ID3, C4.5, Decision Tree Construction with Presorting, Rainforest, Approximate Methods, CLOUDS, BOAT, Pruning Techniques, Integration of Pruning and Construction, Ideal Algorithm

UNIT – V (9hrs)

Other Techniques: What is a Neural Network? Learning in NN, Unsupervised Leaning, Data Mining Using NN: A Case Study, Genetic Algorithms, Rough Sets, Support Vector Machines **Web Mining:** Web Mining, Web Content Mining, Web Structure Mining, Web Usage Mining, Text Mining, Unstructured Text, Episode Rule Discovery for Texts, Hierarchy of Categories, Text Clustering

Learning Outcomes: Upon successful completion of the course, students will be able to:

1. Understand data warehousing concepts, including data warehouse architecture, multidimensional data models, and OLAP operations.
2. Explore the fundamentals of data mining, including its definition, techniques, andapplications in real-world scenarios.
3. Develop knowledge and skills in clustering techniques, including partitioning algorithms, hierarchical clustering, and categorical clustering.
4. Acquire proficiency in decision tree construction and the use of decision tree algorithmsfor data analysis and prediction.
5. Gain exposure to various advanced data mining techniques, such as neural networks, genetic algorithms, and text mining, including web mining concepts and applications.

Text Books:

1. Data Mining Techniques, Arun K Pujari, University Press
2. Data Mining: Concepts and Techniques, 3rd Edition, Jiawei Han, Micheline Kamber, JianPei

Weblinks:

www.w3schools.com

www.greeksforgreeks.com

www.javatpoint.com

www.programmiz.com

VIII Semester
Course 22 A: Data Mining Concepts and Techniques

LIST OF PRACTICAL EXPERIMENTS

1. Study of various Open-Source Data Mining Tools
2. Build Data Warehouse and Explore WEKA
3. Perform data preprocessing tasks and Demonstrate
4. Perform association rule mining on data sets
5. Demonstrate performing classification on data sets
6. Demonstrate performing clustering on data sets
7. Demonstrate performing Regression on data sets
8. Credit Risk Assessment. Sample Programs using German Credit Data
9. Sample Programs using Hospital Management System

R23	SEMESTER-VIII	L	T	P	C
	Course 23 A: Information Security and Cryptography (w.e.f. 2023-24 Admitted Batch)	5	3	2	4 (3+1)
	Total Hours - 45				

Learning Objectives:

To provide students with a comprehensive understanding of cryptography and network security concepts and their practical applications.

UNIT-I (9hrs)

Information Security: Introduction, History of Information security, What is Security, CIA Traid, CNSS Security Model, Components of Information System, Balancing Information Security and Access, Approaches to Information Security Implementation, The Security Systems Development Life Cycle.

Security Attacks (Interruption, Interception, Modification and Fabrication), Vulnerability, Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability)and Mechanisms.

UNIT-II (9hrs)

Cryptography: Concepts and Techniques, Conventional substitution and transposition ciphers, One-time Pad, Block cipher and Stream Cipher, Symmetric and Asymmetric key cryptography, Steganography

Symmetric key Ciphers: DES structure, DES Analysis, Security of DES, variants of DES, Block cipher modes of operation, AES structure, Analysis of AES, Key distribution.

UNIT-III (9hrs)

Asymmetric key Ciphers: Principles of public key cryptosystems, RSA algorithm, Analysis of RSA, Diffie-Hellman Key exchange, Elliptic Curve Cryptography.

Message authentication and Hash Functions, Authentication Requirements and Functions, Message Authentication, Hash Functions and MACs Hash and MAC Algorithms SHA-512, HMAC. Digital Signatures, Authentication Protocols, Digital signature Standard.

UNIT-IV (9hrs)

Program Security: Secure programs, Non-malicious Program errors, Malicious codes virus, Trap doors, Salami attacks, Covert channels, Control against program.

IP Security: Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

Email Security: Pretty Good Privacy (PGP) and S/MIME.

UNIT-V (9hrs)

Web Security: Web Security Requirements, Secure Socket Layer (SSL) and Transport LayerSecurity (TLS), Secure Electronic Transaction (SET).

Intruders, Virus and Firewalls: Intruders, Intrusion detection, password management, Virus and related threats, Countermeasures, Firewall design principles, Types of firewalls

Wireless Security, Honeypots, Traffic flow security.

Learning Outcomes: Upon successful completion of the course, students will be able to:

1. Demonstrate the knowledge of cryptography, network security concepts and applications.
2. Develop security mechanisms to protect computer systems and networks.
3. Apply security principles in system design.
4. Apply methods for authentication, access control, intrusion detection and prevention.
5. Ability to identify and investigate vulnerabilities and security threats and mechanisms to counter them.

Text Book(s)

1. **Principles of Information Security**: *Michael E. Whitman, Herbert J. Mattord*, CENGAGE Learning, 4th Edition.
2. **Cryptography And Network Security Principles And Practice**, Fourth or Fifth Edition, *William Stallings*, Pearson
3. **Security in Computing**, Fourth Edition, by *Charles P. Pfleeger*, Pearson Education

Reference Books

1. **Modern Cryptography**: **Theory and Practice**, by *Wenbo Mao*, Prentice Hall.
2. **Network Security Essentials**: **Applications and Standards**, by *William Stallings*.Prentice Hall.
3. **Principles of Information Security**, *Whitman*, Thomson.
4. **Cryptography and Network Security** : *Forouzan Mukhopadhyay*, Mc Graw Hill, 2nd Edition

Weblinks:

www.w3schools.com

www.greeksforgreeks.com

www.javatpoint.com

www.programmiz.com

VIII Semester
Course 23 A: Information Security and Cryptography

LIST OF PRACTICAL EXPERIMENTS

1. Write a Java Program to implement Ceaser Cipher
2. Write a Java Program to implement Playfair Cipher
3. Write a Java Program to implement Railfence Cipher
4. Write a Java Program to implement Hill Cipher with 2 x 2 Matrix
5. Write a Java Program to implement DES algorithm
6. Write a Java Program to implement RSA algorithm
7. Write a Java Program for Diffie-Hellman Key Exchange
8. Write a Java Program to Generate SHA-512 Hash of a file
9. Write a Java Program to implement Digital Signature with a File
10. Configuring S/MIME for email communication
11. Setup a honeypot and monitor the honeypot on the network
12. Demonstrate how to provide secure data storage, secure data transmission and for creating digital signatures (GnuPG)
13. Perform wireless audit on an access point or a router and decrypt WEP and WPA (Net Stumbler)
14. Demonstrate intrusion detection system (ids) using any tool (snort or any other s/w)

R23	SEMESTER-VIII	L	T	P	C
	Skill based Course 24 B: Cloud Computing (w.e.f. 2023-24 Admitted Batch)	5	3	2	4 (3+1)
	Total Hours - 45				

Learning Objectives:

To provide students with a comprehensive understanding of cloud computing concepts, virtualization technologies, and different service models in the context of cloud computing.

The course will explore the origins, components, and essential characteristics of cloud computing, along with the benefits and limitations associated with its adoption

UNIT-I
(9hrs)

Cloud Computing Overview – Origins of Cloud computing – Cloud components - Essential characteristics – On-demand self-service, Broad network access, Location independent resource pooling, Rapid elasticity, Measured service. **Cloud scenarios** – Benefits: scalability, simplicity, vendors, security. Limitations – Sensitive information - Application development – **Security concerns** - privacy concern with a third party - security level of third party - security benefits Regularity issues: Government policies.

UNIT-II
(9hrs)

Virtualization: Virtualization and cloud computing - Need of virtualization – cost, administration, fast deployment, reduce infrastructure cost - limitations

Types of hardware virtualization: Full virtualization - partial virtualization - para virtualization Desktop virtualization: **Software virtualization** – Memory virtualization - Storage virtualization, **Data virtualization** – **Network virtualization**

UNIT-III
(9hrs)

Microsoft Implementation: Microsoft Hyper V, VMware features and infrastructure – Virtual Box - Thin client

Cloud deployment model: Public clouds – Private clouds – Community clouds - Hybrid clouds - Advantages of Cloud computing

UNIT-IV
(9hrs)

Infrastructure as a Service (IaaS): IaaS service providers – Amazon

EC2, GoGrid, Rack Space, Windows Azure infrastructure services – Amazon EC service level agreement – Recent developments – Benefits

Platform as a Service (PaaS): PaaS service providers – Right Scale – Salesforce.com – Force.com – Oracle APEX cloud - Services and Benefits

Software as a Service (SaaS): SaaS service providers – Google App Engine, Salesforce.com and google platform – Benefits – Operational benefits - Economic benefits – Evaluating SaaS

Learning Outcomes: Upon successful completion of the course, students will be able to:

1. Understand the essential characteristics and benefits of cloud computing
2. Gain knowledge of virtualization technologies
3. Explore Microsoft implementation of virtualization and understand different clouddeployment models and their advantages.
4. Learn about Infrastructure as a Service (IaaS) and Platform as a Service (PaaS) models,
5. Explore Software as a Service (SaaS) and its service providers.

Text Book(s)

Mastering Cloud Computing, Foundations and Application Programming, Raj KumarBuyya,

Christenvecctiola, S Tammaraiselvi, TMH

Reference Books

1. Cloud computing a practical approach - Anthony T.Velte , Toby J. Velte Robert ElsenpeterTATA McGraw- Hill , New Delhi - 2010
2. Cloud Computing: Web-Based Applications That Change the Way You Work andCollaborate Online - Michael Miller - Que 2008
3. Cloud Computing, Theory and Practice, Dan C Marinescu, MK Elsevier.
4. Cloud Computing, A Hands on approach, ArshadeepBahga, Vijay Madisetti, UniversityPress
5. AWS, Azure and Saleforceweb tutorials

Weblinks:

www.w3schools.com

www.greeksforgreeks.com

www.javatpoint.com

VIII Semester

Skill based Course 24 B: Cloud Computing

LIST OF PRACTICAL EXPERIMENTS

1. Setup virtual machines on a single computer using VM Ware and Virtual Box
2. Create a network using multiple virtual machines on a single host using VMware
3. Setup a client server interaction on a single host using VMware
4. Create an AWS account and create an EC2 instance with a C compiler
5. Connect to EC2 instance and run some C programs on EC2 instance
6. Install a web server on an EC2 instance and provide access to it using Security Group rules
7. Create a virtual cloud on EC2 platform
8. Connect to Force.com and create a data entry form using Salesforce APEX
9. Create a new account on Saleforce.com and create leads, quotes and contracts
10. Analyze the services available on Oracle APEX and create sample web applications

R23	SEMESTER-VIII	L	T	P	C
	Skill based Course 25 B: Digital Forensics (w.e.f. 2023-24 Admitted Batch)	5	3	2	4 (3+1)
	Total Hours - 45				

Learning Objectives:

To equip students with the knowledge and skills necessary to effectively handle digital investigations,ensuring the preservation, analysis, and presentation of digital evidence in a legally sound manner.

UNIT-I

(9hrs)

Introduction to Digital Forensic: Definition of Computer Forensics, Cyber Crime, Evolution of Computer Forensics, Objectives of Computer Forensics, Roles of Forensics Investigator, Forensics Readiness, Steps for Forensics

Computer Forensics Investigation Process: Digital Forensics Investigation Process-Assessment Phase, Acquire the Data, Analyze the Data, Report the Investigation

Digital Evidence and First Responder Procedure: Digital Evidence, Digital Evidence Investigation Process. First Responders Toolkit, Issues Facing Computer Forensics, Types of Investigation, Techniques in digital forensics

UNIT-II

(9hrs)

Understanding Storage Media and File System: The Booting Process, LINUX Boot Process, Mac OS Boot Sequence, Windows 10 Booting Sequence, File System, Type of File Systems.

Windows Forensics: Introduction to Windows Forensics, Windows Forensics Volatile Information, Windows Forensics Non- Volatile Information, Recovering deleted files and partitions, Windows Forensics Summary.

Usage of Slack space, tools for Disk Imaging, Data Recovery, Vulnerability Assessment Tools,Encase and FTK tools: **FTK Imager:**

Digital Forensics Road map: Static Data Acquisition from windows using FTK Imager, Live DataAcquisition using FTK Imager

Installation of KALI Linux, RAM Dump Analysis using Volatility, Static Data Acquisition fromLinux OS

UNIT-III (9hrs)

Recovering Deleted Files and Partitions: Digital Forensics Tools, Overview of EnCase Forensics, Deep Information Gathering Tool: Dmitry Page, Computer Forensics Live Practical byusing Autopsy and FTK Imager

Network Forensics: Introduction to Network Forensics, Network Components and their forensic importance, OSI internet Layers and their Forensic importance, Tools Introduction Wireshark and TCPDUMP, Packet Sniffing and Analysis using Ettercap and Wireshark, Wireshark Packet Analyzer, Packet Capture using TCP DUMP

Website Penetration: WHOIS, nslookup

UNIT-IV (9hrs)

Logs & Event Analysis: Forensic Analysis using AUTOPSY: Linux and Windows, Forensics andLoganalysis, Compare and AUDIT Evidences using Hashdeep Page

Data Carving using Bulk Extractor: Kali Linux and Windows, Recovering Evidence from ForensicImages using Foremost

Application Password Cracking: Introduction to Password Cracking, Password Cracking usingJohn the Ripper, Password Cracking using Rainbow Tables, PDF File Analysis, Remote Imagingusing E3 Digital Forensics

UNIT-V

(9hrs)

Wireless and Web Attacks: WiFi Packet Capture and Password Cracking using Aircrack ng, Introduction to Web Attacks, Website Copier: HTTRACK, SQL Injection, Site Report Generation:

Netcraft, Vulnerability Analysis: Nikto, Wayback Machine, Image Metadata Extraction usingImago

Email Forensics Investigation: Email Forensics Investigations, **Mobile Device Forensics:** Mobile Forensics

Preparation for Digital Forensic investigation: Investigative reports, expert witness and cyberregulations, Introduction to Report Writing, Forensic Reports & Expert Witness

Learning Outcomes: Upon successful completion of the course, students will be able to:

1. Gain a clear understanding of the fundamentals of digital forensics
2. Develop knowledge and skills in analyzing storage media and file systems
3. Learn about network forensics and acquire practical skills in network packet sniffing, analysis using tools like Wireshark and TCPDUMP
4. Gain expertise in logs and event analysis, data carving
5. Develop proficiency in wireless and web attacks.

Text Book(s)

1. **Digital Forensics**, *Dr.Jeetendra Pande, Dr. Ajay Prasad,* Uttarakhand Open University,Haldwan 2016
2. *Nilakshi Jain, Dhananjay Kalbande*, **"Digital Forensic: The fascinating world of DigitalEvidences"** Wiley India Pvt Ltd 2017.
3. *Cory Altheide, Harlan Carvey* **"Digital forensics with open source tools**" Syngress Publishing, Inc. 2011.
4. *Chris McNab*, **Network Security Assessment**, By O'Reilly.

Reference Books

1. *Jason Luttgens, Matthew Pepe, Kevin Mandia*, **"Incident Response and computerforensics",**3rd Edition Tata McGraw Hill, 2014.
2. *Clint P Garrison,* **"Digital Forensics for Network, Internet, and Cloud Computing Aforensic evidence guide for moving targets and data"** , Syngress Publishing, Inc. 2010

Weblinks:

www.w3schools.com

www.greeksforgreeks.com

www.javatpoint.com

www.programmiz.com

VIII Semester
Skill based Course 25 B: Digital Forensics

LIST OF PRACTICAL EXPERIMENTS

1. Study of Computer Forensics and different tools used for forensic investigation
2. How to Recover Deleted Files using Forensics Tools
3. Study the steps for hiding and extract any text file behind an image file/ Audio file (Steganography)
4. How to Extract Exchangeable image file format (EXIF) Data from Image Files using Exifreader Software
5. Data Acquisition using FTK imager
6. How to make the forensic image of the hard drive using EnCase Forensics/Autopsy
7. How to Restoring the Evidence Image using EnCase Forensics/Autopsy
8. How to Collect Email Evidence in Victim PC
9. How to Extracting Browser Artifacts
10. How to View Last Activity of Your PC
11. Find Last Connected USB on your system (USB Forensics)
12. Comparison of two Files for forensics investigation by Compare IT software
13. Live Forensics Case Investigation using Autopsy

R23	SEMESTER-I	L	P	T	C
	Course-1: Essentials and Applications of Mathematical, Physical and Chemical Sciences	**5**	**--**	**--**	**4**
TOTAL CONTACT HOURS–70					

COURSE OBJECTIVES:

- The objective of this course is to provide students with a comprehensive understanding of the essential concepts and applications of mathematical, physical, and chemical sciences.
- The course aims to develop students' critical thinking, problem-solving
- Analytical skills in these areas,
- Enabling them to apply scientific principles to real-world situations

SYLLABUS

UNIT I: ESSENTIALS OF MATHEMATICS: **16hr**

(a) Complex Numbers: Introduction of the new symbol i – General Form of a complex number – Modulus-Amplitude form and conversions Trigonometric Ratios: Trigonometric Ratios and their relations

(b) Problems on calculation of angles Vectors: Definition of vector addition – Cartesian form – Scalar and vector product and problems Statistical Measures: Mean, Median, Mode of a data and problems

UNIT II: ESSENTIALS OF PHYSICS: **15hr**

(a) Definition and Scope of Physics- definitions of Measurements and Units - Motion of objects: Newton's three Laws and applications, Principles of relativistic mechanics on based on two postulates - Laws of Thermodynamics and Significance- Acoustic waves and electromagnetic waves-

(b) Electric and Magnetic fields and their interactions- Behavior of atomic and nuclear particles- Wave-particle duality, the uncertainty principle- Helios centric and Big bang Theories, understanding of universe

UNIT III: ESSENTIALS OF CHEMISTRY: **12hr**

(a) Definition and Scope of Chemistry- Importance of Chemistry in daily life -Branches of chemistry and significance- Periodic Table-

(b) Electronic Configuration, chemical changes, classification of matter, Bimolecular- carbohydrates, proteins, fats and vitamins.

UNIT IV: APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY **14hr**

(a) (i) **Applications of Mathematics in Physics & Chemistry**: Calculus, Differential Equations & Complex Analysis

(ii) **Application of Chemistry in Industry and Technology**: Chemical Manufacturing, Pharmaceuticals and Drug Discovery, Materials Science, Food and Beverage Industry.

(b) **Application of Physics in Industry and Technology**: Aspects of Electronics and Semiconductor Industry, Components of Robotics, Benefits of Automation, Components and segments Automotive, segments of Aerospace Industry, Quality Control in Instrumentation, Environmental Monitoring and Sustainable Technologies

UNIT V: ESSENTIALS OF COMPUTER SCIENCE: **13hr**

(a) Milestones of computer evolution – Internet- history, Internet Service Providers, Types of Networks, IP, Domain Name Services, applications.

(b) WWW-web Applications, Web Terminologies, Web Browsers, URL- Components of URL, searching WWW- search Engines and examples

Reference Books:

1. Functions of one complex variable by John.B.Conway, Springer- Verlag.
2. Elementary Trigonometry by H.S.Hall and S.R.Knight
3. Vector Algebra by A.R.Vasishtha, Krishna Prakashan Media(P)Ltd.
4. Basic Statistics by B.L.Agarwal, New age international Publishers
5. University Physics with Modern Physics by Hugh D. Young and Roger A. Freedman
6. Fundamentals of Physics by David Halliday, Robert Resnick, and Jearl Walker
7. Physics for Scientists and Engineers with Modern Physics" by Raymond A. Serway and John W.Jewett Jr.
8. Physics for Technology and Engineering" by John Bird
9. Chemistry in daily life by Kirpal Singh
10. Chemistry of bio molecules by S. P. Bhutan
11. Fundamentals of Computers by V. Raja Raman
12. Cyber Security Essentials by James Graham, Richard Howard, Ryan Olso

Learning Outcomes:

At the end of the course, the learners should be able to:

1. Apply critical thinking skills to solve complex problems involving complex numbers, trigonometric ratios, vectors, and statistical measures.
2. To Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to Connect their knowledge of physics to everyday situations
3. To explain the basic principles and concepts underlying a broad range of fundamental areas of chemistry and to connect their knowledge of chemistry to daily life.
4. Understand the interplay and connections between mathematics, physics, and chemistry in various applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.
5. To explore the history and evolution of the Internet and to gain an understanding of network security concepts, including threats, vulnerabilities, and countermeasures

	SEMESTER-I	L	P	T	C
R23	Course-2: Advances in Mathematical, Physical and Chemical Sciences	5	0	--	4
TOTAL CONTACT HOURS–70					

COURSE OBJECTIVES:

The objective of this course is to provide students with an in-depth understanding of the recent advances and cutting-edge research in mathematical, physical, and chemical sciences.

The course aims to broaden students' knowledge beyond the foundational concepts and expose them to the latest developments in these disciplines, fostering critical thinking, research skills, and the ability to contribute to scientific advancements.

SYLLABUS

UNIT I **16hrs**

ADVANCES IN BASICS MATHEMATICS

Straight Lines: Different forms- Reduction of general equation into various forms -–Point of intersection of two straight lines

Limits and Differentiation: Standard limits -– Derivative of a function- –Problems on product rule and quotient rule

Integration: Integration as a reverse process of differentiation -– Basic methods of integration

Matrices: Types of matrices –- Scalar multiple of a matrix -– Multiplication of matrices -– Transpose of a matrix and determinants

UNIT II **15hrs**

ADVANCES IN PHYSICS:

Renewable energy: Generation, energy storage, and energy-efficient materials and devices.

Recent advances in the field of nanotechnology: Idea of Nano Science and Nano Technology, Nano metric systems, Quantum dots, Quantum Communication; **Nanotechnology in bio-physics;**

Recent advances in medical physics- **Radiation therapy advantages, Radiation protection and safety.**

UNIT III **12hrs**

ADVANCES IN CHEMISTRY:

Computer aided drug design and delivery, nano sensors, Chemical Biology, impact of chemical pollutants on ecosystems and human health, Dye removal - Catalysis method

UNIT IV **14hrs**

ADVANCED APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY

Mathematical Modelling applications in physics and chemistry Application of Renewable energy: Grid Integration and Smart Grids,

Application of nanotechnology: Nano medicine,

Application of biophysics: Biophysical Imaging, Biomechanics, Neuro-physics,

Application of medical physics: Radiation Therapy, Nuclear medicine
Solid waste management, Environmental remediation- Green Technology, Water treatment.

UNIT V: ADVANCED APPLICATIONS OF COMPUTER SCIENCE 13hrs

Number System-Binary, Octal, decimal, and Hexadecimal and their conversions, Signals-Analog, Digital,
Modem, Multiplexing& De-Multiplexing, Transmission media- characteristics and types, Networking devices- Repeater, hub, bridge, switch, router, gateway (Qualitative).

REFERENCE BOOKS:

RB1. Coordinate Geometry by S.L.Lony, Arihant Publications
RB2. Calculus by Thomas and Finny, Pearson Publications
RB3. Matrices by A.R.Vasishtha and A.K.Vasishtha, Krishna Prakashan Media(P)Ltd.
RB4. "Renewable Energy: Power for a Sustainable Future" by Godfrey Boyle
RB5. "Energy Storage: A Nontechnical Guide" by Richard Baxter
RB6. "Nanotechnology: Principles and Applications" by Sulabha K. Kulkarni and Raghvendra A. Bohara
RB7. "Biophysics: An Introduction" by Rodney Cotterill
RB8. "Medical Physics: Imaging" by James G. Webster
RB9. Nano materials and applications by M.N.Borah

RB10. Environmental Chemistry by Anil.K.D.E.
RB11. Digital Logic Design by Morris Mano
RB12. Data Communication & Networking by Bahrouz Forouzan.

LEARNING OUTCOMES:

On successful completion of this course, the student will be able to:

1. Explore the applications of mathematics in various fields of physics and chemistry, to understand how mathematical concepts are used to model and solve real-world problems.
2. To explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to connect their knowledge of physics to everyday situations.
3. Understand the different sources of renewable energy and their generation processes and advances in nano materials and their properties, with a focus on quantum dots. To study the emerging field of quantum communication and its potential applications. To gain an understanding of the principles of biophysics in studying biological systems. Explore the properties and applications of shape memory materials.
4. Understand the principles and techniques used in computer-aided drug design and drug delivery systems, to understand the fabrication techniques and working principles of nano sensors. Explore the effects of chemical pollutants on ecosystems and human health.
5. Understand the interplay and connections between mathematics, physics, and chemistry in various advanced applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.
6. Understand and convert between different number systems, such as binary, octal, decimal, and hexadecimal. Differentiate between analog and digital signals and understand their characteristics. Gain knowledge of different types of transmission media, such as wired (e.g., copper cables, fiber optics) and wireless (e.g., radio waves, microwave, satellite).

	SEMESTER – I	T	P	C
R -23	**A COURSE IN COMMUNICATION AND SOFT SKILLS** **English Language Course-I** (w.e.f 2023 -24 Admitted Batch)	**4**	**0**	**4**

COURSE OBJECTIVES:

The objectives of this course is to make the students:

- Grasp the importance of listening and its types.
- Acquire the knowledge on phonetics with reference to sounds, accent, intonation and rhythm.
- Learn the grammar topics i.e., concord, tenses, articles, prepositions and question tags.
- Enhance speaking skills with the help of Obama`s speech `Yes, We Can` and Kalam`s `A Leader Should Know How to Manage Failure`.
- To get an overview about soft skills i.e., attitude, E.I, T.E. and Interpersonal Skills.

SYLLABUS

UNIT - I:Listening Skills

a. Importance of Listening.
b. Types of Listening.
c. Barriers to Listening.
d. Effective Listening.

UNIT - II: Speaking Skills

a. Sounds of English: Vowels and Consonants.
b. Syllable
c. Word Stress
d. Intonation

UNIT - III: Grammar

a. Concord.
b. Articles

c. Prepositions
d. Tenses
e. Question Tags

UNIT - IV: Writing

a. Greetings & Introduction
b. Asking &Giving Information
c. Yes, We Can – Barack Obama
d. Agreeing & Disagreeing
e. A Leader Should Know How to Manage Failure – Dr.A. P. J. Abdul Kalam

UNIT - V:Soft Skills

a. SWOC.
b. Attitude.
c. Emotional Intelligence.
d. Telephone Etiquette.
e. Inter personal Skills.

CO-CURRICULAR ACTIVITIES:

- Class Room Seminars.
- Group Discussions.
- Role Play.
- Assignments.

TEXT BOOKS:

- English Praxis Course-I by Maruthi Publications.
- English Praxis Course-I by A Course on Communication and Soft skills ---Vivanta Press.

REFERENCE BOOKS:

- A text book of English Phonetics for Indian Students by T.Balasubramanian.
- Essentials of English Grammer by Raymond Murphy.
- Soft Skills Training – A work book to develop Skills for employment by Frederick H. Wentz

1. Duolingo (https://www.duolingo.com/) - This is a language-learning platform that offers a fun and interactive way to learn English through games, exercises, and quizzes.
2. BBC Learning English (https://www.bbc.co.uk/learningenglish/) - The BBC offers a comprehensive range of resources for learners of English, including grammar, vocabulary, and pronunciation.
3. English Central (https://www.englishcentral.com/) - This website provides a platform for practicing your English listening and speaking skills through video lessons and interactive activities.
4. Busuu (https://www.busuu.com/) - Busuu is a language-learning platform that offers lessons in English grammar, vocabulary, and conversation practice.

Activities :

- Make the students to news excerpts.
- Watch interviews and speeches on You Tube.
- Role plays on formal and informal covesations.

LEARNING OUT COMES:

By the end of the course the learner will be able to:

- Understand the importance listening and practice effective listening.
- Use grammar effectively for accuracy in writing and speaking.
- Demonstrate the use of good vocabulary.
- Acquireability to use Soft Skills in professional and daily life.
- Confidently use the tools of communication skills.

COURSE INFORMATION SHEET

Program : General Telugu
Year and semester : I Semester
Course : Saahiti Sourabham
Course Name : TELUGU
Course Coordinator :
Total Number of hours : 60
External Marks : 60

Lecture	Tutorial	Practical	No. Of Hrs per week	Credits
4	0	0	4	4

Course Objectives (అభ్యాసన లక్ష్యాలు):

1. Develop proficiency in reading, writing, and speaking skills
2. Introduce students to classical Telugu literature, including epics, poetry, drama, and philosophical texts.
3. Enhance knowledge of Telugu grammar (Vyakaranam).
4. Provide insights into Indian culture, philosophy, and heritage as reflected in Telugu texts.
5. Encourage the use of Telugu in modern contexts, including employability in education, research, and technology.

Course Outcomes (అభ్యాసన ఫలితాలు);

1. Demonstrate proficiency in Telugu through effective communication, both oral and written.
2. Analyze and interpret classical texts and apply their teachings to contemporary life.
3. Exhibit a clear understanding of Telugu grammar and its application in constructing verses and prose.
4. Develop skills for translation and interpretation of Telugu texts into modern languages.
5. Identify career opportunities in areas like teaching, translation, research, and cultural tourism.

I-BA, BSC, BCOM డిగ్రీ జనరల్ తెలుగు సెమిస్టర్ -I

పాఠ్యప్రణాళిక - 2021-2022

మహారాజా కళాశాల (స్వయంప్రతిపత్తి). విజయనగరం

యూనిట్ – I	బోధన సమయం
	7 గంటలు
రాజనీతి – నన్నయ	

యూనిట్ – II	బోధన సమయం
	7 గంటలు
దక్షయజ్ఞం - నన్నెచోడుడు	

యూనిట్ – III	బోధన సమయం
	7 గంటలు
ధౌమ్య ధర్మోపదేశము - తిక్కన	

యూనిట్ – IV	బోధన సమయం
	6 గంటలు
పలనాటి బెబ్బులి - శ్రీనాథుడు	

యూనిట్ – V	బోధన సమయం
	8 గంటలు
సీతారావణ సంవాదం - మొల్ల	

వ్యాకరణం	బోధన సమయం
	3 గంటలు

1. సంధులు : ఉత్వ, త్రిక, ద్రుతప్రకృతిక, సుగాగమ, ద్విరుక్తటకారాదేశ, యణాదేశ, వృద్ధి, శ్చుత్వ, జస్త్వ, అనునాసిక సంధులు.

వ్యాకరణం	బోధన సమయం
	3 గంటలు

2. సమాసాలు: అవ్యయీభావ, తత్పురుష, కర్మ ధారయ, ద్వంద్వ, ద్విగు, బహువ్రీహి.

అలంకారాలు	బోధన సమయం
	4 గంటలు

3. i) అర్థాలంకారాలు: ఉపమ, ఉత్ప్రేక్ష, రూపక, స్వభావోక్తి, అతిశయోక్తి అలంకారాలు.
   ii) శబ్దాలంకారాలు: అనుప్రాస (వృత్యనుప్రాస, ఛేకానుప్రాస, లాటానుప్రాస, అంత్యానుప్రాస).

చందస్సు	బోధన సమయం
	4 గంటలు

4. i) వుత్తాలు : ఉత్పలమాల, చంపకమాల, శార్దూలము, మత్తేభము;
   ii) జాతులు : కందం, ద్విపద;
   iii) ఉపజాతులు : ఆటవెలది, తేటగీతి, సీసం మరియు ముత్యాలసరాలు

యూనిట్ – VI - జర్నలిజం	బోధన సమయం
	6 గంటలు

i) పాత్రికేయ విద్య
ii) పత్రికా - భేదాలు
iii) విలేఖరి - విలేఖనము
iv) ఉపసంపాదకుడు
v) సంపాదకుడు

పునశ్చరణ	బోధన సమయం
	5 గంటలు

అంశాలు	బోధన సమయం
యూనిట్ – I	7 గంటలు
యూనిట్ – II	7 గంటలు
యూనిట్ – III	7 గంటలు
యూనిట్ – IV	6 గంటలు
యూనిట్ – V	8 గంటలు
వ్యాకరణం	
i) సంధులు	3 గంటలు
ii) సమాసాలు	3 గంటలు
iii) అలంకారాలు	4 గంటలు
a) అర్థాలంకారాలు	
b) శబ్దాలంకారాలు	
iv) చందస్సు	4 గంటలు
a) వుత్తాలు	
b) జాతులు	
c) ఉపజాతులు	
యూనిట్ – VI (జర్నలిజం)	6 గంటలు
i) పాత్రికేయ విద్య	
ii) పత్రికా - భేదాలు	
iii) విలేఖరి - విలేఖనము	
iv) ఉపసంపాదకుడు	
v) సంపాదకుడు	
పునశ్చరణ	5 గంటలు
మొత్తం	**60 గంటలు**

పాఠ్య ప్రణాళిక

యూనిట్-I

రాజనీతి - నన్నయ

మహాభారతం-సభాపర్వం-ప్రథమాశ్వాసం-(26-57 పద్యాలు)

యూనిట్-II

దక్షయజ్ఞం - నన్నెచోడుడు

కుమారసంభవం-ద్వితీయాశ్వాసం- (49-86 పద్యాలు)

యూనిట్-III

ధౌమ్య ధర్మోపదేశము - తిక్కన

మహాభారతం-విరాటపర్వం -ప్రథమాశ్వాసం-(116–146) పద్యాలు

యూనిట్-IV

పలనాటి బెబ్బులి - శ్రీనాథుడు (పలనాటి వీరచరిత్ర- ద్విపద కావ్యం పుట 108-112 'బాలచంద్రుడు భీమంబగు సంగ్రామం బొనర్చుట.. (108).. వెఱగంది కుంది' (112) సం. అక్కిరాజు ఉమాకాంతం ముద్రణ.వి.కె. స్వామి, బెజవాడ 1911.

యూనిట్-V

సీతారావణ సంవాదం - మొల్ల

రామాయణము-సుందరకాండము- (40-87 పద్యాలు)

- వ్యాకరణం

1. సంధులు: ఉత్వ, త్రిక, ద్రుతప్రకృతిక, నుగాగమ, ద్విరుక్తటకారాదేశ, యణాదేశ, వృద్ధి, శ్చుత్వ, జత్వ, అనునాసిక సంధులు.
2. సమాసాలు: అవ్యయీభావ, తత్పురుష, కర్మధారయ, ద్వంద్వ, ద్విగు, బహువ్రీహి.
3. అలంకారాలు:
   a) అర్థాలంకారాలు : ఉపమ, ఉత్ప్రేక్ష, రూపక, స్వభావోక్తి, అర్థాంతరవ్యాస, అతిశయోక్తి.
   b) శబ్దాలంకారాలు : అనుప్రాస (వృత్యనుప్రాస, ఛేకాపప్రాస లాటానుప్రాస, అంత్యానుప్రాస)
4. ఛందస్సు
   a) వృత్తాలు: ఉత్పలమాల, చంపకమాల, శార్దూలము, మత్తేభము;
   b) జాతులు : కందం, ద్విపద; ఉపజాతులు: ఆటవెలది, తేటగీతి, సీసం మరియు ముత్యాలసరాలు.

యూనిట్-VI

i) పాత్రికేయ విద్య
ii) పత్రికా – భేదాలు
iii) విలేఖరి – విలేఖనము
iv) సంపాదకుడు
v) ఉపసంపాదకుడు

ఆధార గ్రంథాలు :

1. శ్రీమదాంధ్ర మహాభారతము : సభాపర్వము-తిరుమల తిరుపతి దేవస్థానం ప్రచురణ
2. శ్రీమదాంధ్ర మహాభారతము : విరాటపర్వము- తిరుమల తిరుపతి దేవస్థానం ప్రచురణ
3. కుమార సంభవం - నన్నెచోడుడు
4. పలనాటి వీరచరిత్ర - శ్రీనాథుడు
5. రామాయణము – మొల్ల

*** సూచించబడిన సహపాఠ్య కార్యక్రమాలు :**

1. నన్నయ్య, తిక్కన, ఎఱ్ఱన మొదలైన ప్రసిద్ధ కవుల పాఠ్యాంశేతర పద్యాలను ఇచ్చి, విద్యార్థులచేత సమీక్షలు రాయించడం; ఆయా పద్యాల్లోని యతిప్రాసాది ఛందోవిశేషాలను గుర్తింపజేయడం.
2. విద్యార్థులచేత పాఠ్యాంశాలకు సంబంధించిన వ్యాసాలు రాయించడం (సెమినార్/అసైన్మెంట్)
3. ప్రాచీన పాఠ్యాంశాలలోని సమకాలీనతను గూర్చిన బృంద చర్చ, ప్రాచీన సాహిత్యాన్ని నేటి సామాజిక దృష్టితో పునర్మూల్యాంకనం చేయించడం.
4. చారిత్రిక, సాంస్కృతిక అంశాలకు సంబంధించిన పర్యాటక ప్రదేశాలను సందర్శించడం.
5. వ్యక్తిగత/బృంద ప్రాజెక్టులు చేయించడం. ప్రశ్నాపత్ర నిర్మాతలకు సూచనలు ప్రతిపదార్థ పద్యాలు, కంఠస్థ పద్యాలు "రాజనీతి, దక్షయజ్ఞం, ధౌమ్య ధర్మోపదేశం, సీతారావణ సంవాదం" అనే నాలుగు పాఠ్యాంశాల నుండి మాత్రమే ఇవ్వాలి.

R23	**SEMESTER-I**	L	P	T	C
	Course 1: POETRY, PROSE & GRAMMER -I **SANSKRIT**	4	0	--	4
TOTAL CONTACT HOURS–60					

Course Objectives

1. Develop proficiency in reading, writing, and speaking skills

2. Introduce students to classical Sanskrit literature, including epics, poetry, drama, and philosophical texts.

3. Enhance knowledge of Sanskrit grammar (Vyakarana).

4. Provide insights into Indian culture, philosophy, and heritage as reflected in Sanskrit texts.

5. Encourage the use of Sanskrit in modern contexts, including employability in education, research, and technology.

Course Outcomes:

1. Demonstrate proficiency in Sanskrit through effective communication, both oral and written.

2. Analyze and interpret classical texts and apply their teachings to contemporary life.

3. Exhibit a clear understanding of Sanskrit grammar and its application in constructing verses and prose.

4. Develop skills for translation and interpretation of Sanskrit texts into modern languages.

5. Identify career opportunities in areas like teaching, translation, research, and cultural tourism.

Learning Outcomes:

1. Ĥाचीन संè कृ तसाŎ ह× य èवØ प पॉ र£ ानम ्भवित ।
2. आधुिनक संè कृ तसाŎ ह× य èवØ प पॉ र£ ानम ्भवित ।
3. मौिलक åयाकरण पॉ रचयः भवित ।

II Syllabus: (Teaching Hours: 60)

Unit - 1: Ĥाचीन पर्ं साŎ ह× यम (12h) ्

1. धनुभा[गः - Įीमġ ामायणे बालकाÖ डे 67 सगः [
2. शरणागतरç णम - ् Į ीमहाभारते अनुशासनपवŭ[ण 32 अÚ यायः

.Unit - 2: आधुिनक पर्ं साŎ ह× यम (12h) ्

1. महोदयः - मुä ळपूŎड नारयणशाŭƮ णः पुğसंजीवन काå ये 2 सगः [
2. रामकà ितः [- स× यॉ तशाŭƮ णः Įीरामकà ित महाका [å ये 1 सगः [

Unit - 3: गर्ं साŎ ह× यम (12h) ्

1. खलोŏơ ः - Ŏहतोपदेशे सŭÛ ध पॉ रां छेदात्
2. लोकमाÛ यः - ĮीरामनाथशाŭƮ कृ तः िनबÛ धः

Unit - 4: åयाकरणम (12h) ्

1. अजÛ त शÞ दाः (देव, कŏ व, भानु, धातृ, ŏपतृ, गो, रमा, मित)
2. धातवः (भू, गम, ्è था, Áिशर, ् लाभ, ्मुĮ , अस, ्भाष)्

Unit - 5: åयाकरणम (12h) ्

1. सÛ धयः (अच ्- हल ्सÛ धयः)
2. समासाः (Ţ ÛŢ , त× पुæंष, कमधारय [, ŎŢगु)

III Skill Outcomes:

On successful completion of this course, student shall be able to:

1. साŎ ह× यकार, ऋŏ ष, कŏ व ø दय ŏववेचनम ्भवित ।
2. मानवीयमूãयसà पदनाभलाषः भवित ।
3. मौिलकå याकरण£ ानेन Ĥयोगे अथात[्पठन लेखन वेलासु भाषाशुÙÚ यै ĤयP ः भवित ।

IV References:

1. Prescribed Sanskrit **Text Book IV**

Co-Curricular Activities: (Hours for Activity: 15h)

1. Assignments
2. Seminars, Group discussions, Quiz, Debates etc.
3. Invited lectures and presentations on related topics by experts.

R23	SEMESTER –I	L	P	T	C
	I. Analytical Skills	4	0	--	4
TOTAL CONTACT HOURS–30					

SYLLABUS

UNIT – 1:

Arithmetic ability: Algebraic operations BODMAS, Fractions, Divisibility rules, LCM & GCD (HCF).

Verbal Reasoning: Number Series, Coding & Decoding, Blood relationship, Clocks, Calendars.

UNIT – 2:

Quantitative aptitude: Averages, Ratio and proportion, Problems on ages, Time-distance – speed.

Business computations: Percentages, Profit & loss, Partnership, simple compound interest.

UNIT – 3:

Data Interpretation: Tabulation, Bar Graphs, Pie Charts, line Graphs. Venn diagrams.

COURSE OUTCOMES:

After successful completion of this course, the student will be able to;

CO1. Understand the basic concepts of arithmetic ability, quantitative ability, logical reasoning, business computations and data interpretation and obtain the associated skills.

CO2. Acquire competency in the use of verbal reasoning.

CO3. Apply the skills and competencies acquired in the related areas

CO4. Solve problems pertaining to quantitative ability, logical reasoning and verbal ability inside and outside the campus.

Recommended Co-Curricular Activities

Surprise tests / Viva-Voice / Problem solving/Group discussion.

Text Book: Quantitative Aptitude for Competitive Examination by R.S. Agrawal, S.Chand Publications.

Reference Books

1. Analytical skills by Showick Thorpe, published by S Chand And Company Limited, Ramnagar,New Delhi-110055

2. Quantitative Aptitude and Reasoning by R V Praveen, PHI publishers.

3. Quantitative Aptitude for Competitive Examination by Abhijit Guha, Tata Mc Graw HillPublications.

MAHARAH`S COLLEGE (AUTONOMOUS) :: VIZIANAGARAM

I B. Sc; First Semester Examinations Model Paper

ANALYTICAL SKILLS

Time: 1 ½ hrs **Max.Marks:30M**

SECTION-A

I. Answer any THREE from the following **3x2=6M**

1. The H.C.F of two numbers is 11 and their L.C.M is 7700.If one of the number is 275, then Find the other number?
2. If $\dfrac{2x}{1+\dfrac{1}{1+\dfrac{x}{1-x}}}=1$, then find the value of x?
3. A, B,C enter into a partnership investing Rs. 35000,45000 and 55,000 respectively. Find the respective shares of A,B,C in an annual profit of Rs. 40,500 ?
4. At what rate percent per annum will a sum of money double in 16 years?
5. How to find the central angle of the component?

SECTION-B

II. Answer all the following questions. Each question carries EIGHT marks. **3x8=24M**

6 (a). Explain any four Divisibility Rules with relevant Examples.

(OR)

6(b). i) What was the day of week on 4th June,2002?

ii) Find at what time between 8 and 9 o'clock will the hands of a clock be in the same straight line but not together?

7(a). i) The present age of a father is 3 years more than three times the age of his son. Three years hence, father's age will be 10 years more than twice the age of the son,. Find the present age of the father?

ii) A cyclist covers a distance of 750m in 2 min 30 sec. What is the speed in km/hr of the cyclist?

(OR)

7(b). A salesman's commission is 5% on all sales up to Rs. 10,000 and 4% on all sales exceeding this. He remits Rs. 31,100 to his parent company after deducting his commission. Find the total sales.

8(a) . Study the following table carefully and answer these questions:

NUMBER OF CANDIDATES APPEARED AND QUALIFIED IN A

COMPETITIVE EXAMINATION FROM DIFFERENT STATES OVER THE YEARS

Year / State	1997		1998		1999		2000		2001	
	App.	Qual.	App.	Qual.	App.	Qual.	App.	Qual.	App.	Qual.
M	5200	720	8500	980	7400	850	6800	775	9500	1125
N	7500	840	9200	1050	8450	920	9200	980	8800	1020
P	6400	780	8800	1020	7800	890	8750	1010	9750	1250
Q	8100	950	9500	1240	8700	980	9700	1200	8950	995
R	7800	870	7600	940	9800	1350	7600	945	7990	885

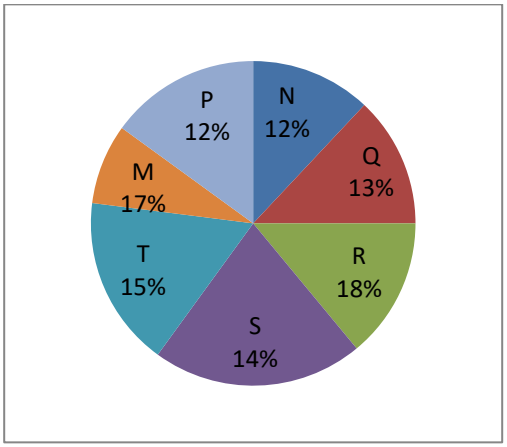
1. Combining the states P and Q together in 1998, what is the percentage of the candidates qualified to that of the candidates appeared?
   (a) 10.87% (b) 11.49% (c) 12.35% (d)12.54%
2. The percentage of the total number of qualified candidates to the total number of appeared candidates among all the five states in 1999 is
   (a) 11.49% (b)11.84% (c) 12.21% (d) 12.57%
3. What is the percentage of candidates qualified from State N for all the years together, over the candidates appeared from State N during all the years together?
   (a) 12.36% (b) 12.16% (c) 11.47% (d) 11.15%
4. What is the average of candidates who appeared from State Q during the given years?
   (a) 8990 (b) 8760 (c) 8810 (d) 8920

(OR)

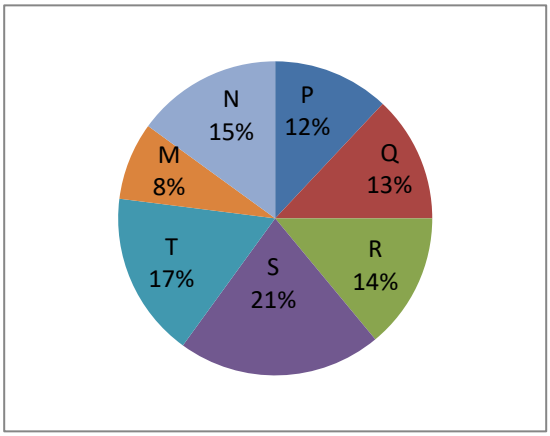
8(b). The following pie-charts show the distribution of students of graduate and post graduate levels in seven different institutes –M,N,P,Q,R,S and T in a town

DISTRIBUTION OF STUDENTS AT GRADUATE AND POST-GRADIATE LEVELS IN SEVEN INSTITUTIONS –M,N,P,Q,R,S and T

Total Number of Students of Graduate Level =27300



Total Number of Students of Post-Graduate Level = 24700



1. How many students of institutes M and S are studying at graduate level?
   (a) 7516 (b)8463 (c) 9127 (d) 9404

2. Total number of students studying at post-graduate level from institutes N and P is :
(a)5601 (b)5944 (c) 6669 (d) 7004

3. What is the total number of graduate and post – graduate level students in institute R?

(a) 8320 (b)7916 (c)9116 (d) 8372

4. What is the ratio between the number of students studying at post-graduate and graduate levels respectively from institute S?

(a) 14:19 (b) 19:21 (c) 17:21 (d) 19:14

R-23	**SEMESTER – 1** **LIFE SKILLS COURSE**	**T**	**P**	**C**
	COURSE 4: COMMUNICATION SKILLS **SEMESTER I** **(w.e.f 2023-24 Admitted Batch)**	**2**	**0**	**2**
	Total Contact Hours - 20			

COURSE OBJECTIVES:

The objectives of the course are to make the student:

1. To know about the types interviews and how to face an interview.
2. To get an idea about communication and principles of communication, barriers to communication and effective communication.
3. To acquire the knowledge about Speaking Skills with reference to Dialogue Building and Giving Instructions /Directions.
5. To apply the knowledge for debating, Descriptions and Role Play.

SYLLABUS

I. UNIT BASICS OF COMMUNICATION SKILLS

1. Nature and Importance of Communication.
2. Process of communication.
3. Principles of Communication.
4. Barriers to Communication.
5. Strategies for Effective Communication.

II. UNIT PRESENTATION SKILLS

1. Preparation of a Good Presentation.
2. Verbal Communication in Presentation.
3. Non-Verbal Communication in Presentation.
4. Visual aids/Materials in Presentation.
5. Analyzing audience and Managing Questions.

III.UNIT INTERVIEW AND GROUP DISCUSSIONS

1. Interview types.
2. Before, during and after an interview.
3. Do`s and Don'ts in an interview.
4. Basic interview questions.
5. Structure and process of Group Discussions.
6. Role functions, Do`s and Don`ts.

Learning outcomes:

By the end of the course the learner will be able to:

- Speak English fluently
- Participate confidently in any social interaction.
- Face any professional discourse.
- Demonstrate critical thinking.
- Enhance conversational skills by observing the professional interviews

Recommended Activities:

----Presenting seminar papers.

----Mock interviews.

----Using Power point presentation in seminars.

CO-CURRICULAR ACTIVITIES:

- Class Room Seminars.
- Elocution.
- Making a Presentation.
- Assignments.

TEXT BOOKS:

- English Praxis Course-III by Maruthi Publications.
- English Praxis Course-III by A Course in Conversational Skills by Vivanta Press.

REFERENCE BOOKS:

- Working in English, Jones, Cambridge.
- Business Communication, Raman – Prakash, Oxford.
- Speaking Personally, Porter – Ladousse, Cambridge.
- Speaking Effectively, Jermy Comfort, et.al, Cambridge.

- AnjaneeSethi&BhavanaAdhikari, Business Communication Tata McGraw Hill
- Jermy Comfort, Speaking Effectively,et,al, Cambridge.

LMS ACCESS

Skills you need: communication skills

- Information and resources to help develop information skills

Nonverbal Communication

Principles of public speaking

- Online course that aims to help you prepare and deliver effective oral presentations, with an emphasis on informative and persuasive public speaking

33 Nonverbal Communication Tips, in 140 characters or less

- Some short and succinct tips on improving your nonverbal communication skills

Nonverbal communication: how body language & nonverbal cues are key

- Article on nonverbal communication that includes some good tips on watching your body language during online video calls

The power of nonverbal communication

- TED talk from a body language expert

MAHARAJAH`S COLLEGE [AUTONOMOUS] ; VIZIANAGARAM

SEMESTER I -COMMUNICATION SKILLS -MODEL QUESTION PAPER
I B,A., B.Sc., B,COM FIRST YEAR w.e.f., 2023

Max. Time : 2 Hrs. **Max. Marks : 30 M**

PART – A

1. **Answer any THREE of the following:** **3X2 = 6 M**

a. Define communication.

b. What is communication process?

c. Visual aids in presentation.

d. What are Do`s in Interview?

e. What is GD in communication?

PART-B

II. Answer any FIVE of the following: **3X8 = 24 M**

2 A] What is the nature and importance of communication?

OR

B] Write a note on major barriers to communication?

3. A] What are the strategies for effective communication?

OR

B] Explain verbal and non-verbal communication in presentation.

4. A] What is GD and write its importance.

OR

B] What are the Do`s and Don`ts of Power Point Presentation?

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R23	SEMESTER-I	L	P	T	C
	PRINCIPLES OF PSYCHOLOGY	2	---	---	2
TOTAL CONTACT HOURS – 30					

LEARNING OBJECTIVES:

1) To understand and apply psychological principles to real-world issues and problems.

2) To investigate the physiological, psychological, and social determinants of motivation.

3) To investigate the various types of memory, including short-term, long-term, and sensory memory.

4) To understand how personality traits impact an individual's behaviour and interactions with others.

SYLLABUS

UNIT - 1: INTRODUCTION

Definition, Origin of Psychology, Psychology as a scientific study of behaviour, Applied fields of Psychology, Biological bases of Behaviour. SENSORY AND PERCEPTUAL PROCESS: Structure and functions of visual and auditory senses; ATTENTION: selective, sustained and divided attention. PERCEPTION: Nature and determinants; Perceptual constancies.

UNIT - 2: EMOTION AND MOTIVATION:

Nature of Emotion, Components of Emotions. Theories of Emotion: James-Lange, Cannon - Bard and Schachter- singer. MOTIVATION: Nature and types of Motivation; Maslow's hierarchy model.

UNIT - 3: INDIVIDUAL DIFFERENCES:

Learning and Memory: Learning - Definition, Classical and Instrumental Conditioning, Principles of Classical Conditioning, Schedules of reinforcement, MemorySensory, Short- term and Long term memory; Forgetting and it's causes.PERSONALITY - Trait and type approaches; Assessment of Personality. INTELLIGENCE- Concept of IQ and Measurement

LEARNING OUTCOMES:

By the end of the course the learner will be able to:

- Speak fluently in English.
- Participate confidently in any social interaction.
- Face any professional discourse.
- Demonstrate critical thinking.
- Enhance conversational skills by observing the professional interviews.

LEARNING OUTCOMES:

1) Students able to improve mental health and well-being for individuals and communities through evidence-based interventions

2) The students able to enhance ability to motivate oneself and others to perform at their best.

3) The students able to improve academic and professional performance through better memory recall.

4) The students able to improve self-awareness and understanding of one's own personality traits.

ACTIVITIES:

Group Discussions; Debates; Assignments; Essay writings;

Seminars, Workshops, PPT Presentations, Charts and Poster Presentations etc.,

REFERENCE

BOOKS AND WEBSITES:

1) Aggarwal, J.C. (2014). Essentials of Educational Psychology (3rd Ed.).New Delhi: Vikas Publishing House Pvt.Ltd.
2) Bhartiya, H.R. (1968). Elements of Educational Psychology. Calcutta: OrientLongman.
3) Chauhan, S.S. (1984). Advanced Educational Psychology (7th Ed).New Delhi: Vikas Publishing House. Pvt. Ltd.
4) Mangal S.K. (2007) Advanced Educational Psychology (2nd Ed). New Delhi, Prentice Hall of India.

MAHARAJAH'S COLLEGE (AUTONOMOUS) - VIZIANAGARAM
MODEL QUESTION PAPER

SUBJECT/ PAPER: PRINCIPLES OF PSYCHOLOGY

PART-A

1. Answer any FIVE questions from the fallowing. (3 x 2 = 6 M)

a. Write the meaning and definition of the Psychology?

b. What is Educational Psychology?

c. Define the Perception.

d. Draw the cycle of Motivation?

e. What are the causes of Forgetting?

PART-B

II. Answer THREE of the following internal choice questions. (3 x 8 = 24 M)

2. a) Define the Attention and Explain the types of Attention?

(OR)

b) Compare between Pure Psychology and Applied Psychology?

3. a) Explain and illustrate the Maslow's Hierarchy Model?

(OR)

b) Discuss the Schedules of Reinforcement.

4. a) Explain the Classical Conditioning Theory?

(OR)

b) Summarize the assessment of Personality