Bharatiya Vidya Bhavan

BHAVAN'S VIVEKANANDA COLLEGE

Department of Computer Science

Sainikpuri, Secunderabad

Autonomous College – Affiliated to Osmania University, w.e.f. 2023-2024

M.Sc. [Computer Science] SEMESTER - I

	Code	Paper Title	PPW		Max Marks		Max Marks		Credits
			TH	PR	TH	TH-CIA	PR	PR-CIA	
I	CS101	Advanced Java Programming	4		70	30			4
II	CS102	Operating Systems	4		70	30			4
III	CS103	Software Engineering	4		70	30			4
IV	CS104	Discrete Mathematics	4		70	30			4
V	CS105(AECC)	Personality Development and Soft Skills		2			50		1
VI	CS101P	Advanced Java Lab		6			75		3
VII	CS102P	Operating Systems Lab		4			50		2
VIII	CS103P	Software Engineering Lab		4			50		2
		Total	16	16	280	120	225		24

SEMESTER – II

Paper	Code	Paper Title	PPW		Max Marks		Max Marks		Credits
			TH	PR	TH	TH-CIA	PR	PR-CIA	
I	CS201	Programming in Python	4		70	30			4
II	CS202	Computer Networks	4		70	30			4
III	CS203	Design and Analysis of Algorithms	4		70	30			4
IV	CS204	Automata Theory	4		70	30			4
V	CS201P	Python Lab		6				75	3
VI	CS202P	Computer Networks Lab		6				75	3
VII	CS203P	Design and Analysis of Algorithms Lab		4				50	2
		Total	16	16	280	120		200	24

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Department of Computer Science

Sainikpuri, Secunderabad

Autonomous College – Affiliated to Osmania University

M.Sc. [Computer Science] II Year

CBCS(Choice Based Credit System) w.e.f 2023-2024

Scheme of Instruction and Examination

SEMESTER-III

Paper	Code	Paper Title	PPW		Max Marks		Max Marks		Credits
			TH	PR	TH	TH-CIA	PR	PR-CIA	
I	CS301	Programming in C#	4		70	30			4
II	CS302	Compiler Design	4		70	30			4
III	CS303(A)	Network Security	4		70	30			4
	CS303(B)	Big Data Analytics							
IV	CS304(A)	Object Oriented Analysis and Design	2		50				2
	CS304(B)	Data Mining							
V	CS305(AECC)	MOOCs (Online SWAYAM Course)	2						2
VI	CS301P	C# Lab		6			75		3
VII	CS302P	Compiler Design Lab		6			75		3
VIII	CS303(A)P	Network Security Lab		4			50		2
	CS303(B)P	Big Data Analytics Lab							
		Total	16	16	260	90	200		24

SEMESTER – IV

Paper	Code	Paper Title	PPW		Max Marks		Max Marks		Credits
			TH	PR	TH	TH-CIA	PR	PR-CIA	
I	CS401	Computer Organization	4		70	30			4
II	CS402	Cloud Computing	4		70	30			4
III	CS403(A)	Mobile Computing	4		70	30			4
	CS403(B)	Distributed Systems							
IV	CS404(A)	Artificial Intelligence	4		70	30			4
	CS404(B)	Internet of Things							
V	CS405P	Project Work		16			150	50	8
		Total	16	16	280	120	150	50	24

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PROGRAM NAME: M.Sc.(Computer Science) (w.e.f. 2022-23)

COURSE NAME: PROGRAMMING IN PYTHON

PAPER CODE: CS201 **PPW: 4**
YEAR/SEMESTER:I/II **NO. OF CREDITS: 4**

COURSE OBJECTIVE : To enable students with the concepts of programming to develop python scripts.

UNIT-WISE COURSE OBJECTIVES:

COb1: To explain conditional and looping statements.
COb2: To demonstrate the concepts of functions, files and exceptions.
COb3: To describe the functionalities of lists, tuples, strings, dictionaries and sets.
COb4: To illustrate object oriented concepts and GUI controls.

UNIT – I **- 15 Hrs.**

Introduction to Python Programming: How a Program Works, Using Python, Program Development Cycle, Input,Processing, and Output, Displaying Output with the Print Function, Comments, Variables, Reading Input from theKeyboard, Performing Calculations (Operators. Type conversions, Expressions), More about Data Output.**Decision Structures and Boolean Logic:** if, if-else, if-elif-else Statements, Nested Decision Structures, ComparingStrings, Logical Operators, Boolean Variables.Repetition Structures: Introduction, while loop, for loop, Calculating a Running Total, Input Validation Loops,Nested Loops.
(Ch – 1.4, 1.5, 2.1 – 2.8, 3.1-3.6, 4.1 – 4.4, 4.6-4.7)

UNIT – II **- 15 Hrs.**

Functions: Introduction, Defining and Calling a Void Function, Designing a Program to Use Functions, LocalVariables, Passing Arguments to Functions, Global Variables and Global Constants, Value-Returning Functions-Generating Random Numbers, Writing Our Own Value-Returning Functions, The math Module, StoringFunctions in Modules.**File and Exceptions:** Introduction to File Input and Output, Using Loops to Process Files, Processing Records,Exceptions.
(Ch – 5.1 – 5.10, 6.1-6.4)

UNIT – III **- 15 Hrs.**

Lists and Tuples: Sequences, Introduction to Lists, List slicing, Finding Items in Lists with the in Operator, ListMethods and Useful Built-in Functions, Copying Lists, Processing Lists, Two-Dimensional Lists, Tuples.**Strings:** Basic String Operations, String Slicing, Testing, Searching, and Manipulating Strings.**Dictionaries and Sets:** Dictionaries, Sets, Serializing Objects.
(Ch – 7.1-7.9, 8.1-8.3, 9.1 – 9.3)

UNIT – IV **– 15 Hrs.**

Object-Oriented Programming: Procedural and Object-Oriented Programming, Classes, Working with Instances,Techniques for Designing Classes, Inheritance, Polymorphism.**GUI Programming:** Graphical User Interfaces, Using the tkinter Module, Display text with Label Widgets,Organizing Widgets with Frames, Button Widgets and Info Dialog Boxes, Getting Input with Entry Widget, UsingLabels as Output Fields, Radio Buttons, Check Buttons.

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(Ch – 10.1 – 10.4, 11.1, 11.2, 13.1 – 13.8)

PRESCRIBED BOOKS:

1. **Starting Out With Python,** Tony Gaddis, Pearson College Div; 4th edition ,2017.

Reference Books

1. **Fundamentals of Python**, Kenneth A. Lambert, Course Technology Inc; 2nd edition, 2018.
2. **Beginning Python using Python 2.6 and Python 3,** James Payne, Wrox; 1st edition, 2010.
3. **Practical Programming: An Introduction to Computer Science using Python 3,** Paul Gries, O'Reilly; 3rd edition ,2018.
4. **Introduction to Computer Science using Python,** Charles Dierach, Wiley; 1st edition, 2015.
5. **Foundations for Analytics with Python: From Non-Programmer to Hacker,** Clinton W. Brownley, Shroff/O'Reilly; First edition , 2016.

COURSE OUTCOMES:

At the end of the course students will be able to:

CS201CO1: Develop programs using conditional and looping statements.
CS201 CO2: Develop programs using functions, files and exceptions.
CS201 CO3: Develop programs using lists, tuples, strings, dictionaries and sets.
CS201 CO4: Develop programs using object oriented concepts and using GUI controls.

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PROGRAM NAME: M.Sc.(Computer Science) (w.e.f. 2022-23)

COURSE NAME: COMPUTER NETWORKS

PAPER CODE: CS202 **PPW: 4**
YEAR/SEMESTER: I/II **NO. OF CREDITS: 4**

Course Objective : This course provides the overview of networking. It deals with the seven layers of OSI/ISO Model in detail and gives an idea to a student as how the Message reaches to the recipient handset device from the handset device.

UNIT-WISE COURSE OBJECTIVES:

CObl: To illustrate some basic concepts of networks in hardware and software terminologies and describe some of the functionalities of Physical Layer.
CObl: To describe the various functionalities of Data Link Layer and switching devices.
Cob3: To describe the various functionalities of Network Layer.
Cob4: To describe the various functionalities of Transport Layer and few services provided by the Application Layer.

UNIT– I **15 Hrs.**
Computer Networks Fundamentals: Network Hardware, Network Software, Reference models– OSI Model, TCP/IP Reference Model, Comparison of OSI and TCP/IP Reference Model.
Physical Layer: Guided Transmission Media, Wireless Transmission, Multiplexing – Frequency Division Multiplexing, Time Division Multiplexing, Switching.
(Ch- 1.2, 1.3, 1.4.1, 1.4.2, 1.4.4, 2.2, 2.3, 2.5.3, 2.5.4, 2.6.5)

UNIT– II **15 Hrs.**
Data Link Layer: Design Issues, Error Detection, Elementary Data Link Protocols, Sliding Window Protocol.**Multiple Access Sub layer**: ALOHA, CSMA, Collision Free Protocols, Ethernet – Classic Ethernet Physical Layer, Classic Ethernet MAC Sub layer Protocol, Fast Ethernet.**Data Link Layer Switching**– Repeaters, Hubs, Bridges, Switches, Routers, Gateways.
(Ch-3.1, 3.2.2, 3.3, 3.4, 4.2.1, 4.2.2, 4.2.3, 4.3.1, 4.3.2, 4.3.5, 4.8.4)

UNIT – III **15 Hrs.**
Network Layer: Design Issues, Routing Algorithms – Shortest path, Flooding, Distance Vector Routing, Link State Routing, Hierarchical, Broadcast Routing, Multicast Routing; Congestion Control Algorithms - Traffic Throttling, Load Shedding.
Internetworking: Tunneling, Internetwork Routing, Packet Fragmentation, IP Version 4 Protocol, IP Addresses, IP Version 6, Internet Control Protocols–ICMP, ARP, RARP, DHCP.
(TB1- Ch- 5.1, 5.2.2, 5.2.3, 5.2.4, 5.2.5, 5.2.6, 5.2.7, 5.2.8, 5.3.4, 5.3.5, 5.5.3, 5.5.4, 5.5.5, 5.6.1 to 5.6.4)

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UNIT– IV **15 Hrs.**

Transport Layer: Services provided to the upper layers, Elements of Transport Protocols.

The Internet Transport Protocols: Introduction to UDP&RPC, The Internet Transport Protocols–TCP, TCP Service Model, TCP protocol, TCP Segment Header, TCP Connection Establishment, TCP Connection Release, Modeling TCP Connection Management, TCP Sliding Window, TCP Time Management.

Application Layer: DNS - Name Space, Domain Name Space, Distribution of Name Space, DNS in the internet, Resolution, DNS Messages, Types of Records.TELNET, E-Mail, FTP.

(Text Book 1 : Chapter 6.1.1, 6.2, 6.4.1, 6.4.2, 6.5.1 to 6.5.9)
(Text Book 2 : Chapter 25.1, 25.2, 25.3, 25.4, 25.5, 25.6, 25.7, 26.1, 26.2, 26.3)

PRESCRIBED BOOK:

1. **Computer Networks,** Andrew S. Tanenbaum, David J Wetherall, Pearson EDUCATION, 5th edition, 2010.
2. **Data Communication and Networking,** Behrouz A. Forouzan, McGraw Hill Education; Fifth edition , 2017.

Reference Books

1. **Computer Networking: A Top-Down Approach Featuring the Internet,** James F. Kurose, Keith W. Ross, Pearson Education; Sixth edition , 2017.
2. **Data Communications, Computer Networks and Open systems,** Fred Harshall, Pearson Education, fourth Edition, 2017.
3. **Data and Computer Communications,** William Stallings, Pearson Education, Tenth edition, 2017.
4. **Computer Networks A Top-Down Approach,** Behrouz A Forouzan, Firouz Mosharraf, McGraw Hill Education; Fifth edition ,2017.
5. **Computer Networks,** S.S. Shinde, new age publishers; First edition, 2008.

Course Outcomes: By the end of the course, student will be able

CS202 CO1 : To relate the different network operations with the related layers of OSI and TCP Protocol and analyze the responsibilities of Physical Layer.
CS202 CO1 : To analyze different Data Link Layer operations and access how the Multiple Access sub layer protocols .
CS202 CO3 : To identify the nomenclature used in IP Addresses and analyze the IP Header Format, different Routing Algorithms and Congestion Control Techniques used in Internet.
CS202 CO4 : To analyze how Transport Layer exactly implements a reliable end to end delivery of messages and analyze TCP Header format and also how Transport Layer overcomes Congestion control at its level. To analyze the different services provided by Application Layer

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PROGRAM NAME: M.Sc.(Computer Science) (w.e.f. 2022-23)

COURSE NAME:DESIGN AND ANALYSIS OF ALGORITHMS

Paper Code :CS203 **PPW : 4**
Year/Semester : I/II **NO. OF CREDITS: 4**

COURSE OBJECTIVE : It helps the student to learn different Sorting- searching algorithms, Divide and Conquer, Dynamic Programming – Back tracking algorithms.

UNIT-WISE COURSE OBJECTIVES

COb1: To acquire the knowledge of different sorting and searching techniques.
Cob2: To describe different problems related to divide and conquer & decrease and conquer.
Cob3: To describe the alternative methods for optimality of Dynamic Programming and Transform and Conquer.
Cob4: To aware of problems related to Greedy Technique and Branch and Bound techniques.

UNIT – I **-15 Hrs.**

Introduction: Algorithm, Fundamentals of Algorithmic Problem Solving, Important Problem Types.**Fundamentals of the Analysis of Algorithm:** The Analysis Framework, Asymptotic Notations and Basic EfficiencyClasses, Mathematical Analysis of Non-recursive & Recursive Algorithms. **Brute Force Search:** Selection Sort,Bubble Sort, Sequential Search, Brute-Force String Matching, Exhaustive Search, Depth-First Search, Breadth-First Search.
(Ch- 1.2, 1.3, 2.1, 2.2, 2.3, 2.4, 3.1 – 3.5)

UNIT – II **- 15 Hrs.**

Decrease–&–Conquer: Insertion Sort, Topological Sorting, Binary Search, Interpolation Search. **Divide-and-Conquer:** Merge Sort, Quick Sort, Multiplication of Large Integers, Strassen's Matrix Multiplication.
(Ch – 4.1, 4.2, 4.4, 4.5, 5.1, 5.2, 5.4)

UNIT – III **- 15 Hrs.**

Transform-and-Conquer: Presorting, Balanced Search Trees, Heaps and Heap Sort, Problem Reduction. Space and Time Trade-Offs, Hashing, B-Trees.
Dynamic Programming: Knapsack Problem, Optimal Binary Search Trees, Warshall's and Floyd's Algorithms.
(CH - 6.1, 6.3, 6.4, 6.6,7.3, 7.4,8.2-8.4)

UNIT – IV **- 15 Hrs.**

Greedy Technique: Prim's Algorithm, Kruskal's Algorithm, Dijkstra's Algorithm, Huffman Trees and Codes.**Iterative Improvement:** Simplex Method, Maximum-Flow Problem.**Limitations of Algorithm Power:** Lower-Bound Arguments, Decision Trees, P, NP, and NP-Complete Problems.Backtracking: n-Queens Problem, Hamiltonian Circuit Problem, Subset-Sum Problem. **Branch-and-Bound:**Assignment Problem, Knapsack Problem, Traveling Salesman Problem, Approximation Algorithms for theKnapsack Problem.
(Ch – 9.1-9.4, 10.1, 10.2, 11.1, 11.2, 11.3, 12.1, 12.2, 12.3)

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PRESCRIBED BOOK:

1. Introduction to the Design and Analysis of Algorithms, Anany Levitin, Pearson Education; Third edition , 2017.

REFERENCE BOOKS:

1. **Foundations of Algorithms,** Richard Neapolitan, Jones and Bartlett Publishers, Inc; 5th edition, 2014.
2. **Introduction to Algorithms,** Thomas H. Cormen, Pearson Education; Third edition ,2017.
3. **Fundamentals of Computer Algorithms**, E.Horowitz, S. Sahni, Galgotia Publications Pvt Ltd , second edition,1999.
4., **The Design and Analysis of Computer Algorithms** , A.V. Aho, J.V. Hopcroft, J.D. Ullmann Pearson Education India; 1st edition ,2002.
5. **The Art of Programming_Volumes-1, 2, 3, 4**, Donald E Knuth, Addison-Wesley; 1st edition , 2011.

COURSE OUTCOMES:

At the end of the course students will be able to:

CS203 CO1: Develop programs using different Sorting and Searching methods.
CS203 CO2: Develop programs using different programs based on Divide and Conquer approach
CS203 CO3: Develop programs related to Dynamic Programming concepts.
CS203 CO4: Develop programs related to Greedy Technique, Branch and Bound related problems

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PROGRAM NAME: MSc Computer science-1year (w.e.f. 2022-2023)
COURSE NAME:Automata Theory

PAPER CODE: CS204 **P PW: 4**
YEAR/SEMESTER: I/II **NO.OF CREDITS: 4**

COURSE OBJECTIVE: This course is intended to teach the fundamentals of DFA's and NFA's, Regular Languages, Context Free Grammars,Pushdown automata and Turing Machine

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UNIT-WISE COURSE OBJECTIVES:

COb1: To understand the behavior of DFA's, NFA's.
COb2: To construct finite automata for a given regular expressions.
COb3: To impart the knowledge of Context Free Grammars,Push Down Automata.
COb4: To design the Turing machines.

UNIT– I

Fundamentals – alphabets, strings, languages, problems, graphs, trees.

Finite State Systems: definitions, Finite Automaton model, acceptance of strings, and languages, Deterministic finite automaton and Nondeterministic finite automaton, transition diagrams, transition tables, proliferation trees and language recognizers, equivalence of DFA's and NFA's.Finite Automata with ε-moves, significance, acceptance of languages, ε-closure, Equivalence of NFA's with and without ε-moves.**Regular Expressions**: regular sets, regular expressions, identity rules, constructing finite automata for a given regular expressions, conversion of finite automata to regular expressions.

(Ch:1-1.1, 1.2) (Ch: 2-2.1:2.5)

UNIT– II

Two-way finite automata: crossing sequence, Finite Automata with output– Moore and Melay machines, equivalence of Moore and mealy machines.

Properties of regular sets:Pumping lemma of regular sets(theorem) and its applications,

closure properties of regular sets (proofs omitted),Decision Algorithms for regular sets (theorem) Minimization of finite automata The Myhill nerode (theorem).

(Ch 2-2.6) (Ch 3-3.1:3.4)

UNIT – III

Context free grammar: derivation trees, sentential forms, right most and leftmost derivation of strings, ambiguity. Simplification of Context Free Grammars

Chomsky normal form, Greiback normal form.

Push Down Automata: PDA definition, model, acceptance of CFL, acceptance by final state and acceptance by empty state and its equivalence.

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Properties of context free languages: Pumping lemma for context free languages and its applications, closure of properties of CFL (proofs omitted).

(**Ch**:4 -4.1:4.3) (**Ch** 5-5.1,5.2) (**Ch** 6-6.1,6.2)

UNIT – IV

Turing Machine: TM definition, model, design of TM, computable functions, types of Turing machines (only theory-proofs omitted),Church's hypothesis.

Chomsky hierarchy: Regular grammars–right linear and left linear grammars, equivalence between regular linear grammarand finite automata, inter conversion (Only statements)unrestricted grammars, recursively enumerable languages, Context sensitivelanguageandLinear bounded automata.Chomsky hierarchy of languages.

(**Ch** 7-7.1:7.6) (**Ch** 9-9.1:9.3)

PRESCRIBED BOOK:

1. **Introduction to Automata Theory, Languages, and Computation**, J. E. Hopcroft, J. D. Ullman, RAINBOW BOOK DISTRIBUTIORS , Third Edition, 2015.

REFERENCE BOOKS:

1. **Theory of Computer Science,** Mishra, Chandrashekaran, Prentice Hall India Learning Private Limited; 3rd edition (1 January 2006)
2. **Switching and Finite Automata Theory** by Zvi Kohavi TMH edition second edition, 2017
3. **An Introduction to Formal Languages and Automata,** Perter Linz, Jones and Bartlett Publishers, Inc; 7th edition ,2022.
4. **Introduction to Languages and the Theory of Computation,** John C.Martin, McGraw Hill Education; 3rd edition (6 June 2007)

COURSE OUTCOMES:

At the end of the course students will be able to

CO1:Know the behavior of DFA's, NFA's.
CO2:Construct finite automata for a given regular expressions.
CO3: Acquainted with Context Free Grammars,Push down Automata.
CO4:Familiar with the Turing machines.

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M.Sc. (Computer Science) III Semester (CBCS)

CS305(AECC):MOOCs Online NPTEL Courses

(w.e.f. 2022-2023)

Credits: 2

Program Duration: 8 Weeks

The students are advised to take NPTEL course on the topics other than curriculum-based subjects. Students are advised to select courses like :

CYBER SECURITY
MACHINE LEARNING
IoT SYSTEMS
BIG DATA ANALYTICS
DISTRIBUTED SYSTEMS
BLOCK CHAIN TECHNOLOGY
RESEARCH METHODOLOGY
Etc.

NOTE: The students will be allotted the subjects that are available in a particular year at NPTEL.

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PROGRAM NAME: M.Sc.(Computer Science), II SEM.
(w.e.f. 2022-23)
COURSE NAME: PYTHON LAB

PAPER CODE: CS201P
YEAR/SEMESTER: I/II

PPW: 6
NO. OF CREDITS: 3

COURSE OBJECTIVE:
To impart knowledge in students on the execution process of Python applications.

COb1: To demonstrate the concepts of conditional statements, loops, functions and files.
COb2: To illustrate object-oriented and GUI applications.

Week 1:

1. Write a program that displays the following information: Your name, Full address, Mobile number, Collegename, Course subjects.

2. Write a program to find the largest three integers using if-else and conditional operator.

Week 2:

3. Write a program with a loop that asks the user to enter a series of positive numbers. The user should enter anegative number to signal the end of the series. The program should display the numbers in order and theirsum.

Week 3:

4. Write a program to find the product of two matrices [A]mxp and [B]pxr.

Week 4:

5. Write recursive and non-recursive functions for the following:

a. To find GCD of two integers.

b. To find the factorial of positive integer

c. To print Fibonacci Sequence up to given number n

Week 5:

6. Write a program to display two random numbers that are to be added, such as: 247 + 129, the Programshould allow the student to enter the answer. If the answer is correct, a message of congratulations shouldbe displayed. If the answer is incorrect, a message showing the correct answer should be displayed.

Week 6:

7. Write recursive and non-recursive functions to display prime number from 2 to n.

Week 7:

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8. Write a program that writes a series of random numbers to a file from 1 to n and display.

9. Write a program to create file, write the content and display the contents of the file with each line proceededwith a line number (start with 1) followed by a colon.

Week 8:

10. In a program, write a function that accepts two arguments: a list and a number n. The function displays all ofthe numbers in the list that are greater than the number n.

Week 9:

11. Write a program with a function that accepts a string as an argument and returns the no. of vowels that the string contains and another function to return no. of consonants.

Week 10:

12. Write a program that opens a specified text file and then displays a list of all the unique words found in thefile. (Store each word as an element of a set.)

Week 11:

13. Write a program to analyze the contents of two text files using set operations.

Week 12:

14. Write a program to implement the inheritance and dynamic polymorphism.

Week 13:

15. Write a GUI program that converts Celsius temperatures to Fahrenheit temperatures.

Week 14:

16. Write a GUI program that displays your details when a button is clicked.

Note: Handle the exceptions raised from file operations.

COURSE OUTCOMES:

At the end of the course students will be able to:

CO1: Develop applications using conditional statements, loops, functions and files.

CO2: Develop object-oriented and GUI applications.

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PROGRAM NAME: M.Sc.(Computer Science) (CBCS)
(w.e.f. 2022-23)
COURSE NAME: COMPUTER NETWORKSLAB

PAPER CODE: CS202P **PPW: 6**
YEAR/SEMESTER: I/II **NO. OF CREDITS: 3**

COURSE OBJECTIVE:
To inculcate knowledge on Socket Programming, Protocols and Routing Algorithms.

COb1: To implement the concepts of IPC, Client and server.
COb2: To implement programs for various Protocols and Routing algorithms.

Week 1:

1. Program to identify the category of the IP address for the given IP address
2. Program to implement sliding window protocol

Week 2:

3. Program Socket pair system call usage in IPC
4. Program for Socket options using signals

Week 3:

5. Program to implement Echo concurrent Stream Server

Week 4:

6. Program to implement Echo concurrent stream client

Week 5:

7. Program to implement Listener and Talker

Week 6:

8. Program to implement TCP time service

Week 7:

9. Program to implement UDP time service

Week 8:

10. Program to implement Ping service

Week 9:

11. Program to implement Route tracing program

Week 10:

12. Program to implement File Transfer Protocol

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Week 11:

13. Program to implement any Shortest path routing Algorithm

Week 12:

14. Program to implement Distance Vector Routing Implementation

Week 13:

15. Program to implement ICMP Error Message simulations

Week 14:

16. Program to implement Reverse Address Resolution Protocol

COURSE OUTCOMES:

At the end of the course students will be able to:

CO1: Execute the concepts of IPC, Client and server.
CO2: Practice programs for various Protocols and Routing algorithms.

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BHAVAN'S VIVEKANANDA COLLEGE

OF SCIENCE, HUMANITIES AND COMMERCE
(Accredited with 'A' Grade by NAAC)
Autonomous College – Affiliated to Osmania University
Department of Computer Science

PROGRAM NAME: M.Sc.(Computer Science)II SEM
(w.e.f. 2022-23)
COURSE NAME: DESIGN AND ANALYSIS OF ALGORITHMS LAB

PAPER CODE: CS203P **PPW: 6**
YEAR/SEMESTER: I/II **NO. OF CREDITS: 3**

COURSE OBJECTIVE:
To acquire knowledge in implementation of different types of algorithms in different applications.

COb1: To impact knowledge on different algorithm's implementation.
COb2: To inculcate knowledge to implement back tracking and greedy methods.

Week 1:

1. Write a program recursive and non-recursive function for the following:

   a) Factorial of an integer b) GCD of two integers c) Fibonacci Sequence

Week 2:

2. WriteaprogramforsortingthegivenlistusingInsertionSort,TopologicalSort.

Week 3:

3. Write a program for sorting the given list using Selection Sort, Bubble Sort.
4. Write a program for sorting the given list using Merge Sort.

Week 4:

5. Write a program for sorting the given list using Quick Sort.

Week 5:

6. Write a program for sorting the given list using Heap Sort.

Week 6:

7. Write a program to find the given number in a list using Sequential Search, Binary Search.

Week 7:

8. Write a program to find product of two matrices [A]mxp and[B]pxr

Week 8:

9. Write a program to create AVL tree.-

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Week 9:

10. Write a program to create B-tree.
11. Write a program to find the Euler circuit and the Hamiltonian circuit for a weighted graph.

Week 10:

12. Write a program to find the shortest path in a weighted graph using Dijkstra's Algorithm.

Week 11:

13. Write a program to solve travelling sales men problem.

Week 12:

14. Write a program to solve knapsack problem.

Week 13:

15. Write a program to find the minimum spanning tree for a weighted graph using Kruskal's Algorithm.

Week 14:

16. Write a program to find the minimum spanning tree for a weighted graph using Prim's Algorithm.

Note: Analyze all the above problems with respect to Time Complexity.

COURSE OUTCOMES:
At the end of the course students will be able to :

CO1: Implement graph related algorithms.
CO2: Know different sorting and searching algorithms.

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