



Bagalkot University, (A State Public University of Govt. of Karnataka) **Jamkhandi**

The Draft

**DEPARTMENT OF STUDIES IN COMPUTER SCIENCE UNDER THE
SCHOOL OF MATHEMATICS & COMPUTER SCIENCE**

M.Sc. COMPUTER SCIENCE

CHOICE BASED CREDIT SYSTEM

**Adapted from RCU Belagavi applicable from the Academic
Year 2023-24**

Preamble for PG Syllabus of Bagalkot University

Bagalkot University Jamkhandi has been established by the Government of Karnataka and has started functioning from the academic year 2023-24. All the degree colleges other than engineering and medical colleges in the district of Bagalkote, are affiliated to this university as per the Karnataka State Universities Act 2000, as modified by the 26th Act of 2022. The students taking admission to any of the colleges in the district of Bagalkote, from the academic year 2023-24 will be students of Bagalkot University. The Chancellor of the university, the honorable Governor of Karnataka, has instructed the Vice chancellor and the university to adapt, the rules and regulations of the parent university, Rani Channamma University, Belagavi for the immediate activities (Vide letter from the office of the Governor GS 01 BGU 2023 dated 17/05/2023).

In this connection, Bagalkot University has adapted the postgraduate syllabus from RCU, Belagavi for all the 2 years degree PG programmes such as M.A.(English), M.A.(Political Science), M.S.W.,M.Com, etc. The syllabus follows the Choice Based Credit System introduced by University and provides flexibility to the students to choose their course from a list of electives and soft-skill courses, which makes teaching-learning student-centric. The higher semester syllabi will be published in due course. The syllabus is being published as one electronic file for each degree and is self-contained. Only the subject codes/ question paper codes are changed, whereas the subject syllabi remains the same. The subject code format is described in the following.

Subject Code Format for M.A. (History) and M.Sc. (Physics)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Ver	Uni. Code		DEGREE			SEM		DISCIPLINE			SUB. TYPE			SL. NO. IN DISC. & S. TYPE		TH/ LAB /B/ I NT.
1	2	6	M	S	C	0	1	P	H	Y	C	S	C	0	1	T
1	2	6	M	A	M	0	1	H	I	S	C	S	C	0	1	T

[1]The Ver information gives the version of the syllabus. It can take values 1,2..9,a,b,...

[2-3]The University UUCMS Code

[4-6] The PG degree codes to be provided as

Sl. No	Degree Code	Degree
1	MSC	Master of Science
2	MAM	Master of Arts
3	MCM	Master of Commerce
4	MBA	Master of Business Administration
5	MCA	Master of Computer Applications
6	MSW	Master of Social Work
7	MED	Master of Education
8	MPE	Master of Physical Education

[7-8]The Semester Information is provided as

Sl. No	Semester
1	'01
2	'02
3	03
....	

[9-11]The Discipline Information to be provided as

Sl No	Degree	Discipline Code
1	MCM-MCOM	XXX
2	MCA	XXX
3	MBA	XXX
4	MSW	XXX
5	MAM	'HIS', 'POL', 'KAN', 'ENG'
6	MSC	'PHY', 'CHE', 'MAT', CSC
7	MED-MEd	XXX
8	MPE-MPEd	XXX

[12-14]The Subject Type to be provided as

Sl. No.	TYPE	Description
1	HCC	Hard Core Course
2	CSC	Core Subject Course
3	SCC/SPC/OPC	Soft Core Course /Specialization Course/ Optional Course
4	OEC	Open Elective Course

[15-16] The Running Serial Number is to be provided for a particular subject type 01 to 99

[17] This character specifies the category of the subject namely, T=theory, L-Lab, P-Project, I-Internship, B- Bothe theory and Lab

I SEMESTER

Syllabus of I Semester M.Sc programme, w.e.f. 2020-21
(According new regulations w.e.f. 2020-21)

I SEMESTER M.Sc w.e.f.2020-21									
Semester-I	Course	Subject Name	Teaching Hrs per week	Practical Hrs/ week	Examination				Credits
					Duration (Hrs.)	Marks			
						Theory/ Practical	IA	Total	
Core Subject	126MSC01CSCCSC01T	Discrete Mathematical Structures	4	--	3	80	20	100	4
	126MSC01CSCCSC02T	Database Management Systems	4	--	3	80	20	100	4
	126MSC01CSCCSC03T	Data structure using C++	4	--	3	80	20	100	4
	126MSC01CSCCSC01L	Database Management Systems -Lab	--	4	3	80	20	100	4
	126MSC01CSCCSC02L	Data structure using C++ Lab	--	4	3	80	20	100	4
Soft Core / Specialization/ Optional	126MSC01CSCCSC01T	Computer System Architecture	4	--	3	80	20	100	4
Total			16	8				600	24

CSC: Computer Science CSC: Core Subject Course SCC: Soft Core Course

L: Practical

Detailed Syllabus

First Semester Syllabus

CORE SUBJECT COURSE PAPERS

COURSE CODE: 126MSC01CSCCSC01T

: Discrete Mathematical Structures	
Teaching:4 hrs./week Credits:04Hrs.:52	Max. Marks:80 I. A. Marks:20
UNIT I 10 Hrs Sets and Logic: Sets, propositions, conditional propositions and logical equivalence, arguments and rules of inference, quantifiers, nested quantifiers.	
UNIT II 12 Hrs Proofs: Principles of mathematical induction, Functions, Relations: relations, operations on relations, Properties of relations, equivalence relations, matrices of relations, Partially ordered sets, lattices, finite Boolean algebra, functions on Boolean algebra.	
UNIT III 10 Hrs Graph Theory: Introduction of Graphs and digraphs, Paths and Cycles, Hamiltonian Cycles, adjacency and incidence matrices, vertex colouring, representations of graphs, isomorphisms of graphs, planar graphs.	
UNITIV 10 Hrs Trees: Terminology and characterizations of trees, spanning trees, minimal spanning trees, shortest-path algorithm, binary trees, tree traversals, decision trees, isomorphism of trees.	
UNITV 10 Hrs Semi Groups and Groups: Semi groups, products and quotients of semi groups, groups, products and quotients of groups. Groups and coding: Coding of Binary information and error detection, decoding and error detection.	
Text Books:	
1. Kenneth H. Rosen, Discrete Mathematics and its Applications, 5/e, Tata McGraw Hill.	
2. Deo N., Graph theory with application to Engineering and Computer Science, Prentice Hall of India,	
3. Kolman, Busby, Ross, Discrete Mathematical Structures, Pearson Education.	
Reference Books:	
1. J.P. Tremblay and R.Manohar, Discrete Mathematical structures with applications toComputer Science, Tata McGraw Hill.	

COURSE CODE: 126MSC01CSCCSC02T

Database Management System	
Teaching:4hrs./week Credits: 04Hrs.:52	Max. Marks:80 I. A. Marks:20
UNIT I	12hrs
Introduction: Data modeling for a database, abstraction and data integration, the three-level architecture, components of DBMS, advantages and disadvantages, data associations, data model classification, Entity-Relationship model.	
UNIT II	10hrs
File organization and storage, secondary storage devices, operations in file, heap files and sorted files, hashing techniques, type of single level ordered index, multi-level indexes indexes on multiple keys, other types of indexes.	
UNIT III	12hrs
The Relational Model: Relational database, relational algebra, relational calculus SQL- Data definition, relational database manipulation using SQL, views, embedded data manipulation. Relational Database Design: Anomalies in a database, functional dependency, normal forms, lossless join and dependency, BCNF, normalization through synthesis, higher order normal forms.	
UNIT IV	10hrs
Transaction processing, desirable properties of transaction, schedules and recoverability, serializ ability of schedules concurrency control, locking techniques, time stamp ordering multi version concurrency control, granularity of data items.	
UNIT V	8hrs
Database recovery techniques based on deferred up data and immediate updating, shadow pages, ARIES recovery algorithm, database security and authorization, security issue access control based on granting/revoking of privileges, introduction of statistical database security.	
Text Books:	
1. Bipin C Desai, An Introduction to Database Systems, Galgotia Publications. 2. Elmasri and Navathe, Fundamentals of Database Systems, Addison Wesley	
References:	
1. Silberschatz A, Korth H.F and Sudarshan S, Database System Concepts, Tata Mc Graw Hill 2. S K Singh, Database Systems-Concepts, Design and Applications, Pearson Education. 3. Bipin C. Desai, An Introduction to Database Systems, Galgotia Publications. 4. Date, C. J., An Introduction to Database Systems, Addison-Wesley.	

COURSE CODE: 126MSC01CSCCSC03T

Data structure using C++	
Teaching:4hrs./week Credits: 04Hrs.:52	Max. Marks:80 I. A. Marks:20
UNIT I	12 Hrs
Overview of C++: Object Oriented Programming concepts, advantages, C++ program development environment, the C++ language standards, C++ as a superset of C.	
Classes & Objects: Classes, structure & classes, union & classes, inline function, scope resolution operator, static class members: static data member, static member function, passing objects to function, returning objects, object assignment, constructors & destructors, friend function, friend classes.	
UNIT II	10 Hrs
Overloading as polymorphism: Function & operator overloading, operator overloading restrictions, operator overloading using friend function.	
Namespaces: Global namespace and namespace std, nested namespaces	
Inheritance : Base class access control, inheritance & protected members, protected base Class inheritance, inheriting multiple base classes, constructors, destructors & inheritance, execution of constructor & destructor functions, passing parameters to base class constructors, granting access, virtual base classes. Virtual Functions & Polymorphism: virtual function, pure virtual functions	
UNIT III	10 Hrs
Introduction to Data Structures: Definition of Data structure and Abstract data type Classification of Data structures Linear, non-linear, homogeneous, non-homogeneous, static & dynamic. Arrays: Definition & types of array, Memory representation of one & two dimensional array, Operations: Insertion, Deletion, Traversal	
UNIT IV	10 Hrs
Stack: Definition, Array implementation of stack (static stack) : Operations PUSH, POP, TRAVERSE. Applications of stack, Infix, Prefix, Postfix representation and evaluation using stack, Use of stack in recursive implementation.	
Queue: Definition, Array implementation of queue (static queue): Operations, Introduction to Circular queue Definition & implementation, Priority queue, Double ended queue Applications of queue	
UNIT V	10 Hrs
Introduction to Linked List: Definition, advantages, Types of linked list: single, doubly, circular linked list, Operations: Creation, insertion, deletion & traversal of linked list	
References:	
<ol style="list-style-type: none">1. Herbert Schildt, C++ The Complete Reference, Tata McGraw Hill Publication.2. B. A. Forouzon, R. F. Gilberge, Computer Science: A Structured Approach Using C++,3. Stroustrup B., The C++ Programming Language, Addison Wesley.4. Michael T. Goodrich, Data Structures and Algorithms in C++,5. Ellis Horowitz, SartajSahni, Dinesh Mehta, Fundamentals of Data Structures in C++	

COURSE CODE: 126MSC01CSCCSC01L

DBMS-Lab	
Teaching:4 hrs./week Credits:04	Max. Marks:80 I. A. Marks:20
<p><u>Reference List of Lab Assignments</u></p> <ol style="list-style-type: none">1. Database Schema for a customer-sale scenario Customer(<u>Cust id</u> : integer, cust_name: string) Item(<u>item id</u>: integer, item_name: string, price: integer) Sale(<u>bill_no</u>: integer, bill_data: date, cust_id: integer, item_id: integer, qty_sold: integer) 2. Database Schema for a Student Library scenario Student(Stud_no : integer, Stud_name: string) Membership(Mem_no: integer, Stud_no: integer) Book(book_no: integer, book_name:string, author: string) Iss_rec(iss_no:integer, iss_date: date, Mem_no: integer, book_no: integer) 3. Database Schema for a Employee-pay scenario employee(emp_id : integer,emp_name: string) department(dept_id: integer,dept_name:string) paydetails(emp_id : integer,dept_id: integer, basic: integer, deductions: integer, additions: integer, DOJ:date) payroll(emp_id : integer, pay_date: date) 4. Database Schema for a Video Library scenario Customer(cust_no: integer,cust_name: string) Membership(Mem_no: integer, cust_no: integer) Cassette(cass_no:integer, cass_name:string, Language: String) Iss_rec(iss_no: integer, iss_date: date, mem_no: integer, cass_no: integer) 5. Database Schema for a student-Lab scenario Student(stud_no: integer, stud_name: string, class: string) Class(class: string,descrip: string) Lab(mach_no: integer, Lab_no: integer, description: String) Allotment(Stud_no: Integer, mach_no: integer, dayof week: string) <p><i>For each of the above mentioned schema,</i></p> <ol style="list-style-type: none">a) <i>Create the tables with the appropriate integrity constraints</i>b) <i>Insert around 10 records in each of the tables</i>c) <i>Perform execution of atleast07 queries that focus on various DBMS concept</i>	

COURSE CODE: 126MSC01CSCCSC02L

Data structure using C++ Lab

Teaching:4 hrs./week

Credits:04

Max. Marks:80

I. A. Marks:20

Reference List of Lab Assignments

1. Write a C++ program to find roots of quadratic Equation
2. Program to do banking operations using constructor and destructor functions
3. Program to find area of cone , square and triangle using inline member function
4. Program to find factorial of a given number using friend function
5. Write a C++ program to demonstrate single inheritance of library transactions
6. Write a C++ program to demonstrate multiple inheritance on students class
7. Write a C++ program to addition and subtraction of complex numbers using operator overloading
8. Program to demonstrate polymorphism concept
9. Program to sort integers and strings using function templates
10. Program to create and append records into employee data file
11. Write a program to search an element of array using binary search method
12. Write a program sort elements of array using Selection sort method
13. Write a C++ program to do STACK operations
14. Write a C++ program to implement evaluation of Expression
15. Program to do Queue operations
16. Write a C++ program to do operations of Circular Queue
17. Write a C++ program to demonstrate Singly Liked List
18. Write a C++ program to Demonstrate Double Liked List

SOFT CORE PAPER
COURSE CODE: 126MSC01CSCSCC01T

Computer System Architecture	
Teaching:4 hrs./week Credits:04Hrs.:52	Max. Marks:80 I. A. Marks:20
UNIT I	12 Hrs
Computer Data Representation- Basic computer data types, Complements, Fixed point representation, Register Transfer and Micro-operations: Floating point representation, Register Transfer language, Register Transfer, Bus and Memory Transfers (Tree-State Bus Buffers, Memory Transfer), Arithmetic Micro-Operations, Logic Micro Operations, Shift Micro-Operations, Arithmetic logical shift unit Basic Computer Organization and Design -Instruction codes, Computer registers, computer instructions, Timing and Control, Instruction cycle, Memory-Reference Instructions,	
UNIT II	10 Hrs
Basic Computer Organization and Design Instruction codes, Computer registers, computer instructions, Timing and Control, Instruction cycle, Memory-Reference Instructions, Input output and interrupt, Complete computer description, Design of Basic computer, design of Accumulator Unit	
UNIT III	10 Hrs
Programming The Basic Computer Introduction, Machine Language, Assembly Language, assembler, Program loops, Programming Arithmetic and logic operations, subroutines, I-O Programming. Micro programmed Control: Control Memory, Address sequencing, Micro program Example, design of control Unit	
UNIT IV	10 Hrs
Central Processing Unit Introduction, General Register Organization, Stack Organization, Instruction format, Addressing Modes, data transfer and manipulation, Program Control, Reduced Instruction Set Computer (RISC)	
UNIT V	10 Hrs
Pipeline And Vector Processing Flynn's taxonomy, Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction, Pipeline, RISC Pipeline, Vector Processing, Array Processors	
Text Books:	
1. M. Morris Mano, Computer System Architecture, Pearson publications. 2. Andrew S. Tanenbaum and Todd Austin, Structured Computer Organization, Sixth Edition, PHI	
References:	
1. M. Murdocca& V. Heuring, Computer Architecture & Organization, WILEY 2. John Hayes, Computer Architecture and Organization, McGrawHill	

II Semester

Syllabus of II Semester MSC programme, w.e.f. 2020-21
(According new regulations w.e.f. 2020-21)

Semester-II	II SEMSTER M.Sc w.e.f.2020-21								
	Course	Subject Name	Teaching Hrs per week	Practica lHrs/ week	Examination				Credits
					Duration (Hrs.)	Marks			
						Theory/ Practical	IA	Total	
Core Subject	126MSC02CSCCSC04T	Programing using Java	4	- -	3	80	20	100	4
	126MSC02CSCCSC05T	Web Programming	4	- -	3	80	20	100	4
	126MSC02CSCCSC03L	Programing using JAVA Lab	-	4	3	80	20	100	4
	126MSC02CSCCSC04L	Web Programming -Lab	-	4	3	80	20	100	4
Soft Core / Specialization/ Optional	126MSC02CSCSCC02T	Data Communication and Computer Networks	4	- -	3	80	20	100	4
Open Elective	126MSC02CSCOEC01T	A. Computer fundamentals	4	- -	3	80	20	100	4
	126MSC02CSCOEC02T	B.. Graph Theory							
	Total		16	8				600	24

CSC: Computer Science CSC: Core Subject Course SCC: Soft Core Course OEC: Open Elective Course
L: Practical

Second Semester Syllabus

CORE SUBJECT COURSE PAPERS

COURSE CODE: 126MSC02CSCCSC04T

Programming using Java	
Teaching:4hrs./week Credits: 04Hrs.:52	Max. Marks:80 I. A. Marks:20
UNIT I	10 Hrs
Introduction to Java programming, The Java Virtual Machine, Variables and data types, Conditional and looping constructs, Arrays.	
UNIT II	10 Hrs
Object-oriented programming with Java Classes and Objects, Fields and Methods, Constructors, Overloading methods, Garbage collection, Nested classes.	
UNIT III	10 Hrs
Inheritance, Overriding methods, Polymorphism, Making methods and classes final, Abstract classes and methods, Interfaces.	
UNIT IV	12 Hrs
Exception handling with try-throw-catch-finally constructs, The Exception class Packages, Package access, Documentation comments. The Object class, Cloning objects, The JDK Linked List class, Strings, String conversions Working with types: Wrapper classes, Enumeration interface.	
UNIT V	10 Hrs
Applets, Configuring applets, Applet capabilities and restrictions, Basics of AWT and Swing, Layout Managers, Event Handling, The Action Listener interface, Panels, Classes for various controls, such as label, choice, list, , Checkbox, etc., Dialogs and frames, Using menus, Using the adapter classes, Graphics.	
References:	
<ol style="list-style-type: none">1. Herbet Schidt and Dale Srien, Java Fundamentals - A comprehensive Introduction, TMH.2. P.J. Deitel and H.M. Deitel, Java for Programmers, Pearson education3. P.J. Deitel and H.M. Deitel, Java: How to Program, PHI.4. S. Malhotra and S. Choudhary, Programming in Java, Oxford Univ.Press.	

COURSE CODE: 126MSC02CSCCSC05T

Web Programming	
Teaching: 4hrs./week Credits: 04Hrs.:52	Max. Marks:80 I. A. Marks:20
UNIT I	12 Hrs
Overview: Web page Designing using HTML, Java Script-Object, names, literals, operators and expressions-statements and features-events - windows - documents - frames - data types - built-in functions- Browser object model - Verifying forms.-HTML5- CSS3- HTML 5 canvas. XML: DTD, Namespaces, XML schemas, displaying raw XML documents, Displaying XML documents with CSS, XSLT style sheets, XML processors	
UNIT II	12 Hrs
PHP : Server-side web scripting, Installing PHP, Adding PHP to HTML, Syntax and Variables, Passing information between pages, Strings, Arrays and Array Functions, Numbers, Basic PHP errors/ problems. Database access with PHP and MySQL, PHP/MySQL Functions, Displaying queries in tables, Building Forms from queries, String and Regular Expressions, Sessions, Cookies and HTTP, Type and Type Conversions.	
UNIT III	10 Hrs
Ruby on Rails: Origins and uses of Ruby, Scalar types and their operations, Simple input and output, Control statements, Arrays, Hashes, Methods, Classes, Code blocks and iterators, Pattern matching. Overview of Rails, Document requests, Processing forms, Rails applications with Databases, Layouts.	
UNIT IV	10 Hrs
JDBC Overview – JDBC implementation – Connection class – Statements – Catching Database Results, handling database Queries. Networking– I net Address class – URL class- TCP sockets - UDP sockets, Java Beans –RM. Java Servlets – life cycle of a servlet. The Servlet API, Handling HTTP Request and Response, using Cookies, Session Tracking. Introduction to JSP.	
UNIT V	8 Hrs
Introduction to Ajax: Overview of Ajax; The basics of Ajax; Rails with Ajax.	

COURSE CODE: 126MSC02CSCCSC03L

Programming using JAVA Lab	
Teaching:4 hrs./week Credits:04	Max. Marks:80 I. A. Marks:20
<p><u>Reference List of Lab Assignments</u></p> <ol style="list-style-type: none">1. Write a program that asks a user to enter an integer n and then determines whether n is prime or not. Your program can perform this by dividing n by all integers from 2 to n-1 and by checking whether the remainder is 0.2. Write a Java program to find GCD and LCM of two numbers (GCD is calculated using Euclidean Algorithm. LCM is found using factorization method.).3. Write a program that computes $C(n, k)$, i.e. the number of k-element subsets of a set with n elements. Remember that $C(n, k) = \frac{n!}{k!(n-k)!}$. Your program should ask the user to enter n and k, and compute and print $C(n, k)$.4. Write a Java program implement basic queue operations.5. Write a Java program to count the frequency of words, characters in the given line of text.6. Write a Java program that creates an object and initializes its data members using constructor. Use constructor overloading concept.7. Write a Java Program to implement inheritance and demonstrate use of method overriding(example: Bank account/Employee)8. Write a program to demonstrate use of user defined package by importing the package and access the member variable of classes contained in the package..9. Write a program to demonstrate use of interfaces for two different classes. Interface should also include constants along with function prototypes.10. Write a program to implement the concept of Exception Handling by creating user defined exceptions11. Illustrate creation of thread by extending Thread class/ implementing runnable interface12. Write a Java program that creates three threads. First thread displays "Good Morning" every one second, the second thread displays "Hello" every five seconds and the third thread displays "Welcome" every ten seconds.13. Illustrate thread join concept.14. Write a java program to implement mouse events like mouse pressed, mouse released and mouse moved by means of adapter classes.15. Write a java program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box16. Write a Java program to illustrate basic calculator using grid layout manager.17. Develop an applet that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named "Compute" is clicked.18. Write a java program to create student report using applet, read the input using text boxes and display the o/p using buttons.	

COURSE CODE: 126MSC02CSCCSC04L

Web Programming Lab	
Teaching:4 hrs./week Credits:04	Max. Marks:80 I. A. Marks:20
<p><u>Reference List of Lab Assignments</u></p> <ol style="list-style-type: none">1. Develop and demonstrate a XHTML document that illustrates the use external style sheet, ordered list, table, borders, padding, color, and the tag.2. Develop and demonstrate a XHTML file that includes Java script script for obtaining n through prompt and computing n Fibonacci numbers3. Design an XML document to store information about a student.4. Write a PHP program to store current date-time in a COOKIE and display the "Last visited on" date-time on the web page upon reopening of the same page.5. Write a PHP program to store page views count in SESSION, to increment the count on each refresh, and to show the count on webpage.6. Create a XHTML form with Name, Address Line 1, Address Line 2, and E-mail text fields. On submitting, store the values in MySQL table. Retrieve and display the data based on Name.7. Using PHP and MySQL, develop a program to accept book information viz. Accession number, title, authors, edition and publisher from a web page and store the information in a database and to search for a book with the title specified by the user and to display the search results with proper headings.8. Develop a COMPANY database browser application. The initial Web page in this application lists all the departments in the company. By following hyperlinks, the user may see more details of departments, employees, and projects in three separate Web pages. Implement the browser program using four PHP scripts: (a) company Browse.php: This script lists all the departments in the company in a tabular form (b) dept View.php: (c) empView.php: (d)project View.php:9. Implement the problem of finding employee names given their social security number as a Web application. Design two Web pages: 1. The first Web page would contain a HTML form that contains a select list of social security numbers of employees and a submit button. 2. Upon choosing a social security number and submitting the form in the first Web page produces the second Web page that lists the name of the employee.10. Mini Project: Illustrate online address/contact book application using PHP and MySQL. The application should perform the following functions: (1) ADD a new contact. (2) DELETE one or more contacts. (3) SEARCH contacts by substring match on name. (4) LIST all contacts.11. Illustrate JDBC connectivity to update customer information.12. Illustrate Simple server let that generates plaintext.13. Write a Servlet program to implement Session Tracking14. JSP program for basic arithmetic operations15. Creating a Java program that connects to a database using JDBC Write a java program to insert the Data of new employee.16. Write a Java program that loads student name and branch from database It takes a name or phone number as input and prints the corresponding other value from the hash table (hint: use hash tables).17. Write a Ruby program to create a user defined function and illustrate to call the function.18. Write a Ruby program to 1) Fetch the values from textbox and radio button 2) Explain the session and cookies in rails.	

SOFT CORE PAPER

COURSE CODE : 126MSC02CSCSCC02T

Data Communication and Computer Networks	
Teaching:4hrs./week Credits: 04Hrs.:52	Max. Marks:80 I. A. Marks:20
UNIT I	12Hrs
Introduction: Data Communications, Networks, the internet, protocols and standards, network models– OSI model, TCP/IP protocol suite, addressing. Data and Signals: Periodic analog signals, digital signals, transmission impairment, data rate limits, performance	
UNIT II	10 Hrs
Physical Layer and Media: Analog transmission: Digital-to-analog conversion, analog-to-analog conversion. Multiplexing, Transmission media – Guided media and unguided media. Data Link Control: Framing, flow and error control,	
UNIT III	10 Hrs
Network Layer: Logical addressing – IPV4, IPV6, Address mapping–ARP, RARP, Transport Layer: Process to Process Delivery, User Datagram Protocol, Transmission Control Protocol, SCTP, Congestion Control.	
UNIT IV	10 Hrs
Detection and Correction: Errors, redundancy, detection versus correction, Network Security- Security Services, Security in the Internet: Firewalls	
UNIT V	10 Hrs
Application Layer: Domain Name Space, DDNS, Remote Logging, Electronic Mail, and File Transfer, WWW, HTTP	
Text Books:	
Behrouza A Forouzan, Data Communications and Networking, McGrawHill. Computer Networks - Andrew s. Tanenbaum, Pearson Education.	
References:	
Data and Computer Communications, William Stallings, Pearson education Data Communications, Computer Networks and Open Systems, fourth edition-Fred Halsall, Addison Wesley.	

OPEN ELECTIVE COURSE PAPERS

COURSE CODE: 126MSC02CSOEC01T

Computer fundamentals and C-Programming	
Teaching:4hrs./week Credits: 04Hrs.:52	Max. Marks:80 I. A. Marks:20
UNIT I	12 Hrs
Introduction to Computer Systems, Interacting with the Computer, Computer Organization Early history, Basic parts and structure of a computer, Categorizing Computers, Information Processing life cycle, Essential computer hardware, Essential computer software. Keyboard, Mouse, Inputting data in other ways: Pen-based systems, Data scanning devices, input devices, Video and sound, Monitors, Printers, Plotters, Data projectors, Sound systems., CPU, Buses, Mother Board, Chip sets, Microprocessors	
UNIT II	10 Hrs
Storage media, Floppy drive, Hard disks, Optical media, CD-ROM, CD-R, CD-RW, DVD-ROM, Recordable DVD. Types of operating systems, Computer processing techniques, Functions of Operating Systems, Networking, Convergence of computing with communications, Networking basics, Need for networking, Basic components of a network	
UNIT III	10 Hrs
Fundamentals of Problem Solving, Introduction to C Language Creating and running programs, System development, Introduction to C Language: Background, C Programs, Identifiers, Types, Variables, Constants, Input / Output, Programming example, Tips and common programming errors	
UNIT IV	10 Hrs
Structure of a C Program, Expressions, Precedence and associativity, Side effects, Evaluating expressions, Type conversion, Statements, Programming examples, Software Engineering, Tips and common programming errors. Functions, Designing structured programs, Functions in C, User-defined Functions, Inter-function communication, Standard functions, Scope, Programming examples	
UNIT V	10 Hrs
Arrays, Strings Concepts, Using arrays in C, Inter-function communication, Array applications, Bubble Sort, Binary search, Two-dimensional Arrays, Multi-dimensional arrays, String concepts, C strings, String input/output, Programming examples, Software Engineering, Tips and common programming errors.	
Text Books:	
1. Computer fundamentals and C Programming by Balagurusamy, Tata McGraw Hill, 2003	
2. V. Rajaraman, Fundamentals of Computers, PHI	

COURSE CODE: 126MSC02CSOEC02T

Graph Theory	
Teaching: 4hrs./week Credits: 04Hrs.:52	Max. Marks:80 I. A. Marks:20
UNIT I	12 Hrs
Introduction to Graph Theory: Definitions and Examples, Sub graphs, Components, and Graph Isomorphism, Vertex Degree, Perfect graphs, Planar graphs.	
UNIT II	10 Hrs
Connectivity and Paths: Walk, Paths and Circuits, Euler Graph, Operations on Graphs, Connectivity, Hamiltonicity: Hamilton Paths and Cycles.	
UNIT III	10 Hrs
Trees : Trees, Properties of trees, Rooted binary trees, Spanning trees, Weighted graphs. Matrix representation of graphs: Incidence Matrix, Circuit Matrix, Cut-set Matrix, Adjacency Matrix.	
UNIT IV	10 Hrs
Graph Coloring & Flows: Matchings, Vertex Coloring, Edge Coloring, Other Coloring Problems, Four Color Problems, Circulations, Flows in Network, Group-Valued Flows, Flow coloring duality	
UNIT V	10 Hrs
Graph Theory in Operation Research: Transparent Network, Extension of Max-Flow Min-Cut Theorem, minimal Cost flow, Multi commodity flow, Activity Networks in project planning, Analysis of an Activity Network.	
Text Books: 1. Narsingh Deo, Graph Theory with Application to Engineering and Computer Science, 4 th Edition, PHI.	
Reference Books: 1. R. Diestel, Graph Theory, Springer-Verlag, 2 nd Edition, 2000.	