



**DR. C.V.RAMAN UNIVERSITY**  
KARGI ROAD, KOTA, BILASPUR (C.G.)

**MASTER OF SCIENCE IN COMPUTER SCIENCE (M.Sc. - CS)**

Duration - 24 Months

(2 Years)

Eligibility – Graduate in BCA/B.Sc.(CS)

**SCHEME OF EXAMINATION**

Course Code	Nature of the Course	Subjects	Credit				Total Marks	Theory		Practical Marks		Assignment	
			L	P	T	Total		Max	Min	Max	Min	Max	Min
<b>First Semester</b>													
4020112101	Core	Fundamentals of Computers with MS Office	3	-	1	4	100	70	28	-	-	30	15
4020112102	Core	Computer Architecture	3	-	1	4	100	70	28	-	-	30	15
4020112103	Core	Programming Methodology & Programming in C	3	-	1	4	100	70	28	-	-	30	15
4020112104	Core	Computer Networks & Internet	3	-	1	4	100	70	28	-	-	30	15
4020122105	Core	Lab 1 (Windows & MS Office)	-	2	-	2	100	-	-	100	50	-	-
4020122106	Core	Lab 2 (Programming in C)	-	2	-	2	100	-	-	100	50	-	-
<b>Total</b>			<b>12</b>	<b>4</b>	<b>4</b>	<b>20</b>	<b>600</b>	<b>280</b>	<b>112</b>	<b>200</b>	<b>100</b>	<b>120</b>	<b>60</b>
<b>Second Semester</b>													
4020212101	Core	Object Oriented Programming with C++	3	-	1	4	100	70	28	-	-	30	15
4020212102	Core	DBMS & SQL	3	-	1	4	100	70	28	-	-	30	15
4020212103	Core	Data Structure	3	-	1	4	100	70	28	-	-	30	15
4020212104	Core	Operating System	3	-	1	4	100	70	28	-	-	30	15
4020222105	Core	Lab 1 (Object Oriented Programming with C++ )	-	2	-	2	100	-	-	100	50	-	-
4020222106	Core	Lab 2 (DBMS & SQL)	-	2	-	2	100	-	-	100	50	-	-
<b>Total</b>			<b>12</b>	<b>4</b>	<b>4</b>	<b>20</b>	<b>600</b>	<b>280</b>	<b>112</b>	<b>200</b>	<b>100</b>	<b>120</b>	<b>60</b>
<b>Third Semester</b>													
4020312101	Core	Java Programming	3	-	1	4	100	70	28	-	-	30	15
4020312102	Core	Programming with VB.Net	3	-	1	4	100	70	28	-	-	30	15
	Discipline Specific Elective	Elective-I	3	-	1	4	100	70	28	-	-	30	15
	Discipline Specific Elective	Elective-II	3	-	1	4	100	70	28	-	-	30	15
4020322103	Core	Lab 1 (Java Programming )	-	2	-	2	100	-	-	100	50	-	-
4020322104	Core	Lab 2 (Programming with VB.Net)	-	2	-	2	100	-	-	100	50	-	-
<b>Total</b>			<b>12</b>	<b>4</b>	<b>4</b>	<b>20</b>	<b>600</b>	<b>280</b>	<b>112</b>	<b>200</b>	<b>100</b>	<b>120</b>	<b>60</b>
<b>Fourth Semester</b>													
4020412101	Core	Advanced Java Programming	3	-	1	4	100	70	28	-	-	30	15
	Discipline Specific Elective	Elective-III	3	-	1	4	100	70	28	-	-	30	15
	Discipline Specific Elective	Elective-IV	3	-	1	4	100	70	28	-	-	30	15
4020432101	Research Component	Project Work	-	8	-	8	300	-	-	300	150	-	-
<b>Total</b>			<b>9</b>	<b>8</b>	<b>3</b>	<b>20</b>	<b>600</b>	<b>210</b>	<b>84</b>	<b>300</b>	<b>150</b>	<b>90</b>	<b>45</b>

**Evaluation Scheme**

- The minimum Marks required to pass any theory paper in a Semester shall be 40 %.
- The minimum Marks required to pass in each Project works/ Practical/ Assignments/Dissertation shall be 50%.

**LIST OF ELECTIVES**

**\*Note** - Students need to select one paper from each elective for third & fourth semester.

<b>Elective Paper Third Semester</b>			<b>Elective Paper Fourth Semester</b>		
<b>Codes</b>	<b>Nature of the Course</b>	<b>List of Electives</b>	<b>Codes</b>	<b>Nature of the Course</b>	<b>List of Electives</b>
<b>Elective -I</b>			<b>Elective -III</b>		
4020342101	Discipline Specific	Software Engineering	4020442101	Discipline Specific	Data warehousing & Mining
4020342102	Discipline Specific	Management Information system	4020442102	Discipline Specific	Soft Computing
<b>Elective -II</b>			<b>Elective -IV</b>		
4020342103	Discipline Specific	Compiler Design	4020442103	Discipline Specific	Research Methodology
4020342104	Discipline Specific	Artificial Intelligence and Expert System	4020442104	Discipline Specific	Operation Research



## Dr. C.V. RAMAN UNIVERSITY

Kargi Road, Kota, Bilaspur (C.G.)

SEMESTER- First Semester

BRANCH: Master of Science in Computer Science (M.Sc. -CS)

SUBJECT: Fundamentals of Computers with MS Office

Subject Code: 4020112101

THEORY MAX. MARKS: 70

Theory Min. Marks: 28

### OBJECTIVE:-

Making the students understand and learn the basics of computer how it computes, to make familiar with the part and function of computer, its types , how to use computer, its characteristics, its usage, limitations and benefits etc.

### UNIT-I

**Introduction** - Introduction, Limitations of computers, Fundamental uses of computers, Types of Computers, Generations of Computers.

**Personal Computer** - Introduction, Components of personal computers, Evolution of PCs.

**Boolean Algebra and Logic Gates** - Introduction, Boolean Algebra And Operator, OR Operator, NOT Operator, Basic Postulates of Boolean Algebra, Basic Logic Gates.

**Number System** - Introduction, Digital and Analog Operations, Binary Data, Binary Number System, Decimal Number System, Octal Number System, Hexadecimal Number System, Coding System.

### UNIT-II

**Data Representation and Binary Arithmetic** - Introduction, Bits, Nibbles, Bytes and Words, Data Representation, Coding system, Binary Arithmetic, Binary Addition, Binary Subtraction, Binary Multiplication, Binary Division.

**Input Devices** - Introduction, Input Device,

**Output Devices** - Introduction, Output Devices, Soft Copy Vs Hard Copy Output, Monitor, Printers, Plotter.

**Central Processing Unit** - Introduction, What is Central Processing Unit, Arithmetic And Logic Unit, Control Unit, Registers, Instruction set, Processor Speed.

**Storage Devices** - Introduction, Storage and its needs, Primary Storage, Secondary Storage.

### UNIT-III

**Basics of Software**- Introduction, What Does Software Stand For ?, Needs of software, Types of software, Open Source Software,

**Operating System** - Introduction, Operating System, Why an Operating System, Functions of Operating System, the Booting Process, Types of Reboot,

**Disk Operating System** - Introduction, What is DOS?, Functions of DOS, Versions of DOS, DOS Commands , Important Internal Commands of DOS, Important External Commands of dos, Executable Vs Non-Executable Files In Dos

**Programming Languages** - Introduction, Data, information And Knowledge, Characteristics of Information, What is a program?, What is a Programming language?, Programming approaches, Types of Programming Language.

### UNIT-IV

**Computer Virus** - Introduction, Virus, History, Mechanism of virus, Types of Computer Virus, Related Concepts: Anti Virus Programs,

**Communication and IT** - Introduction, Computer Network, Communication Process, Communication Types, Transmission Media, Wireless Media, Communication Channels/Media, Modem, Characteristics of a Modem, Types of Modem

**Networks** - Introduction, Internet Vs Intranet, Types of Network, Topology, Types of Connectivity, Network Devices.

**UNIT-V**

**Know the Windows Operating System** - Introduction, What is Windows XP ?, Evolution of Windows Operating System, Features of Windows XP, What's New in Windows XP, Windows and Its Elements, Accessories, Files and Folders

**Microsoft Office Package** – Introduction about MS Word ,Ms Excel, Ms PowerPoint.

**OUTCOMES:-**

- An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.
- An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
- An ability to analyze the local and global impact of computing on individuals, organizations, and society.
- Demonstrate the basic mechanics of creating Word documents ,presentation and excel calculation for office use.

**TEXT BOOK:-**

- 1.Computer fundamental: by V .Rajaraman; PHI
- 2:Fundamental Of IT :Leon and Leon; Leon Tec World
- 3: Computer Fundamental (3rd Ed) Sinha,P.K.
- 4: Fundamental of Information Technology ,Shritvastava Cheton
- 5: Fundamental of Computer Programming & Information Technology Sharma,G.& Singh G. Delhi S. K. Kataria & Sons
- 6: Fundamentals of Computers, Murthy,C.S.V. Delhi S. K. Kataria & Sons.
7. MS office XP for Everyone, Saxena Sanjay, New Delhi Vikas Publication



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Kargi Road, Kota, Bilaspur (C.G.)

SEMESTER- FirstSemester

BRANCH: Master of Science in Computer Science (M.Sc. -CS)

SUBJECT: Computer Architecture

Subject Code: 4020112102

Theory Max. Marks: 70

Theory Min. Marks: 28

### OBJECTIVE:-

- To study the basic organization and architecture of digital computers (CPU, memory, I/O, software).
- Discussions will include digital logic and microprogramming.
- Understanding and utilization of digital computers.
- To help the student understand and more fully appreciate the services provided by the runtime systems associated with modern high-level programming languages as they acquire
- To facilitate the study of the architecture and organization of the computer.

### UNIT-I

**INTRODUCTION-** Digital Computers , Computer Architecture , Computer Organization, Difference between Computer Architecture and Organization, Structure and Functions, Summary, Exercise

**BASIC ARRANGEMENT OF A COMPUTER SYSTEM** - Computer , Basic organization of a computer system, Types of computers, Microprocessor ( $\mu$ p), Working of Microprocessor, Microprocessor 8085 Architecture, Speed of Microprocessors, Summary, Exercise

**NUMBER SYSTEM AND ITS REPRESENTATION** - Data Types, Number System, Number System Conversion, Binary Arithmetic, Integer and Floating Point Representation Overflow Underflow

### UNIT-II

**COMPUTER CODES** - Introduction, BCD (Binary Coded decimal) Code, EBCDIC Code, ASCII Code, Excess-3 Code, Gray Code, Error Detection Code, Error Correction Code

**BASIC BUILDING BLOCKS** - Logic Gates , Universal Gates, Exclusive Gates, Bubbled Gates, Universality of NAND and NOR gates

**BOOLEAN ALGEBRA** - Boolean Variable, Boolean Algebra, Boolean Functions and Truth Tables, Logic Diagram, Laws of Boolean Algebra, Rules for Boolean Algebra, Demorgan's theorems, Simplification of Boolean Functions, Implementation Using Basic Gates, To Obtain Expression from Logic Circuits

**KARNAUGH MAP** - Introduction, Algebraic Expression by Karnaugh Map, Simplification of Boolean Expression using K Map, Simplification of Boolean expression using K-map, Don't care conditions

### UNIT-III

**DIGITAL LOGIC CIRCUITS** - Introduction, Combinational Logic Circuit , Sequential Logic Circuits

**BASIC COMPUTER ORGANIZATION** - Register Transfer language and Micro- operations, Instruction Codes , Instruction Set, Operations and Operands, Computer Registers, Instruction Format, Instruction Cycle, Addressing Modes, Real and Protected Addressing Modes, Assembly Language Programming, Input-Output and Interrupt

### UNIT-IV

**Von Neumann Architecture-** Data Path and Memory Bus, Arithmetic and Logic Unit (ALU), Memory, Static Random Access Memory (SRAM), Dynamic Random Access Memory (DRAM), Control Unit (CU), Register Transfer Language, Execution of Instructions, Microarchitecture, Complex and reduced instruction sets (CISC/RISC), Input/Output

**CENTRAL PROCESSING UNIT DESIGN** - Central Processing Unit (CPU), BUS Organization, Register Organization, Stack Organization, Data Path and Control Signals, Types of Processor (CPU) , Micro

### UNIT-V

**INPUT-OUTPUT ORGANIZATION**, Transfer of Information between I/O Devices, CPU & Memory, Data Transfer Format , Types of Data Transfer , I/O Interface , Modes of Data Transfer , I/O Channels and Processors, Input/Output Identification (Peripheral or Memory Mapped), Conditions of Data Transfer

**MEMORY ORGANIZATION** - Computer Memory, Characteristics of Memory, Units of Memory, Data Accessing/Storing Methods in Computer Memory, Memory Hierarchy, Classification of Memory, Associative Memory, Virtual Memory, Memory Management System

**Optimizing Hardware Performance** - Memory Hierarchy, Cache, Virtual Memory, Pipelining, Pipelining Hazards, Conclusion, Superscalar CPU, Brief Historical Detour into Supercomputing, Superscalar Principle

#### **OUTCOMES:-**

- Understand basic assembly language syntax;
- Identify and use different 8086 addressing modes
- Create and use a stack to store data, addresses, or both.;
- Highlight and know the uses of the different 8086 instruction groups.

#### **TEXT BOOK:-**

1. Computer Architecture & Parallel Processing TMH Sigapur
- 2.W.H Gothman "Digital Electronics"PHI
- 3.R.P Jain "Modern digital electronicsTMH
- 4.Floyd ,Digital fundamental"UBS
5. M.M Mano, Digital logic and computer design"PHI
- 6.Milman taub, pulse,digital and Switching waveforms TMH.



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Kargi Road, Kota, Bilaspur (C.G.)

SEMESTER- First Semester

BRANCH: Master of Science in Computer Science (M.Sc. -CS)

SUBJECT: Programming Methodology & Programming in C

Subject Code: 4020112103

THEORY MAX. MARKS: 70

THEORY MIN. MARKS: 28

### OBJECTIVE:-

1. Develop a greater understanding of the issues involved in programming language design and implementation
2. Develop an in-depth understanding of functional, logic, and object-oriented programming paradigms
3. Implement several programs in languages other than the one emphasized in the core curriculum (Java/C++)
4. Understand design/implementation issues involved with variable allocation and binding, control flow, types, subroutines, parameter passing
5. Develop an understanding of the compilation process.

### UNIT-I

**Principles of Programming**, Introduction to Programming, Program Concept, Characteristics of Programming, Stages in Program Development, Tips for Program Designing, Programming Aids, Algorithms, Notations, Design, Flowcharts, Symbols, Rules

**Programming Techniques and Logic**, Introduction, Introduction to programming techniques, Top-down approach or technique, Bottom -up approach or technique, Unstructured technique of programming, Structured technique of programming, Modular technique of programming, Comparative study of programming techniques, Cohesion , Coupling, Debugging , Syntax Errors, Logical Errors, Data Entry Errors, Linker Errors, Runtime Errors, Program Testing

**Turbo C IDE**, Turbo C IDE (Integrated Development Environment), Main Menu Bar, File Options, Edit option, Run option, Compile option, Project option, Options option, Debug option, Break/watch option, Edit Window, Message Window, Status bar, Editing, Compiling and Running a C Program, Features of C language, C language standards, Standardization , Successors of C language

**Introduction to 'C'**, Introduction, Structure of a C program, 'C' Tokens, Keywords, Identifiers, 'C' Constants, Variables in C, Data Types, Derived Data Types : , Operators, Precedence and Associativity of operators, Hierarchy of operators at a glance, Expression & its Evolution, Type conversion in expressions , Implicit and Explicit type conversion

### UNIT-II

**Decision Making and Branching**, Introduction, Sequential statements, Unformatted I/O functions, Formatted input using scanf() function, Formatted output using print(), Branching statements, The if-else statement, The nested if-statement, The switch statement, Additional programs

**Looping Statements**, Introduction, for-statement, while-statement, do-while statement, Difference between while-loop and do-while loop, Nested loops, Jumps in loops, Programming examples

### UNIT-III

**Arrays**, Introduction, Single-dimensional arrays, Reading and writing single dimensional arrays, Examples of Complex Programs, Searching, Sorting, Two-dimensional arrays (Multi-dimensional arrays), Reading-writing two-dimensional arrays, Manipulation in two-dimensional arrays, Programming Examples

**Strings**, Concepts of string, Strings in C language, String variable, Initializing strings, String input/output functions, Arrays of strings, String handling functions, Memory formatting

### UNIT-IV

**User Defined Functions**, Introduction, Elements of user-defined functions, Categories of functions, Passing parameters to functions, Programming Examples, Arrays in functions, Nesting of Functions, Recursion, Command Line Arguments , Storage Classes

**Structure and Union**, Introduction to structures, Structure and its definition, Structure declaration, Tagged Structure, Structure variables, Type-Defined Structure, Structure initialization, Accessing structures, Nested structures, Array of structures, Structures and functions, Sending individual members, Sending the whole structure, Passing structures through pointers, Uses of structures, Union and its definition

**Debugging**, Common Programming Errors, Program Testing and Debugging, Types of Errors, Debugging C program

### UNIT-V

**Pointers**, Introduction, Pointer concepts, Pointer variable, Accessing variables through pointers, Pointer declaration and Definition, Initializing a pointer variable, Pointers to Pointers, Compatibility, Pointer applications, Pointers and other operators, Memory allocation functions, Memory map of C program, Memory management functions

**File Handling**, Introduction to file handling, File system basics, Standard streams in C, File structure, FILE pointer, Opening and closing a file, File handling functions, File types, Text and Binary, Input / Output operations on file, Reading a character using `getc()`, Writing a character using `putc()`, Using `feof()`, Working with string using `fputs()` and `fgets()`, Using `fprintf()` and `fscanf()`, Using `fread()` and `fwrite()`, Direct Access file, `fseek()`

### OUTCOMES:-

1. An ability to write structured program using C language.
2. An ability to understand common syntax errors and logical errors in program with C.
3. An ability to understand concept of loops, Arrays, function, structure and file handling.
4. An ability to solve aptitude questions based on C language.

### TEXT BOOK:-

- 1-Let us C by yashwant Kanetkar(BPB Pub)2
2. Programming in C ,E Balagurusamy(TMh)
- 3.Programming in C by Ghosh(PHI)
- 4.Computer programming in c by V.Rajaraman(PHI)
5. Programming in C by Byron Gottfrid(TMh)





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Kargi Road, Kota, Bilaspur (C.G.)

SEMESTER- First Semester

BRANCH: Master of Science in Computer Science (M.Sc. -CS)

SUBJECT: Computer Networks & Internet

Subject Code: 4020112104

THEORY MAX. MARKS: 70

THEORY MIN. MARKS: 28

### OBJECTIVE:-

- Build an understanding of the fundamental concepts of computer networking.
- Familiarize the student with the basic taxonomy and terminology of the computer networking area.
- Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
- Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.

### UNIT-I

**Introduction To Internet-** introduction, what is internet actually ?, growth of internet , owner of the internet, internet service provider, anatomy of internet, Arpanet and internet history of the world wide web, services available on internet wais , basic internet terminologies, net etiquette, applications, commerce on the internet, governance on/through the internet, impact of internet on society

**TCP/IP - Internet Technology And Protocols-**introduction, switching technology , internet protocols, overview of TCP/IP reference model, introduction to TCP/IP, routers, internet addressing scheme

**Internet Connectivity** - connectivity types, level one connectivity, level two connectivity, level three connectivity, hardware requirements, modems, narrow-band/phone-line dialup modems, software requirements, modem configuration:, telephone line options, making a dial-up connection, protocol options, service options, news services, desktop alerts

### UNIT-II

**Internet Network-** computer networks, applications of networks, common terminologies :, interoperability, network security, the need for security, common threats, security barriers in network pathways, network components :, communication media, network devices, types of network : client / server & peers, addressing in internet, domain name system (DNS), domain name and their organization, network topology, internet vs. intranet

**Services Of Internet (Definition And Functions)** - introduction, file transfer protocol, ftp related terminologies, ftp servers and authentication, public and private software services, ftp clients, types of ftp client software, displaying files , remote login, chat programs, connecting to a server, search engines

**Electronic Mail** - introduction, what is an e -mail?, email networks and servers, merits of e-mail, limitations, e-mail protocols, structure of an e-mail, e-mail address, Microsoft internet explorer and outlook express, applying stationary, web based emails, working with yahoo, starting the mail program , creating signature in outlook express, creating signature in yahoo, email encryption, why email encryption?, digital certificate

### UNIT-III

**Current Trends On Internet** - current trends of internet:, languages used on the internet, internet phones, internet video / internet tv, streaming video & audio, collaborative computing, e-commerce, technical and organizational aspects

**Web Publishing-** overview, SGML (standard generalized markup language), what is the need of a website? , types of web sites, components of web publishing , domain name planning and

registration, choosing a web host and signing up for an account, web hosting, web design and development, testing your website, promotion of the site, registering your site with a search engine, publishing tools, html editor, image editor, program to transfer your files to a web server, uploading web pages using CuteFTP

**World Wide Web** - introduction , evolution of the www, basic features, mechanism of the world wide web, search and meta-search engines, searching the web, using Boolean operators in your searches, using advanced , using a Metasearch engine, site specific search tools, web protocols, hyper text transfer protocol (http), web server.

#### UNIT-IV

**Browsers** , introduction, www web browsers, Mozilla Firefox browser, the opera browser, google chrome, what are bookmarks?, adding folders, favorites, deleting favorite folders and pages, history, progress indicator, customizing internet explorer, turning off graphics to display all web pages faster, customizing the toolbar, copying, saving and printing in internet explorer, printing an image from a web page, printing a web page, cookies, what is cache setting ?, internet explorer, the standard toolbar, internet explorer keyboard shortcuts

**Hyper Text Markup Language Programming Basics** - introduction, html editors, elements of html, definition lists , compact attribute, nested list, type attribute, html links, using alt attribute, background graphics, html document tables, creating tables within tables, html frames, html rules, introduction of multimedia, meaning of multimedia, what is multimedia ?, identifying multimedia elements, audio on the web, video on the web

**Introduction To Interactivity Tools-** overview, what is ASP?, functions of asp, the basic syntax rule , writing output to a browser, adding some html to the text, declaring a variable in asp, declaring an array in asp, what is VBScript?, java, features of java, starting with java, Javascript and java, syntax and conventions, FrontPage, introduction to flash, installation of flash MX, creating simple animation for the web, working with layers in flash, masking in flashmx, bouncing effect in flash, to create motion tween , flash ripple effect

#### UNIT-V

**Internet Security Management Concepts, Information Privacy And Copyright Issues** - overview , basic security concepts, security events, measures for check threats, firewalls , monitoring tools, security analysis tools, cryptography , information privacy, copyrights and the internet, copyright legislation in India, key points of copyright, encryption & decryption - cryptography, terminology

**Firewalls** - firewalls, firewall design principles, firewall attributes, firewall strengths and weaknesses, types of firewalls, comparison of firewall types, DMZ DNS server, VLAN

#### OUTCOMES:-

- Describe the general principles of data communication.
- Describe how computer networks are organized with the concept of layered approach.
- Describe how signals are used to transfer data between nodes.
- Implement a simple LAN with hubs, bridges and switches.
- Describe how packets in the Internet are delivered.
- Analyze the contents in a given Data Link layer packet, based on the layer concept.
- Design logical sub-address blocks with a given address block.
- Decide routing entries given a simple example of network topology
- Describe what classless addressing scheme is and sub netting.
- Describe how routing protocols work.

#### TEXT BOOK:-

1. Computer Networking & Data Communication Indore kamal Prakashan
- 2 Data Communication Q Computer Networks Gupata,Manoj Ku
- 3 Computer Networking Tanenbaum,A.S
4. Computer Networking With IP & Tech , Stallings,Williams
5. Data Communication Gupta Prakash C N.Delhi Prentice Edu.



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**SEMESTER- First Semester**

**BRANCH: Master of Science in Computer Science (M.Sc. -CS)**

**SUBJECT: Lab1(Windows & MS Office)**

**Subject Code: 4020122105**

**THEORY MAX. MARKS: 100**

**THEORY MIN. MARKS: 50**

### **OBJECTIVE:-**

- Making the students to represent available data in efficient manner.
- Demonstrate the basic mechanics of creating Word documents ,presentation and excel calculation for office use.

### **List of Practical's**

1. Creating, opening, closing, saving and editing a word Document..
2. Insertion of header and footer in the document.
3. Use of word art, spell check and work with Page layout.
4. Creation of a link between two files using Hyperlink.
5. E- mail-merge and providing protection of a document.
6. Creation of a letter/Application in different subjects.
7. How to insert, close, update and save a worksheet?
8. Creation of records in excels for students marks of five subjects and calculation of their average percentage using formulas.
9. Operation of data sorting in a worksheet.
10. Use of mathematical functions, date function and time function.
11. Define trig function with an operation on excel sheet.
12. Creation of new slide and duplicate slide in power point.
13. Steps of presentation and creation of presentation for the seminar in a topic.
14. Use of animation audio and clipart in power point presentation.
15. Changing backgrounds and adding slides in a presentation

### **OUTCOMES:-**

- 1.Demonstrate working knowledge of integrating information from other Microsoft programs into a PowerPoint presentation.
- 2.Demonstrate introductory formatting techniques and presentation styles.
- 3.Demonstrate working knowledge of producing a mail merge.
- 4.Demonstrate the basic mechanics and navigation of an Excel spreadsheet.
- 5.Demonstrate formatting techniques and presentation styles.
- 6.Demonstrate the use of basic functions and formulas
- 7.Demonstrate introductory formatting techniques and presentation styles.
- 8.Demonstrate working knowledge of using clip art to enhance ideas and information in a PowerPoint presentation.



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SEMESTER- First Semester

BRANCH: Master of Science in Computer Science (M.Sc. -CS)

SUBJECT: Lab2(Programming in C)

Subject Code: 4020122106

THEORY MAX. MARKS: 100

THEORY MIN. MARKS: 50

### OBJECTIVE:-

- Develop a greater understanding of the issues involved in programming language design and implementation
- Develop an in-depth understanding of functional, logic, and object-oriented programming paradigms
- Implement several programs in languages other than the one emphasized in the core curriculum (Java/C++)
- Understand design/implementation issues involved with variable allocation and binding, control flow, types, subroutines, parameter passing
- Develop an understanding of the compilation process.

### List of Practical's

1. Write a program to perform addition of any given number.
2. Write a program to calculate the given number is Armstrong or not.
3. Write a program to print Fibonacci series from 01 to 100.
4. Write a program to calculate the multiplication table for given number.
5. Write a program for calculating the area of triangle.
6. Write a program to calculate factorial of given no.
7. Write a program to explain Recursion.
8. Write a program to print this pattern:  
9. 1 2 3 4 5  
1 2 3 4  
1 2 3  
1 2  
1
10. Write a program to perform various file operations. 10. Write a program to use various functions in file handling.

### OUTCOMES:-

1. An ability to write structured program using C language.
2. An ability to understand common syntax errors and logical errors in program with C.
3. An ability to understand concept of loops, Arrays, function, structure and file handling.
4. An ability to solve aptitude questions based on C language.



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SEMESTER- Second Semester

BRANCH: MASTER OF SCIENCE IN COMPUTER SCIENCE (M.Sc. -CS)

SUBJECT: OBJECTS ORIENTED PROGRAMMING with C++

Subject Code: 4020212101

Theory Max. Marks: 70

THEORY MIN. MARKS: 28

### OBJECTIVE:-

- To understand the concept of data abstraction and encapsulation.
- To learn how to overload functions and operators in C++.
- To learn how containment and inheritance promote code reuse in C++.
- To learn how inheritance and virtual functions implement dynamic binding with polymorphism.
- To learn how to design and implement generic classes with C++ templates.
- To learn how to use exception handling in C++ programs.

### UNIT-I

**Overview of C++** - Object oriented programming paradigm, Basic concepts of OOP, Advantages/Benefits of OOP, Usage/applications of OOP.

**C++ Environment**- The C++ standard library, Prototype of main() function, I/O operator, manipulator, comments, data types.

**Creating and Compiling C++ Programs** - Structure of a C++ program, C++ tokens, Type conversion in expressions.

**Decision Making and Branching** - Introduction, statements, Mathematical Functions, Branching statements, looping Statements, Nested loops, Programming examples.

### UNIT-II

**Arrays and Functions**- Arrays, The meaning of an array, Single-dimensional arrays, Two-dimensional arrays (Multi-dimensional arrays), User Defined Functions, Elements of user-defined functions, Return values and their types, Function calls, Categories of functions, Passing parameters to functions, Recursion, Command Line Arguments, Storage Class Specifiers.

**Classes and Objects** - Classes, Structures and classes, Unions and classes, Friend function, Inline function, Scope resolution operator, Static class members, Static data members, Static member functions, passing object to functions, Returning objects.

### UNIT-III

**Array, Pointers, References and the Dynamic Allocation Operators** - Array of objects, Pointer to object, this pointer, Pointer to Derived Types, Pointer to class members, References, C++'s Dynamic Allocation Operators.

**Constructors and Destructors** - Introduction, Constructors, Default Constructor, Parameterized constructors, Copy Constructors, Multiple Constructors in a class, Constructors with default arguments, Default Arguments, Special Characteristics of Constructor functions, Destructors.

### UNIT-IV

**Function and Operator Overloading** - Function overloading, Overloading Constructor, Operator Overloading, Creating Prefix and Postfix forms of the increment (++) and decrement (-- ) operators (Overloading Unary Operator), Overloading the Shorthand Operators (i.e. +=, == etc), Operator Overloading Restriction (Rules), Operator Overloading using friend function, Overloading new and delete operator, Overloading Binary Arithmetic operators, Concatenating String.

**Inheritance** - Introduction to inheritance, Features or Advantages of Inheritance, Type of Inheritance, Base Classes and Derived Classes, Base Class Access Control, Protected Members, Protected Base class Inheritance, Inheriting Multiple Base Classes, Constructors, Destructors and Inheritance, Passing Parameters to Base Class Constructors, Virtual Base Classes.

## UNIT-V

**Polymorphism** - Polymorphism, Types of Polymorphism, Virtual Functions and Polymorphism, Pure Virtual Functions, Early Vs Late Binding.

**The C++ I/O System Basics** - The C++ I/O System basics, C++ predefined streams, Formatting using the ios members, file handling function Using width( ), Using precision( ), Using fill( ), Using Manipulators to format I/O, Creating your own Manipulators.

### OUTCOMES:-

- An ability to understand the features of C++ supporting object oriented programming
- An ability to understand the relative merits of C++ as an object oriented programming language
- An ability to understand how to produce object-oriented software using C++
- An ability understand how to apply the major object-oriented concepts to implement object oriented programs in C++, encapsulation, inheritance and polymorphism.
- An ability understand advanced features of C++ specifically stream I/O, templates and operator overloading

### TEXT BOOK:-

1. OOPs with C++:E Balagurusamy
- 2.Programming in C++ by hemant kumar goyal
3. OOPs with C++ Robert laphore
- 4.Programming with C++ by D Ravichandran.
5. Let us C++ Yashwant Kanetkar.



## Dr. C.V. RAMAN UNIVERSITY

Kargi Road, Kota, Bilaspur (C.G.)

SEMESTER- Second Semester

BRANCH: Master of Science in Computer Science (M.Sc. -CS)

SUBJECT: DBMS & SQL

Subject Code: 4020212102

Theory Max. Marks: 70

Theory Min. Marks: 28

### OBJECTIVE:-

- Write SQL code based on ANSI/ISO standards to build database structures
- Update database content with SQL and transaction handling
- Retrieve data with filter conditions and from multiple tables using various types of join
- Process data with row and aggregate functions

### UNIT-I

**Introduction to DBMS & RDBMS** - Introduction to database, Introduction DBMS, Different database models, Structure of DBMS, RDBMS an introduction, Cod's law for RDBMS, Components of rdbms (kernel/data dictionary).

**Introduction to Oracle RDBMS and Client/Server Computing** - Introduction to Oracle, The Features of Oracle 9i, The oracle product details, An introduction to client/server computing, Oracle and client/server computing.

**Overview of Oracle Architecture**- Oracle Architecture, Oracle Files, System and User Processes, Oracle Memory, System Database Object, Protecting Data.

### UNIT-II

**Introduction to SQL\*PLUS** -Introduction to SQL, Features of SQL, Components of SQL, Introduction to SQL\*PLUS, Features of SQL\*PLUS, Oracle Data-Types.

**Working with Tables** -Tables - An Introduction, Use of Table In SQL, Viewing The Stored Data In Tables, Filtering Table Data, Updating Data, Deleting Data From Tables, Modifying The Structure Of Tables, Destroying A Table.

**Data Constraints** - Data Constraints, the Use of Data Constraints, The Types of Data Constraints, Defining Integrity Constraints By 'Alter Table', Removing Integrity Constraints, 'Null' Value Concept.

### UNIT-III

**Data Manipulation in SQL** - Oracle Operators, Range Searching, Pattern Matching, LIKE 'IN' and 'NOT IN' Predicates, An Introduction to 'DUAL' Table, An Introduction to 'SYSDATE'.

**Oracle Functions** - Oracle Function, Function Types, Group Function, Scalar Function, Working With 'Date' in SQL, Grouping Of Data Of Different Tables In SQL.

**Joins, Sub-Queries & Views** - Types of joins, use of sub-query, 'union' and clause, 'Intersect' Clause, Minus Clause, Concept of View, Types of View, Use of View.

**User Accounts Management & Indexing** - Creation of User Account, User Account Management, Granting Privileges, Revoking Privileges, Modifying Password, Closing User Account, Concept of Index, Creation of Index, Types of Index, Use of Index, Deleting Index.

### UNIT-IV

**Introduction to PL/SQL Programming** - Introduction to PL/SQL, Advantages of PL/SQL, Differences between SQL and PL/SQL, PL/SQL Block Structure, PL/SQL Character set, Variable, Constant and Data type, Assignment Operator and the use of 'SELECT....INTO', PL/SQL Program Control Structure, The use of 'IF...THEN...ELSE...ENDIF', Iteration Control (The use of LOOP, WHILE, FOR), The use of 'GOTO Statement.

**Cursor** - Cursor an Introduction, Types of Cursor, Features of Cursor, Implicit Cursor, Explicit Cursor, Application of for Loop with Cursor.

**Exception Handling in PL/SQL** - Exception Handling in PL/SQL, Built in Exception Handling, User Defined Exception Handling, The Raise Application-error Procedure.

## UNIT-V

**Oracle Transaction** - Oracle Transaction, Commit Statement, Rollback Statement, save point statement, Concept of lock, Types of locks, Levels of Locks, 'SELECT.....FOR UPDATE' Statement, Removing the Lock.

**Procedures and Functions**- Concept of Procedures and Functions, Advantages of Procedure and Function, Creation of Procedure and Function, Deleting Procedure and Function.

**Database Triggers** - Concept of Triggers, Types of Triggers, Creation of Triggers, Application of Triggers, Deleting Triggers.

### OUTCOMES:-

- Learn about database models
- Gain a thorough understanding of Transact-SQL language and SQL Server Management Studio
- Learn how to write simple as well as complex queries for retrieving data from database
- Learn how to retrieve data from tables
- Master the calculation of information across result sets leveraging aggregate queries
- Learn how to update, insert and delete data
- Learn how to work with data types
- Learn about Functions and Procedure and gain understanding on different Views
- Learn how to work with Triggers and design a database
- Learn how to create and manage views
- Understand the concept of managing databases, tables as well as sequences with SQL statements
- Learn how to manage binary data leveraging BLOBs
- Learn how to ensure integrity related to multiple an related database updates

### TEXT BOOK:-

- 1.Principal Of Database System. J.D Ullman Galgotia New Delhi.
2. Database System Concept By H Korth And A Silberschatz, TMH Pub
- 3.Database Management By Dr Madhulika Jain, Vineeta Pillai
- 4.The Theory Of Database Concurrency Control, C. Papadimitriou, Computer Science Press
- 5 Database Management System Pragya Publication.





## Dr. C.V. RAMAN UNIVERSITY

Kargi Road, Kota, Bilaspur (C.G.)

SEMESTER- Second Semester

BRANCH: Master of Science in Computer Science (M.Sc. -CS)

SUBJECT: Data Structure

Subject Code: 4020212103

Theory Max. Marks: 70

Theory Min. Marks: 28

### OBJECTIVE:-

- To impart the basic concepts of data structures and algorithms.
- To understand concepts about searching and sorting techniques.
- To Understand basic concepts about stacks, queues, lists, trees and graphs.
- To understanding about writing algorithms and step by step approach in solving problems with the help of fundamental data structures

### UNIT-I

**Analysis of Algorithm**-Introduction, Criteria of Algorithm, Time Complexity, Space Complexity, Asymptotic Notation : Big Oh (O) Notation : Big Omega ( $\Omega$ ) Notation : Big Theta ( $\Theta$ ) Notation.

**Types of Data structures**- Introduction, Types of Data structures, Linear Data Structures, Non Linear Data Structure, Array, SPARSE MATRICES, Garbage Collection, Benefits, Disadvantages.

### UNIT-II

**Stacks**-Introduction, Push operation, Pop operation, Stack implementation using arrays, (static implementation of stacks), STACK as a Linked List, Stack as an abstract data structure, Applications of stack, Conversion of Expressions, Precedence and associativity of the operators, Evaluation of Postfix expression, Multiple stacks.

**Recursion**- Introduction, Working of recursion, Fibonacci series, Tower of Hanoi, Efficiency of recursion.

### UNIT-III

**Queue**-Introduction, Different types of queues, Queue (Linear queue), Queue as an abstract data structure, Circular queue, Double ended queue (Deque), Priority queue, QUEUE as a Linked List, Applications of Queue.

**Linked Lists**-Concept of list and array , Introduction to Data Structures, Arrays, Linked list, Singly or Linear linked list, Circular singly linked list, Doubly linked lists, Header Node, Applications of linked lists, Addition of two long positive numbers, Evaluation of a polynomial.

### UNIT-IV

**Trees**-Introduction, Representation of tree, Binary Tree , Representation of binary tree, Array representation of binary tree, Linked List representation of binary tree, Basic Operation on Binary Tree- Traversals, Binary Tree Traversal Algorithms (Recursive), Creation of Binary Search Tree; Types of binary trees, Operations on Binary Search Tree (BST), Threaded binary trees, Application of Binary Tree; B-Tree, Height Balanced Tree.

**Graph**- Introduction to Graphs, Undirected Graph, Directed Graph or digraph, Graph Representation, Adjacency Matrix Representation, Adjacency List Representation, Graph Traversals, Breadth First Traversal, Depth First Traversal , Searching in Graph, Minimal Spanning Tree, Kruskal's Algorithm, Prim's Algorithm , Shortest Path in Graph.

### UNIT-V

**Sorting and Searching** - Introduction, Bubble sort, Selection Sort, Merge Sort, Quick sort, Insertion Sort, Shell sort, Address calculation sort, Radix sort, Comparison of sorting methods, Hash Table, Collision Resolution Techniques, Linear Search (Sequential Search), Binary Search, Searching an ordered table, Indexed sequential search, Interpolation search.

**File Structure and Indexing**-Introduction, Objectives, Terminology, File Organisation, Sequential Files, Disadvantages, Direct File Organisation, Indexed Sequential File Organisation.

**OUTCOMES:-**

- An ability to analyze algorithms and algorithm correctness.
- An ability to summarize searching and sorting techniques
- An ability to describe stack, queue and linked list operation.
- An ability to have knowledge of tree and graphs concepts.

**TEXT BOOK:-**

1. Data Structure with C++ Hubbard, John.R N.Delhi, Tata McGraw Hill
2. Algorithms E Data Structure Wirth, Niklaus
3. Data Structure, Seymour Lipschutz Mc Graw Hill
4. introduction to Data Structure Shridhar ,Pragya Publication.
5. Data Structure with C++ , CVRU publication.



## Dr. C.V. RAMAN UNIVERSITY

Kargi Road, Kota, Bilaspur (C.G.)

SEMESTER- Second Semester

BRANCH: Master of Science in Computer Science (M.Sc. -CS)

SUBJECT: Operating System

Subject Code: 4020212104

Theory Max. Marks: 70

Theory Min. Marks: 28

### OBJECTIVE:-

1. To learn the fundamentals of Operating Systems.
2. To learn the mechanisms of OS to handle processes and threads and their communication.
3. To learn the mechanisms involved in memory management in contemporary OS
4. To gain knowledge on distributed operating system concepts that includes architecture, Mutual exclusion algorithms, deadlock detection algorithms and agreement protocols.
5. To know the components and management aspects of concurrency management.
6. To learn programmatically to implement simple OS mechanisms.

### UNIT I

**Operating Systems**-Overview -Introduction of Operating System, Types of Operating System, System Components and it's services, System Calls, System Programs, Structure, Design and Implementation, Operating System Generation.

**Process** -Concept, Description and Control -Concept of process, Process state model, Process description - PCB, Process control, Threads, Threads in Linux.

### UNIT II

**Process Scheduling**-Types of Scheduler, Scheduling Criteria, Uniprocessor, Scheduling, Multiprocessor Scheduling, Algorithm Evaluation, Process Scheduling in Linux.

**Concurrency**-Introduction to concurrency, Critical section problem, Mutual Exclusion solutions, S/w approach, H/w support, semaphore, monitor, Classical problem of synchronization.

### UNIT III

**Deadlock**-Deadlock Characterization, Deadlock Prevention, Deadlock Detection, Deadlock Avoidance, Combined Approach.

**Protection**-Goal of Protection, Protection Domains, Access Matrix, Implementation of Access Matrix, Revocation of Access Rights, Language Based Protection.

**Security and Encryption** - Security Problem, User Authentication, Program Threats, System Threats, Securing System and Facilities, Encryption & Decryption – Cryptography.

### UNIT IV

**Memory Management** -Memory Management Requirements, Address Space, Linking and Loading, Swapping, Partitioning, Paging, Segmentation.

**Virtual Memory**-Introduction to Virtual Memory, Demand Paging, Page Replacement, Thrashing, Demand Segmentation.

### UNIT V

**Input Output Systems** - Input - Output Devices, Hardware Support for I/o, I/O Communication Techniques, I/O Software Device Drivers, Performance Consideration.

**Disk Structure**-Introduction to Disks, Disk Scheduling, Disk Management, Disk Reliability, Swap Space Management, Stable Storage Implementation.

**File Management** - File Concepts, Directory structure, File Sharing, Protection, File system in Linux.

### OUTCOMES:-

- Analyze the structure of OS and basic architectural components involved in OS design.
- Analyze and design the applications to run in parallel either using process or thread models of different OS.
- Analyze the various device and resource management techniques for timesharing and distributed systems.

**w.e.f: July 2018**

- Understand the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system.
- Conceptualize the components involved in designing a contemporary OS.

**TEXT BOOK:-**

1. Operating system concepts silberschatz A and Peterson JL,PE-LPE
2. Operating system concept & design Milenkovic M Mc graw hill
3. Operating System H.M Deital
4. Operating system, stalling William,,Maxwell Mc millan int edition
- 5 Operating System, Gupta Rajeev Kumar Chaturvedi Arun Kumar



## Dr. C.V. RAMAN UNIVERSITY

Kargi Road, Kota, Bilaspur (C.G.)

SEMESTER- Second Semester

BRANCH: Master of Science in Computer Science (M.Sc. -CS)

SUBJECT: Lab1(Object Oriented Programming with C++)

Subject Code: 4020222105

THEORY MAX. MARKS: 100

THEORY MIN. MARKS: 50

### OBJECTIVE:-

- Develop a greater understanding of the issues involved in programming language design and implementation
- Develop an in-depth understanding of functional, logic, and object-oriented programming paradigms
- Implement several programs in languages other than the one emphasized in the core curriculum (Java/C++)
- Understand design/implementation issues involved with variable allocation and binding, control flow, types, subroutines, parameter passing
- Develop an understanding of the compilation process.

### List of Practical's

1. Write a program to calculate the given number is Armstrong or not.
2. Write a program to print Fibonacci series from 1 to 100.
3. Write a program to calculate the multiplication table for given number.
4. Write a program for calculating the area of any shape by function overloading.
5. Write a program to create and use a class for employee.
6. Write a program to demonstrate the use of parameterized constructor.
7. Write a program to demonstrate the working of multiple Inheritance.
8. Write a program to demonstrate the use of friend function.
9. Write a program for binary operator overloading.
10. Write a program to demonstrate the working of hybrid inheritance.
11. Write a program to access employee record from their object.
12. Write a program to print this pattern:

```
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1
```

### OUTCOMES:-

- An ability to understand the features of C++ supporting object oriented programming
- An ability to understand the relative merits of C++ as an object oriented programming language
- An ability to understand how to produce object-oriented software using C++
- An ability understand how to apply the major object-oriented concepts to implement object oriented programs in C++, encapsulation, inheritance and polymorphism.
- An ability understand advanced features of C++ specifically stream I/O, templates and operator overloading



## Dr. C.V. RAMAN UNIVERSITY

Kargi Road, Kota, Bilaspur (C.G.)

SEMESTER- Second Semester

BRANCH: Master of Science in Computer Science (M.Sc. -CS)

SUBJECT: Lab2(DBMS & SQL)

Subject Code: 4010222106

THEORY MAX. MARKS: 100

THEORY MIN. MARKS: 50

### OBJECTIVE:-

- Write SQL code based on ANSI/ISO standards to build database structures
- Update database content with SQL and transaction handling
- Retrieve data with filter conditions and from multiple tables using various types of join
- Process data with row and aggregate functions

### List of Practical's

1. Define Data Definition Language Commands.
2. Define Data Manipulation Language Commands.
3. Explain various Set operators.
4. Define Procedure and Functions.
5. Explain the use of trigger command.
6. Explain Front End Tools in DBMS?
7. How can you design Menu in a form?
8. Define Control Structure in DBMS.
9. Write the SQL query for creating, updating and selecting student table.
10. Write the SQL query for inner join and outer join.
11. Write a program for adding two numbers.
12. Write the SQL query for intersect clause and minus clause.
13. Write a program in PLSQL to calculate commission of employee by using function according to following condition:
  - a- if salary<10000 then commission=10%
  - b- if salary>=1000 then commission=20%
14. Write a program in PLSQL to increase the salary of employee by using procedure.
15. In PLSQL, I want to declare a cursor within cursor. The second cursor should use a value from the first cursor in the "where clause" How can I do this

### OUTCOMES:-

- Learn about database models
- Gain a thorough understanding of Transact-SQL language and SQL Server Management Studio
- Learn how to write simple as well as complex queries for retrieving data from database
- Learn how to retrieve data from tables
- Master the calculation of information across result sets leveraging aggregate queries
- Learn how to update, insert and delete data
- Learn how to work with data types
- Learn about Functions and Procedure and gain understanding on different Views
- Learn how to work with Triggers and design a database
- Learn how to create and manage views
- Understand the concept of managing databases, tables as well as sequences with SQL statements
- Learn how to manage binary data leveraging BLOBs
- Learn how to ensure integrity related to multiple an related database updates



## Dr. C.V. RAMAN UNIVERSITY

Kargi Road, Kota, Bilaspur (C.G.)

SEMESTER- Third Semester

BRANCH: Master of Science in Computer Science (M.Sc. -CS)

SUBJECT: Java Programming

Subject Code: 4020312101

Theory Max. Marks: 70

Theory Min. Marks: 28

### OBJECTIVE:-

- To gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc.
- To understand the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc and exception handling mechanisms.
- To understand the principles of inheritance, packages and interfaces.

### UNIT-1

**Overview Of JAVA** - Introduction, Programming paradigm, OOPS Concepts, Evolution of Java, Features of Java, C++ Vs Java, Java and Internet, Java and WWW, Java support systems, Java Environment.

**Key Features Of JAVA** - Introduction, Java Program Structure, Simple Java Program, Tokens, Java Statements, Java Virtual Machine, Constants and Variables, Declaration of Variables, Scope of Variables, Data types, Symbolic Constants, Type Casting, Command line arguments.

### UNIT-II

**Operators** - Operators, Arithmetic Operators, Relational Operators, Logical Operators, Bitwise Operators, Increment and Decrement, Conditional Operators, Special Operators, Assignment Operators, Expression & its evaluation.

**Control Statements** - Introduction, Control Statements, Sequence Control Statement, Decision Control Statement, Case Control Statement, Iteration Control Statement, Jump in loops, Labelled Loops.

**Arrays And Strings** - Introduction, Array, Need of Array, Types of Array, One dimensional Array, Two-Dimensional Array, Multidimensional Array, Strings, Concatenation of Strings, Methods for String Comparison, Methods for searching Strings, Changing the case of characters, String Buffer.

### UNIT-III

**Classes** - Introduction, Defining a Class, Adding Variables, Adding Methods, Creating Objects, Accessing Class members, Call by value and call by reference, Recursion, Access Control, Constructors, Method overloading, Constructor Overloading, Garbage Collection, finalize( ) method, this keyword, Static Members, Nesting of Methods.

**Inheritance** - Inheritance, Single Inheritance, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Using Super, Constructor -Order of Execution in Inheritance, Overriding methods, Final variables and methods, Final Classes, Abstract methods and Classes.

### UNIT-IV

**Wrapper Classes And Vectors** - Introduction, Wrapper Classes, Number Class, Byte class, Short class, Integer class, Long class, Converting Numbers to and from Strings, Float class, Double class, Character class.

**Interface & Packages** - Introduction, Interfaces, Defining interface, Implementing interface, Accessing interface method, Accessing interface variable, Extending interfaces, Packages, System packages, Using system packages, User defined packages, Adding class to a package, Accessing and using package.

### UNIT-V

**Exception Handling** - Introduction, Exceptions, Using try & catch, Multiple catch clauses, Finally, Throw, Throws.

**w.e.f: July 2018**

**Multithreading** - Introduction, The Main Thread, Creating Threads, Life cycle of Thread, Using Threads Methods, Thread Priorities, Stopping and Blocking a thread, Thread Exceptions, Using is Alive() and join(), Synchronization.

**Applets** - Introduction, Local & remote applets, Applet vs applications, Writing applets, Life cycle of an applet, Creating source code of applet, Creating an executable applet, Creating applet tag, Adding applet tag to html, Running the applet, Detailed form of applet tag, Passing parameters to applet, Aligning the display, Html tags, Getting input from user.

**OUTCOMES:-**

- Identify classes, objects, members of a class and relationships among them needed for a specific problem.
- Write Java application programs using OOP principles and proper program structuring.
- Demonstrate the concepts of polymorphism and inheritance.
- Write Java programs to implement error handling techniques using exception handling

**TEXT BOOK:-**

1. Programining With JAVA Balagurusamy,E
2. Programining With JAVA Hubbard,J.R
- 3 The Complete Reference JAVA tm2 Schidt,Herbert
4. Programining With JAVA CVRU publication
- 5 Mastering JAVA m2,J2 SE 1.4 Zukowski,John N.D.BPB.Pub





## Dr. C.V. RAMAN UNIVERSITY

Kargi Road, Kota, Bilaspur (C.G.)

SEMESTER- Third Semester

BRANCH: Master of Science in Computer Science (M.Sc. -CS)

SUBJECT: Programming with VB.NET

Subject Code: 4020312102

Theory Max. Marks: 70

Theory Min. Marks: 28

### OBJECTIVE:-

- Introduction to computer programming using the Visual BASIC programming language with object-oriented programming principles.
- Emphasis is on event-driven programming methods, including creating and manipulating and objects, classes using object-oriented tools such as the class debugger.
- Make students to be able to design, code, test and debug at a beginning level.

### UNIT-I

**Introduction to .NET** - Introduction, What is a Program?, What is Programming?, What do you mean by .NET Framework?, Features of .NET Framework, VB 6 VS VB.NET, VB.NET VS JAVA, VB.NET VS C#, What is .NET Architecture?, What is CLR?, What do you mean by Class Library?, Versions of .NET Framework, What are Assemblies?, Namespaces, CTS (Common Type System), Interfaces, What is special in VB.NET?

**Visual Studio 2005** - Introduction, What is Visual Studio?, Flavors of Visual Studio, Visual Studio 2005, File Extensions Used in VB.Net, Using Visual Studio 2005, Feature of Visual Studio 2005, Output Window, Components Tray, References and the Reference Window, Quick View of Visual Studio 2005, Opening an existing project, Adding a Form to a Project.

### UNIT-II

**The Visual Basic Language** - Visual Basic Statements, Data Types in VB.NET, Declaring Variables, Declaration of Variables (Advanced), Data Type Conversion, String Functions, Formatting Data, Arithmetic Operators, Parentheses and Precedence, Operator Operation, Constants, Control Statements, Arrays in VB.NET, Specifying Optional Procedure Arguments, Passing a Variable Number of Arguments, Recursion, Using a Delegate.

**Working With The Controls** - The Toolbox, Adding and deleting Tools in the Toolbox, creating a tab on the toolbox, Form Designer Basics, The Button, The ComboBox, The ListBox, The Checkbox, The PictureBox, The RadioButtons, The Scroll Bar, Timer, List View, Tree View, Toolbar, Dialog Boxes, Menus in VB.NET, LinkLabel Control.

### UNIT-III

**Designing Menus** - Menus, Context menu, Event of the MenuItem, Creating menu items in Visual Studio.Net.

**Object Oriented Programming with VB.NET** - OOPs?, What is an Object?, What are Classes?, Visual Basic .NET and Object-Oriented, Principles of Object-Oriented Programming, Classes V/s Objects, Inheritance, Polymorphism and Overloading, Scope and Accessibility in Class Modules, Namespaces, Managed Execution, Assemblies, Assemblies in VB .NET.

**The .NET Framework Class Library** - The .NET Framework Class Library, The System Namespace, Data Type Conversion Using Convert Class, The Array Class, The Math Class, The String Class, Other Namespaces, System.Collections, System.Data, System.

### UNIT-IV

**OLE/COM/Win32 API** - Object Linking and Embedding, History of OLE/COM, Component Object Model (COM), COM interoperability in .NET, Win32 API in .NET, COM Interoperability in .NET, Installation and Registration of Assembly, Microsoft Office solutions with Visual Studio .NET, Automation of Office from Visual Studio .NET, Creating and opening Microsoft Word document from VB.NET.

**User Controls in VB.NET** - Introduction, The Control Class, The Control Class' Properties, The Control Class' Methods, Creating the Control Project 1, The RoundButton Control, Creating the Control Project 2, Building the new Button.

#### UNIT-V

**A Brief Introduction to Database Access with VB .NET** - Introduction, What is ADO?, What is ADO.NET?, The Connection Object, Connecting to a Database, The Command Object, The DataAdapter Object, The DataReader Object, The DataSet Object, Updating Your Database by Using DataSets, The AcceptChanges () Method, The RejectChanges () Method, The HasChanges () Method, The GetChanges () Method, Working with DataSets in Visual Studio, Moving Around in DataSet and Retrieving Data, Using Strongly Typed DataSets, DataSets With Multiple Tables, Finding and Sorting Data in DataSets, Filtering on Row State and Version, Data View Manager.

**Graphics In VB.NET** - Introduction, Service of GDI+, Using GDI+ Manged Classes, BRUSH Class, Bitmap Class, Graphics Class, Simple Drawing, Drawing Text, An Example: Show All Fonts, Printing, Printing Multiple Pages, More on the PrintPageEventArgs Class, Using a Print Dialog Control, Rolling Your Own Printing Code, Print Preview.

#### OUTCOMES:-

- Design, create, build, and debug Visual Basic applications.
- Explore Visual Basic's Integrated Development Environment (IDE).
- Implement syntax rules in Visual Basic programs.
- Explain variables and data types used in program development.
- Apply arithmetic operations for displaying numeric output.
- Write and apply decision structures for determining different operations.
- Write and apply loop structures to perform repetitive tasks.
- Write and apply procedures, sub-procedures, and functions to create manageable code.
- Create one and two dimensional arrays for sorting, calculating, and displaying of data.
- Write Visual Basic programs using object-oriented programming techniques including classes, objects, methods, instance variables, composition, and inheritance, and polymorphism.
- Write Windows applications using forms, controls, and events.

#### TEXT BOOK:-

- 1 Programming With VB.NET By Hemant Bairagee, Kamal Prakashan
- 2 Beginning Web Prog.Using VB.Net Bowes ,Gaig
- 3 Object Oriented Programming With Visual Basic. NET Mc Millan Michael
4. ASP Net In 3.5 Framework With C# Indore Kamal Prakashan
5. Basics Of Visual Basic Naik N K



## Dr. C.V. RAMAN UNIVERSITY

Kargi Road, Kota, Bilaspur (C.G.)

SEMESTER- Third Semester

BRANCH: Master of Science in Computer Science (M.Sc. -CS)

SUBJECT: Software Engineering (Elective Paper - I)

Subject Code: 4020342101

Theory Max. Marks: 70

Theory Min. Marks: 28

### OBJECTIVE:-

- This course introduces the concepts and methods required for the construction of large software intensive systems. It aims to develop a broad understanding of the discipline of software engineering.
- It seeks to complement this with a detailed knowledge of techniques for the analysis and design of complex software intensive systems. It aims to set these techniques in an appropriate engineering and management context.
- It provides a brief account of associated professional and legal issues.

### UNIT-I

**Introduction To Software Engineering** - introduction, reusable software components, what is well engineered software?, Programming and software engineering, what is software engineering?, goals of software engineering, software processes, software process models, process iteration, other important software models

**Software Project Management** - project management, management activities, project planning, project scheduling, risk management, selecting staff, metrics used for measuring the software cost, cocomo model

**Software Process and Project Metric** - software quality, metrics for the analysis model, metrics for the design model, metrics for source code, metrics for testing

### UNIT-II

**Software Cost Estimation** - introduction, software cost factors, programmer's ability, product complexity, product size, required level of reliability, level of technology, decomposition technique, empirical estimation models, the structure of estimation models

**Software Project Requirements** - software requirements, functional and non-functional requirements, user requirements, system requirements, software requirements document.

**Requirements Engineering Process** - requirements engineering process, feasibility study, requirements elicitation and analysis, requirements specification, requirements validation, requirements management.

### UNIT-III

**Software Prototyping** - software prototyping, prototyping in the software process, rapid prototyping techniques, user interface prototyping.

**Analysis Concept And Modeling** - analysis modeling, context model, data modeling concepts, cardinality and modality, flow oriented diagram, data dictionary.

**Design Concepts And Principles** - introduction, design within the context of software engineering, design process and design quality, information hiding, functional independence, design classes, the design model, software patterns.

### UNIT-IV

**Software Architecture** - software architecture data design, architectural styles and patterns, analyzing alternative architectural designs, mapping the requirements into a software architecture, architectural design.

**Designing The User Interface** - user interface, input design, end-user considerations for input design, output design, design principles, screens, forms, menu, messages, importance of code, data codification schemes, designing code less systems.

**Software Quality Management**-software quality management, role of a software quality manager, ISO quality model, quality assurance standards, quality planning, quality control.

**Verification And Validation** - verification and validation, software inspections, automated static analysis, cleanroom software development.

#### UNIT-V

**Software Testing Models** - software testing fundamentals, black-box and white-box testing, white-box testing, basis path testing, control structure testing, object-oriented testing methods.

**Software Testing Strategies** - the strategic approach, the software, unit testing, integration testing, validation testing, system testing, test automation.

**Computer Aided Software Engineering (CASE)** - computer aided software engineering (CASE), case workbenches, need of software reuse: types of reuse, reuse.

#### OUTCOMES:-

- How to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment
- An ability to work in one or more significant application domains
- Work as an individual and as part of a multidisciplinary team to develop and deliver quality software
- Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle
- Demonstrate an ability to use the techniques and tools necessary for engineering practice

#### TEXT BOOK:-

1. Software Engineering A Practitioner Approach ,Roger S Pressman TMH
2. Object Oriented Modeling & Design , Rumbaugh J Blaha, M Premerlani PHI
3. Software Engineering. Pearson Education Asia 6 Edition.
4. An Integrated Approach To Software Engineering ,Pankaj Jalote Springer Verlag
5. Software Engineering –An Engineering Approach James F Peters And Witold Pedrycz Wily And Sons New Delhi 2000



## Dr. C.V. RAMAN UNIVERSITY

Kargi Road, Kota, Bilaspur (C.G.)

SEMESTER- Third Semester

BRANCH: Master of Science in Computer Science (M.Sc. -CS)

SUBJECT: Management Information System (Elective Paper - I)

Subject Code: 4020342102

Theory Max. Marks: 70

Theory Min. Marks: 28

### OBJECTIVE:-

- It is expected that students are able to understand the usage of Information Systems in management.
- The students also would understand the activities that are undertaken in acquiring an Information System in an organization.
- The student would be aware of various Information System solutions like ERP, CRM, Data warehouses and the issues in successful implementation of these technology solutions in any organization.

### UNIT1

**Fundamentals of Information Systems**, Introduction, Data, Information and Knowledge, Concept of System, Characteristics of A System, Elements of A System, , types of a system, **Management Information System** , Introduction, Management Information System (MIS), Elements Of MIS, Objectives Of MIS, Characteristics of MIS, Views Of MIS, Role of MIS in Management.

**Information**, Introduction, What is Information, Need of Information, Levels of Information.

### UNIT2

**System Development Life Cycle**, Introduction, System development Life cycle, The problems of a system mean, Different Phases of System Development Life Cycle, Considerations for candidate systems , political consideration, prototyping.

**PLANNING**, Introduction, Meaning and Definition of Planning, Nature / Features of Planning, Objective of Planning, Levels of Planning, Types of planning, Advantages of Planning, Limitations of Planning.

**System Planning and Initial Investigation** , Introduction, System planning, Why system planning ?, Strategic MIS planning, Managerial and operational Mis planning, Strategies for determining information requirements, Getting information from the existing information system, Prototyping, Initial investigation, , Activities in initial investigation, Background analysis, Fact-Finding techniques, Data collection, Correspondence and questionnaires, Personal interview, Observation, Research.

### UNIT3

**Structured Analysis and Feasibility Study** , Introduction, What is Structured Analysis ?, Why Structured Analysis ?, Charts, Data Flow Diagram, Data Dictionary, Data Dictionary Decision Trees, Structured English, Why Feasibility Study ?, Steps In Feasibility Study, Cost Benefit Analysis.

**System Design**, Introduction, Design Process, Phases of Design, Methodologies of Designing, Structured Design, Functional Decomposition, Module Coupling and Cohesion, Prototyping,

**Input, Output And Form Design**, Introduction, Input Design, Input Design Considerations, Input Devices, Output Design, Form Design, Types of Forms, Layout Considerations, Print Forms in Reasonable Quantities, Automated Form Design, Forms Control.

### UNIT4

**File Organisation And Database Design**, Introduction, File Structure, File Organisation, Methods of Organising Files, Objectives of Database, Data Structure, Types of Relationship Amidst Data, Types of Data structure, Entities and Attributes, Normalization, Why is Normalization Necessary ?, Role of Database Administrator, Managing Data Activities, Managing Database Structure, Managing Database Management System.

**Implementation And Software Maintenance** , Introduction, What is System Implementation ?, What is System Conversion ?, Types of Implementation, Conversion, Conversion Activities, User Training, Combating Resistance to Change, Post Implementation Review, Software Maintenance, Maintenance or Enhancement ?, Primary Activities of Maintenance Procedure, Reducing Maintenance Costs.

### UNIT5

**System Security And Disaster Recovery Planning** , Introduction, System Security, , Threats to System Security, Personal, Risk Analysis, Control Measures, Recovery/Restart Requirements, System Failures and Recovery, Disaster/Recovery Planning, Plans, Team, Planning Task,

**Information System for Business Operations**, E-Business, Components of E-Business Model, E-Business Trends, Information system for strategic advantage, Information System for Managerial Decision Support, Management Information systems, Decision Support System (DSS), Other Information systems.

#### OUTCOMES:-

- Describe the role of information technology and information systems in business
- Record the current issues of information technology and relate those issues to the firm
- Reproduce a working knowledge of concepts and terminology related to information technology
- Appraise the knowledge previously acquired of Microsoft Office
- Analyze how information technology impacts a firm
- Interpret how to use information technology to solve business problems
- Illustrate the impact of information systems in society

#### TEXT BOOK:-

1. Management Information Systems Innaging The Digital Firm Kenneth C.Laudon & Jone P.Laudon
2. Management Information System Davis,G.B.& Olson,M.H.
- 3 Management Information System, Khander,S.S
4. Management information system.CVRU publication.
5. Management Information System New Delhi TMP



## Dr. C.V. RAMAN UNIVERSITY

Kargi Road, Kota, Bilaspur (C.G.)

**SEMESTER-** Third Semester

**BRANCH:** Master of Science in Computer Science (M.Sc. -CS)

**SUBJECT:** Compiler Design (Elective Paper – II)

**Subject Code:** 4020342103

**Theory Max. Marks:** 70

**Theory Min. Marks:** 28

### **OBJECTIVE:-**

- To understand the general concepts pertaining to the Compiler Design
- To have a good working knowledge of Parsers.

### **UNIT-I**

Automata Introduction to Finite Automata, Structure Representation, Automata and Complexity, Alphabets, String, Language Informal Picture of Finite Automata, Deterministic Finite Automata, Nondeterministic Finite Automata, An Application.

### **UNIT – II**

Introduction To Compiler, Overview of Compilation, Process, Typical Compiler Structure, Implementing A Compiler. Programming Language Grammars, Elements of A Formal Language Grammar, Derivation, Reduction & Syntax Trees, Ambiguity Regular Grammar & Regular Expression – Context Free Grammar.

### **UNIT – III**

Scanning & Parsing Techniques – The Scanner, Regular Grammar and Fsa, Top Down Parsing, Parsing Algorithm, Top Down Parsing Without Backtracking, Predictive Parsers, Bottom Up Parsing, Parsing, Lr Parsers, Shift Reduce Parsing .

### **UNIT – IV**

Symbol Table Organization, Memory Allocation – Static & Dynamic Memory Allocation, Compilation Control Transfer, Procedure Calls, Conditional Execution, Iteration Control Construct.

### **UNIT – V**

Syntax Errors, Lexical Semantic, Major Issues In Optimization, Optimizing, Transformations, Local Optimization, Program Flow Analysis, Global Optimization.

### **OUTCOMES:-**

An ability to understand working principle of various phases of compiler design and construction.

### **TEXT BOOK:-**

1. Introduction To Automata Theory, Language And Comutation - John E - Hopcoft, Rajeev Motwani, Jeffery D. Ullman 2nd Edition
2. Compiler Construction Principles & Practice – D.M. Dhamdhare 2nd Edition
3. Principles Of Compiler Design – Affred V. Aho, Jeffery D. Ullmancompilers Principles, Techniques And Tools – Affred V. Aho Ravi Sethi, Jeffery D. Ullman



## Dr. C.V. RAMAN UNIVERSITY

Kargi Road, Kota, Bilaspur (C.G.)

SEMESTER- Third Semester

BRANCH: Master of Science in Computer Science (M.Sc. -CS)

SUBJECT: Artificial Intelligence and Expert System (Elective Paper – II)

Subject Code: 4020342104

Theory Max. Marks: 70

Theory Min. Marks: 28

### OBJECTIVE

- To introduce the concept of data Mining as an important tool for enterprise data management and as a cutting edge technology for building competitive advantage.
- To enable students to effectively identify sources of data and process it for data mining.
- To make students well versed in all data mining algorithms, methods of evaluation.
- To impart knowledge of tools used for data mining.
- To provide knowledge on how to gather and analyze large sets of data to gain useful business understanding.
- To impart skills that can enable students to approach business problems analytically by identifying opportunities to derive business value from data.

### UNIT I

**Introduction to Artificial Intelligence**-Overview and definition of AI, Importance of AI, Early work in AI, General issues in AI, Problems of AI, AI Techniques, Scope and Application areas of AI.

**Knowledge Representation and Logic**-Introduction and Importance of Knowledge, Characteristics of Knowledge, Explicit and Implicit Knowledge, Declarative or Procedural knowledge, Internal vs. External Knowledge, Mappings and Knowledge representation Methods, Issues in Knowledge representation, Important Attributes, Relationship among attributes, Granularity of representation, Representing set of objects, Finding the Suitable structure.

### UNIT II

**Knowledge Representation Using Rules**- Representing Knowledge Using Rules, Procedural V/S Declarative Knowledge, Logic Programming, Forward and Backward Reasoning, Matching, Indexing, Matching with Variable, Complex and Approximate Matching, Conflict Resolution, Control Knowledge.

**Structural Knowledge Representation**-Weak Slot and filter structures, Semantic nets, Intersection search, Non-binary predicates Representation, Essential distinctions, Partitioned semantic nets, Semantic nets to Frames, Frames, Frames as sets and instances, Additional ways of relating classes to each other, Slots and full-fledged objects, Property Inheritance algorithm, Languages for Frame, Strong slot and filter structures, Conceptual Dependency, Scripts, CYC.

### UNIT III

**Problem Solving and Search**-State Space Search for problem solving, Production System, Search and Control Strategies, Breadth First Search, Depth First Search, Heuristic Search, Production System Characteristics, Problem characteristics, Some other Control Strategies, Uniform cost search, Depth-limited search, Iterative deepening search, Adversarial Search, Two agent Games, The Minimax procedure, Example Problems, -Puzzle Problem and Playing Chess, Traveling Salesman Problem, Tic-Tac-Toc Problem, Water Jug Problem.

**Heuristic Search Techniques**- Introduction, A General Graph Searching Algorithm, Generate and Test, Hill Climbing Search, Best First Search and A\* algorithm, Admissibility of A\*, Monotone or Consistency Condition, Problem Reduction, AND-OR TREE, Constraint Satisfaction, Cryptarithmic Problem.

### UNIT IV

**Symbolic and Statistical Reasoning**- Symbolic Reasoning Under Uncertainty, Introduction to Reasoning, Nonmonotonic Reasoning and its Logics, Implementation Issues, Implementation: Depth – First Search, Implementation: Breadth – First Search, Statistical Reasoning, Symbolic Verses Statistical Reasoning.

**NLP : Natural Language Processing**- Introduction, Computational linguistics, Problems of NLP, NLP Steps, Syntactic processing, Grammars, parsers, One or many Interpretations, Parsing



techniques, Transition networks and augmented transition net, Unification Grammar, Semantic analysis, Semantic grammars, Case grammars, Conceptual parsing, Semantic interpretation, Discourse & pragmatic processing, Focus use in understanding, Modeling beliefs, Use of goals and plans for understanding, Acts of speech, Postulates of conversation.

#### **UNIT V**

**Expert system-** Introduction, Need and Justification, Benefits of using ES, Characteristics, Applications, Building blocks of Expert system, Knowledge Base, Inference Engine, User Interface, Expert System Life Cycle, Representing and Using Domain Knowledge, Knowledge Engineering and Acquisition, Expert System Tools, Expert System Shells, Case Study: Mycin & Dendral, Rule Based Systems, Learning Procedure.

**PROLOG: AI Programming Language-** Introduction, Data Types & Structures: Atom, Variables, Lists, Prolog Syntax and Programming, Prolog Objects and Methods, Objects & Relationships using Trees and Lists, Facts, rules, Relationships and queries, 'IS' Operator & Singleton Variable, 'CUT' Operator.

#### **OUTCOMES:-**

- Demonstrate an understanding of the importance of data mining and the principles of business intelligence
- Organize and Prepare the data needed for data mining using preprocessing techniques
- Perform exploratory analysis of the data to be used for mining.
- Implement the appropriate data mining methods like classification, clustering or Frequent Pattern mining on large data sets.
- Define and apply metrics to measure the performance of various data mining algorithms.
- Apply BI to solve practical problems : Analyze the problem domain, use the data collected in enterprise apply the appropriate data mining technique, interpret and visualize the results.

#### **TEXT BOOK:-**

1. Data Mining Data Warehousing & Olap Sharma Gajendra
- 2 Introduction to Data Mining With Case Studies Gupta G K
- 3 Data Mining Concepts & Technique, Han J Kamber
4. Data Mining Techniques. Pujari A.K.
5. Data Mining And Data Warehousing Agrawal Bharat Bhushan



## Dr. C.V. RAMAN UNIVERSITY

Kargi Road, Kota, Bilaspur (C.G.)

SEMESTER- Third Semester

BRANCH: Master of Science in Computer Science (M.Sc. -CS)

SUBJECT: Lab 1 (Java Programming)

Subject Code: 4020322103

THEORY MAX. MARKS: 100

THEORY MIN. MARKS: 50

### OBJECTIVE:-

- To gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc.
- To understand the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc and exception handling mechanisms.
- To understand the principles of inheritance, packages and interfaces.

### List of Practical's

1. Write a program to calculate the simple interest of a number through command line.
2. Write a program to calculate the sum of first 50 natural numbers.
3. Write a program to print the following pattern:-
  - (a) 1  
22  
333  
4444
  - (b) #  
# #  
###  
####  
#####  
#####
4. Write a program for matrix multiplication using array.
5. Write a program for calculating sum of a given digit.
6. Write a program for checking the number is negative or positive.
7. Write a program for Multiple inheritance.
8. Write a program and collectively show the use of final variable, final method and final class.
9. Create your own exception.
10. Write a program using applet and use the following function.
  - a. init()
  - b. stop()
  - c. start()
  - d. destroy()

### OUTCOMES:-

- Identify classes, objects, members of a class and relationships among them needed for a specific problem.
- Write Java application programs using OOP principles and proper program structuring.
- Demonstrate the concepts of polymorphism and inheritance.
- Write Java programs to implement error handling techniques using exception handling



## Dr. C.V. RAMAN UNIVERSITY

Kargi Road, Kota, Bilaspur (C.G.)

**SEMESTER-** Third Semester

**BRANCH:** Master of Science in Computer Science (M.Sc. -CS)

**SUBJECT:** Lab 2 (Programming with VB.Net)

**Subject Code:** 4020322104

**THEORY MAX. MARKS:** 100

**THEORY MIN. MARKS:** 50

### OBJECTIVE:-

- Introduction to computer programming using the Visual BASIC programming language with object-oriented programming principles.
- Emphasis is on event-driven programming methods, including creating and manipulating and objects, classes using object-oriented tools such as the class debugger.
- Make students to be able to design, code, test and debug at a beginning level.

### List of Practical's

1. Write a program to show the use of any three controls in vb.net.
2. Write a program to show the use of timer.
3. Write a program to create a procedure to calculate factorial of a number with arguments.
4. Write a program to show the use of ListBox, ComboBox, Checkbox and radioButton.
5. Write a program to display a tree of Colors.
6. Write a program to Show use of ColorDialog and Font Dialog Control.
7. Write a program to create menu in vb.net.
8. Write a program to Print the document and PageSetup.
9. Write a program to Display a picture in Form.
10. Write a program to Show the use of Multifields With student Registration Form.
11. Write a program to create context menu strip.
12. Write a program to perform Polymorphism in Vb.Net.
13. Write a program to handle Constructor and Destructor in VB.net.
14. Write a program to Perform database connectivity with MS Access with the fields Name, rollNo, DOB, Class and Address.
15. Write a program to perform data binding with DataGrid Control.

### OUTCOMES:-

- Design, create, build, and debug Visual Basic applications.
- Explore Visual Basic's Integrated Development Environment (IDE).
- Implement syntax rules in Visual Basic programs.
- Explain variables and data types used in program development.
- Apply arithmetic operations for displaying numeric output.
- Write and apply decision structures for determining different operations.
- Write and apply loop structures to perform repetitive tasks.
- Write and apply procedures, sub-procedures, and functions to create manageable code.
- Create one and two dimensional arrays for sorting, calculating, and displaying of data.
- Write Visual Basic programs using object-oriented programming techniques including classes, objects, methods, instance variables, composition, and inheritance, and polymorphism.
- Write Windows applications using forms, controls, and events.



## Dr. C.V. RAMAN UNIVERSITY

Kargi Road, Kota, Bilaspur (C.G.)

SEMESTER- Fourth Semester

BRANCH: Master of Science in Computer Science (M.Sc. -CS)

SUBJECT: Advanced Java Programming

Subject Code: 4020412101

Theory Max. Marks: 70

Theory Min. Marks: 28

### OBJECTIVE:-

- To gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc.
- To understand the fundamentals knowledge of exception handling, Multithreading, and Applet handling mechanisms.
- To understand the concept of java.util package.
- To understand the principles of Event handling, Graphics and Socket programming concept.

### UNIT-I

**Exception Handling** - Introduction, Exceptions, Using try & catch, Multiple catch clauses, Finally, Throw, Throws

**Multithreading** - Introduction, The Main Thread, Creating Threads, Life cycle of Thread, Using Threads Methods, Thread Priorities, Stopping and Blocking a thread, Thread Exceptions, Using is Alive() and join(), Synchronization

### UNIT-II

**Applets** - Introduction, Local & remote applets, Applet vs applications, Writing applets, Life cycle of an applet, Creating source code of applet, Creating an executable applet, Creating applet tag, Adding applet tag to html, Running the applet, Detailed form of applet tag, Passing parameters to applet, Aligning the display, Html tags, Getting input from user

### UNIT-III

**Exploring Java.util package-** Interface summary, Class summary, Collection Framework, Core collection Interface, Set Interface, List Interface, Map Interface, Stored Map, Interface Iterator.

### UNIT-IV

**Networking in Java-**Network Basics, Java & Networking – Sockets & Ports, Client Server architecture, TCP, UDP, Server Sockets ad Datagram, Networking classes in JDK

**TCP/IP & Datagram Programming in Java** – Socket Programming basics, Datagram communication, TCP/IP Socket Programming in Java.

### UNIT-V

**AWT** – AWT Programming basics, Working with Windows, Graphics & Text.

**Multimedia in Java-** Handling images, sound and animations in Java.

**Event Handling in Java-**Handling of various events in Java, Handling Mouse & Keyboards events Swing Classes.

### OUTCOMES:-

- Identify classes, objects, members of a class and relationships among them needed for a specific problem.
- Write Java application programs using Multithreading concept and proper program structuring.
- Write Java application programs using Applet handling concept and proper program structuring.
- Demonstrate the socket programming and java.util package programming.
- Write Java programs to implement event handling techniques and graphics designing feature.

**TEXT BOOK:-**

1. Programining With JAVA Balagurusamy,E
2. Programining With JAVA Hubbard,J.R
- 3 The Complete Reference JAVA tm2 Schidt,Herbert
4. Programining With JAVA CVRU publication
- 5 Mastering JAVA m2,J2 SE 1.4 Zukowski,John N.D.BPB.Pub



## Dr. C.V. RAMAN UNIVERSITY

Kargi Road, Kota, Bilaspur (C.G.)

SEMESTER- Fourth Semester

BRANCH: Master of Science in Computer Science (M.Sc. -CS)

SUBJECT: Data warehousing & Mining (Elective Paper – III)

Subject Code: 4020442101

Theory Max. Marks: 70

Theory Min. Marks: 28

### OBJECTIVE:-

- To introduce the concept of data Mining as an important tool for enterprise data management and as a cutting edge technology for building competitive advantage.
- To enable students to effectively identify sources of data and process it for data mining.
- To make students well versed in all data mining algorithms, methods of evaluation.
- To impart knowledge of tools used for data mining.
- To provide knowledge on how to gather and analyze large sets of data to gain useful business understanding.
- To impart skills that can enable students to approach business problems analytically by identifying opportunities to derive business value from data.

### UNIT-I

**Strategic Information Management**-Need for strategic information, Decision support system, Knowledge discovery & decision making, Need for data warehouse, Definitions of Data warehousing and data mining, Common characteristics of Data warehouse, Data Marts, Metadata, Operational versus analytical databases, Trends and planning of Data warehousing.

### UNIT-II

**Data Modeling Strategy**- Defining business requirements, Data modeling strategy, Fact tables, Dimensions, Star schema and other schemas, Multi dimensional data models, Data Cube presentation of fact tables, Using the Data warehouse, Designing tools for Data warehouse, OLAP models and operations.

### UNIT-III

**Data Warehouse Architecture Components and Implementation Options**- Architectural components, Infrastructure: Operational & Physical, Extraction, Transformation and Loading, Components of an Oracle Data warehouse, Data Transformation Functions, DBA responsibilities, Capacity Planning.

### UNIT-IV

**Data Warehouse Implementation**- Implementation of Data warehouse, Physical design: steps, considerations, physical storage, indexing, Performance Optimization, Data warehouse deployment activities, Data security, Backup and recovery concepts, Data warehouse Maintenance.

### UNIT-V

**Data Mining**-Basics of data mining, Related concepts, Data mining techniques, Data Mining Algorithms , Classification, Clustering and Association rules, Knowledge Discovery in databases(KDD) Process, Introduction to Web Mining.

### OUTCOMES:-

- Demonstrate an understanding of the importance of data mining and the principles of business intelligence
- Organize and Prepare the data needed for data mining using preprocessing techniques
- Perform exploratory analysis of the data to be used for mining.
- Implement the appropriate data mining methods like classification, clustering or Frequent Pattern mining on large data sets.
- Define and apply metrics to measure the performance of various data mining algorithms.
- Apply BI to solve practical problems : Analyze the problem domain, use the data collected in enterprise apply the appropriate data mining technique, interpret and visualize the results.

**TEXT BOOK:-**

1. Data Mining Data Warehousing & Olap Sharma Gajendra
- 2 Introduction to Data Mining With Case Studies Gupta G K
- 3 Data Mining Concepts & Technique, Han J Kamber
4. Data Mining Techniques. Pujari A.K.
5. Data Mining And Data Warehousing Agrawal Bharat Bhushan



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Kargi Road, Kota, Bilaspur (C.G.)

SEMESTER- Fourth Semester

BRANCH: Master of Science in Computer Science (M.Sc. -CS)

SUBJECT: Soft Computing (Elective Paper – III)

Subject Code: 4020442102

Theory Max. Marks: 70

Theory Min. Marks: 28

### OBJECTIVE:-

This course provide concept of basic principle techniques and application of soft computing. It will be helpful for understanding the basic area of soft computing including artificial neural network , fuzzy logic and genetic algorithms that will be beneficial in the field of research work.

### UNIT-I

**Introduction-** What is soft computing, important soft computing techniques

### UNIT-II

**Artificial Neural Network** :Biological neural network Vs Artificial neural network, Neuron Model and Neural Network Architectures, ANN terminologies, ANN benefits, Supervised learning network :Error back propagation network, Perceptron learning (single layer only), Unsupervised learning network :Kohonen self organizing feature maps (SOM)

### UNIT-III

**Fuzzy Logic**-Crisp set Vs Fuzzy set, Operations on Fuzzy sets, Fuzzy relation, Membership function, Fuzzy arithmetic and Fuzzy measures

### UNIT-IV

**Genetic Algorithm** – Introduction, representations of GA by binary and real-valued numbers, Genetic ,OPE rators and Parameters: Selection, crossover, mutation, elitism, Genetic Algorithms in Problem Solving

### UNIT-V

**Swarm Intelligence:** Meaning, Particle Swarm Optimization: basics, terminology, problem solving using PSO

### OUTCOMES:-

An ability to understand the soft computing techniques by the learners and soft computing techniques are helpful for learners to solve the character recognition ,pattern classification , regression and similar problems.

### TEXT BOOK:-

- Principles of soft computing , S.N.Shivanandan and S.N. deepa Wiley India publication ,First Indian edition ,2008.
- A Comprehensive Foundation to Neural Networks , Simon Haykins , Prentice Hall
- Fuzzy Sets and Fuzzy Logic: Theory and Applications , G. J. Klir, and B. Yuan, PHI learning ,2011.
- Dr.G.Canon, Fuzzy Logic and Fuzzy Decision Making: Concepts and Applications, Galgotia Publication.
- D. E. Goldberg, Genetic Algorithms in Search, Optimization, and Machine Learning, Addison-Wesley, 1989.
- Jang,Sun and Mizutani :Neuro-Fuzzy and soft computing :A computational Approach to learning and machine intelligence ,PHI learning ,2011.
- N.K. Sinha & M. M. Gupta(Eds), Soft Computing and Intelligent Systems: Theory & Applications, Academic Press, 2000.





## Dr. C.V. RAMAN UNIVERSITY

Kargi Road, Kota, Bilaspur (C.G.)

**SEMESTER-** Fourth Semester

**BRANCH:** Master of Science in Computer Science (M.Sc. -CS)

**SUBJECT:** Research Methodology (Elective Paper – IV)

**Subject Code:** 4020442103

**Theory Max. Marks:** 70

**Theory Min. Marks:** 28

### **OBJECTIVE:-**

- Making the students understand and learn the educational concept of research and solve the research related problem.
- It also includes scientific and inductive thinking and promotes development of logical habits of thinking and organization.

### **UNIT-I**

Research- Definition, Importance and Meaning of Research, Characteristics of Research, Types of research, Steps in research, Selection and Formulation of research problem.

### **UNIT-II**

Hypotheses- meaning and characteristics of working hypotheses, problem in formulating hypotheses, sources of Hypotheses, Origin of hypotheses, types and significance of Hypotheses.

### **UNIT-III**

Research Design- Meaning, Objectives and contents of Research, Types of experimental Research Design, Collection of Primary data-Observation Methods, questionnaire method and schedule methods.

### **UNIT-IV**

Case study Methods-Its Characteristics Advantages and limitation, Sampling techniques: Sampling Theory, types of sampling, Steps in sampling, Sampling and Advantages and Limitations of Sampling, inferential statistics – frequency distribution, graphical presentation of data, measure of central tendency, measure of variability 't' test.

### **UNIT-V**

Research Reports- Types of reports- contents-styles of reporting- steps in drafting reports-Editing the final draft-Evaluating the final draft. Analysis and Interpretation of Data and Report Writing.

### **OUTCOMES:-**

- An ability to apply knowledge of research methodology in society and various field like medical, stock market, information security, defense, etc.
- An ability to understand the educational research, including those issues that arise in using quantitative and qualitative research.
- An ability to understand distinguish purpose statement, a research question or hypothesis, and a research objective.
- An ability to understand and analyze the meaning of research, research design and application of research tools and techniques.

### **Reference Books:**

- Research Methodology by C.R. Kothati.
- Research Methodology by H.K. Kapil.
- Statistics (Theory & Practice) by B. N. Gupta.
- Social Research & Statistical by R.N. Mukhargi.
- Social Research by D.S. Baghel.
- Statistical Methods by S. P. Gupta.



## Dr. C.V. RAMAN UNIVERSITY

Kargi Road, Kota, Bilaspur (C.G.)

SEMESTER- Fourth Semester

BRANCH: Master of Science in Computer Science (M.Sc. -CS)

SUBJECT: Operation Research (Elective Paper - IV)

Subject Code: 4020442104

Theory Max. Marks: 70

Theory Min. Marks: 28

### OBJECTIVE:-

The main objective of operation research is used to use of systematic research techniques for decision making, improve quality, identify optimum solution, improve the productivity and minimize the cast and maximize the profit.

### UNIT-I

**Introduction** to OR, The Nature and Meaning of OR, History, Management Applications of OR , Principles, Characteristics, Scope of OR.

### UNIT-II

**Linear Programming**-Introduction and Applications of LP, Limitations of LP Formulation of a LP Model, Graphical Solution of a LPP, Simplex Method, Two Phase Method, Big-M Method, duality in LPP.

### UNIT-III

**Transportation Problem** – Introduction, Mathematical Formulation, Feasible Solution and Optimum Solution (simple case only).

### UNIT-IV

**Assignment Problem** – Introduction, Mathematical Formulation, Traveling Salesman Problem, elementary Problems, Replacement Problems-Types, Simple Replacement Problems.

### UNIT-V

**Project Management by PERT-CPM** – Introduction, History & Applications, Basic Steps, Network Diagram Representation, Rules, Time Estimates and Critical Path in Network Analysis, Uses and Applications of PERT/CPM.

### OUTCOMES:-

- Identify and develop operational research models from the verbal description of the real system.
- Understand the mathematical tools that are needed to solve optimisation problems.
- Use mathematical software to solve the proposed models.
- Develop a report that describes the model and the solving technique, analyse the results and propose recommendations in language understandable to the decision-making processes.

### Reference Books:

- Operations Research By H.A.Taha.
- Operations Research By V.K.Kapoor .
- Operation Research By S.D. Sharma.



**Dr. C.V. RAMAN UNIVERSITY**

Kargi Road, Kota, Bilaspur (C.G.)

**SEMESTER- Fourth Semester**

**BRANCH: Master of Science in Computer Science (M.Sc. -CS)**

**SUBJECT: Project Work**

**Subject Code: 4020432101**

**Theory Max. Marks: 300**

**Theory Min. Marks: 150**

All the candidates of **M.Sc. -CS** are required to submit a project-report based on the work done by him/her during the project period. A detailed Viva shall be conducted by an external examiner based on the project report. Students are advised to see the detailed project related guidelines on the website of CVRU. ([www.cvru.ac.in](http://www.cvru.ac.in)) under Project Guidelines for student section.