

GOVT. E. RAGHAVENDRA RAO PG SCIENCE COLLEGE,

BILASPUR (C.G.)

Affiliated to Atal Bihari Vajpayee Vishwavidyalaya, Bilaspur (C.G)

Grade - B+ Accredited by NAAC



SYLLABUS

SESSION 2023-2024

**Learning Outcome Based Scheme and Syllabus
of**

M.Sc. - Information Technology

POST GRADUATE PROGRAM IN INFORMATION TECHNOLOGY

MASTER OF SCIENCE IN INFORMATION TECHNOLOGY 2023-25

SCHEME OF TEACHING AND EXAMINATIONS

FIRST SEMESTER

Subject Code	Subjects	Credit			Total	Marks		Total	
		L	T	P		ESE	IA	MAX	MIN
MSc(IT)101	Computer System Architecture	3	1		4	80	20	100	36
MSc(IT)102	Data Structure using C++	3	1		4	80	20	100	36
MSc(IT)103	Advance Operating System	3	1		4	80	20	100	36
MSc(IT)104	Advance JAVA	3	1		4	80	20	100	36
MSc(IT)105	Lab-I: Data Structure using C++	-	-	2	2	-	-	100	36
MSc(IT)106	Lab-II: Programming in JAVA	-	-	2	2	-	-	100	36
	Total	12	4	4	20	320	80	600	216

SECOND SEMESTER

Subject Code	Subjects	Credit			Total	Marks		Total	
		L	T	P		ESE	IA	MAX	MIN
MSc(IT)201	Theory of computation	3	1		4	80	20	100	36
MSc(IT)202	Data Communication	3	1		4	80	20	100	36
MSc(IT)203	Web Technology	3	1		4	80	20	100	36
MSc(IT)204	Relational database management system	3	1		4	80	20	100	36
MSc(IT)205	Lab-I: Web Technology Lab	-	-	2	2	-	-	100	36
MSc(IT)206	Lab-II: SQL / PLSQL Lab	-	-	2	2	-	-	100	36
	Total	12	4	4	20	320	80	600	216

(Signature)

(Signature)

(Signature)

(Signature)

THIRD SEMESTER

Subject Code	Subjects	Credit			Total	Marks		Total	
		L	T	P		ESE	IA	MAX	MIN
MSc(IT)301	Compiler Design	3	1		4	80	20	100	36
MSc(IT)302	Python Programming	3	1		4	80	20	100	36
MSc(IT)303	Artificial Intelligence And Machine Learning	3	1		4	80	20	100	36
MSc(IT)304	Software Engineering	3	1		4	80	20	100	36
MSc(IT)305	Lab-I: Python Programming Lab	-	-	2	2	-	-	100	36
MSc(IT)306	Lab-II: AIML Lab	-	-	2	2	-	-	100	36
Total		12	4	4	20	320	80	600	216

FOURTH SEMESTER

Course Code	Course Name	Credit			Total	Marks		Total	
		L	T	P		ESE	IA	MAX	MIN
MSc(IT)401	Soft Computing	3	1	-	4	80	20	100	36
MSc(IT)402	Internet of Things(IoT)	3	1	-	4	80	20	100	36
MSc(IT)403	Research Based Major Project	-	-	-		-	-	400	240
MSc(IT)404	Software Development Based Major Project							2400	
Grand Total (Semester I,II,III and IV)									

Notes :-
Abbreviation: L-Lecture, P-Practical, T-Tutorials, ESE- End Semester Examination, IA- Internal Assessment

Part A: Introduction

Program: Master Degree		Class: M.Sc. IT I Semester	Year: 2023	Session: 2023-24
1.	Course Code	MSCIT101		
2.	Course Title	Computer System Architecture		
3.	Course Type	Theory		
4.	Pre-requisite (if any)	As per Govt. Norms / Institutional scheme		
5.	Course Learning Outcomes (CLO)	<p>At the end of this course, the students will be able to:</p> <ul style="list-style-type: none"> • Provide with a deep understanding of the fundamental principles and concepts behind the design and organization of digital computer. • Understand the fundamental concepts of digital computer organization and architecture. • Develop a basic understanding of the building blocks of a digital computer system. • Enable understanding of how these building blocks are organized together to architect a digital computer system • Enable understanding of how various functional units of a digital computer system interacts to meet the processing requirements of the user. 		
6.	Credit Value	Theory : 04		
7.	Total Marks	Max. Marks: 100	Min.Marks: 36	

Part B: Content of the Course

Total number of Teaching-Learning – Hours-60

Unit	Topics	Hours
I.	Digital Logic Circuit: Digital Computers, Logic Gates, Boolean Algebra, Map Simplification, Combinational Circuits: Adder, Binary Adder, Subtractor, Decoders, Multiplexers, Sequential Circuits: Flip Flops, Registers, Shift Registers, Binary Counters. Data Representation Data Types, Complements, Fixed Point Representation, Floating Point Representation, Binary Codes.	12
II.	Register Transfer and Micro-operations: Register Transfer Language, register transfer, Bus and Memory Transfer, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic Logic Shift Unit. Basic Computer Organization: Instruction codes, Stored Program Organization, Computer Registers - Common Bus System; Computer Instructions - Instruction Set Completeness, Instruction Cycle - Fetch and Decode, Determine the Type of Instruction, Register-Reference Instructions; Memory Reference Instructions; Input-Output and Interrupt.	12
III.	Programming the Basic Computer: Machine Language, Assembly Language, Introduction to Assembler, Program Loops, Programming Arithmetic and Logic Operations Micro Programmed Control: Control Memory, Address Sequencing- Conditional Branching, Mapping of Instructions, Subroutines, Micro program Example - Computer Configuration, Microinstruction Format Symbolic Microinstructions, Fetch Routine, Symbolic Micro program Binary Micro program. Design of Control Unit Sequencer Micro program.	12
IV.	Central Processing Unit: Introduction, General Register Organization, Stack Organization, Evaluation of Arithmetic Expressions, Instruction Formats Three-, Two-, One- and Zero-Address Instructions, - Addressing Modes, Data Transfer and	12

	Manipulation, Program Control, Program Interrupt, Types of Interrupt, RISC & CISC Characteristics, Overlap Register Window, Pipeline and Vector Processing: Parallel Processing, Pipelining Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.	
V.	Input-Output Organization: Peripheral Devices, Input-Output Interface, Modes of Transfer - Programmed I/O, Interrupt-Driven I/O. Priority Interrupt, Direct Memory Access (DMA), Input-Output Processor (IOP), Serial Communication. Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory, Memory Management Hardware.	12

Part C - Learning Resources

Text Books, Reference Books and E-Resources

Suggested Readings:

Text Books Recommended:

1. Computer System Architecture, by M. Morris Mano, Third Edition. 2007 Low Price Edition. Pearson Education
2. Computer Architecture and Organization, by John P. Hayes. Third Edition. 2017. McGraw Hill
3. Computer Organization and Architecture: Designing for Performance, by William Stallings. Tenth Edition.

Reference books:

1. Computer Organization and Design by David A. Patterson and John L. Hennessy.
2. Structured Computer Organization, A. S. Tanenbaum, Pearson Education.
3. Fundamentals of Computer Organization, P Dandamudi. Springer 4 Computer Architecture & Parallel processing - Kai Hwang 7 Briggs. (MGH)

Online resources:

1. Computer system architecture: <https://online.stanford.edu>
2. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=fBYckQKJvP3a/8Vd3108tQ>
3. <https://www.coursera.org>

Part D: Assessment and Evaluation

Maximum Marks:	100 Marks	
End Semester Examination (ESE):	80 Marks	
Internal Assessment (IA):	20 Marks	
Internal Assessment:		Total: 20 Marks
1.	Unit test (10 Marks): There will be two tests for 10 marks.	
2.	Presentation/Seminar (10 Marks)	

Part A: Introduction			
Program: Master Degree	Class: M.Sc. IT I Semester	Year: 2023	Session: 2023-24
Course Code	MSCIT102		
Course Title	Data Structure using C++		
Course Type	Theory		
1.	Pre-requisite(if any)	As per Govt. Norms / Institutional Scheme	
2.	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Use different types of data structures, operations and algorithms. • Implement appropriate sorting/searching technique for any given problem. • Use stack, Queue, Lists, Trees and Graphs in problem solving. • Find suitable data structure during application development/ Problem Solving. • Understand complex data structure like B+ Tree, Graph and use this structure in problem solving. 	
3.	Credit Value	Theory : 04	
4.	Total Marks	Max. Marks: 100	Min Passing Marks: 36
Part B: Content of the Course			
Total number of Teaching-Learning – Hours-60			
Unit	Topics(Course Contents)		Hours
I.	Introduction and Basic Concepts of Data Structure: Data types: primitive, non-primitive data types, ADT, Linear and Nonlinear data structure. Linear Data Structures: Arrays: One dimensional, Multidimensional array, allocation methods, address calculations, sparse arrays. Linked List: Singly and Doubly Linear link lists, singly and doubly circular linked list: Definitions, operations (INSERT, DELETE, TRAVERSE) on these lists. (Insertion and deletion operation includes – insertion & deletion before a given element, insertion& deletion after a given element, insertion & deletion at given position)		12
II.	Stack: Definition, Operations: PUSH, POP, TRAVERSE, implementations using array and linked list, Applications of stack. Infix, Prefix, Postfix representation and conversion using stack, Postfix expression evaluation using stack. Queue: Introduction, and Types of Queues: Priority Queue, Circular queue, Double Ended Queue, operations (INSERT, DELETE, TRAVERSE), implementation using array and linked list and applications.		12
III.	Non-linear Data Structure: Trees: Definition of trees and their types, Binary trees, Properties of Binary trees and Implementation, operations (Insertion, deletion, searching and traversal algorithm) preorder, post order, in-order, Binary search tree, implementation, Threaded binary tree, AVL tree, Red black tree, Binary heap.		12
IV.	Graph: Definition of Graph and their types, adjacency and incident matrices and linked list representation of graphs, Graph Traversal- Breadth first Traversal, Depth first Traversal, Spanning tree: Minimum Spanning tree, Kruskal's and prim's algorithms.		12
V.	Sorting Methods: Types of sorting: Selection Sort, Insertion Sort, Bubble Sort, Quick Sort, Merge Sort and Radix Sort. Searching: Linear search, Binary search, Hashing: collision Resolution methods.		12

K.S. (circled)

 Karthik

 (Signature)

 (Signature)

 (Signature)

Part C - Learning Resources

Text Books, Reference Books and E-Resources

Suggested Readings:

Text Books Recommended:

1. Fundamentals of Data Structures, Horowitz and Sahani, Computer Science Press, 1978
2. Data structure Through C, G S. Baluja, Dhanpat Rai And Co.
3. Data Structure, Seymour Lipschutz, Schaum's Outline Series

Reference books:

1. Data Structures and Algorithms in C++, Michael T Goodrich, Wiley, 2007
2. Data structures and Algorithms, Afred V Aho, Jhon E Joperoft and JE Ullman
3. An Introduction to Data Structures with Applications, Jean Paul Trembley and Paul Sorenson, TMH. International Student Edition. 1985
4. Data Structures and Program Design in C. R. Kurse, Leung &Tondo, 2 Edition, PHI

Online resources:

1. <https://epup.inflibnet.ac.in/Home/ViewSubject?catid=fBYckOKJVP3a>
2. <https://www.coursera.org/learn/data-structures>
3. SWAYAM Link <https://onlinecourses.swayam2.ac.in/cec19 es04/preview>

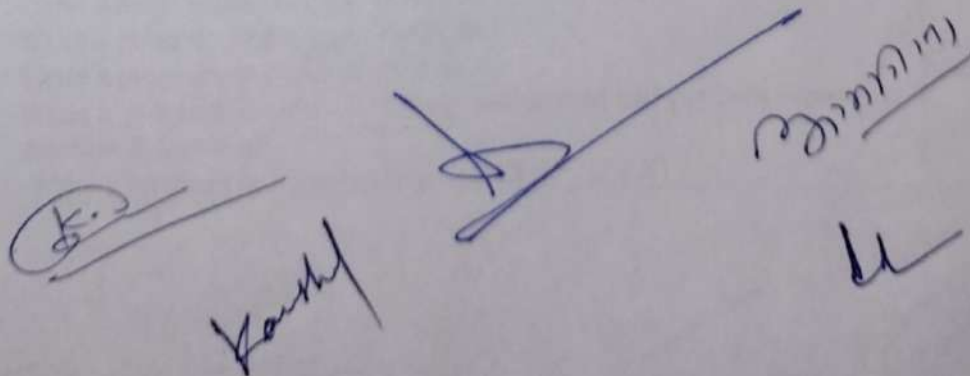
Part D: Assessment and Evaluation

Maximum Marks: 100 Marks
End Semester Examination(ESE): 80 Marks
Internal Assessment(IA): 20Marks

Internal Assessment:

1. Unit test (10 Marks): There will be two tests for 10 marks.
2. Presentation/Seminar (10 Marks)

Total:20 Marks

Handwritten signatures and initials in blue ink at the bottom of the page. From left to right: a signature that appears to be 'K. S.', a signature that appears to be 'Karthik', a signature that appears to be 'S.', and a signature that appears to be 'Srinivas' with 'u' written below it.

Part A: Introduction			
Program: Master Degree	Class: M.Sc. IT I Semester	Year: 2023	Session: 2023-24
1. Course Code	MSCIT103		
2. Course Title	Advance operating system		
3. Course Type	Theory		
4. Pre-requisite(if any)	As per Govt. Norms / Institutional Scheme		
5. Course Learning Outcomes (CLO)	<p>At the end of this course, the students will be able to:</p> <ul style="list-style-type: none"> Describe the importance of computer system resources and the role of operating system in their management policies and algorithms. Understanding of design issues associated with operating systems. Understand various process management concepts including scheduling, synchronization, and deadlocks. Have a basic knowledge about multithreading.. Understand concepts of memory management including virtual memory Have sound knowledge of various types of operating systems including Unix and Android. Describe the functions of a contemporary operating system with respect to convenience, efficiency, and the ability to evolve. 		
6. Credit Value	Theory : 04		
7. Total Marks	Max. Marks: 100	Min Passing Marks: 36	

Part B: Content of the Course

Total number of Teaching-Learning – Hours-60

Unit	Topics(Course Contents)	Hours
I.	Introduction to Operating System: What is Operating System? History and Evolution of OS, Basic OS functions, Resource Abstraction, Types of Operating Systems- Multiprogramming Systems, Batch Operating Systems, Time Sharing Systems, Operating Systems for Personal Computers, Workstations and Hand-held Devices, Process Control and Real time Systems.	12
II.	Operating System Organization and Process Characterization: Processor and User Modes, Kernels, System Calls and System Programs, System View of the Process and Resources, Process Abstraction, Process Hierarchy, Threads, Threading Issues, Thread Libraries, Process Scheduling, Non-Pre-emptive and Pre-emptive Scheduling Algorithms.	12
III.	Inter Process Communication and Synchronization: Concurrent and Dependent Processes, Critical Section, Semaphores. Methods for Inter-process Communication, Process Synchronization, Classical Process Synchronization Problems Producer-Consumer problem, Reader-Writer problem. Deadlock: Deadlock, Deadlock Characterization, Necessary and Sufficient Conditions for Deadlock. Deadlock Handling Approaches Deadlock Prevention, Deadlock Avoidance and Deadlock Detection and Recovery.	12
IV.	Memory Management: Physical and Virtual Address Space, Memory Allocation Strategies- Fixed and Variable Partitions, Paging, Segmentation, Virtual Memory Demand Paging, Page Replacement, Page replacement Algorithms, Performance of Demand Paging, Allocation of Frames, Thrashing	12

V.	Introduction to Android Operating System: Introduction to Android Operating System, Android Development Framework, Android Application Architecture, Android Process Management and File System, Small Application Development using Android Development Framework.	12
----	--	----

Part C - Learning Resources

Text Books, Reference Books and E-Resources

Suggested Readings:

Text Books Recommended:

1. A Silberschatz, P.B Galvin, G. Gagne, Operating Systems Concepts, 8th Edition, John Wiley Publications 2008
2. W Stallings. Operating Systems, Internals & Design Principles 2008 5th Edition, Prentice Hall of India.

Reference books:

1. A.S Tanenbaum, Modern Operating Systems, 3rd Edition, Pearson Education 2007
2. G Nutt, Operating Systems: A Modern Perspective, 2nd Edition Pearson Education 1997
3. M Milenkoue Operating Systems, Concepts and design Tata McGraw Hill 1992

Online resources:

1. SWAYAM/NPTEL – IITD
<https://youtube.com/playlist?list=PLsYlUObWSM3CAGT60dubyH6FztKfJCcFB>
2. NPTEL IIT Madras https://youtube.com/playlist?list=PL3-wYxbt4yCjpcfUDz-TgD_ainZ2K3MUZ

Part D: Assessment and Evaluation

Maximum Marks: 100 Marks
End Semester Examination(ESE): 80 Marks
Internal Assessment(IA): 20Marks

Internal Assessment:

1. Unit test (10 Marks): There will be two tests for 10 marks.
2. Presentation/Seminar (10 Marks)

Total:20 Marks

(Handwritten signatures and marks)

Part A: Introduction

Program: Master Degree		Class: M.Sc. IT I Semester	Year: 2023	Session: 2023-24
1.	Course Code	MSCIT104		
2.	Course Title	Advance JAVA		
3.	Course Type	Theory		
4.	Pre-requisite (if any)	As per Govt. Norms / Institutional scheme		
5.	Course Learning Outcomes (CLO)	At the end of this course, the students will be able to: <ul style="list-style-type: none"> • Develop application using java based technologies. • Demonstrate the principles of object-oriented programming. • Understand multi-threading and event handling mechanism • Express different Decision-Making statements and Functions 		
6.	Credit Value	Theory : 04		
7.	Total Marks	Max. Marks: 100	Min Passing Marks: 36	

Part B: Content of the Course

Total number of Teaching-Learning – Hours-60

Unit	Topics(Course Contents)	Hours
I.	Overview of JAVA: The Genesis of Java, History of Java. Java Virtual Machine (JVM), Java Development Kit (JDK), Java Runtime Environment (JRE), Source Files, And Jar Files. Compiling And Running of Files, Byte Code, Platform Independency, Data Types, Literals, Variables, Constants, Array And It's Types, Operators, Conditional And Looping Statements. Writing Simple JAVA Program.	12
II.	Concept of Class & Inheritance, - Introduction of Class, Objects And Methods, Concept of Super And Sub Class, Types of Inheritance, Access Specifiers, Method Overloading & Overriding. Abstract Class, Constructor, Using Final With Inheritance,	12
III.	Packages And Interface: Defining Package, Built-In Packages: Java.Lang , Java.Util , Java.io, Rules For Creating A New Package, Interface: Defining And Implementing Interface, Extending Interface, Nested Interface, Importance of Interface In Java.	12
IV.	Exception Handling And Multithreading: Using Try And Catch, Multiple Catch Classes, Nested Try Statements, Throw, Throws And Finally, Built In Exception, Uncaught Exception. Creating own Exception Class. Java Thread Model: Main Thread, Creating own Thread, Life Cycle Of Thread.	12
V.	Java Applets And Event Handling: Applet Class, Life Cycle of Applet, Event Handling In Java: Classifications of Event, Event Classes , Java AWT: Java AWT Hierarchy, Containers, Collections In Java: Hierarchy of Collection,.	12

[Signature]

[Signature]

[Signature]

[Signature]

[Signature]

Part C - Learning Resources	
Text Books, Reference Books and E-Resources	
Suggested Readings:	
Text Books Recommended:	
<ol style="list-style-type: none"> 1. The complete reference, Naughton P and Schildt H., Ost omne, McGraw-Hill. 2. Java Programming, By E.Balgarusany. 	
Reference books:	
<ol style="list-style-type: none"> 1. McGraw-Hill Publication. An Introduction to JAVA programming. James R Levenick Firewall Mediapublication 2. Core JAVA for beginners, Rashmi KanaiDas Vikas Publication 3. Java beginners Guide, Herben Schildt. McGraw-Hill Publication. 	
Online resources:	
<ol style="list-style-type: none"> 1. SWAYAM- https://onlinecourses.swayam2.ac.in/tic20_spl3/preview 2. SWAYAM URL link for Java https://onlinecourses.upel.ac.in/moc19/cs84/preview 3. SWAYAM URL link for Java https://www.dgindia.com/it-bombay-offers-free-online-course-java-swayam-platform/ 4. SWAYAM URL link for Java https://www.classcentral.com/course/swayam-programming-in-java-12930 5. Coursera URL Link for Java https://www.coursera.org/specializations/core-java 6. UdemY URL Link for Java https://www.udemy.com/course/java-development-for-beginners-learnit 	

Part D: Assessment and Evaluation	
Maximum Marks: 100 Marks End Semester Examination(ESE): 80 Marks Internal Assessment(IA): 20Marks	
Internal Assessment:	
<ol style="list-style-type: none"> 1. Unit test (10 Marks): There will be two tests for 10 marks. 2. Presentation/Seminar (10 Marks) 	Total:20 Marks






Part A: Introduction

Program: Master Degree		Class: M.Sc. IT II Semester	Year: 2023	Session: 2023-2
1.	Course Code	MSCIT201		
2.	Course Title	Theory of computation		
3.	Course Type	Theory		
4.	Pre-requisite (if any)	As per Gov. Norms / Institutional scheme		
5.	Course Learning Outcomes (CLO)	At the end of this course ,the students will be able to: <ul style="list-style-type: none"> • Understand the basic theory of computation. • Automata regular expression. • Context frees Grammars. • Compiling understanding. 		
6.	Credit Value	Theory : 04		
7.	Total Marks	Max. Marks: 100	Min Passing Marks: 36	

Part B: Content of the Course

Total number of Teaching-Learning – Hours-60

Unit	Topics(Course Contents)	Hours
I.	Automata Regular Expression and Languages: Principle of Mathematical Induction, Finite Automata, Deterministic Finite Automata, Non Deterministic Finite Automata, Regular Expression, Proving Languages not to be Regular, Closure Properties of Regular Language, Equivalence and Minimization of Automata.	12
II.	Context Free Grammar and Language: Context Free Grammar, Parse Tree, Ambiguity in Grammar and Languages Definition of The Pushdown Automata, Languages of Pushdown Automata, Equivalence of Pushdown Automata and CFG, Deterministic Pushdown Automata.	12
III.	Properties of Context Free Languages Undesirability: Normal Form For CFG, Pumping Lemma for CFL, Closure Properties of CFL, Turing Machine. A Language That Is Not Recursively Enumerable, an Un Decidable Problem that is RE, Un Decidable Problem About Turing Machine, Post Correspondence Problem.	12
IV.	Introduction to Compiling Syntax Analysis: Compiler – Analysis of The Source Programme Phases of A Compiler, Compiler Construction Tools, Lexical Analysis, Role of Lexical Analyzer, Role of The Parser, Writing Grammar, Context Free Grammar, Top Down Parsing, Bottom Up Parsing, Shift Reduce Parsing, Operator Precedence Parsing, LR Parser, SLR Parser.	12
V.	Code Generation & Optimization, Run Time Environment : Issue In The Design of Code Generation, Basic Block And Flow Graph, a Simple Code Generator – DAG Representation of Basic Block, Peephole Optimization, Principle Source of Optimization, Optimization of Basic Block, Introduction to Global Data Flow Analysis, Runtime Environments.	12

Part C - Learning Resources

Text Books, Reference Books and E-Resources

Suggested Readings:

Text Books Recommended:

1. Theory of Computer Science (Automata Language & Computation), K.L.P. Mishra and N. Chandrasekran, PHI.
2. Introduction to Automata theory. Language and Computation, John E. Hopcroft & Jeffery D. Ullman, Narosa Publishing House.

Reference books:

1. Theory of Automata and Formal Language, R.B. Patel & P. Nath, Umesh Publication.
2. An Introduction and finite automata theory, Adesh K. Pandey, TMH.
3. Theory of Computation AM Natrajan. Tamarasi, Bilasubramani, New Age International Publishers.

Online resources:

1. <https://epup.inflibnet.ac.in/Home/ViewSubject?catid=fBYckOKJVP3a>
2. <https://www.coursera.org/learn/data-structures>
SWAYAM Link https://onlinecourses.swayam2.ac.in/cec19_es04/preview

Part D: Assessment and Evaluation

Maximum Marks: 100 Marks

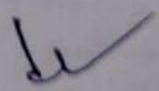
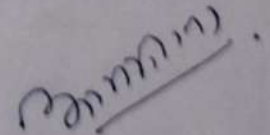
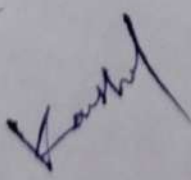
End Semester Examination(ESE): 80 Marks

Internal Assessment(IA): 20Marks

Internal Assessment:

3. Unit test (10 Marks): There will be two tests for 10 marks.
4. Presentation/Seminar (10 Marks)

Total:20 Marks



Part A: Introduction

Program: Master Degree		Class: M.Sc. IT II Semester	Year: 2023	Session: 2023-24
1.	Course Code	MSCIT202		
2.	Course Title	Data Communication and Networking		
3.	Course Type	Theory		
4.	Pre-requisite (if any)	As per Govt. Norms / Institutional scheme		
5.	Course Learning Outcomes (CLO)	At the end of this course ,the students will be able to: <ul style="list-style-type: none"> • Understand the basic computer network technology. • In depth understanding goes principals, protocols, technologies of computer network. • Understand and explain the data communication system and its components. • Identify the different type so network topologies and protocols. • Understand the layers of the OSI model and TCP/IP. Expose wireless and wired LANs. 		
6.	Credit Value	Theory: 04		
7.	Total Marks	Max. Marks: 100	Min .Marks: 36	

Part B: Content of the Course

Total number of Teaching-Learning – Hours-60

Unit	Topics (Course Contents)	Hours
I.	Overview of Data Communication and Networking: Data Communications: components ,data representation, direction of data flow(simplex ,half duplex, full duplex; Networks: distributed processing ,network criteria ,physical structure(type of connection topology),categories of network (LAN, MAN, WAN), Protocol and standards ;Reference Models :OSI&TCP/IP reference model Comparative study.	12
II.	Physical layer: Analog and Digital Transmission: Transmission Impairments, Data Rates Limits, Digital to Digital Conversion, Digital to Analog conversion, Analog To Digital Conversion: Modulation, Transmission Modes, Parallel, Serials Asynchronous and Synchronous communication; Constellation Diagram, Analog to Analog conversion, Band width Utilization, Transmission Media :Multiplexing: FDM, WDM AND TDM, Guided Media: Twisted Pair, Coaxial and Fiber Optic, Unguided Media: Wireless, Radio Waves, Microwaves and Infrared.	12
III.	Data Link Layer: Flow control: Protocols: Stop & wait ARQ, Go- Back-N ARQ, Selective repeat ARQ, HDLC; Medium Access Sub- layer. Point to point protocol, LCP, NCP, FDDI, token bus, token ring; Multiple Access Protocols: Pure ALOHA, Slotted ALOHA, CSMA, CSMA/CD, FDMA, TDMA, CDMA; Traditional Ethernet, Fast Ethernet.	12
IV.	Network Layer: Networking and Internetworking Devices: Repeaters, Hubs, Bridges, Switches, Router and Gateway. Addressing: Internet address, Class Full Address, Sub Netting, Classless Address; Routing: Techniques, Static Vs Dynamic Routing, And Routing Table For Glassful Address; Routing Algorithms :Shortest Partly Algorism,	12
V.	Transport Layer and Application Layer: UDP, TCP; Congestion Conti of algorithm: Leaky bucket algorithm, Token bucket algorithm, choke packets; Quality of service: techniques to improve QoS, DNS, SMTP, SNMP, FTP, HTTP, and World Wide Web (WWW). Domain Name System (DNS), Telnet, Firewalls; Modern Topics:WirelessLAN:IEEE802.11;IntroductiontoBluetooth, VLAN's, Cellular Telephony and Satellite Network.	12

Part A: Introduction

Program: Master Degree		Class: M.Sc. IT II Semester	Year: 2023	Session: 2023-24
1.	Course Code	MSCIT203		
2.	Course Title	Web Technology		
3.	Course Type	Theory		
4.	Pre-requisite (if any)	As per Govt. Norms / Institutional Scheme		
5.	Course Learning Outcomes (CLO)	At the end do this course ,the students will be able to: <ul style="list-style-type: none"> • Analyze webpage and identify its elements and attributes. • Create web pages using HTML,CSS,JAVASCRIPT,XHTML • Build dynamic web pages using Java Script (Client side programming). • Create XML Documents and Schemas. • Build interactive web applications using, PHP. AU.X. Learn Web Hosting and Deployment. 		
6.	Credit Value	Theory: 04		
7.	Total Marks	Max. Marks: 100	Min Passing Marks: 36	

Part B: Content of the Course

Total number of Teaching-Learning – Hours-60

Unit	Topics (Course Contents)	Hours
I	Introduction: Introduction to Web, Introduction to Internet WWW, Web Browsers, Web Server's. URL, Multipurpose Internet Mail Extensions, Protocols Governing The Web, Web Development Strategies, Web Design Principles and Web Site Structure Web Applications, Introduction to Web Publishing: Introduction, Domains Mean Hierarchy Domain Name Registration.	12
II	HTML: Introduction, Basic Formatting Tags: Heading, Paragraph, Line Breach, Bold, Italic, Underline, Superscript, Subscript, Font And Image. Different Attributes Like Align, Color, Go Color, Font Lace, Border, Size. Navigation Links Using Anchor Tag: Internal, External, Mail And Image Links, Link To Different Web Pages And Sections. Lists: Ordered, Unordered And Definition, Table Tag, HTML Form Controls: Form, Text, Password, Text Area, Button, Checkbox, Radio Button, Select Box, Hidden Controls, Frameset And Frames.	12
III	Scripting Languages: Usefulness of Style Sheets, Creating Style Sheets, Classes and Pseudo Classes, OSS Tags, Background, Font, Text, Position Etc. JavaScript: Overview, Syntax & Conventions, Variables, Expression ,Branching A Looping, Function ,Array, Objects, Events & Document Object Model Alerts Prompts And Confirms.	12
IV	PHP: Introduction to PHP, Server Side Scripting, Role of Web Server Software, Including Files, Comments, Variables and Scope, Echo and Print, Operators: Logical!, Comparison And Conditional Operators, Branching Statements, Loops, Break and Continue PHP Functions. Passing Information Between Pages, HTTP GET and POST Method, String Functions: Stolen, Strops, Starts, Shrimp, Subset, Set Replace, String Case, Array Constructs: Array(), List() And For Each (), PHP Advanced Functions: Header , Session, Cookie, Object Oriented Programming Using PHP :Class .Object, Constructor, Destructor and Inheritance.	12

V	Web Hosting and Deployment: Introduction to Webhosting, Word Press : Introduction to CMS and Word Press Why CMS Advantages and Disadvantages of CMS, Word Press Installation, User Administration, Word Press Themes, Working with Widgets Working with Menu for Website .Web Deployment ,XAMPP Configuring DHCP,IIS and DDNS Server.	12
---	---	----

Part C - Learning Resources

Text Books, Reference Books and E-Resources

Suggested Readings:

Text Books Recommended:

1. Xavier ,C," Web Technology and Design", New Age International.
2. Ivan Baryons, "HTML ,DHT kill, Java Script, Perl & CGI",BPB Publication.
3. Ramesh Bangia, "Internet and Web Design" ,New Age International.
4. Ulpian, "PHP for the Web: Visual Quick Start Guide" ,Pearson Education.
5. Jim Converse & Joyce Park, "PHP & My SQL Bible ", Wiley India Publication
6. Raj Canal , "Internet and Web Technologies", Tata Mc Craw-Hill.

Reference books:

1. Internet and Internet Engineering, Daniel Minoli,TMI4.
2. Cliuckniusiano & BillKenndy ,O Reilly HTML The Definite Guide"
3. JosephSchinuller,DynamicHTML,RPB,2000.
4. Deitel,Deitel,Goldberg."Inteniet& WorldSideWebHowtoProgram",Third Edition, Peaison Education, 2006.

Online resources:

1. <https://onlinecourses.sv.ayaic2.ac.in/aic20sp11/preview>
2. https://www.coursera.org/learn/introduction-to-web-development-y7j/html_c_js-javascript?act
3. <https://epu0.inflibnet.ac.in/e0gpdata/unloads/epu0content/S000007CS/P001071/M017403/ET/14>
4. <https://epfip.inflibnet.ac.in/Home/ViewSubject?catid=fBYckOKJvP3a/8Vd3>
5. <https://www.coursera.org/learn/introduction-to-relational-database>

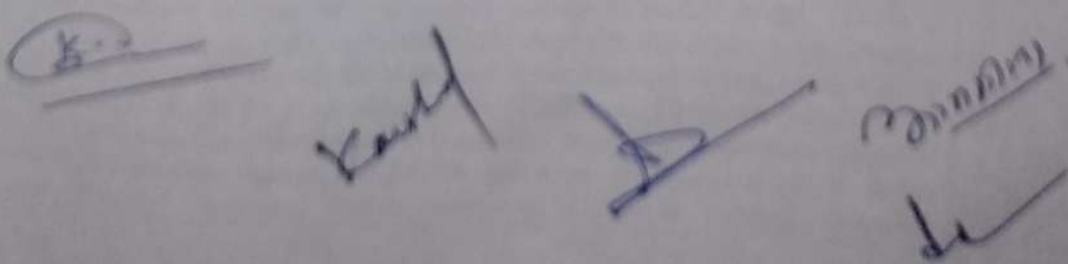
Part D: Assessment and Evaluation

Maximum Marks: 100 Marks
End Semester Examination(ESE): 80 Marks
Internal Assessment(IA): 20Marks

Internal Assessment:

1. Unit test (10 Marks): There will be two tests for 10 marks.
2. Presentation/Seminar (10 Marks)

Total:20 Marks



Part A: Introduction			
Program: Master Degree		Class: M.Sc. IT II Semester	Year: 2023
Session: 2023-24			
1.	Course Code	MSCIT204	
2.	Course Title	Relational Database Management System	
3.	Course Type	Theory	
4.	Pre-requisite (if any)	As per Govt. Norms / Institutional scheme	
5.	Course Learning Outcomes (CLO)	<p>At the end of this course ,the students will be able to:</p> <ul style="list-style-type: none"> • Learn about Database Concepts ,Architecture ,various Users, Data hides and Data management which helps them to interact with various Databases • Develop various tables and Databases which helps them to develop new Software • Practice various SQL commands which help them to generate new relationships among various Tables and Databases which are used for Software Development • Make familiar about r d b m s Software like Oracle and SQL Server which are used for Backend for Software Development. • Development which enhances their Data Storage, Data accessibility) and data management. 	
6.	Credit Value	Theory : 04	
7.	Total Marks	Max. Marks: 100	Min Passing Marks: 36

Part B: Content of the Course

Total number of Teaching-Learning – Hours-60

Unit	Topics(Course Contents)	Hours
I.	Overview of Database Management: data. Information and Knowledge, Data Processing versus Data Management, File Oriented Approach verses Database Oriented Approach, Data Independence, Database administration Roles, Overview of Database DBMS Architecture, Different minds of DBMS users, Introduction to Data dictionary, data Models: Network model, Relational model, Hierarchical Model .Database Languages : DDL, DML, DCL , TCL, Structured Query Language: Basic Data Types, Commands: Create, insert, Select. Delete. Truncate Drop, Alter, Grant, and Revoke. Commit ,it roll back, Queries on multiple relation, Join Operations, string operations ,Set Operations, grouping and nested sub queries.	12
II.	Concept of Database Management System: Definition of Tables, Cardinality relationships in a Database, Constraints Database, Entity Attributes, Strong and weak. entity, ER-Diagram, symbol and Implementation, Concept of keys :Candidate key ,Primary key,12Alternate key, Foreign key, Case study of ER modelling Generalization, Specialization, aggregation converting and ER model in to relational schema.	12
III.	Relational Database design: Normalization concept in logical model, Pitfalls in database design, Functional dependencies, Join dependencies Natural Join Normal forms (1NF, 2NF, 3NF). Boyce- Cods Normal forts, Decomposition, Multi-Valued Dependencies, 4NF, 5NF. De-normalization. Relational Database, Structure of Relational Database, Schema. Relational Operation. Selection, Projection, Cartesian Production, Union, Intersection and Minus operation .Relational Algebra: Select operation, Project operation, Union operation, Cartesian Product operation	12

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

	Intersection operation, Join operation, Different types of joins (Inner join, Outer join, Self join).	
IV.	Transaction Processing: ACID Properties of Transactions, Concurrency control, Transaction support in SQL, Locking Techniques, Database recovery techniques - Shadow paging, Log Based Recovery, recovery algorithm, Database Security, Deadlock: Detection, Avoidance and Recovery.	12
V.	DBMS Software: Oracle, SQL Server and My SQL- Oracle, SQL Server and My SQL Installation Features of this software's, Database creation, Backup and restore. Implementation of SQL: Data Definition Language (DDL) commands, Data Manipulation language (DML) commands, Data Control Language- (DCL) command, Transaction Control Language (TCL) command, Data Constraints, Introduction to PL/SQL Programming, Data types, Looping Statements, Cursors, Stored Procedure, Function.	12

Part C - Learning Resources

Text Books, Reference Books and E-Resources

Suggested Readings:

Text books:

1. Database system concept, H. Korth and A. Silberschatz, TMHPublications.
2. Data Base Management System ,Alexies & Mathews, Vikashpublication.
3. Data Base Management System, C. J. Date ,Naroslia Publication.
4. Data Base Management Systems By James Matin.

Reference Books:

1. ProgramDesign,PeterJuliff,PHIPublications.
2. TheCompleteReference,KevinLoney,OraclePress.
3. SQL,PL/SQLTheProgrammingLanguageofOracle,IvanBayross,PustakKosh Publication.
4. Microsoft SQLServer Management and Administration.Ross,STIvl Publications.

Online resources:

1. SWAYAMURLlinkforDBMSandRDBMS:<http://youtube/f6LgtJutWyA>
2. SWAYAMURLlinkforDBMSandPWBNI:<https://youtu.be/IoL9Ve2SRwO>
3. SWAYAM URL linkfor DBMS and RDBMS:https://swavam.gov.in/courses/4434-data-base-managgrri-entsy_yte_jy.
4. IntroductionofDBMS:<https://onlinecourses.swayain2.ac.in/cec19cs05/preview>
5. Introductionof RDBMS:<https://onlinecourses.nptel.ac.in/noel9cs46/preview>
6. <https://epfip.inflibnet.ac.in/Home/ViewSubject?catid=fBYckOKJvP3a/8Vd3L08tO>
7. <https://www.coursera.org/learn/introduction-to-relational-databases>

Part D: Assessment and Evaluation

Maximum Marks: 100 Marks

End Semester Examination(ESE): 80 Marks

Internal Assessment(IA): 20Marks

Internal Assessment:

1. Unit test (10 Marks): There will be two tests for 10 marks.
2. Presentation/Seminar (10 Marks)

Total:20 Marks

