DEPARTMENT OF COMPUTER SCIENCE

COURSE CURRICULUM & MARKING SCHEME

PROGRAM CODE: DPMS07

Scheme of M. Sc. Computer Science Under Semester System

(Based on CBCS)

SESSION: 2025-26

D. P. VIPRA COLLEGE,

(AN AUTONOMOUS INSTITUTION)

OLD HIGH COURT ROAD BILASPUR

(CHHATTISGARH)

RE-ACCREDIATED "A" GRADE BY NAAC Phone No: 07752-424497

Website: www.dpvipracollege.ac.in Email: dpvipracollege@gmail.com

Scheme of M. Sc. Computer Science Under Semester System

Program Code & Name: DPMS07 - M.Sc. (Computer Science)

Session 2025-26

Semester	Course Code	Course Name	Credit			Total Credit	Marks			
							ESE	CIA	Total	
			L	T	P				MAX	MIN
First	MCST101	Computer Architecture	3	1	-	4	70	30	100	40
	MCST102	Advanced Computer Network	3	1	-	4	70	30	100	40
	MCST103	JAVA Programming	3	1	-	4	70	30	100	40
	MCSE104	Operating System Concepts	3	1	-	4	70	30	100	40
	MCSP101	Programming Lab in JAVA	-	-	2	2	35	15	50	20
	MCSP102	Programming Lab in Linux	-	-	2	2	35	15	50	20
						20	**350**	**150**	**500**	**200**
Second	MCST201	RDBMS Using ORACLE	3	1	-	4	70	30	100	40
	MCST202	Data Structure with C++	3	1	-	4	70	30	100	40
	MCST203	Software Engineering	3	1	-	4	70	30	100	40
	MCSE201	Cryptography and Network Security	3	1	-	4	70	30	100	40
	MCSP201	Programming Lab in RDBMS	-	-	2	2	35	15	50	20
	MCSP202	Programming Lab in Data Structure in C++	-	-	2	2	35	15	50	20
					Total	**20**	**350**	**150**	**500**	**200**
Third	MCST301	Theory of Computation	3	1	-	4	70	30	100	40
	MCST302	Data Science using Python	3	1	-	4	70	30	100	40
	MCST303	ASP.NET using C#	3	1	-	4	70	30	100	40
	MCSE304	Mobile Computing	3	1	-	4	70	30	100	40
	MCSE305	Data Mining and Data Warehousing	3	1	-	4	70	30	100	40
	MCSP301	ASP.NET using C# Lab - I	-	-	2	2	35	15	50	20
	MCSP302	Python Programming Lab - II	-	-	2	2	35	15	50	20
					Total	**20**	**350**	**150**	**500**	**200**
Fourth	MCST401	Compiler Design	3	1	-	4	70	30	100	40
	MCST402	Artificial Intelligence & Machine Learning	3	1	-	4	70	30	100	40
	MCST403	IOT based Programming	3	1	-	4	70	30	100	40
	MCSE404	Advanced Neural Network & Deep Learning	3	1	-	4	70	30	100	40
	MCSE405	Cloud Computing	3	1	-	4	70	30	100	40
	MCSP401	Major Project	-	-	4	4	70	30	100	40
					Total	**20**	**350**	**150**	**500**	**200**
					Grand Total	**80**	**1400**	**600**	**2000**	**800**

Program Code and Name	**DPMS07, M.Sc. (COMPUTER SCIENCE)**			Semester	**I**
Exam Code and Name	**2071 - M. Sc. COMPUTER SCIENCE FIRST SEMESTER**			Paper	**I**
Course Code	**MCST101**			Course Type	**T**
Course Title	**Computer Architecture**				
Total Credit	**4**				
Total Marks	CIA: 30/15	ESE: 70/35	Max Marks: 100/50	Min. Pass. Marks: 40/20	
Prerequisites (if any)					
Course Outcomes	CO1: Identify basic components and design of the CPU: the ALU and control unit. CO2: Compare and select various Memory devices as per requirement. CO3: Compare various types of IO mapping techniques. CO4: Critique the performance issues of cache memory and virtual memory.				

Contents of Course

Unit	Contents	No. of Period
I	**STRUCTURE OF COMPUTERS:** Computer types, Functional units, Basic operational concepts, Evolution of Computer architecture, Von- Neumann Architecture, Bus Structures, Software, Performance, Multiprocessors and Multicomputer, Data representation, Fixed and Floating point, Error detection and correction codes. **COMPUTER ARITHMETIC:** Addition and Subtraction, Multiplication and Division algorithms, Floating-point Arithmetic Operations, Decimal arithmetic operations.	15
II	**BASIC COMPUTER ORGANIZATION AND DESIGN:** Instruction codes, Computer Registers, Computer Instructions and Instruction cycle. Timing and Control, Memory-Reference Instructions, Input-Output and interrupt. Central processing unit: Stack organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Complex Instruction Set Computer (CISC) Reduced Instruction Set Computer (RISC), CISC vs RISC. Pipelined processors-Linear pipeline, on linear pipeline-Instruction pipeline design-Arithmetic pipeline design.	15
III	**REGISTER TRANSFER AND MICRO-OPERATIONS:** Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic Micro-Operations, Logic Micro-Operations, Shift Micro-Operations, Arithmetic logic shift unit. **MICRO-PROGRAMMED CONTROL:** Control Memory, Address Sequencing, Micro-Program example, Design of Control Unit.	15
IV	**MEMORY SYSTEM & Buses:** Memory Hierarchy, Semiconductor Memories, RAM (Random Access Memory), Read Only Memory (ROM), Types of ROM, Performance considerations, Virtual memory, Paging, Secondary Storage, RAID. Cache Memory, Aliasing problem in cache, cache memory mapping techniques-Shared memory organization-Interleaved memory organization, Lower order interleaving, Higher order interleaving. Backplane bus systems-Bus addressing, arbitration and transaction.	15
	Total no. of Lectures	**60**

Text books	1. M. Moris Mano (2006), Computer System Architecture, 3rd edition, Pearson/PHI, India.
Reference books	1. Carl Hamacher, Zvonks Vranesic, SafeaZaky (2002), Computer Organization, 5th edition, McGraw Hill, New Delhi, India. 2. William Stallings (2010), Computer Organization and Architecture- designing for performance,8th edition, Prentice Hall, New Jersy. 3. Anrew S. Tanenbaum (2006), Structured Computer Organization, 5th edition, Pearson Education Inc,

Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks	Continuous Internal Assessment (CIA): 30 Marks	End Semester Exam (ESE) : 70 Marks
Continuous Internal Assessment (CIA)	Internal Test/Quiz- (2): 20 & 20 Assignment / Seminar: 10 Total Marks: 30	Better marks out of the two Test / Quiz + obtained marks is Assignment shall be considered against **30** Marks
End Semester Exam (ESE)	**Three Section - A, B & C** Section A: Q1. Objective- 10 x 1 = 10 Mark; Section B: Long Answer type questions 1 out of 2 from each unit- 4 x 5 = 20 Marks; Section C: Descriptive answer type questions 1 out of 2 from each unit- 4 x 10 = 40 Marks;	

Program Code and Name	**DPMS07, M.Sc. (COMPUTER SCIENCE)**		Semester	**I**
Exam Code and Name	**2071 - M. Sc. COMPUTER SCIENCE FIRST SEMESTER**		Paper	**II**
Course Code	**MCST102**		Course Type	**T**
Course Title	**Advanced Computer Network**			
Total Credit	**4**			
Total Marks	CIA: 30/15	ESE: 70/35	Max Marks: 100/50	Min. Pass. Marks: 40/20
Prerequisites (if any)				
Course Outcomes	CO1: Demonstrate the Basic Concepts of Networking, Networking Principles Routing Algorithms IP Addressing and Working of Networking Devices. CO2: Describe compare and contrast LAN WAN MAN Intranet Internet AM FM PM and Various Switching Techniques. CO3: Explain the working of Layers and apply the various protocols of OSI & TCP/IP model. CO4: Install and Configure the Networking Devices.			

Contents of Course

Unit	Contents	No. of Period
I	**Computer Networks and the Internet:** History of Computer Networking and the Internet, Internet and Intranet, Network Applications like Web, HTTP, FTP and Electronic Mail in the Internet, Networking Devices, The Network edge, The Network core, Access Networks and Physical media, ISPs and Internet Backbones. Networking Models: 5-layer TCP/IP Model, 7-Layer OSI Model, Internet Protocols and Addressing, Equal-Sized Packets Model: ATM.	15
II	**Network Routing and its Concepts:** Structure of a Router, Basic Router Configuration, Routing Algorithms: Link-State Routing Algorithm, The distance Vector Routing Algorithm, Hierarchical Routing. Routing in the Internet: Intra-AS Routing in the Internet: RIP, OSPF, BGP. Broadcast and Multicast Routing.	15
III	**Wireless and Mobile Network:** Introduction, Wireless Links and Network characteristics, CDMA, WiFi 802.11 wireless LANs, Cellular Internet access, Mobility Management: Principles, Mobile IP, Managing mobility in Cellular Networks, Routing calls o mobile users, Handoffs in GSM. Impact of wireless and mobility on higher layer protocols.	15
IV	**Network Management:** What Is Network Management? The Infrastructure for Network Management, The Internet-Standard Management Framework, Structure of Management Information: SMI, Management Information Base: MIB, SNMP Protocol Operations and Transport Mappings, Security and Administration.	15
	Total no. of Lectures	**60**

Text books	1. Data communications and Networking, Behrouz A Forouzan, Tata Mc Graw-Hill 5th edition, 2013.
Reference books	1. Behrouz A. Forouzan (2006), Data communication and Networking, 4th Edition, Mc Graw-Hill, India. 2. Kurose, Ross (2010), Computer Networking: A top down approach, Pearson Education, India.

Assessment and Evaluation

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Continuous Internal Assessment (CIA)	Internal Test/Quiz- (2): 20 & 20 Assignment / Seminar: 10 Total Marks: 30	Better marks out of the two Test / Quiz + obtained marks is Assignment shall be considered against **30** Marks
End Semester Exam (ESE)	**Three Section - A, B & C** Section A: Q1. Objective- 10 x 1 = 10 Mark; Section B: Long Answer type questions 1 out of 2 from each unit- 4 x 5 = 20 Marks; Section C: Descriptive answer type questions 1 out of 2 from each unit- 4 x 10 = 40 Marks;	

Program Code and Name	**DPMS07, M.Sc. (COMPUTER SCIENCE)**		Semester	**I**
Exam Code and Name	**2071 - M. Sc. COMPUTER SCIENCE FIRST SEMESTER**		Paper	**III**
Course Code	**MCST103**		Course Type	**T**
Course Title	**JAVA Programming**			
Total Credit	**4**			
Total Marks	CIA: 30/15	ESE: 70/35	Max Marks: 100/50	Min. Pass. Marks: 40/20
Prerequisites (if any)				
Course Outcomes	CO1: Explain and apply the Object-Oriented Concepts for Solving Real Problem. CO2: Use the Java SDK Environment to Create Debug and Run Simple Java Programs. CO3: Apply Java Technology to Develop the Small Applications Utilities and Web Applications. CO4: Apply Event Management and Layout Managers Using AWT Swing JDBC and Servlet for Developing the Software for Various Problems.			

Contents of Course

Unit	Contents	No. of Period
I	**Basics of Java: History and Basics of Java:** Java Environment JDK Tools Java Virtual Machine Java Program Structure Java Language- Tokens Keywords Constants Variables and Data Types. Operators and Expressions Statements - Decision Making Branching and Looping Labeled Loops Statement Jump Statements: Break Continue and Return Command Line Argument.	15
II	Adding Variables and Methods Creating Objects Accessing Class Members Constructors Static Members Nesting of Methods Inheritance and Polymorphism: Basics Types Extending a Class Using Super Method Overloading Method Overriding Final Variables and Methods Final Classes Finalize Method Abstract Methods and Classes Visibility Control.	15
III	One and Two Dimension Arrays String Array String and String Buffer Classes Vectors Wrapper Classes, Interfaces: Defining Interfaces Extending Interfaces Implementing Interfaces Accessing Interface Variables Packages: System Packages Naming Conventions Creating Packages Accessing a Package Using Package Adding a Class to a Package Hiding Classes, Exception Handling: Introduction to Exception Handling, Try-Catch Finally Throws Throw, Java Thread Model: Life Cycle of a Thread, Thread Class Runnable Interface	15
IV	**Applet Programming:** Creating and Executing Java Applets Inserting Applets in a Web Page Applet Tag Local and Remote Applets Applets Vs. Applications Applets Life Cycle. Database Programming Using JDBC: Introduction to JDBC: JDBC Drivers Types of JDBC Drivers Connecting with Database. **J2EE:** Introduction of J2EE Web Application Basics Architecture and Challenges of Web Application Servlet Servlet Life Cycle Developing and Deploying Servlets.	15
	Total no. of Lectures	**60**

Text books	1. E. Balagurusamy "Programming with Java a Primer" TMH ISBN-13: 978-0-07-061713-1 Isbn-10: 0-07-061713-9.
Reference books	1. Patrick Naughton and Herbert Schildt "Java: The Complete Reference" TMH Publication ISBN 0-07-463769 X. 2. Yashavant Kanetkar "Let us Java" BPB Publications. 3. Ivan Bayross "Web Enabled Commercial Application Development Using HTML DHTML Javascript Perl CGI" BPB Publications

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End Semester Exam (ESE)	**Three Section - A, B & C** Section A: Q1. Objective- 10 x 1 = 10 Mark; Section B: Long Answer type questions 1 out of 2 from each unit- 4 x 5 = 20 Marks; Section C: Descriptive answer type questions 1 out of 2 from each unit- 4 x 10 = 40 Marks;	

Program Code and Name	**DPMS07, M.Sc. (COMPUTER SCIENCE)**			Semester	**I**
Exam Code and Name	**2071 - M. Sc. COMPUTER SCIENCE FIRST SEMESTER**			Paper	**IV**
Course Code	**MCST104**			Course Type	**T**
Course Title	**Operating System Concepts**				
Total Credit	**4**				
Total Marks	CIA: 30/15	ESE: 70/35	Max Marks: 100/50	Min. Pass. Marks: 40/20	
Prerequisites (if any)					
Course Outcomes	CO1: Able to analyze and design the applications to run in parallel either using process or thread models of different OS. CO2: Able to analyze the various device and resource management techniques. CO3: Able to understand the Mutual exclusion, Deadlock detection. CO4: Able to understand the file and secondary storage management system.				

Contents of Course

Unit	Contents	No. of Period
I	**Introduction**: Definition, Design Goals, Types, Batch processing, Multi-programming, Real time, Timesharing; Functions of Operating System. **Process Management**: Process states, Process Control block, Schedulers, CPU Scheduling algorithms	15
II	**Inter process synchronization and communication**: need, Mutual exclusion, semaphore, and classical problems in concurrent programming, critical region and conditional critical region, Deadlock, Characteristics, prevention, resource allocation graphs.	15
III	**Memory Management**: Address Binding, Dynamic Loading and Linking Concepts, Logical and Physical, Addresses, Contiguous Allocation, Fragmentation, Paging, Segmentation, Virtual Memory, Demand, Paging, Page fault, Page replacement algorithms, Global Vs Local Allocation, Thrashing	15
IV	**File and Secondary** Storage Management: File Attributes, File Types, File Access Methods, Directory, Structure, File System Organization, Allocation Methods, Free Space management; Disk Structure, Logical and Physical View, Disk Head Scheduling, Formatting, Swap Management. UNIX/ LINUX/ WINDOWS/Android as an example of Operating systems.	15
	Total no. of Lectures	**60**

Text books	1. Operating System Principles by P. B. Hansen, PHI.
Reference books	1. Operating System Concepts 6/ed By Silberschatz and Galvin, Addison Wesley. 2. Operating Systems: Internals and Design Principles 5/ed By William Stalling, PHI. 3. Modern operating Systems by Tanenbaum, PHI. 4. Operating System Concepts by Peterson and Silberschatz, Addison Wesley.

Assessment and Evaluation

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Maximum Marks: 100 Marks	Continuous Internal Assessment (CIA): 30 Marks	End Semester Exam (ESE) : 70 Marks
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End Semester Exam (ESE)	**Three Section - A, B & C** Section A: Q1. Objective- 10 x 1 = 10 Mark; Section B: Long Answer type questions 1 out of 2 from each unit- 4 x 5 = 20 Marks; Section C: Descriptive answer type questions 1 out of 2 from each unit- 4 x 10 = 40 Marks;	

Program Code and Name	**DPMS07, M.Sc. (COMPUTER SCIENCE)**			Semester	**I**
Exam Code and Name	**2071 - M. Sc. COMPUTER SCIENCE FIRST SEMESTER**			Paper	**I**
Course Code	**MCSP101**			Course Type	**P**
Course Title	**Programming Lab in JAVA**				
Total Credit	**2**				
Total Marks	CIA: 15	ESE: 35	Max Marks: 50	Min. Pass. Marks: 20	
Prerequisites (if any)					
Course Outcomes	CO1: Apply object-oriented programming concepts to develop Java applications effectively. CO2: Develop and execute Java programs using classes, inheritance, polymorphism, and exception handling. CO3: Implement file handling, multithreading, and GUI-based applications in Java. CO4: Design, debug, and test real-world Java programs using standard programming practices.				

Contents of Course

List of Experiments	**No. of Period**
1. Write a Program in Java to Calculate the Simple Interest. 2. Write a Program in Java to Calculate Sum of Two Numbers Input from Command Line Argument. 3. Write a Program in Java to Calculate Area of Circle Using Scanner Class. 4. Write a Program in Java to Calculate Square Root of a Number. 5. Write a Program in Java to Display Name Age Calendar and Salary of a Person Input from the Keyboard. 6. Write a Program in Java to Display Grading of Student When His Percentage is Input from Keyboard. 7. Write a Program in Java to Display Odd Number from 1 to 100. 8. Write a Program in Java to Display the Following Pattern. 1 2 2 3 3 3 4 4 4 4 5 5 5 5 5 9. Write a Program in Java to Calculate the Factorial of a Number. 10. Write a Program in Java to Determine Whether a Number Input from Keyboard is Prime Number or Not. 11. Write a Program in Java to Display the Prime Numbers from 1 to 500 Using Function. 12. Write a Program in Java to Show Accessing Class Members and use a Dot(.). 13. Write a Program in Java to Show Multilevel Inheritance. 14. Write a Program in Java to Show Single Inheritance. 15. Write a Program in Java to Concatenate Two Strings Without Using Library Function. 16. Write a Program in Java to Make First Alphabet Capital of Each Word in a String. 17. Write a Program in Java to Get the Last Index of Any Given Character in a String. 18. Write a Program in Java to Reverse Words of a String. 19. Write a Program in Java to Find Occurrences of Each Character in a String. 20. Java Program to Get String and Count Number of Words in Provided String. 21. Write a Program in Java to Check Given String is Palindrome String or Not in Java. 22. Write a Program in Java to Reverse Each Word of Given String. 23. Write a Program in Java to Get Sub String from a Given String. 24. Java Program to Convert String to Lowercase and Uppercase. 25. Create a Java Applet and Show the use of Drawstring () Function. 26. Create a Java Applet to Show How to use Various Methods of Applet Class and Graphics Class in a Java Applet. 27. Write a Program in Java to Show the use of Interface. 28. Create Two Html Pages with Links to Navigate from One Page to Other Page. 29. Write a Servlet to Display Current Date and Time of Server on Client Date Servlet 30. Write a Servlet to Display Natural Numbers from 1 to 100: Number servlet.	15
Total no. of Lectures	**60**

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Exam Code and Name	**2071 - M. Sc. COMPUTER SCIENCE FIRST SEMESTER**			Paper	**II**
Course Code	**MCSP102**			Course Type	**P**
Course Title	**Programming Lab in Linux**				
Total Credit	**2**				
Total Marks	CIA: 15	ESE: 35	Max Marks: 50	Min. Pass. Marks: 20	
Prerequisites (if any)					
Course Outcomes	CO1: Understand and execute basic Linux commands, shell scripting, and file management operations. CO2: Develop shell scripts using conditional statements, loops, functions, and text-processing utilities. CO3: Perform user management, process handling, and system administration tasks in Linux environment. CO4: Apply Linux tools and utilities to automate tasks, manage files, and solve real-world computing problems.				

Contents of Course

	List of Experiments	**No. of Period**
	1. Create a new directory named lab2 **2.** Change directories into lab2 **3.** List all files even hidden files (directory should be blank) **4.** Create a new file that contains the calendar for this month **5.** List all files again even hidden files (there should be just one file) **6.** Display the entire contents of that new file **7.** Delete the file **8.** Ask the system for today's date **9.** Write a shell script that prints "Hello World" to the terminal. **10.** How can you assign a value to a variable in a shell script? **11.** Write a shell script that takes a user's name as input and greets them. **12.** Create a shell script that checks if a file exists in the current directory. **13.** How can you use command-line arguments in a shell script? **14.** How do you use the for loop to iterate through a list of values? **15.** Write a shell script that calculates the sum of integers from 1 to N using a loop. **16.** Create a script that searches for a specific word in a file and counts its occurrences. **17.** How do you read lines from a file within a shell script? **18.** Write a function in a shell script that calculates the factorial of a given number. **19.** Create a script that checks for and removes duplicate lines in a text file. **20.** Write a script that generates a secure random password. **21.** Write a shell script that calculates the total size of all files in a directory. **22.** Create a shell script that finds and lists all empty files in a directory. **23.** Write a shell script that converts all filenames in a directory to lowercase. **24.** Create a script that checks if a network host is reachable. **25.** Write a Shell Script to Find the Greatest Element in an Array. **26.** Write a script to calculate the sum of Elements in an Array.	15
	Total no. of Lectures	**60**

Text books	1. Operating System Principles by P. B. Hansen, PHI.
Reference books	1. Operating System Concepts 6/ed By Silberschatz and Galvin, Addison Wesley. 2. Operating Systems: Internals and Design Principles 5/ed By William Stalling, PHI. 3. Modern operating Systems by Tanenbaum, PHI. 4. Operating System Concepts by Peterson and Silberschatz, Addison Wesley.

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