Programme	BCA Honors		Branch/Spec.	Computer Applications	
Semester	VI		Version	1.0.0.0	
Effective from Academic Year	2026-2027		Effective for the batch Admitted in	June 2024	
Subject Code	U36B4FOD	Subject Name	FUNDAMENTALS OF DATACENTER		

Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	4	-	-	-	4	Theory	50	50	100
Hours	4	-	-	-	4	Practical	-	-	-

Objective:

To provide theoretical knowledge about datacenter infrastructure, operations and management, covering topics like storage systems, virtualization, cloud integration and disaster recovery.

Pre-requisites:

Basic understanding of computer systems, networks, and storage fundamentals.

Course Outcomes:

Name of CO	Description
CO1	Understand the architecture and key components of datacenters.
CO2	Learn about datacenter infrastructure standards, design, and layout.
CO3	Explain storage systems and their management in datacenters.
CO4	Understand the role of virtualization and cloud computing in datacenters.
CO5	Describe datacenter operations, monitoring, and disaster recovery planning.
CO6	Analyze emerging trends and best practices in datacenter management.

Mapping of CO and PO											
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

CO1	3	2	0	2	2	2	1	1	1	1	2	1
CO2	3	2	0	3	2	2	2	2	1	1	1	1
CO3	2	3	0	3	3	2	2	2	1	1	1	0
CO4	2	2	1	2	3	3	2	3	1	1	2	1
CO5	2	2	0	3	3	2	2	2	2	1	2	2
CO6	2	2	1	2	2	3	2	2	2	2	3	2

Content:

Unit		Hrs
1	**Introduction to Datacenters** Definition, purpose and types of datacenters, Datacenter components: servers, storage, networking, power, cooling, History and evolution of datacenters, Datacenter facilities: raised floor, HVAC, security systems	10
2	**Datacenter Design and Infrastructure Standards** TIA-942 and other datacenter standards, Design considerations: power, cooling, space, scalability, Tier levels (Tier I to Tier IV) and availability, Redundancy, uptime, and fault tolerance	10
3	**Storage Technologies in Datacenters** Introduction to storage types: DAS, NAS, SAN, RAID levels and implementation concepts, Backup strategies and storage management, Data availability and deduplication	10
4	**Virtualization and Cloud Integration** Basics of virtualization: server, storage, and network virtualization, Virtualization benefits and architecture, Datacenter and cloud convergence, Private, public, and hybrid cloud models (conceptual overview)	10
5	**Datacenter Operations and Monitoring** Datacenter operation management and roles, Environmental monitoring and power management, Security measures (physical and logical), Energy efficiency and Green IT practices	10
6	**Disaster Recovery and Future Trends** Disaster recovery planning and business continuity concepts, Data replication and recovery techniques, Emerging technologies: software-defined datacenter, edge computing, Trends in automation and AI in datacenter management	10

Practical Content:

NA	
Text Books:	
1	Hwaiyu Geng, Data Center Handbook: Plan, Design, Build, and Operations of a Smart Data Center, Publisher: Wiley, Publication Date: May 4, 2021, ISBN-10: 1119597501
Reference Books:	
1	Javvin Technologies Inc., Data Center Networking: Fundamentals and Design, Publisher : Javvin Technologies Inc., Publication Year: 2004 , ISBN-10: 097409451X
2	Scott D. Lowe, David M. Davis, James Green; Building a Modern Data Center: Principles and Strategies of Design; Publisher :ActualTech Media, Publication Date: January 1, 2016, ISBN-10: 1943952078
3	B.A. Ayomaya ; Data Center for Beginners: A beginner's guide towards understanding Data Center Design (Data Center Design Guide): ISBN-10: 1520527071, Edition: 1st (March 31, 2020)
Web References / MOOC / Certification Course	
1	https://www.udemy.com/course/data-center-fundamentals-the-complete-introduction
2	https://www.coursera.org/learn/gcp-fundamentals
3	https://www.mooc-list.com/course/managing-windows-servers-virtualization-containerization-coursera
4	https://www.udemy.com/course/data-center-fundamentals-the-complete-introduction/?srsltid=AfmBOop4tpOeR0te11geX2sQCg0c3VirxRX2qhuA91vcgPCMja2XtzBt&couponCode=MT40825C
5	https://cnet-training.com/programs/data-centre-fundamentals-dcf/

Question Paper Scheme:	
	End Semester Examination Duration: (2 Hours Theory Examination)
	Note for Examiner: -
	Q-1 Any Five out of Seven (25 Marks)
	Q-2 Any Two out of Three (06 Marks)
	Q-3 Mandatory question (05 Marks)
	Q-4 Any Two out of Three (08 Marks)
	Q-5 Any Two out of Three (06 Marks)
	The question paper must comprehensively address all Course Outcomes (COs), align Taxonomy levels, and ensure complete syllabus coverage.